October 20, 2010

Mr. William Ports, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, New York 12233-7017

RE: Revised Remedial Design Work Plan dated October 2010 and Responses to New York State Department of Environmental Conservation and New York State Department of Health Comments on the Remedial Design Work Plan - New York State Electric & Gas Corporation Cortland Remote Holder Site (Site # 7-12-012)

Dear Mr. Ports:

On behalf of New York State Electric & Gas Corporation (NYSEG), URS Corporation – New York (URS) is pleased to present the New York State Department of Environmental Conservation (NYSDEC) with one revised copy of the Remedial Design Work Plan for the above-referenced site dated October 2010. This submittal incorporates minor revisions based upon your September 29, 2010 Comment Letter on the September 2010 submittal. Also included is one electronic copy in PDF format on CD. We have also sent a revised copy and an electronic copy to Ms. Julia Kenney at the New York State Department of Health (NYSDOH), two hard copies and two electronic copies to the Cortland Free Library, and one hard copy and one electronic copy to Ms. Diane Carlton at the Department's Region 7 Office.

The NYSEG response to comments is presented below. NYSDEC comments are *italicized* and responses are in **bold**.

Comment 1. Submit a revised cover page with the stamp, certification, and signature by a New York State licensed Professional Engineer.

NYSEG Response: Comment noted. A revised cover page is included in this submittal, and has been stamped, certified, and signed by a New York State licensed Professional Engineer.

Comment 2. On Page 3-3, please change Julia Kenney's email address to the following: beei@health.state.ny.us.

NYSEG Response: Ms. Kenney's email address has been changed in the document. A revised page 3-3 is included in the October 2010 submittal.

Comment 3. Page 3-5-CAMP Section: The daily recorded perimeter real-time air monitoring readings for volatile organic compounds and particulates should be submitted to the Department and NYSDOH at the end of each week via email.

NYSEG Response: NYSEG proposes to email the air monitoring data in the manner that is consistent and currently used at similar NYSEG projects. On other projects NYSEG has emailed the CAMP data no later than the end of day Tuesday following the week in which the data were collected and will do the same for this project as well.

Comment 4. Page 3-11, Section 3.9 The backfill materials will meet the requirements found in Part 375-6 for restricted residential use.

URS Corporation
77 Goodell Street
Buffalo, NY 14203
Tel: 716.856.5636
Fax: 716.856.2545

NYSEG Response: The referenced sections were modified to include the '6' in 375-6.

Comment 5. Appendix C, Section 1.3 Odor Monitoring, page 1-2: I understand that NYSEG will set up a toll-free number to register odor complaints from residents. A list of the residents and the nature of the complaints should be forwarded to the State.

NYSEG Response: The list of the calls and complaints to the toll-free number set up to register odor complaints from residents will be forwarded to the Department.

General Comment: The modifications above are minor and revised pages could be submitted instead of reproducing the entire Work Plan. We still need to have revised electronic copies of the Work Plan submitted. Please send copies to the Cortland Free Library and our Department's Region 7 Office document repositories.

NYSEG Response: The modifications noted above have been made to the Work Plan. Revised pages are included in the October 2010 submittal. Electronic copies of the entire Work Plan, Plans, Specifications and Drawings are also enclosed. Final electronic and paper copies of the Remedial Design Work Plan have been distributed to the repositories.

If you have any questions or concerns please contact Tracy Blazicek at (607) 762-8839.

Sincerely,

URS Corporation

Michael Gutmann
Project Manager

Enc. 1 hard copy + 1 cd

cc: Tracy Blazicek, NYSEG – 1 hard copy + 1 cd
Ms. Julia Kenney, NYSDOH – 1 hard copy + 1 cd
Cortland Free Library – 2 hard copies + 2 cds
Ms. Diane Carlton, NYSDEC Region 7 – 1 hard copy + 1 cd
File: 11174305 C-1

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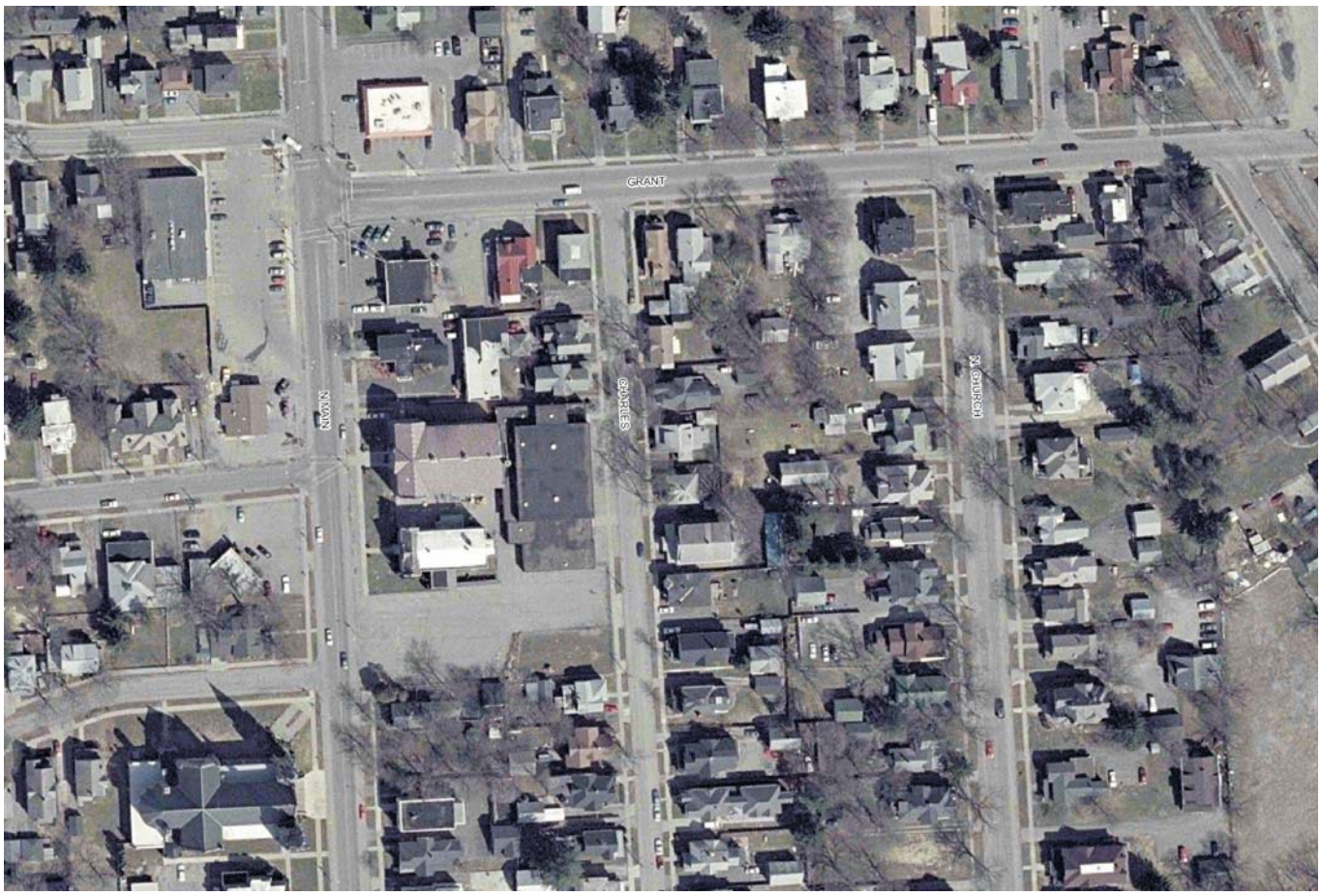
NYSEG

New York State Electric & Gas Corporation

Charles Street Site
Site #7-12-012
Cortland, New York

REMEDIAL DESIGN WORK PLAN
OCTOBER 2010



Prepared For:
New York State Electric & Gas Corporation
Kirkwood Industrial Park
Kirkwood, New York

URS

URS Corporation - New York

REMEDIAL DESIGN WORK PLAN

FOR

REMEDIATION OF THE CHARLES STREET SITE

SITE #7-12-012

CITY OF CORTLAND, CORTLAND COUNTY, NEW YORK

Prepared For:

NEW YORK STATE ELECTRIC & GAS CORPORATION

James A. Carrigg Center
18 Link Drive
P.O. Box 5224
Binghamton, New York 13902-5224

Prepared by:

URS CORPORATION

77 Goodell Street
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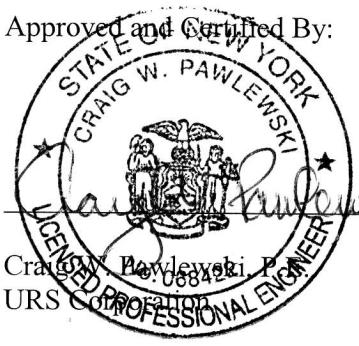
OCTOBER 2010

Approved and Certified By:



Craig W. Pawlewski, P.E.
URS Corporation

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A Work Plan - NYSDEC Approval Letter (to be included following NYSDEC approval)
B Record of Decision (NYSDEC, March 2010)
C Community Air Monitoring Plan
D Construction Quality Assurance and Quality Control Plan
E Contingency Plan
F Odor, Vapor, and Dust Control Plan
G Quality Assurance Project Plan
H Sampling and Analysis Plan
I Traffic Plan
J Transportation of Solid or Liquid Material Plan
K NYSEG Health and Safety Plan

LIST OF ACRONYMS REFERRED TO IN THE DOCUMENT

ac	asphalt/concrete
CAMP	Community Air Monitoring Plan
CPP	Citizen Participation Plan
CQAP	Construction Quality Assurance Plan
DPW	Department of Public Works
FS	feasibility study
HASP	NYSEG Health and Safety Plan
H&CGL	Homer & Cortland Gas Light Company
kg	kilogram
L	liter
mg	milligram
ml	milliliter
MGP	manufactured gas plant
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
NYSEG	New York State Electric & Gas Corporation
OVDCP	Odor, Vapor, and Dust Control Plan
OSHA	Occupational Safety and Health Act or Administration
PAHs	polycyclic aromatic hydrocarbons
ppb	part per billion
PPE	personal protective equipment
ppm	parts per million
PSA	preliminary site assessment
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
RI	Remedial Investigation
ROD	Record of Decision
ROW	right-of-way
SAP	Sampling and Analysis Plan
SCOs	soil cleanup objectives
sf	square foot
TAGM	technical and administrative guidance memorandum
URS	URS Corportation

1.0 INTRODUCTION

URS Corporation (URS) has prepared this *Remedial Design Work Plan (Work Plan)* for New York State Electric and Gas (NYSEG) for NYSEG's former off-site gasholder site (located in the City of Cortland, Cortland County, New York) associated with the Homer former Manufactured Gas Plant (MGP) site. The Site is located on Charles Street. The New York State Department of Environmental Conservation (NYSDEC) identification number for the Site is 7-12-012. This *Work Plan* for the Charles Street Site and all the work completed at the Site is intended to address the requirements under Subparagraph IV (4) of the Order on Consent. This *Work Plan* was prepared by URS and approved by NYSDEC (Appendix A) and is based on information and data presented in the *Remedial Investigation (RI) Report, NYSEG – Former Off-site Gasholder Associated with the Homer Former MGP Site*, prepared by URS, March, 2009, and the *Feasibility Study (FS) Report, NYSEG- Cortland Remote Holder Site*, prepared by URS, March, 2010, and the *Record of Decision (ROD), Cortland Remote Holder Site*, prepared by the NYSDEC, March, 2010 (Appendix B). This project will be undertaken by NYSEG and will involve soil removal with offsite disposal. A minimum of two feet of cover will be placed over excavated areas for the protection of human health and the environment. The excavated area will be backfilled in preparation for the as yet to be determined future use of the site. The cover may consist of a combination of soil, vegetation, concrete sidewalks, and asphalt parking areas. At a minimum the Design includes replacement of the public sidewalk and street trees, and green space. Potential land use may also include construction of a parking lot, additional sidewalks, and/or landscaping within the green space. Optional components which may be included in the Design are discussed in Sections 3.11and 3.12 of this *Work Plan*. The Design Plans, Specifications, and Drawings include provisions for these optional components. Future land use of the Site will be consistent with its current zoning.

This *Work Plan* describes the techniques to be utilized for the excavation, waste characterization (if necessary for disposal), transportation and disposal of materials, air monitoring, and construction of the Remedial Design components. The *Work Plan* will be performed under the approval and oversight of the NYSDEC and the New York State Department of Health (NYSDOH).

1.1 Site Location and Description

The site is situated in a residential neighborhood, encompasses two residential lots (43 and 45 Charles Street), and is bounded on the northern, eastern, and southern sides by other residences as shown on Drawing 2. Charles Street runs north/south along the western side of the Site. St. Mary's School is located across

Charles Street from the site. The topography is relatively flat with elevations near 1,119 feet above mean sea level across the site. The nearest surface water bodies to the study area are, Otter Creek, the West Branch of the Tioughnioga River and the Tioughnioga River, all located 1,000 feet or farther from the site.

There were 2 two-story residences within the study area, each with a one-car garage. The onsite buildings were demolished to ground level in December 2009. The open basement areas are exposed at the surface and partially filled with foundation materials (e.g., concrete blocks, cinder blocks, and stones). Asphalt driveways and concrete sidewalks remain, the locations of which are shown on Drawing 2 (Existing Site Conditions). A six-foot high chain link fence surrounds the site area east of the public sidewalk. The properties are currently owned by NYSEG and zoned as R-4, residential for single and multi-family residences.

1.2 Site History

In 1858, the Homer & Cortland Gas Light Company (H&CGL) constructed and operated a manufactured gas plant at what is now 216 South Main Street (Route 11) in the Village of Homer, Cortland County, New York. Coal gas and carbureted water gas were produced at the MGP from 1858 until 1932. Based on the property deed, as recorded in Liber 43/Page 574 of the City of Cortland records, in May 1867 H&CGL acquired one third of an acre of land, in the City of Cortland, and constructed a 22,000 cubic foot gasholder on the property as part of a distribution network for the MGP. Historical records and Sanborn maps indicate that the remote gasholder was located at the approximate location shown on Figure 1. Historical records also indicate that in July 1867, H&CGL acquired the rights from a property owner for property located east of the site to install a gas pipeline extending from the former gasholder east through the property (eight feet south of a house) to North Church Street. New York State Gas and Electric (a predecessor to NYSEG) acquired the MGP on Route 11 from H&CGL in 1911. In February 1913, H&CGL sold the one third of an acre upon which the gasholder was located to Edward S. Dalton and L.R. Chase. Sanborn maps from 1915 and 1926 indicate the gasholder was no longer present and the residences previously located at 43 and 45 Charles Street existed at that time.

1.3 Previous Investigations

The area surrounding the site is an urban setting and has been for over 100 years. No investigation work was completed at the site prior to a Preliminary Site Assessment (PSA). The following site assessments have been performed:

- October 2007 – Preliminary Site Assessment for NYSEG - Former Off-site Gasholder Associated with the Homer Former MGP Site, Cortland, New York, prepared by URS Corporation;

- March 2009 – Remedial Investigation Report for NYSEG – Former Off-site Gasholder Associated with the Homer Former MGP Site, Cortland, New York, prepared by URS Corporation; and

- February 2010 – Feasibility Study Report for NYSEG – Cortland Remote Holder Site, Cortland, New York, prepared by URS Corporation.

Documents associated with previous investigations and this *Work Plan* are available for public review at the following document repositories:

- Cortland Free Library
  32 Church Street
  Cortland, New York 13045
  Phone: (845) 357-1237

- New York State Department of Environmental Conservation
  Region 7
  615 Erie Boulevard West
  Syracuse, New York 13204
  Phone: (315) 426-7403.

1.4 Nature and Extent of Contamination

The primary soil contamination is associated with the former remote gasholder and is found in subsurface soil at depths ranging 9 to 12 feet below ground surface (bgs), within a layer of darkly stained ash and silt. The primary soil contaminants present are polycyclic aromatic hydrocarbons (PAHs). PAHs and metals contamination was also found above soil cleanup objectives (SCOs) for unrestricted use in onsite surface soil samples. The PAHs that exceeded SCOs in onsite surface soil samples were benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene, and the metals were lead and mercury.

Groundwater at the site was observed at a depth of about 14 to 15 feet bgs, with flow to the east with a low horizontal gradient. No site related contaminants were detected in the first round of groundwater sampling. During a second round of sampling, low levels of site related contaminants (PAHs) were determined to be likely due to soil particles entrained in the groundwater sample from a turbid groundwater

monitoring well. Groundwater contaminants were not found in downgradient wells, indicating contamination was not migrating beyond the area of the former gas holder.

1.5 Record of Decision

A copy of the *Record of Decision* for this site (*Cortland Remote Holder Site State Superfund Project City of Cortland, Cortland County, New York, NYSDEC, March, 2010)* has been included in Appendix B of this document. The components of the selected remedy are as follows:

1. A site cover will be installed on the properties comprising the site to allow for restricted residential use of the site. This cover will consist of either buildings, pavement/sidewalks, or a soil cover in areas of exposed surface soil. The soil cover will consist of a minimum of two feet of soil, meeting the restricted residential requirements for cover material set forth in 6 NYCRR Part 375-6.8(d), placed over a demarcation layer. The upper six inches of the soil will be of sufficient quality to maintain a vegetation layer.

2. Existing surface soils will either be removed for off-site disposal or may be consolidated onsite beneath the site cover. Up to two feet of soil will be removed, as needed in areas of exposed surface soil, or as needed for pavement/building construction in order to maintain existing grades at the site.

3. To maximize the net environmental benefit, Green remediation and sustainability efforts are considered in the design and implementation of the remedy to the extent practicable, including:

    - Using renewable energy sources
    - Reducing green house gas emissions
    - Encouraging low carbon technologies
    - Fostering green and healthy communities
    - Conserving natural resources
    - Increasing recycling and reuse of clean materials
    - Preserving open space and working landscapes
    - Enhancing recreational use of natural resources
    - Designing cover systems to be usable for habitat or recreation
    - Designing storm water management systems to recharge aquifers.

4. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

   a) Requires the remedial party or site owner to complete and submit to NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).
   b) Allows the use and development of the property for restricted residential use, subject to local zoning laws.
   c) Prohibits agriculture or vegetable gardens on the controlled property.
   d) Requires compliance with Department approved Site Management Plan.

5. Since the remedy results in contamination remaining at the site that does not allow for unrestricted use, a Site Management Plan is required, which includes the following:

   a) An Institutional and Engineering Control Plan that identifies all use restrictions and engineer- ing controls for the Site and details the steps and media-specific requirements necessary to assure the following institutional and/or engineering controls remain in place and effective:

   b) A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but will not be limited to:

      Institutional Controls: The Environmental Easement discussed above.

      Engineering Controls: The soil cover discussed above.

   This plan includes, but may not be limited to:

      i. Soil Management Plan which details the provisions for management of future excavations in areas of remaining contamination;
      ii. Descriptions of the provisions of the environmental easement including any land use and groundwater;
      iii. Provisions for the management and inspection of identified engineering controls; and
      iv. Maintaining Department notification.

   The steps necessary for the periodic reviews and certification of the institutional and/or engineering controls:

      i. monitoring and inspection of the cover to assess the performance and effectiveness of the remedy; and

ii. a schedule of monitoring and frequency of submittals to the Department.

2.0 PRE-DESIGN INVESTIGATIONS

No pre-design investigations or additional sampling and analysis are necessary at the site. Existing data is sufficient to complete the design. A property survey was conducted in August 2010 by Reagan Land Surveying of Dryden, New York. The property survey is included as Attachment 1 to the Drawings. Since the demolition of the onsite residential structures changed the surface of the site, several topographic surface elevations were obtained by NYSEG in May 2010. Current topography is presented on Drawing 2.

3.0 REMEDIAL DESIGN SCOPE

This *Work Plan* presents the approach by which the Work will be completed in order to satisfy the remedial objectives for the site as presented in the NYSDEC *Record of Decision,* and in compliance with applicable New York State requirements, in particular DER-10, dated May 2010. Remediation will provide protection to human health and the environment through excavation activities and the construction of a minimum of two feet of cover over excavated areas. The future land use of the site has yet to be determined. The cover may consist of a combination of soil, vegetation, concrete sidewalks, and a parking area. At a minimum the Design includes replacement of the public sidewalk and four street trees, and open green space. Potential land use may also necessitate construction of a parking lot, additional sidewalks, and/or landscaping within the green space. To the extent practicable, this Remedial Design includes green remediation and sustainability efforts including:

- Incorporating a site-specific plan to preserve open space and working landscapes;
- Creating open green space to enhance recreational use of natural resources;
- Designing the cover and vegetation to be usable for habitat and recreation; and
- Designing the green space storm water management system to naturally recharge the aquifer.

The Work Plan includes a chronological description of anticipated project activities. Drawings, Specifications, and the following Plans are considered part of the *Work Plan*:

- *Community Air Monitoring Plan* (Appendix C);
- *Construction Quality Assurance and Quality Control Plan* (Appendix D);
- *Contingency Plan* (Appendix E)
- *Odor, Vapor, and Dust Control Plan* (Appendix F);
- *Quality Assurance Project Plan* (Appendix G);
- *Sampling and Analysis Plan (*Appendix H*)*
- *Traffic Plan* (Appendix I); and
- *Transportation of Solid or Liquid Material Plan* (Appendix J).
- A Health and Safety Plan has been developed by NYSEG (Appendix K).

The project may result in temporary nuisance community impacts such as noise, vibration, dust, odors and traffic. Appropriate engineering controls will be utilized to prevent dust and odors. All work will be conducted so that public impact is minimized to the extent practicable. Hours of construction operations will

not begin prior to 7 a.m. or continue after 7 p.m., Monday through Friday. Work on the weekend will only be undertaken if necessary. The following sections describe the procedures to be used for remedial activities.

3.1 Organization Structure and Responsibility

NYSEG and New York State regulatory agencies will participate jointly in the remedial action for the site. NYSEG has the ultimate responsibility for implementing this *Work Plan* including the Community Air Monitoring Program during the project. Approval of this *Work Plan* by the NYSDEC and the NYSDOH will be secured prior to remedial activities. NYSDEC and NYSDOH personnel are anticipated to be onsite periodically for purposes of general program oversight. NYSEG will be responsible for all onsite construction operations during the project, unless otherwise stated, including: implementation of contingency plans for odor control; management of wastewater and waste-handling operations; maintenance of site controls (i.e., run-off, run-on); the construction, excavation, and material handling activities associated with remediation implementation; community air monitoring; and documentation of the extent of the removal action.

Communication with regulatory agencies and with members of the surrounding community will be managed by NYSEG as per the existing *Citizen Participation Plan* for the Charles Street Site. Key personnel and their assigned responsibilities for implementation of the remedial design include:

NYSEG:

Mr. Joseph M. Simone, PE
Manager Environmental Health & Safety Compliance
NYSEG
PO Box 5224
Binghamton, New York 13902-5224
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E-mail: jmsimone@nyseg.com

Mr. Tracy L. Blazicek, CHMM
Remediation Project Manager
NYSEG
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Binghamton, New York 13902-5224
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NYSDEC:

Mr. William Ports, P.E.: Project Manager
NYSDEC
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E-mail wfports@gw.dec.state.ny.us.

NYSDOH: Ms. Julia Kenney
NYSDOH
547 River Street
Troy, New York 12180-2216
Phone: (800) 458-1158 ext. 27860
E-mail beei@health.state.ny.us.

3.2 Site Set Up

All materials and equipment are designed to meet specific project needs. Each delivery of materials and/or equipment will be inspected upon arrival by the construction quality control representative and stored at a designated area of the site. Equipment will be set-up and tested per the *Work Plan* and Drawings.

3.2.1 Utility Notification

Prior to any construction activities, NYSEG will coordinate with Dig Safely New York to identify and mark out underground utilities on and adjacent to the site. Local police and fire departments also will be notified. The existing *Citizen Participation Plan* for the project addresses notification of adjacent property owners and local officials.

No substantial utility clearance or moving requirements are anticipated for the project with the exception of the potential installation of a new catch basin and tie-in to the existing storm sewer if a parking lot is included in the Design. Information regarding the existing water, electric, communication, gas lines, sanitary and storm sewers is shown on the Drawings and described below:

- The City of Cortland has terminated the water service to the previous residences at 43 and 45 Charles Street to the point of the water valves near the public sidewalks. Water service lines are at a depth of approximately 4 feet and located along the west side of Charles Street according to information provided by the City of Cortland Department of Public Works (DPW).
- Overhead electric and communication lines are located on the west side of Charles Street.
- Gas lines are located on the west side of Charles Street. NYSEG has terminated the gas service to the previous residences at 43 and 45 Charles Street.
- Sanitary sewers and manholes are located at the centerline of Charles Street.
- Storm sewers are located about 6 inches from the grade of the pavement on the east side of Charles Street. The City of Cortland DPW has indicated that this is a 12 inch concrete pipe at a variable depth. The elevations of two existing catch basins north and south of the site were surveyed in May 2010 and are presented on the Drawings. A new catch basin and a tie-in to the

existing storm sewer would be included if a parking lot is included in the Design. The tie-in and details of any required storm sewer repairs are provided in Section 3.12.

3.2.2 Property Access

NYSEG will obtain access agreements to the off-site adjacent properties if required for remedial action work. In order to restrict unauthorized access to the site, the 6-foot high chain link fence may be moved and an entrance gate on Charles Street added. During daily operations, admittance requirements and visitor monitoring will be in effect. Excavation will extend to the property lines along the north, east and south, and to Charles Street on the west. As indicated on the Drawings, if fences currently existing on adjacent properties are damaged during construction, they will be replaced in kind.

3.2.3 Site Preparation

The site will be prepared for the required remedial work including mobilization and installation and preparation of temporary site facilities. All necessary best management practices for erosion and sediment control, air monitoring, and storm water management will be installed prior to the start of excavation activities.

Temporary facilities (e.g., portable toilet) necessary for completion of the project will be located near the site on Charles Street for use by NYSEG and NYSDEC. Equipment, materials and other supplies will be staged on or near the site in a location so as not to interfere with excavation and backfilling operations. The exact location will be determined prior to mobilization to the site. A decontamination area will be prepared onsite for use in cleaning equipment during the remediation.

Four existing onsite piezometers installed during the Remedial Investigation as monitoring wells, and shown on Drawing 2 will be removed in their entirety or abandoned per NYSDEC abandonment procedures and per Specification 02610 - Well Abandonment during site preparation activities. Documentation required for the abandonment of these wells will be included in the completion report.

Four large trees are present onsite within the Charles Street right-of-way as shown on Drawing 2. These trees will be removed to ground level during site preparation activities per Specification 02110 - Site Clearing and Preparation. Tree stumps below ground level will be removed as part of the excavation work.

3.2.4 Traffic Controls

Traffic flow within Charles Street is one way in a northerly direction. Traffic controls described in the *Traffic Control Plan* will provide for public safety and allow unrestricted flow for a minimum width of one vehicle along the western half of Charles Street. Traffic controls shall be conducted so as to accommodate emergency vehicles, cause a minimum of inconvenience to public travel, and permit safe and convenient access to properties on Charles Street and other impacted roadways. NYSEG will request that for the duration of the construction work, traffic associated with St. Mary's School be re-directed to North Main Street.

3.2.5 Building Debris

The buildings previously located onsite have been demolished. The open basement areas are partially filled with foundation materials (e.g., concrete slabs and large stones). This debris will be broken into smaller pieces in place without being excavated, to a nominal size of 6 inches or less, and as approved by the onsite representatives, and redistributed within the open basement areas. Breaking the debris into smaller sizes will reduce void space and facilitate the compaction of overlying backfill material (i.e., stone and soil) as per Specification 02110 - Site Clearing and Preparation, and Specification 02300 - Earthwork and Backfilling.

3.2.6 Erosion and Sedimentation Control

Erosion and sediment controls will be installed as per Specification 02120 – Soil Erosion and Sediment Controls in those areas of the site susceptible to erosion. Siltation fence and inlet protection will be installed as necessary. NYSEG may direct the Contractor to install additional erosion and sedimentation controls during construction. The Contractor will monitor and clean the streets as required.

3.2.7 Community Air Monitoring

Community and work zone air monitoring will be performed in accordance with the site-specific *Community Air Monitoring Plan* (*CAMP*) and the NYSEG Health and Safety Plan (HASP), and per NYSDOH and Occupational Safety and Health Administration (OSHA) requirements. Daily community air monitoring will commence prior to start of any excavation or backfill activities and continue until activities have ended for the day. For the protection of the local community, summaries of all air monitoring data will be provided as dictated by the *CAMP* and HASP.

3.3 Excavation

The proposed limits of excavation across the approximately 8,850 square foot (sf) site area are shown on the Drawings. The area spans two properties from the eastern property lines extending to the curb line of Charles Street. A minimum of two feet of material will be removed from the site per Specification 02300 - Earthwork and Backfilling to include: asphalt driveways, concrete sidewalk slabs, concrete driveway apron, building foundation materials, grass, soil, four tree stumps and existing curbing along Charles Street. The depth of excavation may be deeper due to field conditions or as necessary for the final cover system and/or grading plan. Due to the shallow depth of removal, no shoring or dewatering will be required during excavation.

Removal of the existing concrete curbing along Charles Street and excavation to a minimum depth of 2 feet will likely damage the Charles Street pavement. Therefore, the Work includes saw cutting Charles Street to a width of one-foot along the length of the site, and, if needed, a width of three feet in the area of the catch basin. Charles Street curbing and asphalt/concrete (ac) pavement will be restored in kind.

Excavation onsite will proceed in a manner to coordinate excavation, loading onto trucks, demarcation layer installation, and backfill operations. Onsite excavated areas will be covered overnight. Odor, vapor and dust control will be conducted during excavation as discussed in Section 3.5 below. Backfill may be temporarily placed onsite in an uncompacted layer to limit dust generation. Any areas excavated within Charles Street will be covered overnight for safety purposes.

Excavated material will be loaded into awaiting trucks for off-site disposal. Stockpiling of excavated materials will be minimized to the extent practicable. Care will be taken to prevent contaminated material from impacting areas outside the work area. If a condition is observed that might spread contamination, immediate action will be taken to correct the situation.

3.4 Equipment Decontamination

Prior to leaving the work area, soil that has accumulated on equipment will be removed through washing over the equipment decontamination pad constructed onsite. Wastewater will be collected and stored onsite while awaiting off-site disposal.

3.5 Odor, Vapor, and Dust Control

During remedial work, odors, fugitive vapors and dust emanating from the excavation will be actively controlled, as necessary, by misting the working area with water or BIO SOLVE® or as presented in the *Odor, Vapor, and Dust Control Plan* (*OVDCP*).

3.6 Demarcation Layer

A demarcation layer (e.g., orange construction fencing) will be installed as per Specification 02300- Earthwork and Backfilling between the top of native soil and the backfill. It will be weighted down by either a temporary measure (e.g., sand bags) or by backfill material. Backfill may be temporarily placed onsite in an uncompacted layer to secure the demarcation layer.

3.7 Disposal Protocol

Excavated materials, wastewater, and PPE will be disposed off-site as per the *Transportation of Solid or Liquid Material Plan* and Specification 02111- Waste Management and Handling of Contaminated Material. Based on sampling results from previous investigations and as presented in the NYSDEC *Record of Decision*, it is anticipated that materials will be non-hazardous and disposed off-site at a landfill. Sampling and analysis of excavated materials may be required by the disposal facility. A *Sampling and Analysis Plan* (*SAP*) is included as part of the *Work Plan*. Based on the analytical results, soil will be handled according to the criteria presented in the following subsections.

3.7.1 RCRA Non-Hazardous Waste:

If the soil sample analytical results indicate that the analytes listed in Table 3-1, Table 3-2, Table 3-3 and Table 3-4 are within their specified limits, the materials will be sent to a RCRA Subtitle D landfill permitted to accept it. At NYSEG's discretion, such waste may also be sent to a thermal treatment facility permitted to accept it.

3.7.2 Conditionally Exempt MGP Remediation Waste

If the soil sample analytical results indicate that the analytes listed in Table 3-2, Table 3-3, and Table 3-4 are within their specified limits but fail to meet TCLP limit for benzene as specified in Table 3-1, then its respective soil may be managed as a RCRA conditionally exempt waste and sent to a thermal treatment facility permitted to accept it.

3.7.3 RCRA Hazardous Waste:

If the soil sample analytical results indicate that any analyte listed in Table 3-1, Table 3-2, Table 3-3, and Table 3-4 exceeds its specified limit, then its respective material will be sent to a RCRA permitted facility.

TABLE 3-1
SAMPLE TCLP BENZENE ANALYTE AND LIMIT

TCLP ANALYTE	REGULATORY LIMIT (mg/L) [6 NYCRR Part 371]
Benzene	0.5

TABLE 3-2
SAMPLE ANALYTES AND ACTION LIMITS (CN and S)
REACTIVE CYANIDE AND REACTIVE SULFIDE (REACTIVITY)

ANALYTE	US EPA ACTION LIMIT (mg/kg)
Reactive Cyanide	250
Reactive Sulfide	500

TABLE 3-3
SAMPLE ANALYTES AND ACTION LIMITS (Other)
OTHER RCRA CHARACTERISTICS, LANDFILL REQUIREMENTS, and REQUIREMENTS FOR CONDITIONALLY EXEMPT MGP WASTE

ANALYTE	LIMIT
PCBs (total)	50 mg/kg
Corrosivity (pH)	Non-Corrosive (pH must be >2 or <12.5)
Ignitability	Must be non-ignitable
Percent Sulfur	Must be <3.5%

TABLE 3-4
SAMPLE TCLP ANALYTES AND LIMITS

TCLP ANALYTE	REGULATORY LIMIT (mg/L) [6 NYCRR Part 371)
Arsenic	5.0
Barium	100.0
Cadmium	1.0
Carbon tetrachloride	0.5
Chlorobenzene	0.03
Chloroform	6.0
Chromium	5.0
Cresols (total of o,m,p)	200.0
2,4-D	10.0
1,4-Dichlorobenzene	7.5
1,2-Dichloroethane	0.5
1,1-Dichloroethylene	0.7
2,4-Dinitro toluene	0.13
Endrin	0.02
Heptachlor	0.008
Hexachlorobenzene	0.13
Hexachlorobutadiene	0.5
Lead	5.0
Lindane	0.4
Mercury	0.2
Methoxychlor	10.0
Methyl ethyl ketone	200.0
Nitrobenzene	2.0
Pentachlorophenol	100.0
Pyridine	5.0
Selenium	1.0
Silver	5.0

TCLP ANALYTE	REGULATORY LIMIT (mg/L) [6 NYCRR Part 371)
Silvex	1.0
Tetrachloroethylene	0.7
Toxaphene	0.5
Trichloroethylene	0.5
2,4,5-Trichlorophenol	400.0
2,4,6-Trichlorophenol	2.0
Vinyl chloride	0.2

3.8 Waste Transportation and Disposal

Excavated materials will be transported to an off-site disposal facility. The facility will be determined by NYSEG and be permitted to accept the material. The transportation of excavated soil, concrete, asphalt and other materials will be accomplished by a transportation contractor in accordance with the *Transportation of Solid or Liquid Material Plan.* Trucks will enter Charles Street from Clinton Street (south) and proceed in a northerly direction only. Once loaded the truck will turn east (right) onto Grant Street, turn south (right) onto N. Church Street, and proceed to Clinton Street where they will follow signs for Route 13. Care will be exercised when loading trucks not to spill material on the outside of the trucks. After loading, the dump trailer will be covered with a tarp to control dust and potential vapor emissions. Prior to leaving the loading area, each truck will be visually inspected (i.e., box sidewalls, box tailgate, and tires, etc.) and cleaned with brushes as required.

3.9 Backfill

Backfill will be transported from an approved off-site source. No material excavated from either onsite or within Charles Street will be used as backfill material during the project. A minimum of two feet of cover will be placed over excavated areas. The cover may consist of a combination of soil, vegetation, concrete sidewalks, and asphalt parking. At a minimum, replacement of the public sidewalk and some green space is anticipated. Potential land use may also necessitate construction of a parking lot, additional sidewalks, and/or landscaping within the green space.

Backfill materials will meet Part 375-6 restricted residential use criteria and consist of:

- general fill to fill green spaces to the proposed subgrade;
- select fill to fill open basement areas;
- select fill for backfill of utility abandonments;
- topsoil;
- stone for storm sewer bedding and backfill, if included in the Design; and
- stone for concrete sidewalk subbase and/or any parking areas and driveway aprons, if included in the Design.

3.10 Public Sidewalk, Street Trees and Green Space

The Remedial Design includes open green space which meets the green remediation and sustainability effort requirements of the *ROD*. Such efforts include:

- Incorporating the use of grass which has increased sustainability and requires fewer grass cuttings during the growing season. The proposed grass mixture (low mow) will allow for mowing the grass once per month as opposed to once per week thus reducing green house gas emissions;
- Creating open green space and replacing the four removed trees; and
- Designing the storm water management system of the green space to naturally recharge the aquifer through a flat grading plan which minimizes the amount of surface water which is expected to run off the site.

Grass will be planted in accordance with Specification 02920 - Lawns and Grasses and as shown on Drawing 9. Trees will be planted in accordance with Specification - 02930 Exterior Plants and as shown on Drawing 9. As part of the cover, the five-foot wide public sidewalk will be replaced as shown on the Drawings per City of Cortland and NYSDOT specifications, and in accordance with Specifications - 02640 Placement of Concrete, 03010 - Cast-in-Place Concrete, and 03210 - Steel Reinforcement. A 4-foot high, green fabric covered chain-link fence will be installed along the eastern edge of the properties to deter foot traffic cutting through from N Church St. to Charles St.

The Work includes saw cutting Charles Street to a width of approximately 1 foot along the length of the site Charles Street pavement and curbing will be restored.

Storm sewers are located at a depth of approximately 2 feet and within 1 foot of the curb line on the east side of Charles Street. The City of Cortland Department of Public Works has indicated that there is a 12 inch concrete pipe at a variable depth. 2010 elevation information of the existing storm sewer in the vicinity of the Site is presented on Drawing 2. If during the course of the Work the existing storm sewer piping is damaged, the Contractor will repair/replace the damaged piping. Details of replacement piping and tie-ins to the existing storm sewer system are shown on the Drawings.

3.11 Optional Design Components

An asphalt parking lot with a concrete apron and curbing may be included in the Design as part of the cover. These optional components are shown on Drawings 6, 7 and 8. The design of curbing, aprons, parking lot, and sidewalks will be per City of Cortland and NYSDOT specifications and in accordance with the Design Specifications.

If a parking lot is included in the Design, parking spaces with pull-in diagonal parking will be installed as shown on the Drawings and in accordance with Specifications 02741 - Hot-Mix Asphalt Paving, and 09963 - Pavement Markings and Paint. Parking spaces will be a minimum of 10 feet wide and 24 feet long (perpendicular to the curb) to accommodate the anticipated vehicles (e.g., minivans) which would be utilizing the parking spaces for drop off/pick up at the elementary school. Signage indicating parking/green space use and available hours would be posted.

Additional green remediation and sustainability efforts to be considered when developing a Landscaping Plan other than the green space included are:

- Incorporating a site-specific landscape plan to preserve open space and working landscapes;
- Creating open green space and a seasonal sidewalk to enhance recreational use of natural resources;
- Designing a blended cover and vegetation to be usable for habitat by native species and public recreation; and
- Designing the storm water management system of the landscaped space to naturally recharge the aquifer through a gentle grading plan and implementation of rain garden-like areas. The grading plan would minimize the amount of surface water which is expected to run off the site. The low-

lying areas would promote infiltration of rainwater and storm water. In order to prevent ponding, specific wet tolerant vegetation would be planted in these areas.

3.12 Catch Basin, Storm Sewer Tie-in and Repair

If a parking lot is included in the Design, a new catch basin will be constructed as shown on the Drawings to receive storm water drainage from the parking area. Construction will be in accordance with Specification - 02630 Storm Sewer Tie-in and Replacement. A tie-in to the existing storm sewer system would be included with the Work. If, during the course of the remedial Work, the existing storm sewer piping is damaged, the Contractor will repair/replace the damaged piping. Details of replacement piping and tie-ins to the existing storm sewer system are shown on the Drawings.

3.13 Contingency Plan

A *Contingency Plan* for activities associated with site remediation has been developed to address spills and temporary stop work. The City of Cortland DPW (water and sewer) and National Grid (electric) will be notified prior to start of excavation activities. If any utility line needs repair, NYSEG will notify the City and/or National Grid that a line has been damaged or broken and needs to be repaired.

3.14 Restoration and Demobilization

It is anticipated that the overall site demobilization will include the following activities:

- All equipment and materials will be demobilized from the site;
- Any fencing around the site will be removed; and
- All roadways, sidewalks, driveways, curbing, fencing, etc. that were damaged or removed during the construction will be cleaned and replaced, as required.

3.15 Documentation of Site Activities

3.15.1 Daily Logbook

A designated logbook will be used to document daily onsite activities. The daily logbook will be kept until completion of the project.

3.15.2 Master Sample Log

A laboratory notebook will be used to record any samples collected. The field technician will log in all samples collected and those sent to the off-site analytical laboratory. Waybill numbers will be logged at the end of each day.

3.15.3 Chain-of-Custody Record

A Chain-of-Custody form will document custody of all samples from the field to the laboratory.

3.15.4 Waybills

A waybill receipt will be obtained at the time of accepted sample shipment by Federal Express or courier and will be attached to the Master Sample Log.

3.15.5 Material Disposition Log

The material disposition log is designed to document receipt of off-site materials and the off-site disposition of all materials excavated during the remediation and how it corresponds to the *Work Plan*. All observations, waste manifests and bills of lading will be recorded on a daily material disposition log.

3.15.6 NYSEG's Forms

NYSEG's Public Liability Accident Report, Report of Employee Injury, and Incident Report forms will be used to document any accident occurring onsite during the remedial work. The sheets will be available at the site.

3.15.7 Final Engineering Report

A Final Engineering Report will be prepared for the NYSDEC and include a final site survey and Record Drawings. This report will include a summary of the daily logbook, Photographic Log, Master Sample Log, Material Disposition Log, and variances to the *Work Plan*. The Final Engineering Report will be signed and certified by a professional engineer that all activities that comprised the remedial design were performed in full accordance with NYSDEC approved *Work Plan*, the NYSDEC Order on Consent, and DER-10.

4.0 PERMITS

NYSDEC may grant exemption from most state permits required for completion of this Work provided the substantive requirements of the permit programs are followed. The following local, state and federal requirements will be met:

NYSDEC Waste Transporter permits (6 NYCRR Part 364) will be obtained by the Transportation Contractor for vehicles used for transportation of waste.

NYSEG will obtain a Street permit from the City of Cortland as required when performing the following work:

- Construct, remove, replace or repair a sidewalk or driveway within the limits of any public street, highway or other public property;
- Open or cause to be opened, by cutting or excavating, the pavement or soil of any street, highway, sidewalk area or other public grounds;
- Obstruct, encumber or occupy in any manner or for any purpose whatsoever any public street, highway, or sidewalk area.

NYSEG will obtain a Building permit from the City of Cortland as required when performing the following work:

- new construction;
- driveways and parking areas;
- signs; and
- fences.

A SPDES General Construction Stormwater Permit GP-08-001 will not be required due to the small site size (less than 1 acre).

5.0 AIR MONITORING PROGRAM

The objective of the Air Quality Monitoring Program is to provide direct measurement of volatile organic compounds and total suspended particulates (0.1 to 10 microns) which could potentially be released during excavation, handling, and transportation of contaminants at the site. The air-quality monitoring program consists of work zone air-monitoring for evaluating construction worker health and safety and community air monitoring to determine the levels of volatile organic compounds and total suspended particulates at the perimeter of the Work Area. Real-time air monitoring and speciated real-time data will be used to guide appropriate action to reduce/minimize air emissions to acceptable levels. NYSEG has developed a Charles Street Site *Community Air Monitoring Plan* and an *Odor, Vapor, and Dust Control Plan* containing the *Emission Response Plan* to address any exceedances of acceptable levels.

APPENDIX A

WORK PLAN – NYSDEC APPROVAL LETTER

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C, 11th Floor
625 Broadway, Albany, New York 12233-7014
Phone: (518) 402-9662 • **Fax:** (518) 402-9679
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

September 29, 2010

Mr. Tracy Blacizek
New York State Electric and Gas
Corporate Dr. Kirkwood Industrial Park
PO Box 5224
Binghamton, New York 13902-5224

Dear Mr. Blazicek;

Re: Cortland Remote Holder
Site No. 7-12-012

The New York State Departments of Environmental Conservation (Department) and the New York State Department of Health (NYSDOH) have reviewed the Remedial Design Work Plan dated September 2010 for the Cortland Remote Holder Site. The Remedial Design Work Plan is approved with the following modifications.

1. Submit a revised cover page with the stamp, certification, and signature by a New York State licensed Professional Engineer.

2. On Page 3-3, please change Julia Kenney's email address to the following: beei@health.state.ny.us

3. Page 3-5- CAMP Section: The daily recorded perimeter real-time air monitoring readings for volatile organic compounds and particulates should be submitted to the Department and NYSDOH at the end of each week via email.

4. Page 3-11, Section 3.9 The backfill materials will meet the requirements found in Part 375-6 for restricted residential use.

5. Appendix C, Section 1.3 Odor Monitoring, page 1-2: I understand that NYSEG will set up a toll-free number to register odor complaints from residents. A list of the residents and the nature of the complaints should be forwarded to the State.

The modifications above are minor and revised pages could be submitted instead of reproducing the entire work plan. We will still need to have revised electronic copies of the work plan submitted.

Please send copies to the Cortland Free Library and our Department's Region 7 Office document repositories.

If you have any questions or concerns please contact this office at (518) 402-9667.

Sincerely,

William T. Ports, PE
Environmental Engineer 2
Remedial Section
Division of Environmental Remediation

ec: G. Heitzman
G. Townsend, Region 7
D. Carlton, Region 7
J. Laccetti, DOH
J.Kenney, DOH

cc: J. Helgren, CCHD
M. Gutmann, URS

APPENDIX B

RECORD OF DECISION (NYSDEC, MARCH 2010)

Division of Environmental Remediation

Record of Decision

Cortland Remote Holder Site
State Superfund Project
City of Cortland, Cortland County, New York
Site Number 712012

March 2010

New York State Department of Environmental Conservation
DAVID A. PATERSON, *Governor* ALEXANDER B. GRANNIS, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Cortland Remote Holder Site
City of Cortland, Cortland County, New York
Site No. 712012

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Cortland Remote Holder Site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law, 6 NYCRR Part 375, and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Cortland Remote Holder Site and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Description of Selected Remedy

Based on the results of the remedial investigation and feasibility study (RI/FS) for the Cortland Remote Holder Site, and the criteria identified for evaluation of alternatives, the Department has selected surface soil removal, cover and institutional controls. The components of the remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.

2. A site cover will be installed on the properties comprising the site to allow for restricted residential use of the site. This cover will consist of either buildings, pavement/sidewalks or a soil cover in areas of exposed surface soil. The soil cover will consist of a minimum of two feet of soil, meeting the restricted residential requirements for cover material set forth in 6 NYCRR Part 375-6.8(d), placed over a demarcation layer. The upper six inches of the soil will be of sufficient quality to maintain a vegetation layer.

3. Existing surface soils will either be removed for off-site disposal or may be consolidated on-site beneath the site cover. Up to two feet of soil will be removed, as needed in areas of exposed surface soil, or as needed for pavement/building construction in order to maintain existing grades at the site.

4. To maximize the net environmental benefit, Green remediation and sustainability efforts are considered in the design and implementation of the remedy to the extent practicable, including;

- using renewable energy sources
- reducing green house gas emissions
- encouraging low carbon technologies
- fostering green and healthy communities
- conserving natural resources
- increasing recycling and reuse of clean materials
- preserving open space and working landscapes
- enhancing recreational use of natural resources
- designing cover systems to be usable for habitat or recreation
- designing storm water management systems to recharge aquifers

5. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

(a) requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).
(b) allows the use and development of the property for restricted residential use, subject to local zoning laws,
(c) prohibits agriculture or vegetable gardens on the controlled property; and
(d) requires compliance with the Department approved Site Management Plan.

6. Since the remedy results in contamination remaining at the site that does not allow for unrestricted use, a Site Management Plan is required, which includes the following:

(a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to assure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in Paragraph 5 above.

Engineering Controls: The soil cover discussed in Paragraph 3 above.

This plan includes, but may not be limited to:

(i) Soil Management Plan which details the provisions for management of future excavations in areas of remaining contamination;
(ii) descriptions of the provisions of the environmental easement including any land use and groundwater;

(ii) descriptions of the provisions of the environmental easement including any land use and groundwater;
(iii) provisions for the management and inspection of the identified engineering controls;
(iv) maintaining Department notification; and
(v) the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls;

(b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but will not be limited to:

(i) monitoring and inspection of the cover to assess the performance and effectiveness of the remedy; and
(ii) a schedule of monitoring and frequency of submittals to the Department.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

MAR 3 0 2010

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

RECORD OF DECISION
Cortland Remote Holder Site
City of Cortland, Cortland County, New York
Site No. 712012
March 2010

SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the above referenced site. The disposal of hazardous waste at the site has resulted in threats to public health and the environment that are addressed by this remedy in this Record of Decision (ROD). The disposal of hazardous wastes at this site, as more fully described in Sections 5 of this document, have contaminated various environmental media. The remedy, discussed in detail in Section 8, is intended to attain the remedial action objectives identified for this site in Section 6 for the protection of public health and the environment. This ROD identifies the selected remedy, summarizes the other alternatives considered, and discusses the reasons for the selected remedy. The Department has selected a final remedy for the site after careful consideration of all comments received during the public comment period.

The Department has issued this ROD in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, 6 NYCRR Part 375.

SECTION 2: SITE DESCRIPTION AND HISTORY

2.1: Location and Description

The Cortland Remote Holder Site is located in the City of Cortland on Charles Street (see Figures 1and 2). The site is less than a quarter acre in area, and consists of two adjoining land parcels and part of the city street, in an urban residential setting. The parcels are currently unoccupied residential properties at 43 and 45 Charles Street. The site is surrounded on three sides by residential properties and the St. Mary's School is located across Charles Street to the west. The single family residences that formerly existed on the site were demolished in December 2009.

This site was the location of a former remote gas holder, which was a tank used for storage prior to distribution of manufactured gas that was generated elsewhere. The tank foundation was likely set below the soil surface. The underlying soils consist primarily of clayey silt with cobbles, gravel and fill material (See Figure 3). The fill material consists of ash, bricks, firebrick, coal, glass, bottles and cinders and extends to approximately 10 to 13 feet below the ground surface. A thin darkly stained silt and ash layer (0.2 to 1.0 foot thick) was present from 9 to 12 feet below ground surface in some

soil borings. Groundwater at the site was observed at a depth of about 14 to 15 feet, with flow towards the east.

2.2: Operational/Disposal History

In 1858 the Homer & Cortland Gas Light Company constructed and operated a manufactured gas plant (MGP) at 216 South Main Street, in the Village of Homer, New York, just north of the City of Cortland. The plant made combustible gas from coal and operated from approximately 1858 until 1935. The gas was provided to homes, businesses and industries in much the same way natural gas is used today. In 1867 the Homer & Cortland Gas Light Company acquired property at the Charles Street location to construct a 22,000 cubic foot gas holder as part of their gas distribution network. The former tank was called a remote gas holder. Sometime between 1915 and 1926 the former remote gas holder was removed, and houses were constructed at 43 and 45 Charles Street. In 2007 NYSEG acquired the 43 and 45 Charles Street properties from the previous owners.

2.3: Remedial History

Between 2005 and 2007, NYSEG conducted a Preliminary Site Assessment (PSA), which involved a geophysical survey; test trenching; monitoring well installation; groundwater and soil sampling; and sub-slab soil vapor and indoor air monitoring of the two homes at the site.

Sub-slab soil vapor and indoor air monitoring performed found that volatile organic compounds were present at levels that were consistent with homes not affected by environmental contamination. The Department and NYSDOH determined that no action was needed at that time to address the potential for soil vapor intrusion in the two residences. The PSA was completed in November 2007.

SECTION 3: LAND USE

The Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings when assessing the nature and extent of contamination. For this site alternatives that may restrict the use of the site to restricted residential criteria as described in Part 375-1.8 (g) are being evaluated in addition to unrestricted SCGs because, the two properties are currently zoned by the City of Cortland as R-4 which would allow multifamily dwellings; personal and professional services; single-family and two-family dwellings. The future use will remain consistent with the City of Cortland's R-4 designation. The Department will evaluate the unrestricted and restricted residential Soil Cleanup Objectives found in Part 375-6.8(b) in assessing the nature and extent of contamination.

A comparison of the appropriate SCGs for the identified land use against the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in section 5.1.2.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The Department and the New York State Electric and Gas (NYSEG) entered into a multi-site Consent Order on March 30, 1994 and subsequently modified that order on March 26, 2007 to include the Cortland Remote Holder Site. The Order obligates the responsible parties to implement a full remedial program.

SECTION 5: SITE CONTAMINATION

A remedial investigation has been conducted to determine the nature and extent of contamination and to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the Remedial Investigation (RI) was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between May 2008 and March 2009. The field activities and findings of the investigation are described in the RI Report.

The RI included collecting and analyzing surface and subsurface soil samples to further define the nature and extent of contamination resulting from the operation of the former remote gas holder. This information further delineated the soil contamination beyond the limits identified in the Preliminary Site Assessment Report. Groundwater samples and soil vapor samples were taken during the site characterization.

The following general activities are conducted during an RI:

- Soil borings,
- Sampling of surface and subsurface soils,
- Sampling of groundwater,
- Human Health Exposure Assessments.

5.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and surface and subsurface soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in the following Sections list the applicable SCG in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized in Section 5.1.2. More complete information can be found in the RI Report.

5.1.2: Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation. As described in the RI report, waste/source materials were identified at the site and are impacting groundwater and soil.

This section describes the findings for all environmental media that were evaluated. As described in the RI report, soil samples were collected to further characterize the nature and extent of contamination beyond the information gathered in the PSA.

For each media, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into four categories; volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/ polychlorinated biphenyls (PCBs), and inorganics (metals). For comparison purposes the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCOs identified in Section 3 are also presented.

Groundwater

Groundwater at the site was observed to occur at a depth of about 14 to 15 feet, with flow to the east with a low horizontal gradient. The first set of groundwater monitoring results, from the site characterization, showed no detections of site related contaminants. The second set of results identified one well (PZ-3) with detections of several site related contaminants at low levels. This monitoring well sample was more turbid than the other groundwater samples, suggesting that the contamination is associated with particles of soil entrained in the sample. The groundwater contaminants found were not found in the down gradient wells, which indicates that the contamination is not moving beyond the area of the former remote gas holder.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
SVOCs			
Benzo(a)anthracene	0.27	0.002	1/2
Benzo(a)pyrene	0.27	ND	1/2
Benzo(k)fluoranthene	0.27	0.002	1/2
Indeno(1,2,3-cd)pyrene	0.34	0.002	1/2

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Based on the findings of the RI, the presence of the remote holder has not resulted in the contamination of groundwater.

Soil

Surface and subsurface soil samples were collected at the site during the RI. Surface soil samples were collected from a depth of 0-2 inches to assess direct human exposure. Figure 4 shows the surface soil locations which exceed the unrestricted soil cleanup objectives for PAHs and metals. The PAHs and metals that exceeded their SCOs for unrestricted use in on-site surface soil samples were benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h) anthracene, indeno(1,2,3-cd) pyrene, lead and mercury. Subsurface soil samples were collected from a depth of 2 - 20 feet to assess soil contamination impacts to groundwater. The presence of a darkly stained ash and silt layer was found 9 to 12 feet below the ground surface. The concentrations of SVOCs in this layer ranged 4.3 to 7,300 ppm. See Figure 3. The results indicate that soil at the site exceeds the unrestricted and restricted residential SCOs for volatile and semi-volatile organics and metals.

Table 2 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Residential SCG[c] (ppm)	Frequency Exceeding Restricted Residential SCG
Metals					
Arsenic	2.3-25	13	2/74	16	2/74
Barium	23.9-404	350	1/74	400	1/74
Cadmium	ND-4.2	2.5	1/74	4.3	0/74
Chromium, trivalent	5.8-77	30	1/74	180	0/74
Copper	7.3-72.9	50	1/26	270	0/26
Lead	3.6-3320	63	29/74	400	3/74
Total Mercury	ND-2.3	0.18	16/74	0.81	2/74
SVOCs					
Dibenzofuran	ND-200	7	8/93	59	3/93

Acenaphthene	ND-230	20	3/93	100	1/93
Acenapthylene	ND-150	100	2/93	100	2/93
Anthracene	ND-620	100	4/93	100	4/93
Benzo(a)anthracene	ND-670	1	38/93	1	38/93
Benzo(a)pyrene	ND-410	1	36/93	1	36/93
Benzo(b)fluoranthene	ND-610	1	39/93	1	39/93
Benzo(g,h,i)perylene	ND-140	100	2/93	100	2/93
Benzo(k)fluoranthene	ND-200	0.8	27/93	3.9	12/93
Chrysene	ND-650	1	36/93	3.9	18/93
Dibenz(a,h)anthracene	ND-69	0.33	30/93	0.33	30/93
Fluoranthene	NA-150	100	6/93	100	6/93
Fluorene	ND-370	30	5/93	100	2/93
Indeno(1,2,3-cd)pyrene	ND-160	0.5	40/93	0.5	40/93
Naphthalene	ND-160	12	6/93	100	2/93
o-Cresol	ND-0.94	0.33	2/74	100	0/74
p-Cresol	ND-4.9	0.33	4/74	100	0/74
Phenanthrene	ND-1000	100	7/93	100	7/93
Phenol	ND-2.4	0.33	2/74	100	0/74
Pyrene	ND-1000	100	6/93	100	6/93
VOCs					
Acetone	ND-0.088	0.05	1/63	100	0/63
Benzene	ND-.12	0.06	1/76	4.8	0/76
Ethylbenzene	ND-53	1	1/76	41	1/76
Xylene (mixed)	ND-640	0.26	1/76	100	1/76

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Residential Soil Cleanup Objectives.

The primary soil contaminants are polycyclic aromatic hydrocarbons (PAHs) associated with residues from the operation of the former remote gas holder. As noted on Figure 4, the primary soil contamination is associated with the former remote gas holder and is found in surface and sub-surface soils depths ranging 9 to 12 feet below ground surface. PAHs and metals surface soil contamination was found above the SCOs for unrestricted use in on-site surface soil samples.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are, polycyclic aromatic hydrocarbons (PAHs).

Soil Vapor Intrusion

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of soil vapor, sub-slab soil vapor under structures, and indoor air inside structures. At this site due to the presence of buildings in the impacted area a full suite of samples were collected to evaluate whether soil vapor intrusion was occurring.

Sub-slab soil vapor and indoor air monitoring performed found that volatile organic compounds were present at levels that were consistent with homes not affected by environmental contamination. The Department and NYSDOH determined that no action was needed at that time to address the potential for soil vapor intrusion in the two residences.

No site-related soil vapor contamination of concern was identified during the Site Characterization. Therefore, no remedial alternatives need to be evaluated for soil vapor.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

There were no IRMs performed at this site during the RI.

5.3: Summary of Human Exposure Pathways:

This section describes the current or potential human exposures (the way people may come in contact with contamination) that may result from the site contamination. A more detailed discussion of the human exposure pathways can be found in the RI report available at the document repository. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

No complete exposure pathways exist at this site. At this site the potential exposure pathways are:

- Dermal contact with contaminated soil;
- Incidental ingestion of contaminated soils; and
- Inhalation of contaminated dust.

Exposure to contaminated groundwater is unlikely because the area is served by public water. However, the potential for exposure to contaminated groundwater in the future, although remote due to the limited impact to groundwater, exists if wells were to be installed on-site or construction was to occur below the groundwater table. Site-related contamination was detected in surface and subsurface soils. Redevelopment of the site or subsurface utility work in the future could bring workers into contact with residual contaminated sub-surface material.

The soil vapor intrusion investigation conducted at the site indicated that there is no complete pathway to on-site residences via soil vapor intrusion.

5.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

No complete or potentially complete environmental exposure pathways or ecological risks were identified as part of the investigations. Based on knowledge of the site and its location in an urban residential setting with fully developed surrounding property uses no fish and wildlife resources were identified on the site, adjacent to or down gradient from the site. Furthermore, the minor soil contamination identified does not extend beyond the existing site and adjacent street. Based on the site setting a Fish and Wildlife Impact Analysis was not performed at this site.

Groundwater resources at the site exist but only a low level of contamination was identified in a single well on the site. The groundwater contaminants found were not found in the down gradient wells which indicates that contamination is not moving beyond the area of the former remote gas holder.

Site related contamination is not impacting groundwater.

SECTION 6: SUMMARY OF THE REMEDIATION OBJECTIVES

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial objectives for this site are:

Public Health Protection

Soil

- Prevent inhalation, ingestion and direct contact with contaminated soil.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

To be selected the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Site were identified, screened and evaluated in the feasibility study report which is available at the document repositories established for this site.

A summary of the remedial alternatives that were considered for this site is presented below. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The following alternatives were considered to address the contaminated media identified at the site as describe in Section 5:

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Alternative 2: Site Management

The Site Management Alternative requires only institutional controls for the site. This alternative includes institutional controls, in the form of an environmental easement, fence and a site management plan, necessary to protect public health from any contamination identified in on-site and off-site soil. Figure 5 shows the area addressed by this alternative. Access to the site would be controlled by the fence which would restrict its use. The site would remain vacant and would not be used for a designated purpose.

Present Worth: $113,000
Capital Cost: $66,000
Annual Costs: $3,000

Alternative 3: Surface Soil Removal, Cover, Institutional Controls

This alternative includes addressing surface soil to allow placement of a soil or asphalt cover system. Surface soil would either be removed for offsite disposal or consolidated on-site beneath a cover as appropriate. The soil cover system for any exposed surface soil consists of a demarcation layer, 18 inches of clean fill and 6 inches of clean topsoil meeting Part 375 restricted residential use SCOs with vegetation. The paved cover option consists of placing an asphalt or concrete cover at least 6 inches thick. This alternative includes institutional controls, in the form of an environmental easement and a site management plan to protect public health from any contamination identified in the on-site soil. The off-site (Charles Street) subsurface soil contamination would be addressed in the site management plan. This alternative considers the anticipated future use of the site which is expected to be open space. Figure 6 shows the area to be covered by the soil and asphalt cover system.

Present Worth (Grass-Asphalt): ..... $296,000-$291,000
Capital Cost: ..... $249,000-$251,000
Annual Costs: ..... $3,000-$2,600

Alternative 4: On-Site Soil Removal, Institutional Controls

This alternative includes soil removal to meet predisposal conditions by achieving the unrestricted use SCOs on-site. The off-site soils (Charles Street) would be addressed by a site management plan. The estimated volume of soil excavated would be approximately 1,350 cubic yards. Excavated areas would be backfilled with soil meeting Part 375 unrestricted use SCOs. The excavation area for this alternative is shown on Figure 8 as the On-Site Excavation Area.

Present Worth: $651,000
Capital Cost: $651,000
Annual Costs: $0

Alternative 5: In Situ Treatment On-Site Soils, Institutional Controls

This alternative would include treatment of on-site soils utilizing solidification to treat on-site soil exceeding restricted residential use SCOs. This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health

from any contamination identified in the on-site and off-site soil. The site use would be limited to restricted residential because contamination would remain. Off-site soil contamination would be addressed by a site management plan. This is the same area addressed in Alternative 4 and is shown on Figure 7.

Present Worth: $762,000
Capital Cost: $715,000
Annual Costs: $3,000

Alternative 6: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 5.1.1 and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). This alternative includes excavation and off-site disposal of all waste and soil contamination above the unrestricted soil cleanup objectives, both on-site and off-site. The remedy will not rely on engineering or institutional controls to prevent future exposure. There is no site management, no restrictions or institutional controls and no periodic review. Figure 8 shows the area addressed by this alternative.

Capital Cost: $809,000

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which sets forth the requirements for the remediation of inactive hazardous waste disposal sites in New York. A detailed discussion of the evaluation criteria and comparative analysis is included in the feasibility study.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the

remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in the Remedial Alternatives Cost Table 3

Table 3
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
1. No Action	0	0	0
2. Site Management	$66,000	$3,000	$113,000
3. Surface Soil Removal, Cover (Grass-Asphalt), Institutional Controls	$249,000-$251,000	$3,000-$2,600	$296,000-$291,000
4. On-Site Soil Removal, Institutional Controls	$651,000	0	$651,000
5. In Situ Treatment On-Site Soils, Institutional Controls	$715,000	$3,000	$762,000
6. Restoration to Pre-Disposal	$809,000		

or Unrestricted Conditions		0	$809,000

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the Department addressed the concerns raised.

In general, most of the public comments received were supportive of the selected. One comment letter received, however, advocated removing all of the contaminated soil from the site.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the Department has selected Alternative 3, Surface Soil Removal, Cover and Institutional Controls as the remedy for this site. The elements of this remedy are described at the end of this section.

8.1 Basis for Selection

The selected remedy is based on the results of the RI and the evaluation of alternatives.

Alternative 3 is selected because, as described below, it satisfies the threshold criteria and provides the best balance of the balancing criterion described in Section 7.2. It would achieve the remediation goals for the site by addressing the contaminated surface soils up to a depth of 2 feet. The alternative will evaluate consolidating soils in an area which would be covered with clean soil and vegetation or an asphalt cover. Alternative 3 addresses the surface soils which represent the most significant exposure pathway. This alternative is an effective measure to address the soil contamination at the site.

Alternative 1 (No Action) does not provide protection to public health and the environment with the existing conditions, does not meet the SCGs and does not satisfy RAOs. Alternative 1 was rejected and will not be evaluated further. Because Alternatives 2, 3, 4, 5 and 6 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site. Alternatives 2 through 5 rely on varying levels of institutional controls and/or a SMP to provide protection to human health and meet RAOs.

Long-term effectiveness is best accomplished by those alternatives involving excavation of the contaminated overburden soils (Alternatives 3, 4 and 6). The major portion of the contamination is in the former footprint of the remote gas holder and the highest levels are located 9 to 12 feet below the surface. Alternative 6 results in removal of almost all of the chemical contamination found in the on-site and off-site areas and eliminates the need for institutional controls for property use restrictions and long-term monitoring. Contamination would remain in the on-site and off-site areas for Alternatives 3, 4, and 5 above SCGs, and future exposure to remaining contamination would be addressed by a soil or asphalt cover and pavement, property use restrictions, site management plan and periodic inspections. For Alternative 2, site management remains effective, but it would be less desirable because the long-term effectiveness and reliability of controlling site access with a fence. Alternative 3 addresses the contaminated soil by installing a cover which effectively reduces potential exposure to surface soil. Alternative 4 would be more effective than Alternative 3 because it removes some of the on-site contaminated soil. Alternative 5, which treats the soil in place, would be effective in the long-term, but less effective as compared to the soil removal in Alternative 6.

Alternative 2 would control potential exposures with institutional controls only and would not reduce the toxicity, mobility or volume of contaminants remaining. Alternative 3, excavation and off-site disposal, would not reduce the toxicity, mobility and volume of on-site waste. Alternative 4 requires the excavation of approximately 1,350 cubic yards of contaminated soil. Alternative 5 would permanently reduce the mobility of contaminants by use of chemical

treatment to solidify the soils in place. Alternative 6 would remove a greater volume of contaminated soils which reduces the toxicity, mobility and volume of on-site waste by transferring the material to an approved off-site location. Depending on the off-site disposal facility, the volume of the material would not be reduced for Alternative 6.

Alternatives 2 through 6 all would have short-term impacts to the community and workers which could be controlled, however, Alternative 2 would have the smallest impact. The time needed to achieve the remediation goals is also the shortest for Alternative 2. Alternatives 3, 4, 5 and 6 would take longer to achieve the remediation goals and the short-term impacts increase with the greater potential for short-term impacts occurring with Alternative 5 and 6 because of the greater soil volume for solidification or removal. Alternative 6 would require Charles Street to be shut down while the excavation of contaminated soil in the street. Alternatives 3, 4 and 5 would have progressively greater short-term impacts.

Alternatives 2, 3, 4, 5 and 6 are favorable in that they would be readily implementable technically and administratively. Alternative 3, 4, 5 and 6 would increase the truck traffic on local roads. Alternative 5 would require testing to determine the correct mixture to solidify the soil and this may create some uncertainty regarding the implementability of Alternative 5 due to the nature of the subsurface soil.

The costs of the alternatives vary significantly. Alternative 2 has a low cost, but the contaminated soil would not be addressed other than by institutional controls. With its large volume of soil to be handled, Alternative 6 (excavation and off-site disposal) would have the highest present worth cost. Consolidation and capping (Alternative 3) would be much less expensive than Alternative 6, yet it would provide protection of the human health. The present worth costs of Alternatives 4 and 5 would be higher than Alternative 3, although the capital cost for Alternative 5 would be higher than that of Alternative 4. The long-term maintenance cost for Alternatives 2, 3 and 5 would be the same. The long-term maintenance costs for Alternatives 4 and 6 are less than the other alternatives because of the contaminated soil removal.

The specific use of the site would be decided by the property owner in accordance with local zoning. Alternative 3 would restrict the future use of the site to restricted residential use because at least some contaminated soil would remain on the property, whereas Alternatives 4 and 6 would remove the contaminated soil permanently. However, the remaining contamination associated with Alternative 3 would be controllable with the cover and implementation of institutional controls and a Site Management Plan. With Alternatives 4 and 6 restrictions on the site use would not be necessary because the contaminated surface and subsurface soil in the unsaturated overburden would be removed.

The estimated present worth cost to implement the remedy is $296,000. The cost to construct the remedy is estimated to be $251,000 and the estimated average annual costs for 30 years is $3,000.

8.2 **Elements of the Selected Remedy**

The elements of the selected restricted use remedy are as follows:

1. A remedial design program will implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.

2. A site cover will be installed on the properties comprising the site to allow for restricted residential use of the site. This cover will consist of either buildings, pavement/sidewalks or a soil cover in areas of exposed surface soil. The soil cover will consist of a minimum of two feet of soil, meeting the restricted residential requirements for cover material set forth in 6 NYCRR Part 375-6.8(d), placed over a demarcation layer. The upper six inches of the soil will be of sufficient quality to maintain a vegetation layer.

3. Existing surface soils will either be removed for off-site disposal or may be consolidated on-site beneath the site cover. Up to two feet of soil will be removed, as needed in areas of exposed surface soil, or as needed for pavement/building construction in order to maintain existing grades at the site.

4. To maximize the net environmental benefit, Green remediation and sustainability efforts are considered in the design and implementation of the remedy to the extent practicable, including;

   - using renewable energy sources
   - reducing green house gas emissions
   - encouraging low carbon technologies
   - fostering green and healthy communities
   - conserving natural resources
   - increasing recycling and reuse of clean materials
   - preserving open space and working landscapes
   - enhancing recreational use of natural resources
   - designing cover systems to be usable for habitat or recreation
   - designing storm water management systems to recharge aquifers

5. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

   (a) requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).
   (b) allows the use and development of the property for restricted residential use, subject to local zoning laws,
   (c) prohibits agriculture or vegetable gardens on the controlled property; and
   (d) requires compliance with the Department approved Site Management Plan.

6. Since the remedy results in contamination remaining at the site that does not allow for unrestricted use, a Site Management Plan is required, which includes the following:

(a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to assure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in Paragraph 5 above.

Engineering Controls: The soil cover discussed in Paragraph 3 above.

This plan includes, but may not be limited to:

(i) Soil Management Plan which details the provisions for management of future excavations in areas of remaining contamination;
(ii) descriptions of the provisions of the environmental easement including any land use and groundwater;
(iii) provisions for the management and inspection of the identified engineering controls;
(iv) maintaining Department notification; and
(v) the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls;

(b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but will not be limited to:

(i) monitoring and inspection of the cover to assess the performance and effectiveness of the remedy; and
(ii) a schedule of monitoring and frequency of submittals to the Department.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- Repositories for documents pertaining to the site were established.

- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.

- A fact sheet was sent to the public in October 2007 which announced the availability of the Preliminary Site Assessment and a public availability session to discuss the results.

- Public availability session was held on October 17, 2007 to discuss the results of the Preliminary Site Assessment.

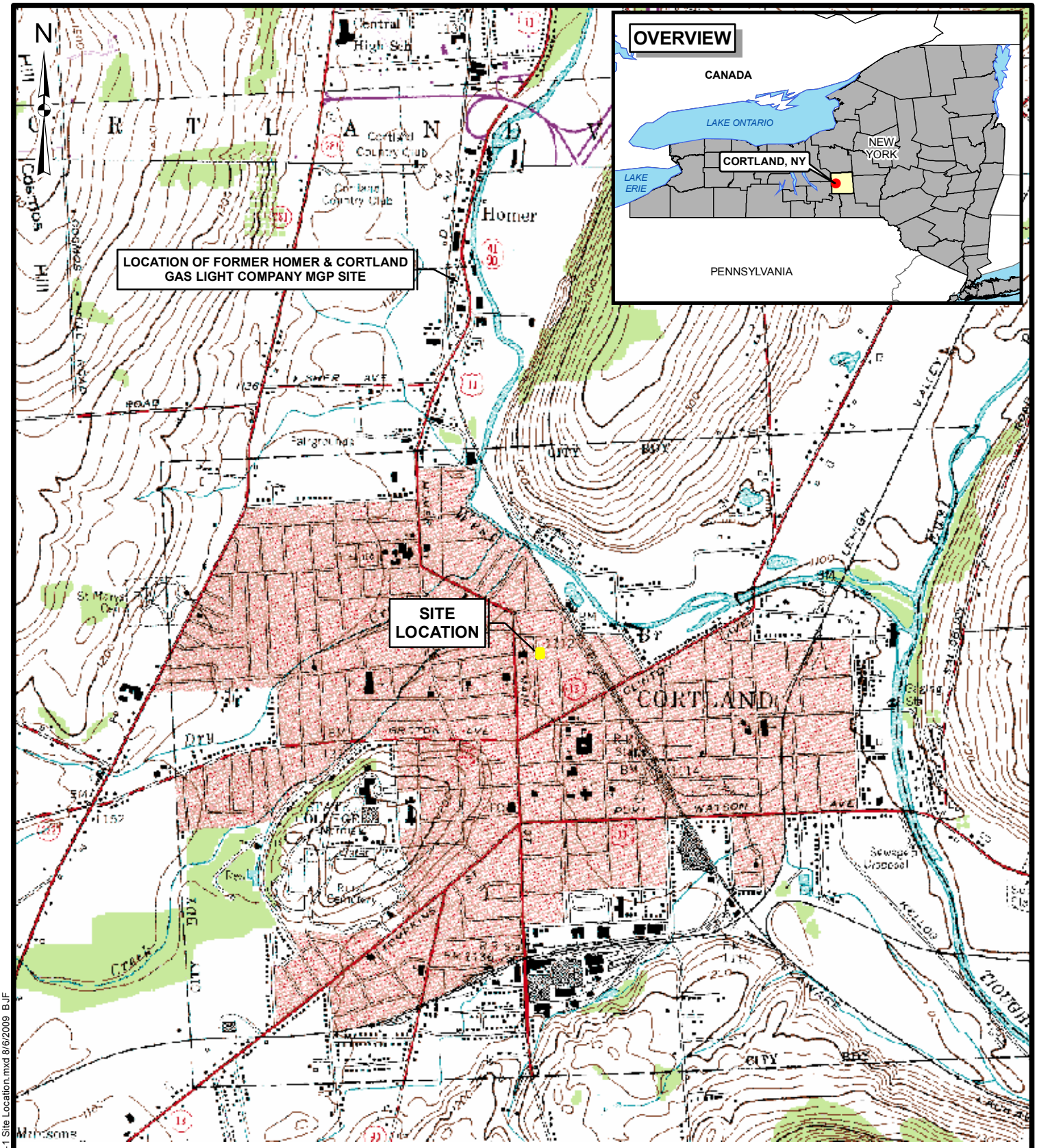
- A fact sheet was sent to the mailing list in June 2009 announcing the completion of the Remedial Investigation Report and a public meeting was held on June 25, 2009 to discuss the results found in the report.

- Public Meeting was held on June 25, 2009 to present the results of the remedial investigation.

- A fact sheet was sent to the public in February 2010 which announced the availability of the PRAP, identified the public comment period, and public meeting date to present the proposed remedial alternative.

- A public meeting was held on March 4, 2010 to present and receive comment on the PRAP.

- A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.



SOURCE: USGS 7.5 Minute Quadrangles - Cortland, NY - 1955 and Homer, NY - 1988.

2,000 0 2,000 Feet

URS

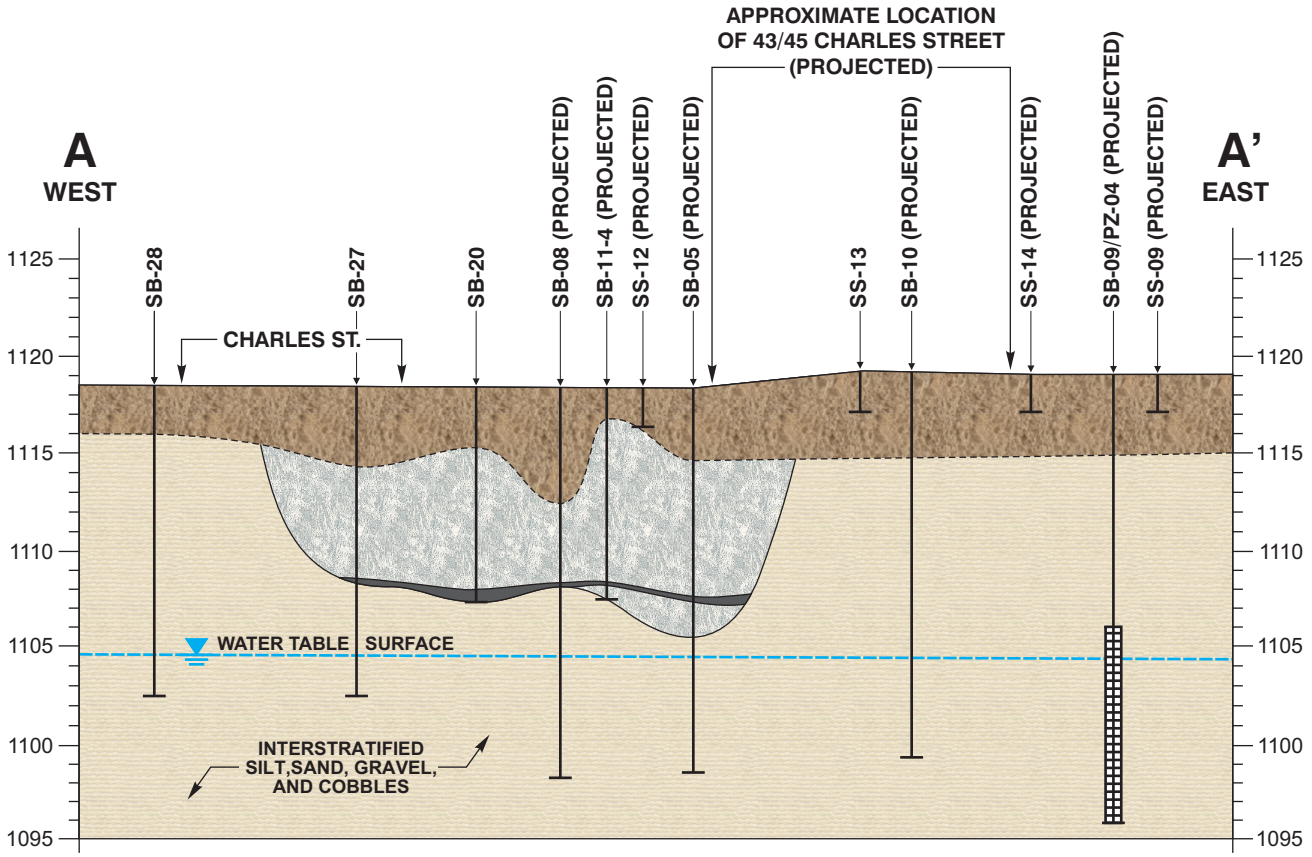
NYSEG - CORTLAND
SITE LOCATION MAP

FIGURE 1

N:\11174305.00000\DB\GIS\FS_Aug2009\FIG 1-1 Site Location.mxd 8/6/2009 BJF

Figure 2
Site Location Map
Cortland Remote Holder Site

AG20278-11176029-082009-GCM



Very darkly stained Ash and Silt with mild to moderate odor typically associated with MGP sites.

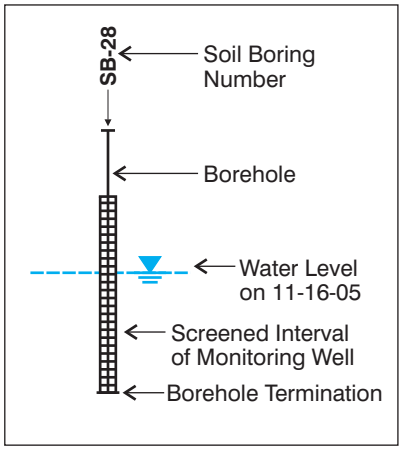
Reworked Silt, Sand, Gravel, and Cobbles with minor amounts of urban fill material

Fill (Ash and Cinders)

Interstratified Silt, Sand, Gravel, and Cobbles

NOTES:
1. Location of the section is shown on Figure 1-2.
2. Water table surface based on November 16, 2005.
3. Trace coal fragments were observed from 12-16 feet at location SB-09/PZ-04 indicating reworked native materials may be present to that depth.

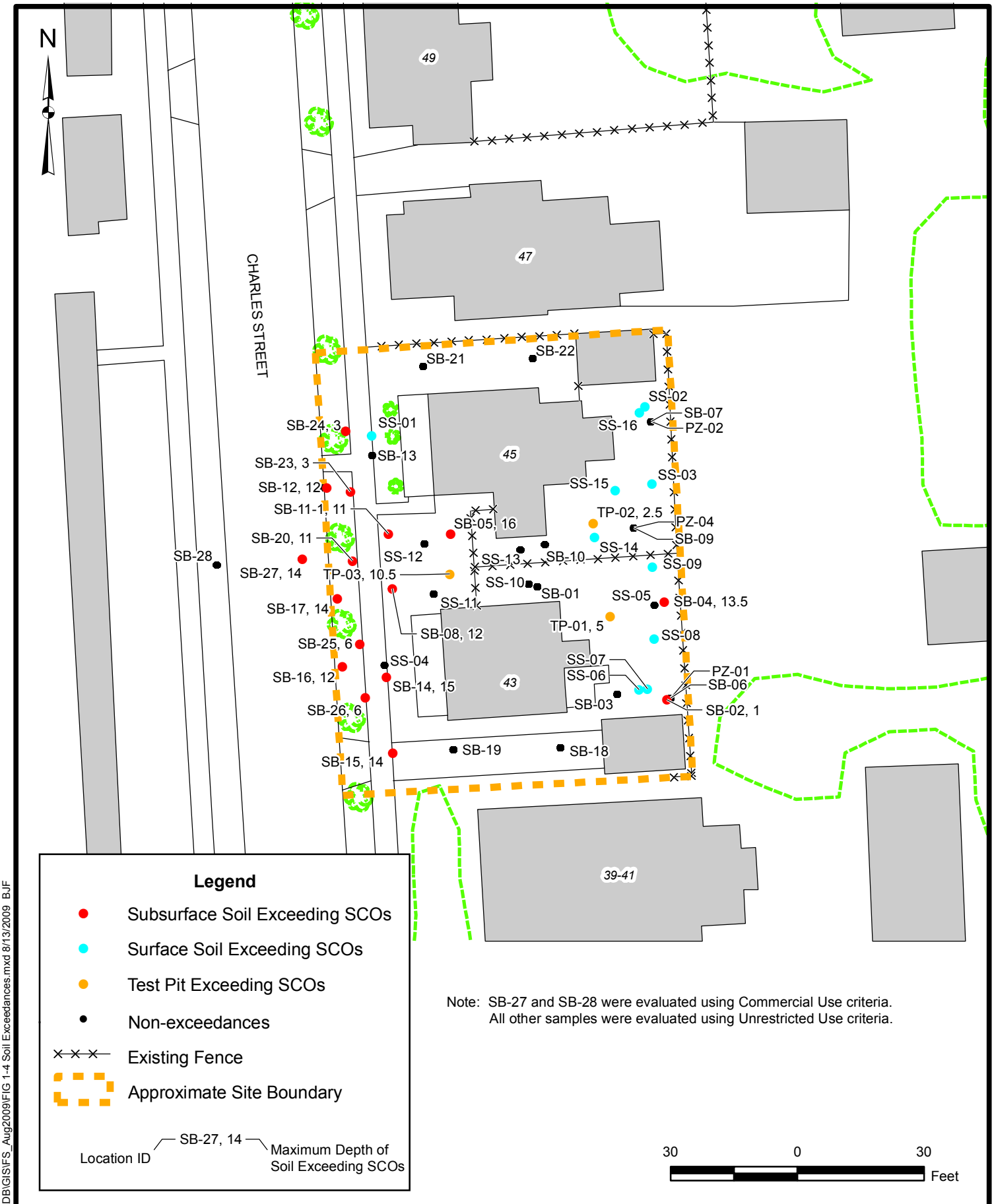
Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 10'



URS

NYSEG-CORTLAND
CROSS SECTION A-A'

FIGURE 3



Note: SB-27 and SB-28 were evaluated using Commercial Use criteria.
All other samples were evaluated using Unrestricted Use criteria.

N:\11174305.00000\DB\GIS\FS_Aug2009\FIG 1-4 Soil Exceedances.mxd 8/13/2009 BJF

URS

NYSEG - CORTLAND
SOIL EXCEEDING SCGs

FIGURE 4

Legend

- Proposed Fence
- Approximate Site Boundary
- Buildings to be removed by NYSEG

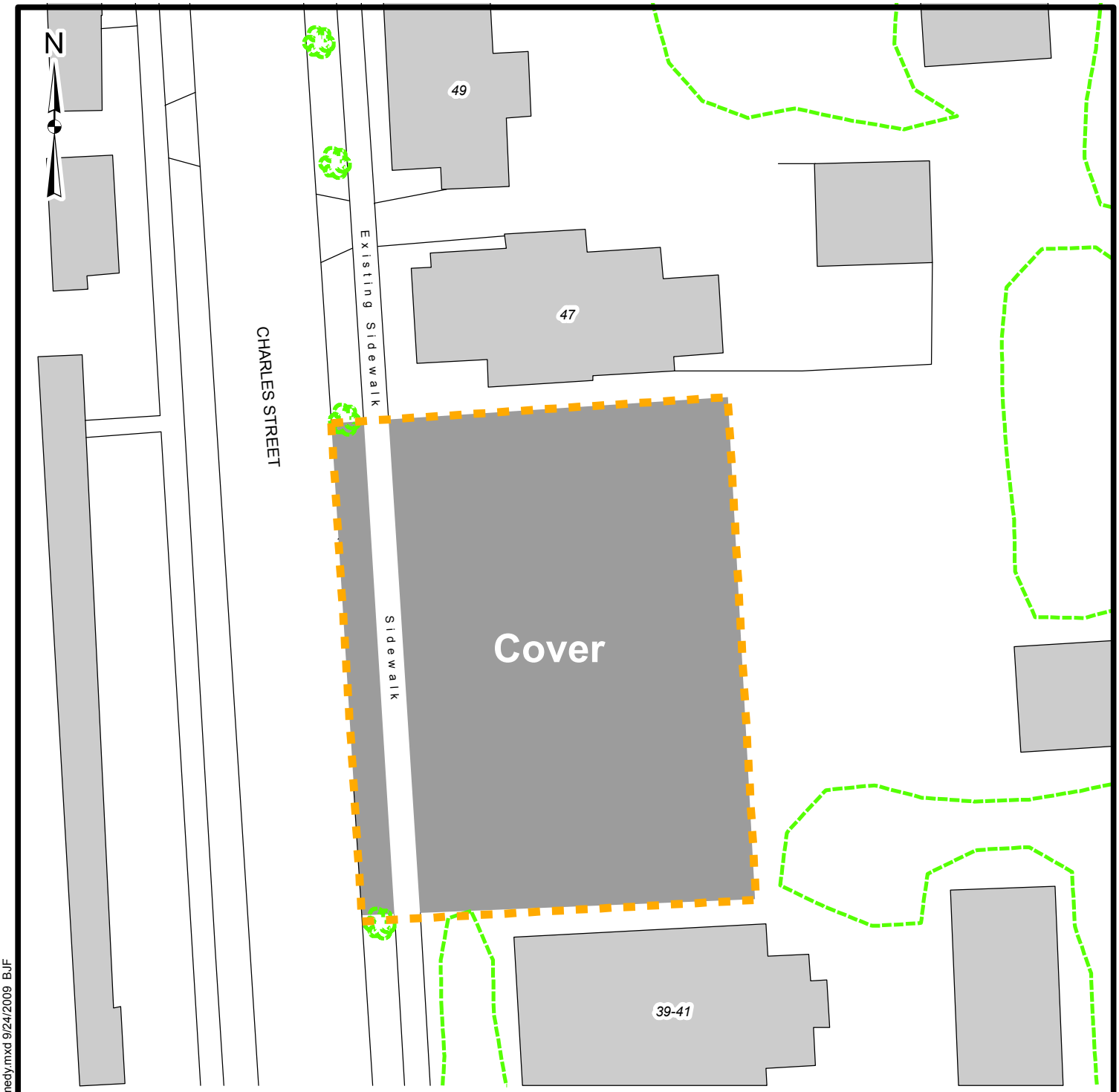
30 0 30
Feet

URS

NYSEG - CORTLAND
CONCEPTUAL LAYOUT FOR ALTERNATIVE 2

FIGURE 5

N:\11174305.00000\DB\GIS\FS_Aug2009\FIG 4-1 ALT 2.mxd 9/22/2009 BJF



Legend

Approximate Site Boundary

Cover

30 0 30

Feet

N:\11174305.00000\DB\GIS\FS_Aug2009\FIG 6-1 Recommended Remedy.mxd 9/24/2009 BJF

URS

NYSEG - CORTLAND
CONCEPTUAL LAYOUT FOR RECOMMENDED REMEDY

FIGURE 6

Legend

Approximate Site Boundary

ISS Area (volume = 1350 cy)

30 0 30

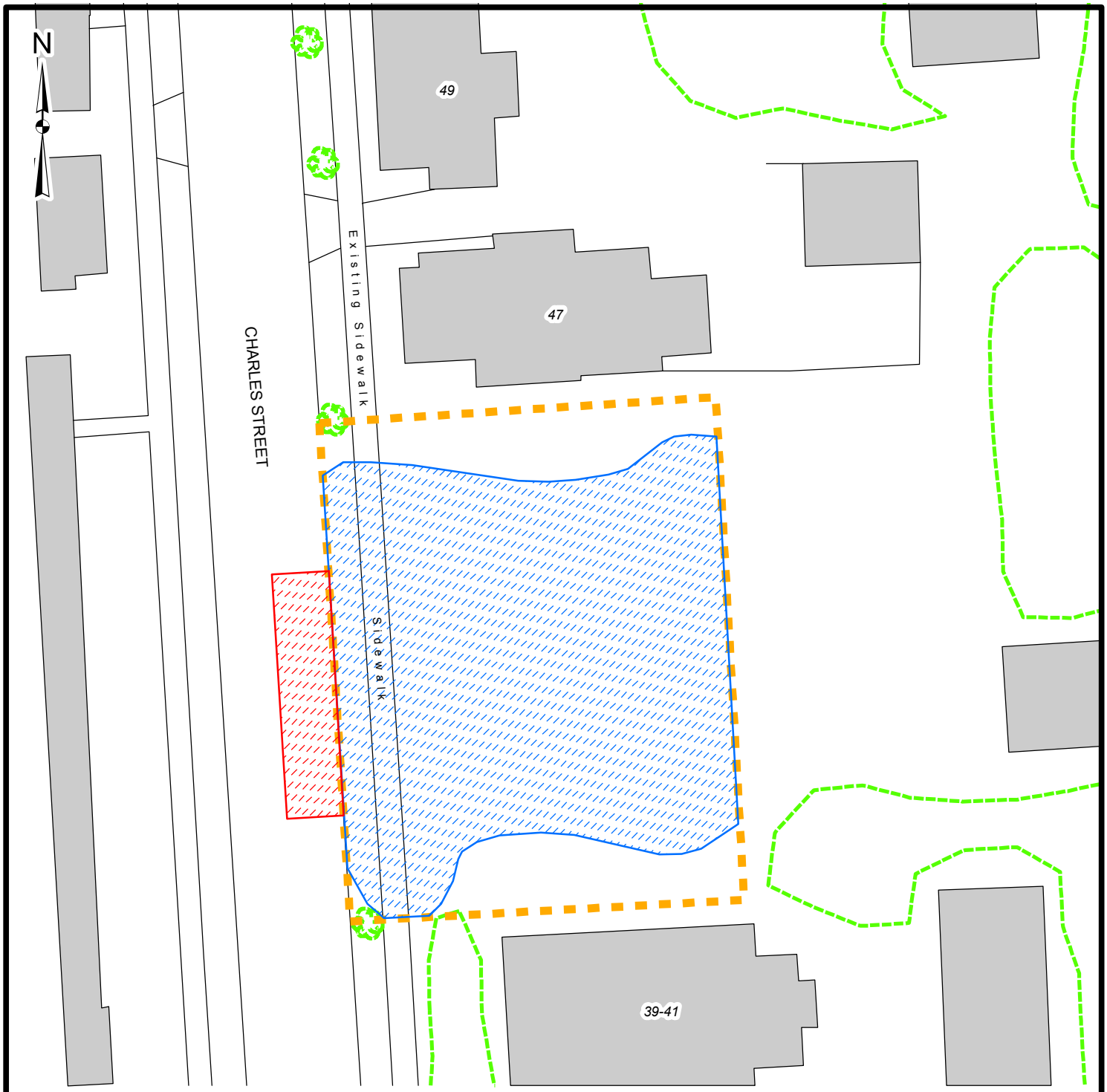
Feet

URS

NYSEG - CORTLAND
CONCEPTUAL LAYOUT FOR ALTERNATIVE 5

FIGURE 7

N:\11174305.00000\DB\GIS\FS_Aug2009\FIG 4-5 ALT 5.mxd 8/20/2009 BJF



Legend

- Approximate Site Boundary
- On-Site Soil Excavation Area (volume = 1350 cy)
- Off-Site Soil Excavation Area (volume = 228 cy)

30 0 30
Feet

URS

NYSEG - CORTLAND
CONCEPTUAL LAYOUT FOR ALTERNATIVE 6

FIGURE 8

N:\11174305.00000\DB\GIS\FS_Aug2009\FIG 4-6 ALT 6.mxd 8/20/2009 BJF

APPENDIX A

RESPONSIVENESS SUMMARY

Cortland Remote Holder Site
City of Cortland, Cortland County New York
Site No. 712012

The Proposed Remedial Action Plan (PRAP) for the Cortland Remote Holder Site was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 16, 2010. The PRAP outlined the remedial measure proposed for the contaminated soil at the Cortland Remote Holder Site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on March 4, 2010, which included a presentation of the remedial investigation feasibility study (RI/FS) for the Cortland Remote Holder Site as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 18, 2010.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the Department's responses:

COMMENT 1: How did the gas get from Homer to here (i.e., Charles Street, Cortland, New York)?

RESPONSE 1: The gas was piped underground.

COMMENT 2: Will NYSEG own the property forever?

RESPONSE 2: This question is beyond the scope of this document and should be directed to NYSEG. The ROD requires NYSEG to place an environmental easement on the property that will pass to any future owners of the property.

COMMENT 3: Does NYSEG pay taxes on the property? How much?

RESPONSE 3: This question is beyond the scope of this document and should be directed to NYSEG or the City of Cortland.

COMMENT 4: Will NYSEG provide trees, shrubs, and playground equipment for the future end use if a grass cover is chosen instead of an asphalt cover?

RESPONSE 4: Specific landscaping is beyond the scope of the remedy, but NYSEG has indicated that they will work with the City to identify an appropriate use for the properties.

COMMENT 5: Will the project evaluate green options and consider the carbon footprint for the future end use?

RESPONSE 5: Yes. The proposed remedy includes consideration of green remediation and sustainability efforts in the design and implementation of the remedy.

COMMENT 6: I am concerned about the safety of the street crossing if there is a possibility of constructing a playground at the site because of the speed of cars traveling on Charles Street.

RESPONSE 6: The comment is noted and should be considered in the local land use review of any redevelopment of the site.

COMMENT 7: What is NYSEG's preference for the specific use of this site?

RESPONSE 7: While the remedy will be protective for all uses within the definition of restricted residential use, the specific site use is beyond the scope of this document and should be directed to NYSEG.

COMMENT 8: A neighboring property owner indicated he would prefer that the end use of the properties as a flower garden and green space area. There would be some hazards associated with school kids crossing the Street to a potential playground. Cortland Mayor Susan Feiszli indicated that there would be no benches and the green area should consider having lighting. The consensus was not to end up with an attractive nuisance.

RESPONSE 8: Comment noted. These issues are not part of the remedy decision. They will

be considered during the design of the remedy as appropriate. See also Response 6 above.

COMMENT 9: Why is Alternative 3 the proposed remedy?

RESPONSE 9: The proposed remedy meets the threshold criteria because it protects public health and the environment and complies with Standards, Criteria, and Guidance by eliminating potential exposure to contaminated soil at the site. It also provides the best balance of the primary balancing criteria.

COMMENT 10: Could some of the contaminants at the site be gone due the 80 year history?

RESPONSE 10: It is possible that some contamination may have dissipated since the holder was removed, but it is important to note that the site was not used as a facility for manufacturing gas, and therefore never contained the high levels of contamination that are typically associated with manufactured gas production facilities.

COMMENT 11: What is NYSEG's obligation for remediation?

RESPONSE 11: NYSEG is under an Order on Consent with the Department to complete a full remedial action at the site, including post-construction site management.

COMMENT 12: Is monitoring part of the remedy, such as groundwater?

RESPONSE 12: Groundwater monitoring is not part of the remedy. No groundwater contamination was identified during the investigation, therefore no groundwater monitoring is needed. There will be periodic inspections of the site and maintenance of the cover, if needed.

COMMENT 13: Did you say that maintenance of the green cover would be taken care of by NYSEG?

RESPONSE 13: Maintenance of the site cover will be required by a Site Management Plan. A periodic evaluation of the engineering controls would be required. NYSEG, as current owner and remedial party, is responsible for the Site ManagementPlan.

COMMENT 14: Since the contamination is so confined and at a relatively close proximity to ground level, the contaminants and ash fill above could be easily removed and replaced with clean fill as has been done at many sites just like this one. It seems the cost to completely remove all of the impacted soil would be less than $250,000.00?

RESPONSE 14: The cost estimate for removing all impacted soil is included in the Feasibility Study. These estimated costs include shoring, excavation, transportation and off-site disposal of the excavated soils. The total cost estimate is in excess of $800,000.

COMMENT 15: When will the remediation happen?

RESPONSE 15: The remedial work will likely be conducted this summer.

COMMENT 16: What is the areal extent of soil contamination?

RESPONSE 16: The area of soil contamination is less than a quarter acre.

COMMENT 17: Is there a connection between the proposed remedy selection and NYSEG's interest?

RESPONSE 17: No. Department regulations require that the remedy be protective of public health and the environment and meet SCGs. The remedy was selected based upon a detailed evaluation of the Department's threshold and balancing criteria, see section 8.1 of the ROD.

COMMENT 18: An adjacent property owner is concerned that property values will plummet due to the proposed cleanup and contamination remaining at the site. The landowners living adjacent to the property will continue to have a contaminated site which will impact their ability to sell their house in the future. It seems like NYSEG is just taking the cheapest way out and not really cleaning up the site.

RESPONSE 18: The affect of the remedy on the value of neighboring properties is beyond the scope of this document.

COMMENT 19: What will happen with the building foundations?

RESPONSE 19: The building foundation walls will be taken down below the ground level to allow placement of the soil or asphalt cover. The concrete basement floors will be broken up to prevent water from collecting and allow precipitation to percolate into the soils.

COMMENT 20: Can flower gardens be planted on site? What about vegetable gardens?

RESPONSE 20: Flower gardens would be allowed, but vegetable gardens would not be allowed unless additional soil cover is provided.

COMMENT 21: Were the monitoring wells along the northern property border clean?

RESPONSE 21: Yes, they all met drinking water quality standards.

Mr. Jack Musci, a nearby resident, submitted an email (dated March 4, 2010) which included the following comment:

COMMENT 22: The cover system should be grass covered rather than the asphalt cover because the esthetic and economic point of view. The possibilities of further enhancement of the property with trees and other vegetation are limitless.

RESPONSE 22: The comment is noted.

Helen and Don Spaulding, nearby residents, submitted an email (dated March 4, 2010) which included the following comment:

COMMENT 23: The best way to improve the area is to fill with clean soil and plant grass, flowers and some trees. Commenter recommended no park benches for the area.

RESPONSE 23: The comment is noted.

Mr. Sean Mack, a nearby resident submitted a letter (dated March 17, 2010) which included the following comments:

COMMENT 24: The proposed “capping” of the site appears to have been largely about minimizing expense and liability for the utility company NYSEG, and not about the protection of the residents and property owners.

RESPONSE 24: The decision to choose the remedy was made based on the threshold criteria because it is protective of public health and the environment and complies with Standards, Criteria, and Guidance. The remedy also provides the best balance of the other primary balancing criteria which were to eliminate potential exposure to soil at the site. It is true that cost was evaluated, but it was not the primary criteria for choosing the remedy.

COMMENT 25: Leaving the contaminants on the site would foreclose the possibility of a new structure being built there and leave the neighborhood with a reminder of the site’s environmental flaws

RESPONSE 25: The remedy would allow future buildings to be constructed, but they would need to be multi-family dwellings or commercial buildings.

COMMENT 26: A large amount of contaminant (perhaps thousands of tons) would have been produced at the site over its 40 or 50 year lifespan. These sites are notorious for having contamination at adjoining properties.

RESPONSE 26: The comment is true for manufactured gas plant sites such as the one located a mile and a half away in Homer. However, this site was only used for storing gas as part of the distribution system. The nature and extent of contamination reported in the remedial investigation report demonstrates the limits of the contamination which has not spread to the adjoining properties. Limited contamination was found in Charles Street.

COMMENT 27: Why has there been no soil testing or any interior air quality testing done at the adjacent property at 43 Charles Street.

RESPONSE 27: Indoor air and sub slab vapor samples were collected at both residences during the preliminary investigations. One residence exhibited staining on the basement wall, where scrape samples were also collected to evaluate the potential for exposures. The NYSDOH, in cooperation with the Department, determined at that time that no actions needed to be taken to protect public health. During the remedial investigation additional soil borings were installed and sampling was performed. Based on the results it was determined that the contamination did not move to adjacent property. Based on that, the

State determined no additional off-site investigation was warranted.

COMMENT 28: Purportedly there was a black sludge oozing into the basement of one of the homes.

RESPONSE 28: Five foundation stones in the basement of 45 Charles Street were identified as discolored and sampled at the request of the homeowner. Scrape samples of the material were taken for analysis. The results indicated the coating contains coal tar material. This may have been applied as a waterproofing compound, or may be present because the foundation stones were reused from the remote holder. During the sampling there was no indication of the material seeping into the basement.

COMMENT 29: The owners and occupants of 49 Charles Street have endured two illnesses, both cancers I believe, and one a very rare ailment of the brain. I worry about what my tenants, neighbors and I might be exposed to if there is not additional testing and real remediation done.

RESPONSE 29: Unfortunately cancer is a very common disease. It is actually not one disease, but many different diseases, with different risk factors. Based on the available data, the Department and NYSDOH determined that there are currently no complete exposure pathways to contaminants at the site.

COMMENT 30: Removing the contaminants would demonstrate to the neighborhood residents that their health and safety has been given at least as much consideration as has been given to the interests of the utility company. Present and future owners and residents can feel assured that the risk from dangerous materials has been mitigated and it is safe to live there.

RESPONSE 30: The soil contamination found at the surface will be removed and covered with either soil or asphalt to minimize exposures via direct contact. It is unlikely for people to come into contact with the contamination found in the subsurface since it was found at depth.

COMMENT 31: Home values in the area have undoubtedly been negatively impacted. Mitigating the contaminants will go a long way toward restoring those diminished values and insuring that residences do not become vacant because of fear or the inability of owners to spend money to maintain properties in the neighborhood when they cannot get a return on their investment.

RESPONSE 31: This comment is beyond the scope of the remedy.

COMMENT 32: I think the highest and best use at this time is a parking area even though esthetically that might be less attractive than other proposed options. Some neighbors have argued that to preserve the residential nature of the area, the best thing would be to leave the site as a green area. This would be nice if the site were to be a park and properly maintained. However, those who favor keeping the site green expressed concerns that a park would attract undesirable activities at the premises. Leaving the site unused would forever highlight its troubled past and raise questions about safety in the minds of future owners and occupants in the neighborhood.

RESPONSE 32: The remedy allows both uses for the site. The future use of the site will be decided during the design.

COMMENT 33: NYSEG has stated that it is unwilling to perpetually maintain a green area site, and if it fails to do so, the burden would presumably fall upon the city. To expect the City of Cortland to take on this obligation is unrealistic given the lack of any benefit to the City and its current extreme financial difficulties.

RESPONSE 33: NYSEG will be responsible for the maintenance of the cover as a required component of the remedy through implementation of the Site Management Plan. The responsibility for maintaining any enhancements to the cover, such as landscaping, may be worked out between NYSEG and the City of Cortland.

APPENDIX B

Administrative Record

Administrative Record

Cortland Remote Holder Site
City of Cortland, Cortland County New York
Site No. 712012

Proposed Remedial Action Plan for the Cortland Remote Holder Site, dated February 2010, prepared by the Department.

Order on Consent, Index No. D0-0002-9309, between the Department and New York State Electric & Gas Corporation, executed on March 30, 1994 and modified on subsequent dates including March 26, 2007.

"Preliminary Site Assessment", October 2007, prepared by URS Corporation

"Remedial Investigation Letter Work Plan", February 2008 prepared by URS Corporation

"Remedial Investigation Report", March 2009 prepared by URS Corporation

"Feasibility Study Report", February 2010 prepared by URS Corporation

APPENDIX C

COMMUNITY AIR MONITORING PLAN (CAMP)

COMMUNITY AIR MONITORING PROGRAM

FOR

REMEDIATION OF THE CHARLES STREET SITE

SITE #7-12-012

CITY OF CORTLAND, CORTLAND COUNTY, NEW YORK

Prepared For:

NEW YORK STATE ELECTRIC & GAS CORPORATION

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18 Link Drive
P.O. Box 5224
Binghamton, New York 13902-5224

Prepared by:

URS CORPORATION

77 Goodell Street
Buffalo, New York 14203

OCTOBER 2010

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1.0 COMMUNITY AIR MONITORING PROGRAM

1.1 Overview

NYSEG will undertake a community air monitoring program during the project to provide direct measurement of volatile organic compounds and total suspended particulates which may be released during excavation and handling of excavated materials.

This air monitoring program was established to address the following objectives:

- To ensure concentrations of volatile organic compounds and total suspended particulate are minimized to protect human health and the environment.
- To provide an early warning system so engineering controls can be enacted to prevent unnecessary exposures or emissions resulting from project activities.
- To measure and document the concentrations of volatile organic compounds and total suspended particulates for determining compliance with the established air monitoring limits.

The community air monitoring is intended to be a discrete program which will be operated in conjunction with the work zone air monitoring program. The work zone monitoring is established to protect worker health and safety during construction and materials handling. The community air monitoring will include real time air quality data that will be collected throughout the duration of all excavation activities and will include upwind, down wind and site perimeter measurements. Wind direction will be determined using a wind sock, weather vane or equivalent device.

1.2 Real-Time Air Monitoring - Volatile Organic Compounds

The total VOC monitoring will be accomplished using a total volatile organic analyzer (TVA) equipped with a photo ionization detector (PID) using a 10.2 eV lamp. Each day the analyzer will be calibrated to benzene with a 10 ppm isobutylene air standard. The TVA will be capable of calculating a 15 minute running average of the measured VOC concentrations. The 15 minute averages will be used to monitor air quality and will be recorded throughout the day.

Real-Time VOC monitoring will be initiated one day prior to any excavation or soil handling activities. In addition a daily upwind measurement will be taken at the start of each work day and immediately

following any changes in wind direction. These measurements will be used for establishing baseline emissions due to natural and anthropogenic sources. The baseline value will be added to the air monitoring limits to compensate for the existing ambient conditions.

Total VOC monitoring will operate continuously and include the downwind location for the site perimeter. Readings at each location will be accomplished by pointing the intake tube of the TVA toward the likely emission source, generally at the height of 3 feet above grade. The instrument will measure concentrations continuously and calculate four 15 minute averages per hour throughout the day. Each 15 minute average will be recorded on log sheets along with the date, time, sampling location, wind direction and weather conditions. A hard copy of the data will be maintained onsite. The previous week's daily data will be submitted via email by Tuesday of the following week to the NYSDOH and the NYSDEC.

Based on data published by OSHA (Occupational Safety and Health Administration), ACGIH (American Congress of Government Industrial Hygienists) and NIOSH (National Institute for Occupational Safety and Health), a short term air quality action level of 5 ppm for total VOCs has been established for air emissions action level at the site perimeter. If the total VOC concentration exceeds 5.0 ppm, the worker personal protective equipment will be upgraded from modified Level D to Level C which requires the use of respirators as specified in the NYSEG Health and Safety Plan.

The 5.0 ppm action level (above background) at the site perimeter is based on an estimated concentration for benzene which is one of the VOC compounds included in the TVA reading. Since the TVA detects volatile compounds other than benzene, the 5.0 ppm action level is considered to be conservative.

1.3 Odor Monitoring

The nature of the onsite wastes pose a potential concern regarding the generation of nuisance odors during excavation and material handling. An odor control plan is included in the *Odor, Vapor, and Dust Control Plan* developed for the site. For an odor complaint residents may speak with the NYSEG onsite construction supervisor or the NYSDEC onsite representative. To register an odor complaint residents may call a toll-free number that will be staffed 24-hours per day, seven days per week. The toll-free number will be established prior to the start of the project and posted on the site perimeter fencing. Calls to the toll-free number will generate a call from the answering service to project team members based on a call out list that will be prepared at the commencement of the project. Project team members will record the callers concern

and contact the site construction supervisor or project manager, who will assess the reason for concern and apply the appropriate engineering controls.

A project fact sheet will be distributed to adjacent property owners explaining the remediation work to occur at the site, the potential for odors and how the phone system works. This will be distributed prior to beginning any excavation work. Additionally, door to door contacts of persons living and working immediately adjacent to the site will be made regarding planned work activities.

If significant odor is detected by the site personnel or a complaint is received, engineering controls will be implemented as outlined in the Charles Street *Emission Response Plan* to reduce odor causing emissions. Once odors become non-discernable, normal operations may resume. This determination will be subject to the approval of the onsite NYSDEC representative.

1.4 Real-Time Air Monitoring - Total Suspended Particulates

In conjunction with the real-time volatile emission monitoring, direct-reading monitoring equipment for particulate matter will be used to collect real-time airborne particulate data on an every 15 minutes basis at the site perimeter. The instrument to be used for this sampling is a personal DataRam™ which operates on the principle of light scattering. The personal DataRam™ responds to particles in the size range of 0.1 to 10 micrometers and in the concentration range of 0.01 to 400 mg/m^3. Particulate measurements will be based on a 30-second, time-weighted average. The personal DataRam™ will be calibrated daily with a filtered air sample. Recorded measurements at the upwind and downwind site perimeter monitoring locations will be logged by the technician every 15 minutes. Equivalent backup real-time air monitoring equipment will be available on-site in the event of an equipment malfunction.

A New York State recommended action level of 0.15 mg/m^3 for particulate matter (above background) will be used to determine whether modifications to given processes are required. If the action level is exceeded, monitoring of the upwind background level will commence immediately using the same portable monitor. If the site particulate measurement is greater than 0.15 mg/m^3 above the upwind background level, the source of the dust will be identified. Dust suppression techniques similar to emission controls (i.e., misting surfaces with water or covering open piles) will be implemented as indicated on the *Emission Response Plan*.

1.5 Documentation for Air Quality Monitoring

An essential part of any sampling/analytical scheme is ensuring the integrity of the sample from collection to data reporting. Sample integrity includes the possession and handling of a sample that is traceable from the time of collection, through analysis and final disposition.

Sample Labels: Unique sample identification codes will be assigned at the time of collection to prevent misidentification of samples. The identification codes will include the following information:

- project/name/number;
- sample location;
- date of collection;
- time of collection;
- initials of sampler; and
- analytical method.

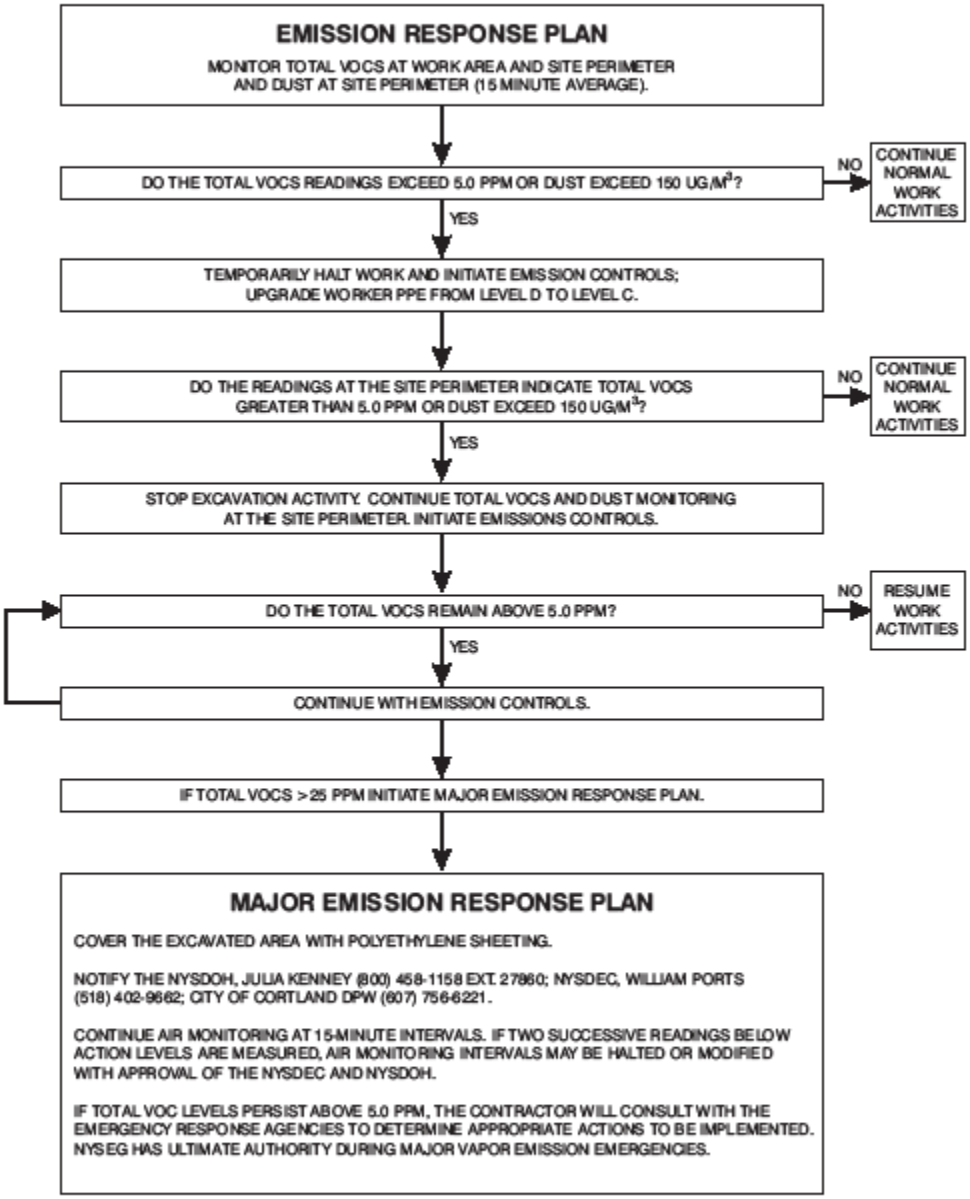
Field Log Book: All information pertinent to sampling will be recorded in a log book. It is imperative that sufficient information be recorded so that the sampling event can be reconstructed without reliance on the collector's memory. Information will be entered into a bound notebook and as a minimum, entries will include the following:

- location of sampling point;
- sample identification code;
- sample collection date and time;
- sample methodology;
- sample analysis;
- collector's initials;
- field observations, if any; and
- field measurements, if any.

Dedicated field log books will be maintained onsite to document the daily calibration of the real-time and speciated real-time air monitoring equipment.

2.0 EMISSION RESPONSE PLAN AND MAJOR EMISSION RESPONSE PLANS

CHARLES STREET SITE



2.1 Emission Response Plan

The Charles Street Site *Emission Response Plan* will be triggered by an exceedance of the 15 minute average VOC concentration of 5.0 ppm (above background) at the site perimeter. If the *Emission Response Plan* is triggered all excavation activities will be stopped and the following actions will be taken:

- Continue total VOC monitoring of emissions from onsite and the site perimeter. If the total VOC level drops below 5.0 ppm (above background) at both locations, then excavation activities can resume. However if the VOC levels at either location persist above 5.0 ppm, based on continual observance of the meter, then the Contractor shall implement engineering controls such as misting the excavation area with BioSolve®, covering, back filling etc. required to reduce emissions and at the same time notify the site Project Manager and the Project Health & Safety Coordinator (PHSC).
- If the total VOC levels drop below 5.0 ppm (above background) after the implementation of additional engineering controls, then the excavation activity can resume provided work activities were adjusted to reduce emission levels.
- If the total VOC levels continue to be greater than 5.0 ppm (above background) at the site perimeter then all site activities must be halted and emission controls continued until levels drop below 5.0 ppm.

Primary engineering controls which may be implemented to reduce emission levels include:

- Adding surfactant such as BioSolve®;
- Limiting excavation size and the surface area of exposed contaminated soil; and
- Covering contaminated soil with polyethylene sheeting.

2.2 Major Emission Response Plan

If efforts to abate the emission source are unsuccessful and total VOCs greater than 25.0 ppm persist for more than 30 minutes, then the *Major Emission Response Plan* shall automatically be placed in effect. Upon activation of the *Major Emission Response Plan*, the following activities will be undertaken:

- Cover the excavated area with polyethylene sheeting or clean soil.
- Notify:
  - City of Cortland DPW at (607) 756-6221;
  - William Ports with the NYSDEC at (518) 402-9662; and
  - Julia Kenney of NYSDOH at (800) 458-1158 ext 27860.
- Total VOC levels will be monitored at 15 minute intervals at the site perimeter.
- If total VOC levels persist above 5.0 ppm (above background) the construction supervisor, PHSC and NYSEG project manager will consult with each other and the Emergency Response agencies to determine the appropriate actions to be implemented. NYSEG project management personnel have ultimate authority during major vapor emission emergencies. The NYSDEC must approve any action to continue work following such a shut down.
- If total VOCs levels in two successive readings fall below action levels, air monitoring may be halted or modified by PHSC and work activities resumed.

APPENDIX D

CONSTRUCTION QUALITY ASSURANCE AND

QUALITY CONTROL PLAN

CONSTRUCTION QUALITY ASSURANCE AND QUALITY CONTROL PLAN

FOR

REMEDIATION OF THE CHARLES STREET SITE

SITE #7-12-012

CITY OF CORTLAND, CORTLAND COUNTY, NEW YORK

Prepared For:

NEW YORK STATE ELECTRIC & GAS CORPORATION

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1.0 INTRODUCTION

This *Construction Quality Assurance and Quality Control Plan (CQA/QC)* is designed to assure the quality of the project by monitoring, inspecting, and testing the processes and materials associated with the *Remedial Design Work Plan* (*Work Plan*) to be completed at the Charles Street Site, City of Cortland, Cortland County, New York. This CQA/QC Plan supplements the *Work Plan.*

1.1 Construction Quality Assurance and Quality Control Plan (CQA/QC) Objectives

The objective of this *CQA/QC* is to identify and standardize measures to provide confidence that activities in all phases of the project will be completed in accordance with the *Work Plan*, applicable local, state and federal regulations and appropriate industry standards. The CQA/QC will be implemented through inspection, sampling, testing, review of services, workmanship, and materials. Specific objectives of this *CQA/QC Plan* establish protocols and procedures for the following components:

1. **Responsibility and Authority** - The responsibility and authority of the key personnel involved in the completion of the project.

2. **Inspection and Testing Activities** - Establish the observations and implement inspections that will be used to ensure that the construction activities for the project meet or exceed all design criteria, (i.e., *Work Plan*, and local, state and federal regulations).

3. **Sampling Strategies** - Establish responsibility for sampling activities and methods including frequency and acceptance criteria for ensuring that waste characterization sampling meets criteria in the *Work Plan*, local, state and federal regulations.

4. **Documentation and Reporting** - Establish appropriate field documents (i.e., daily field construction reports, photographic log, sampling log, and variances to the *Work Plan*).

2.0 RESPONSIBILITY AND AUTHORITY

Responsibilities of each member of the construction project team are described below.

2.1 Contractor (NYSEG)

The Contractor is responsible for coordinating field operations of the project, including coordination of subcontractors, to comply with the requirements of the *Work Plan* and permitting agencies. The Contractor is responsible for completing and submitting documentation required by the *CQA/QC* and also has the authority to accept or reject the materials and workmanship of any subcontractors at the Site.

The Contractor is also responsible to ensure that a functional construction quality control organization is active during the project and provide support for the construction quality control system to perform inspections, tests and retesting in the event of failure of any item of Work, including that of the subcontractors, and to assure compliance with the contract provisions. The construction quality control system includes, but is not limited to, the inspections and tests required in the technical provisions of the *Work Plan*, and will cover all project operations.

2.2 Construction Quality Assurance Officer: TBD, Project Manager

The responsibility of the construction quality assurance officer is to perform those activities in this *CQA/QC* deemed necessary to assure the quality of construction and support quality control efforts. The construction quality assurance officer will be onsite as required during construction activities. The responsibility of the construction quality assurance officer is to ensure that the quality of construction meets or exceeds that defined by the *Work Plan*. Specific responsibilities of the construction quality assurance officer include:

- Directing and supporting the construction quality control representative and additional inspection personnel in performing observations and tests by verifying that the data are properly recorded, validated, reduced, summarized, and inspected;
- Evaluating the construction activities and the construction quality control representative's efforts;
- Evaluating sampling activities and efforts of the sampling quality assurance officer;
- Educating construction quality control inspection personnel on construction quality control requirements and procedures; and
- Scheduling and coordinating construction quality assurance inspection activities.

2.3 Sampling Quality Assurance Officer: TBD, Project Manager

The responsibility of the sampling quality assurance officer is to perform those activities in this *CQA/QC, Work Plan* and *QAPP* deemed necessary to assure the quality of sampling and testing and support quality control efforts.

To avoid conflicts of interest, the sampling quality assurance is performed by an entity other than the construction quality control, and provides the permitting agency an assurance that all sampling efforts, for both field and laboratory analysis, meet or exceed that defined by the *Work Plan* and identified in the *CQA/QC.* The sampling quality assurance officer will be onsite as required during the project. The sampling quality assurance officer will report directly to the construction quality assurance officer.

Specific responsibilities of the sampling quality assurance officer include:

- Confirm that the test data are properly recorded and maintained (this may involve selecting reported results and backtracking them to the original observation and test data sheets);
- Confirm that the testing equipment, personnel, and procedures do not change over time or making sure that any changes do not adversely impact the inspection process;
- Confirm that regular calibration of testing equipment occurs and is properly recorded; and
- Provide the construction quality control officer with up to date sampling results.

2.4 Construction Quality Control Representative: TBD, Construction Supervisor

A construction quality control representative, supplemented as necessary by additional personnel, is to be on the Site during the construction process, with complete authority to take any action necessary to ensure compliance with the *Work Plan* as necessary to achieve quality in the constructed facility. The construction quality control representative will be the field engineer and will report directly to the quality assurance officer. Specific responsibilities of the construction quality control representative include:

- Review *Work Plan* for clarity and completeness so that the construction activities can be effectively implemented;
- Verifying that the remedial subcontractor's construction quality is in accordance with the *CQA/QC*;
- Performing onsite inspection of the work in progress to assess compliance with the *Work Plan*;
- Prepare and log material shipping manifests for off-site transportation of materials;
- Perform the duties of the health and safety officer;

- Report the results of all observations and tests as the work progresses modify materials and work to comply with the *Work Plan*. This includes:

    1. Provide reports on daily field construction, material shipments, and inspection results.

    2. Review and interpretation of all data sheets and reports.

    3. Identification of work that should be accepted, rejected, or uncovered for observation, or that may require special testing, inspection, or approval.

    4. Rejection of defective work and verification that corrective measures are implemented.

    5. Make observations and records that will aid in preparation of the Final Engineering Report.

- Report to the construction quality assurance officer results of all inspections including work that is not of acceptable quality or that fails to meet the *Work Plan*;
- Verify that the equipment used in testing meets the test requirements and that the tests are conducted according to the proper standardized procedures; and
- Verify that materials are installed as specified, except where necessary field modifications were required.

2.5 Sampling Representative: TBD, Sampling Technician

A sampling representative, supplemented as necessary by additional personnel, is to be on the work site at all times during the construction process. The sampling representative reports directly to the sampling quality assurance officer. Specific responsibilities of the sampling representative include:

- Set up and operation of the weather station. Daily recording of meteorological data;
- Daily calibration and operation of real time total volatile organic compound and suspended particulate air monitoring equipment. Daily recording of real time air quality data. Informs construction supervisor and onsite NYSDEC and NYSDOH representatives when concentration of air contaminants approaches or exceeds action levels specified in the *Work Plan* or *CAMP*. Faxing or e-mailing real-time air quality data to the NYSDOH representative and Sampling Quality Assurance Officer by Tuesday of the following week;

- Collection, packaging and shipment of any required soil and water samples per guidelines specified in the *Work Plan*. Maintaining master log and chain of custody forms of all air, water and soil samples collected.
- Consultation with Sampling Quality Assurance Officer for all technical questions, problems, considerations, or requests for supplies or equipment.
- Maintaining and organizing onsite field specialist equipment and supplies storage area.

3.0 FIELD QUALITY CONTROL INSPECTIONS, TESTING, AND SAMPLING REQUIREMENTS

The definable features of work identified below are described in the *Work Plan*. This section of the *CQA/QC* describes the anticipated inspection, testing, and sampling requirements of these definable feature works.

3.1 Site Preparation

Elements of the Site preparation, including debris and tree clearing and removal, and well abandonment will be inspected as they occur to assure compliance with the *Work Plan*.

3.2 Equipment Set-up

All materials and equipment are designed to meet specific project needs. Each delivery of materials and/or equipment will be inspected upon arrival by the construction quality control representative and stored at a designated area of the Site. Equipment will be setup and tested per the *Work Plan* and Drawings.

3.3 Excavation and Off-Site Disposal

A minimum of two feet of material will be removed from the site and includes: asphalt driveways, concrete sidewalk slabs, concrete driveway apron, building foundation materials, grass, soil, and four tree stumps. Approximately 550 cubic yards (cy) of material will be removed. The depth of excavation may be deeper due to field conditions. Due to the shallow depth of removal, no shoring or dewatering will be required during excavation.

Excavation onsite will proceed in a manner to coordinate excavation, loading onto trucks, demarcation layer installation, and backfill operations. Excavated areas will not be exposed overnight. In order to limit dust generation, engineering controls may be utilized or backfill may be temporarily placed onsite in an uncompacted layer.

Excavated material will not be stockpiled onsite to the extent possible; it will be loaded into waiting trucks for off-site disposal. Care will be taken to prevent contaminated material from impacting areas outside the work area. If the onsite NYSDEC representative observes a condition that might spread contamination, immediate action will be taken to correct the situation. The transportation of excavated soil, concrete, asphalt

and other materials will be accomplished in accordance with the *Transportation of Solid or Liquid Material Plan.*

3.4 Storm Water, Groundwater and Wastewater Management

All collected storm water, groundwater and wastewater will be managed and containerized for off-site disposal in compliance with the *Work Plan*.

3.5 Backfill and Grading

A minimum of two feet of cover will be placed over excavated areas for the protection of human health and the environment. The excavated area will be backfilled as specified in the *Work Plan* in preparation for the as yet to be determined future land use of the site. The cover may consist of a combination of soil, vegetation, concrete sidewalks, and asphalt parking areas. At a minimum, replacement of the public sidewalk and some green space is anticipated. Potential land use may also necessitate construction of a parking area, additional sidewalks, and/or landscaping within the green space.

Within green space areas, the upper six inches will consist of clean imported topsoil. The topsoil will be inspected upon arrival and the source documented. Six inches of clean imported stone will be used for subase material within any concrete and/or asphalt areas. The final site surface, while yet to be determined, will match the existing grade of the surrounding properties along the north, south and east property lines. Backfilling and compacting of the excavation will be observed and documented by the construction quality control representative. No stockpiles will remain onsite at the end of the project. Visual inspections will confirm that the site surfacing meets NYSEG approval.

3.6 Public Sidewalk and Green Space

The existing concrete public sidewalk will be replaced as specified in the *Work Plan*. While the future land use of the site is yet to be determined, at a minimum, some (grass-covered) green space is anticipated along with replacement of the four street trees removed during site preparation activities.

3.7 Potential Parking Area

An asphalt parking lot with a concrete apron may be included in the Design as shown on the Drawings. This final site surface is yet to be determined.

3.8 Potential Landscaped Green Space with Sidewalk

While the future land use of the site is yet to be determined, to create a park-like setting, landscaped green space may be included in the Design. Onsite areas not covered by the public sidewalk or the parking area could be constructed as landscaped green space. A stamped concrete sidewalk may traverse the landscaped green space as shown on the Drawings.

4.0 DOCUMENTATION AND REPORTING REQUIREMENTS FOR *CQA/QC* ACTIVITIES

The value of the *CQA/QC* will be assured by proper documentation techniques. The documentation of the inspection activities will facilitate the adherence to the design documents and maintain the level of reporting required by the parties involved in the project.

4.1 Inspection Reports

In general, documentation may involve daily summary and photographic reports including sketches of a particular section or activity, inspection log, corrective measure summary, or schedule summary. Specific documentation procedures are listed in the following subsections. The construction quality control representative will ensure that one set of full sized contract drawings are marked on a daily basis to record deviations from the contract drawings, including utilities which are revealed during the course of site work. The construction quality control representative shall initial each variation or revision. The construction quality control representative shall, upon completion of site work, certify the accuracy of the record drawings, and submit them to the project manager.

4.2 Daily Logbook

The construction quality control representative shall prepare a Daily Field Construction Report (DFCR) identifying work force and their labor hours, location and description of work performed, lost time accidents, equipment left on job site, equipment/materials received and if applicable, submittal status, non-compliance notices received, errors and/or omission in plans and specifications, visitors to the job site, weather conditions and temperatures, and any other pertinent information.

4.3 Photo Log

The photo log is designed to document construction activities by still photos. The photo log may also be used to photographically record activities recorded in a daily construction log or an as-built sketch log. Photos will be collected by the construction quality control representative.

4.4 Daily Sampling Log

The daily sampling log is designed to document all sampling and testing activities and how they correspond to the *Work Plan*. All observations, field and/or laboratory tests will be recorded on a daily

sampling log. It is important to note recorded field observations may take the form of notes, charts, sketches, or photographs. The daily sampling log will be completed by the sampling technician.

4.5 Material Disposition Log

The material disposition log is designed to document receipt of off-site materials and off-site disposition of all materials excavated during the remediation and how it corresponds to the *Work Plan*. All observations, waste manifests and bills of lading will be recorded on a daily material disposition log. The daily material disposition log will be completed by the construction quality control representative.

4.6 Variances to *Work Plan*

Required changes to the *Work Plan* will be processed through the use of a variance log. Approval from the NYSEG project manager is required to recommend a change to the *Work Plan*.

4.7 Final Engineering Report

A Final Engineering Report will be prepared for the NYSDEC and include a final site survey and Record Drawings. This report will include a summary of all onsite activities, Photographic Log, Master Sample Log, Material Disposition Log, and variances to the *Work Plan*. The Final Engineering Report will be signed and certified by a professional engineer that all activities that comprised the remedial design were performed in full accordance with NYSDEC approved *Work Plan* and the NYSDEC Order on Consent Index #D0-0002-9309.

APPENDIX E

CONTINGENCY PLAN

CONTINGENCY PLAN

FOR

REMEDIATION OF THE CHARLES STREET SITE

SITE #7-12-012

CITY OF CORTLAND, CORTLAND COUNTY, NEW YORK

Prepared For:

NEW YORK STATE ELECTRIC & GAS CORPORATION

James A. Carrigg Center
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P.O. Box 5224
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Prepared by:

URS CORPORATION

77 Goodell Street
Buffalo, New York 14203

OCTOBER 2010

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1.0 CONTINGENCY PLAN

This *Contingency Plan* is designed to address potential emergencies that may arise as a result of operations during the Remedial Action to be completed at NYSEG's Charles Street Site, City of Cortland, Cortland County, New York. This Plan supplements the *Remedial Design Work Plan* and the NYSEG Health and Safety Plan (HASP). Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions. The objectives during any emergency will be to protect human health and safety and then the environment. A qualified environmental professional or Site Safety Officer (SSO) will determine the best course of action for dealing with the emergency and possible follow-up requirements that may result from implementing those actions. The SSO will serve as the overall Project Emergency Coordinator (PEC) and have the ultimate authority in specifying and facilitating any contingency action. If the SSO is not able to perform these duties, he will specify another senior individual to serve in this capacity. The PEC will become familiar with contingency plans developed by each contractor and subcontractor.

1.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance, the SSO will contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. The emergency contact lists will be posted prominently at the site and made readily available to all personnel at all times.

EMERGENCY CONTACT NUMBERS

Medical, Fire and Police	911
Dig Safely New York	811 or (800) 962-7962
Poison Control Center	(800) 222-1222
USEPA National Response Center	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

OTHER CONTACT NUMBERS

NYSEG Project Manager – Joseph Simone, PE	(607) 762-7498
NYSDEC Project Manager – William Ports, PE	(518) 457-9662

Note: Emergency contact numbers are subject to change and will be updated whenever a change in personnel occurs.

1.2 Map and Directions to Emergency Health Facility

Site Location: 43 and 45 Charles Street, Cortland, New York

Nearest Emergency Facility Name: Cortland Regional Medical Center

Emergency Facility Location: 134 Homer Avenue

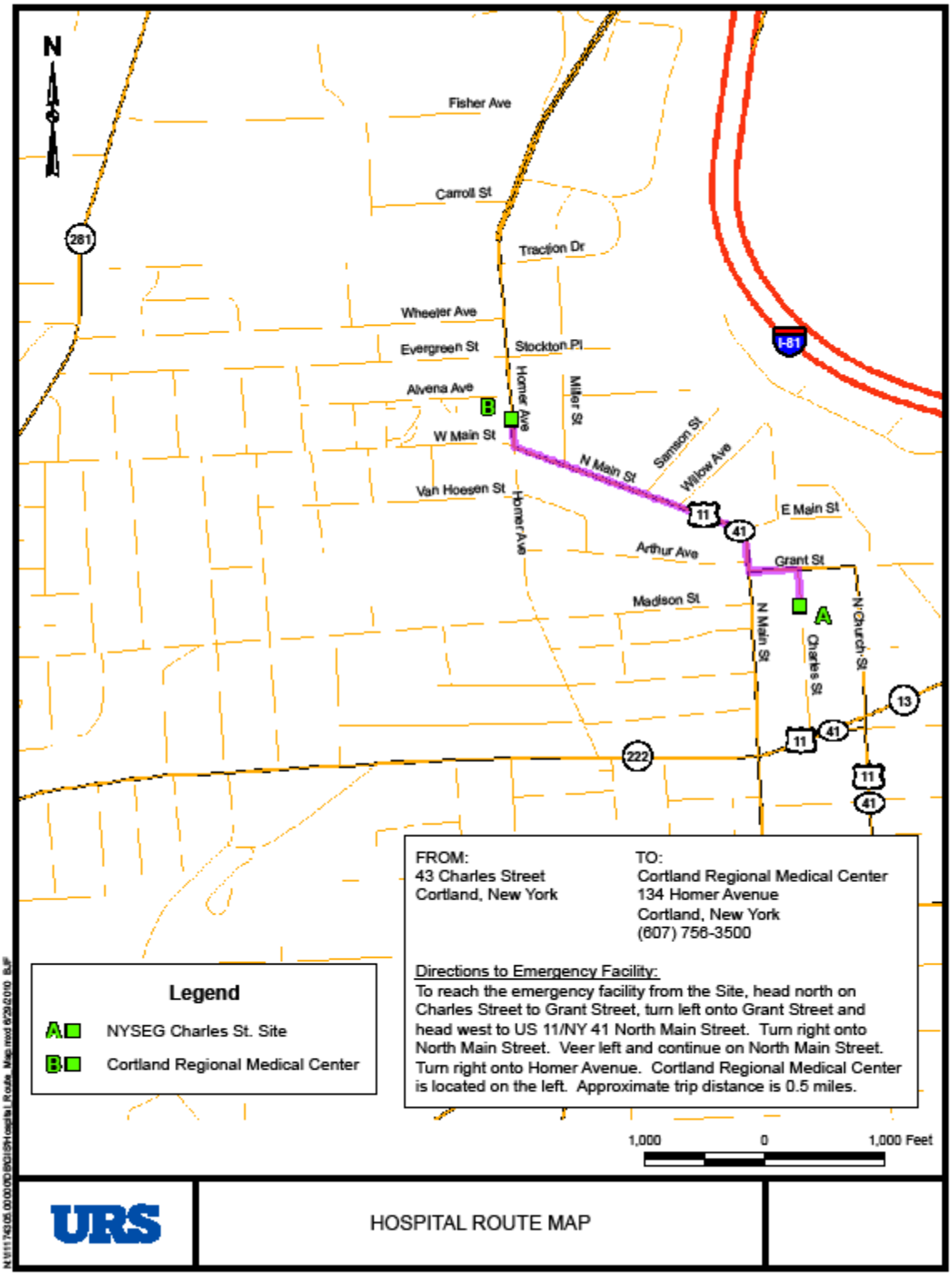
Emergency Facility Telephone: (607) 756-3500.

Directions to Emergency Facility: To reach the emergency facility from the Site, head north on Charles Street to Grant Street, turn left onto Grant Street and head west to US 11/NY 41 North Main Street. Turn right onto North Main Street. Veer left and continue on North Main Street. Turn right onto Homer Avenue. Cortland Regional Medical Center is located on the left. Approximate trip distance is 0.5 miles.

Total Distance: 0.5 miles

Total Estimated Time: less than 2 minutes

A mapped route to the emergency health facility is provided on the following page.


N
Fisher Ave
Carroll St
Traction Dr
Wheeler Ave
Evergreen St
Stockton Pl
Alvena Ave
W Main St
Van Hoesen St
Homer Ave
Miller St
N Main St
Samson St
Willow Ave
E Main St
Arthur Ave
Grant St
Madison St
N Main St
Charles St
N Church St
281
I-81
11
41
222
13
A
B
FROM:
43 Charles Street
Cortland, New York
TO:
Cortland Regional Medical Center
134 Homer Avenue
Cortland, New York
(607) 756-3500
Directions to Emergency Facility:
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Legend
A NYSEG Charles St. Site
B Cortland Regional Medical Center
1,000 0 1,000 Feet
URS
HOSPITAL ROUTE MAP

1.3 Identifying the Hazards and Assessing the Risk

The objectives during any emergency shall be to protect human health and safety and then the environment. Possible hazards to human health or the environment that may result from any emergency situation will be identified by the PEC. The PEC must take into consideration both direct and indirect effects of the incident. The PEC will then assess the possible risks to human health or the environment that may result from the emergency (e.g., fire/explosion, release, or severe weather conditions). He will make this assessment by:

- identifying the materials involved in the incident;
- consulting the appropriate Occupational Health Guideline or MSDS to determine the potential effects of exposure/release, and appropriate safety precautions; and
- identifying the exposure and/or release pathways and the quantities of materials involved.

Based on this information the PEC will determine the best course of action for dealing with the emergency, and possible follow-up requirements that may result from implementing those actions (e.g., equipment repair, material disposal, etc.).

If the incident cannot be controlled by operating personnel without incurring undue risk, the PEC will implement the Site Evacuation Procedures (Section 2.1); if off-site neighboring population is at risk the Off-Site Evacuation Procedures (Section 2.2) will be implemented. The PEC will notify the NYSEG project manager and the City of Cortland and any other government agencies and departments that a situation resulting in evacuation has occurred. Should emergency assistance in treating injuries or carrying out the evacuation be required, the PEC will request assistance of the appropriate parties.

1.4 Conditions for Implementing a Contingency Plan

Some of the conditions under which the contingency plan would be implemented are:

- fire or explosion;
- occurrence of a spill or material release;
- severe weather conditions; and
- physical or chemical injury to a worker.

1.4.1 Fire and/or Explosion Conditions

Contingency procedures will immediately be implemented upon notification that any of the following scenarios involving fire and/or explosion is imminent or has occurred:

- a fire that causes, or could cause, the release of toxic fumes;
- a fire that could possibly ignite nearby flammable materials or could cause heat-induced explosions;
- a fire that could possibly spread to off-site areas;
- a danger exists that an explosion could occur causing a safety or health hazard; and
- an explosion has occurred.

1.4.2 Spill or Material Release Conditions

Any of the following scenarios involving a spill or material release, whether imminent or having already occurred, will cause implementation of contingency procedures:

- a spill or material release that could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard;
- a spill or material release that could cause the release of toxic vapors or fumes into the atmosphere in concentrations higher than the OSHA Permissible Exposure Limits (PELs);
- a spill or material release that can be contained onsite where a potential exists for groundwater or surface water contamination; and
- a spill or material release that cannot be contained onsite, resulting in a potential for off-site contamination and/or groundwater contamination.

The PEC will immediately identify the character, source, amount, and extent of any release. Spills or material releases shall be reported immediately to the PEC. Initial identification will be based on visual analysis of the material and location of the release. If the release material cannot be identified, samples will be taken for analysis.

1.4.3 Severe Weather Conditions

The following severe weather conditions, whether imminent or having occurred, may cause implementation of contingency procedures:

- a tornado has been sighted in the area;
- a tornado warning is in effect for the area;
- a lightning storm is underway in the area (storm center less than 5 miles away); and
- other severe weather or weather induced conditions (e.g., hurricane or flood).

1.4.4 Physical or Chemical Injury Conditions

The following worker injuries may cause implementation of the Contingency Plan:

- major physical injuries;
- chemical injuries; and
- severe symptoms of chemical overexposure.

1.5 Contingency Procedures

If any of the aforementioned conditions for implementing the Contingency Plan are met, the appropriate following contingency procedure(s) shall be performed.

1.5.1 Contingency Procedures for Fire/Explosion

When fire or explosion appear imminent or have occurred, all normal activity in affected areas will cease. The PEC will make an assessment of the potential risk and severity of the situation to decide whether the emergency event will or will not be readily controllable with existing portable fire extinguishers or site equipment and materials at hand. Fire fighting will not be done at the risk to site workers. Local fire departments will be contacted in all situations in which fires and/or explosions have occurred. The following steps will be taken for localized fire:

- contact local fire departments;
- move all personnel to an upwind location at a safe distance away;
- determine if fire is within onsite personnel capabilities to attempt initial fire fighting;
- determine if smoke and/or fumes from fire are potentially impacting off-site areas;
- if the fire is not impacting off-site areas and is within onsite personnel capabilities, utilize most appropriate means of extinguishing fire (e.g., fire extinguishers, water, covering with soil); and,
- once fire is extinguished, containerize and properly dispose of any spilled material, runoff, or soil.

If the situation appears uncontrollable and poses a direct threat to human life, fire departments will be contacted and the Emergency Evacuation Procedures identified in Section 2 will be implemented. If the chances of an impending explosion are high, the entire area within a 1,000-foot radius of the fire source will be evacuated. The PEC will alert personnel when all danger has passed, as determined by the chief fire fighter from the responding fire department. All equipment used in the emergency will be cleaned and refurbished as soon as possible after the emergency has passed so that it will be ready for use in the event of any future emergency.

1.5.2 Contingency Procedures for Spills or Material Releases

If a hazardous waste spill or material release or process upset resulting in probable vapor release is identified, the PEC will immediately assess the magnitude and potential seriousness of the spill or release based upon:

- MSDS for the material spilled or released;
- source of the release or spillage of hazardous material;
- an estimate of the quantity released and the rate at which it is being released;
- the direction in which the spill or air release is moving;
- personnel who may be or may have been in contact with the material, or air release, and possible injury or sickness as a result;
- potential for fire and/or explosion resulting from the situation; and
- estimates of area under influence of the release.

If the spill or release is determined to be within the onsite emergency response capabilities, the PEC will ensure implementation of the necessary remedial action. If the accident is beyond the capabilities of the operating crew, all personnel not involved with the emergency response activity will be evacuated from the immediate area and the appropriate emergency response group(s) will be contacted.

1.5.3 Contingency Procedures for Severe Weather

When severe weather occurs, such as a tornado is sighted in the area, when a tornado warning has been issued, or when a lightning storm occurs, the information will be immediately relayed to the PEC. In the case of a tornado sighting, the PEC will then institute emergency shutdown procedures, and all personnel will be directed to proceed indoors after completing appropriate shutdown procedures. In the case of a tornado

warning, or lightning storm, the PEC will have operations stopped and direct all personnel to stand by for emergency procedures. Other types of weather or weather induced conditions (e.g., hurricane or flooding) for which long range prediction is available may also require positive action as identified herein.

When the severe weather has passed, the PEC will direct personnel to inspect onsite equipment to ensure its readiness for operation prior to restarting operations.

If an inspection indicates a fire, explosion, or release has occurred as the result of a severe weather condition, the procedures for those events will be followed.

1.5.4 Contingency Procedures for Physical Injury to Workers

Regardless of the nature and degree of the injury, the PEC will be apprised of **all** injuries requiring first aid of any kind. A report of the injury or incident will be completed as required by the NYSEG Health and Safety Plan. Upon notification that a worker has been injured, the PEC will immediately determine the severity of the accident, and whether the victim can be safely moved from the incident site. Appropriate medical assistance will be summoned immediately.

Minor injuries sustained by workers will be treated onsite using materials from the first aid kits. Whenever possible such treatment will be administered by trained personnel in a "clean zone". Examples of minor injuries include small scrapes and blisters. Minor injuries would not be expected to trigger implementation of the contingency plan.

Major injuries sustained by workers will require professional medical attention at a hospital. The PEC will immediately summon an ambulance and contact the hospital to which the injured worker will be transported. The PEC will notify the NYSEG manager as soon as practical. The hospital and ambulance should be advised of:

- the nature of the injury;
- whether the injured worker will be decontaminated prior to transport;
- when and where the injury was sustained; and
- the present condition of the injured worker (e.g., conscious, breathing).

1.5.5 Contingency Procedures for Chemical Injury to Workers

Injuries involving hazardous chemicals or symptoms of severe chemical overexposure will automatically trigger implementation of the contingency plan. Upon notification that a chemical injury has been sustained or severe symptoms of chemical exposure are being experienced, the PEC will notify the hospital and ambulance of the occurrence. The PEC will provide, to the extent possible, the following information:

- the nature of the injury (e.g., eyes contaminated);
- the chemical(s) involved;
- the present condition of the injured worker (e.g., conscious, breathing);
- whether the injured worker will be decontaminated prior to transport; and
- when and where the injury was sustained.

Steps will immediately be taken to remove the victim from the incident site using whatever personal protective equipment (PPE) and safety equipment is necessary. Rescuers will check for vital signs and, if possible, remove contaminated outer clothing. If the victim's eyes have been contaminated, personnel trained in administering first aid will flush the victim's eyes with eyewash solution until the emergency response team arrives.

Details on the nature of the contaminant and methods for treating exposure or injury can be obtained from the MSDSs or Occupational Health Guidelines as provided in the NYSEG Health and Safety Plan.

2.0 EMERGENCY EVACUATION PROCEDURES

2.1 Site Evacuation Procedures

If an emergency occurs that requires the evacuation of an area to ensure personnel safety, including (but not limited to) fire/explosion, severe weather, material spills, or a significant release of vapors into the atmosphere, an air horn will be sounded on the site by the nearest person aware of the event. The horn will sound continuously for approximately 15 seconds, signaling that immediate evacuation of all personnel from the area is necessary as a result of some existing or impending danger. In areas where only two or three people are working side by side, and the need to evacuate can be communicated verbally by the nearest person aware of the event, the air horn will not be necessary.

All heavy equipment in the area will be shutdown. Under no circumstances will incoming visitors (other than emergency response personnel) be allowed to enter any area where an emergency is occurring. Visitors or observers and all non-essential personnel present in the area of an emergency will be instructed to evacuate the area immediately.

Contractor and subcontractor emergency coordinators and/or health and safety officers (as designated) will be responsible for ensuring that emergency response requirements specific to their own operations are carried out. These parties will report their activities to the PEC. The PEC, however, has final authority regarding all emergency response activities.

All non-essential personnel shall evacuate the emergency areas and notify personnel in adjacent areas to evacuate also. The evacuated workers will assemble at the primary assembly area on Charles Street, where the PEC will give directions for implementing necessary actions. In the event that the primary assembly area is involved, unapproachable, or unsafe due to the event, evacuated workers shall assemble at the alternate assembly area on Charles Street. The PEC will phone for backup assistance.

Personnel are to avoid encountering smoke/gas plumes as practicable during evacuation and assembling.

The PEC will take charge of all emergency response activities and dictate the procedures that will be followed until emergency personnel arrive. The PEC will assess the seriousness of the situation, and direct whatever efforts are necessary until the emergency response units arrive.

After initiating emergency response procedures, the PEC will assign appropriate personnel to check and attempt to ensure that Charles Street is not obstructed. If traffic control is necessary, as in the event of a fire or explosion, personnel who have been trained in these procedures and designated at the project safety meeting will take over these duties until emergency units arrive.

The PEC will remain at the site to provide any assistance requested by emergency-response squads as they arrive to deal with the situation. The PEC will have the authority to shut down any part or the entire project after an emergency until he deems it safe to continue operations. He will dictate any changes in project safety practices which are made necessary by the emergency that has occurred or are required for preventing further emergencies.

2.2 Off-Site Evacuation Procedures

If the PEC deems that humans outside of the Site are at risk, he will notify the appropriate agencies and departments (e.g., NYSEG project manager, Cortland County Department of Health, City of Cortland DPW, City of Cortland Police and/or Fire Department, NYSDEC and NYSDOH, etc.) of the need, or potential need, to institute off-site evacuation procedures. The PEC will provide, at a minimum, the following information:

- his name and telephone number;
- name and address of facility;
- time and type of incident (e.g., release, fire, etc.);
- name and quantity of materials or materials involved, to the extent this information is known;
- the extent of injuries, if any; and
- the possible hazards to human health or environment, and cleanup procedures.

APPENDIX F

ODOR, VAPOR, AND DUST CONTROL PLAN

ODOR, VAPOR, AND DUST CONTROL PLAN

FOR

REMEDIATION OF THE CHARLES STREET SITE

SITE #7-12-012

CITY OF CORTLAND, CORTLAND COUNTY, NEW YORK

Prepared For:

NEW YORK STATE ELECTRIC & GAS CORPORATION

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OCTOBER 2010

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1.0 ODOR, VAPOR, AND DUST CONTROL PLAN

This *Odor, Vapor, and Dust Control Plan (OVDCP)* is designed to address potential emissions of odor, vapor and/or dust that may arise as a result of operations during the Remedial Action to be completed at NYSEG's Charles Street Site, City of Cortland, Cortland County, New York. This *OVDCP Plan* supplements the *Work Plan* and the NYSEG Health and Safety Plan.

As part of the air monitoring program, NYSEG will undertake a community air monitoring program detailed in the *Community Air Monitoring Plan (CAMP)* to provide direct measurement of volatile organic compounds and total suspended particulates which may be released during excavation and handling of excavated materials. This air monitoring program was established to address the following objectives:

- To ensure concentrations of volatile organic compounds and total suspended particulate are minimized to protect human health and the environment.
- To provide an early warning system so engineering controls can be enacted to prevent unnecessary exposures or emissions resulting from project activities.

The *Emission Response Plan* is provided as Attachment 1.

1.1 Constituents of Concern and Action Levels

1.1.1 Total VOCs

Based on data published by OSHA (Occupational Safety and Health Administration), ACGIH (American Congress of Government Industrial Hygienists) and NIOSH (National Institute for Occupational Safety and Health), a short term air quality action level (above background) of 5 ppm for total VOCs has been established for air emissions action levels at the site perimeter. The attached *Emission Response Plan* will be implemented if these levels are exceeded. The *Major Emission Response Plan* will be implemented if total VOCs exceed 25 ppm for more than 30 minutes.

1.1.2 Odors

If significant odor is detected by the site personnel or a complaint is received, engineering controls will be implemented as outlined in the Charles Street attached *Emission Response Plan* and discussed in

Section 1.3 to reduce odor causing emissions. Once odors become non-discernable, normal operations may resume.

1.1.3 Dust

A New York State recommended action level of 0.15 mg/m^3 for particulate matter (above background) will be used to determine whether modifications to given processes are required. If the site particulate measurement is greater than 0.15 mg/m^3 above the upwind background level, the source of the dust will be identified. Dust suppression techniques similar to emission controls discussed in Section 1.3 will be implemented as indicated on the *Emission Response Plan*.

1.2 Air Monitoring Equipment and Methods

Equipment and methods for air monitoring are detailed in the *Community Air Monitoring Program*.

1.3 Emission Response Plan

Due to the site location within a residential neighborhood and the close proximity of nearby residences and St. Mary's Elementary school (and playground), vapor and dust control will be required. Attachment 1 presents the *Emission Response Plan* for the control of vapors and dust.

The Charles Street Site *Emission Response Plan* will be triggered by an exceedance of the 15 minute average VOC concentration of 5.0 ppm (above background) at the site perimeter. If the *Emission Response Plan* is triggered all excavation activities will be stopped and the following actions will be taken:

- Continue total VOC monitoring of emissions at the site perimeter. If the total VOC level drops below 5.0 ppm (above background), then excavation activities can resume. However if the VOC levels persist above 5.0 ppm, based on continual observance of the meter, then the Contractor shall implement engineering controls such as misting the excavation area with BioSolve®, covering, backfilling etc. required to reduce emissions and at the same time notify the site Project Manager and the Project Health & Safety Coordinator (PHSC).
- If the total VOC levels drop below 5.0 ppm (above background) after the implementation of additional engineering controls, then the excavation activity can resume provided work activities were adjusted to reduce emission levels.
- If the total VOC levels continue to be greater than 5.0 ppm (above background) at the site perimeter then all site activities must be halted and emission controls continued until levels drop below 5.0 ppm.

Primary controls which may be implemented to reduce emission levels include:

- Adding surfactant such as BioSolve®;
- Limiting excavation size and the surface area of exposed contaminated soil;
- Covering contaminated soil with polyethylene sheeting; and
- If meteorological conditions, such as wind, are contributing factors to dust generation, site activities may be temporarily halted.

If efforts to abate the emission source are unsuccessful and total VOCs greater than 25.0 ppm persist for more than 30 minutes, then the *Major Emission Response Plan* shall automatically be placed in effect. Upon activation of the *Major Emission Response Plan*, the following activities will be undertaken:

- Cover the excavated area with polyethylene sheeting or clean soil.
- Notify the City of Cortland DPW at (607) 756-6221 William Ports with the NYSDEC at (518) 402-9662 and Julia Kenney of NYSDOH at (800) 458-1158 ext 27860.
- Total VOC levels will be monitored at 15 minute intervals at the site perimeter.
- If total VOC levels persist above 5.0 ppm (above background) the construction supervisor, PHSC and NYSEG project manager will consult with each other and the Emergency Response agencies to determine the appropriate actions to be implemented. NYSEG project management personnel have ultimate authority during major vapor emission emergencies.

If total VOCs levels in two successive readings fall below action levels, air monitoring may be halted or modified by PHSC and work activities resumed.

If the site particulate measurement is greater than 0.15 mg/m^3 above the upwind background level, the source of the dust will be identified. Dust suppression techniques similar to emission controls (i.e., misting surfaces with water or covering open piles) will be implemented as indicated on the *Emission Response Plan*.

1.4 Odor Control Plan

The nature of the onsite wastes pose a potential concern regarding the generation of nuisance odors during excavation and material handling. Onsite personnel will record observations of odors generated during the course of the remedial work both onsite and off-site in adjacent areas and attempt to limit odor generation.

For an odor complaint residents may speak with the NYSEG onsite construction supervisor or the NYSDEC onsite representative. To register an odor complaint residents may call a toll-free number that will

be staffed 24-hours per day, seven days per week. The toll-free number will be established prior to the start of the project and posted on the site perimeter fencing. Calls to the toll-free number will generate a call from the answering service to project team members based on a call out list that will prepared at the commencement of the project. Project team members will record the callers concern and contact the site construction supervisor or project manager, who will assess the reason for concern and apply the appropriate engineering controls which include:

- Adding surfactant such as BioSolve®;
- Limiting excavation size and the surface area of exposed contaminated soil;
- Covering contaminated soil with polyethylene sheeting; and
- If meteorological conditions, such as wind, are contributing factors to an odor nuisance, site activities may be temporarily halted.

Once odors become non-discernable, normal operations may resume. This determination will be subject to the approval of the onsite NYSDEC representative.

ATTACHMENT 1

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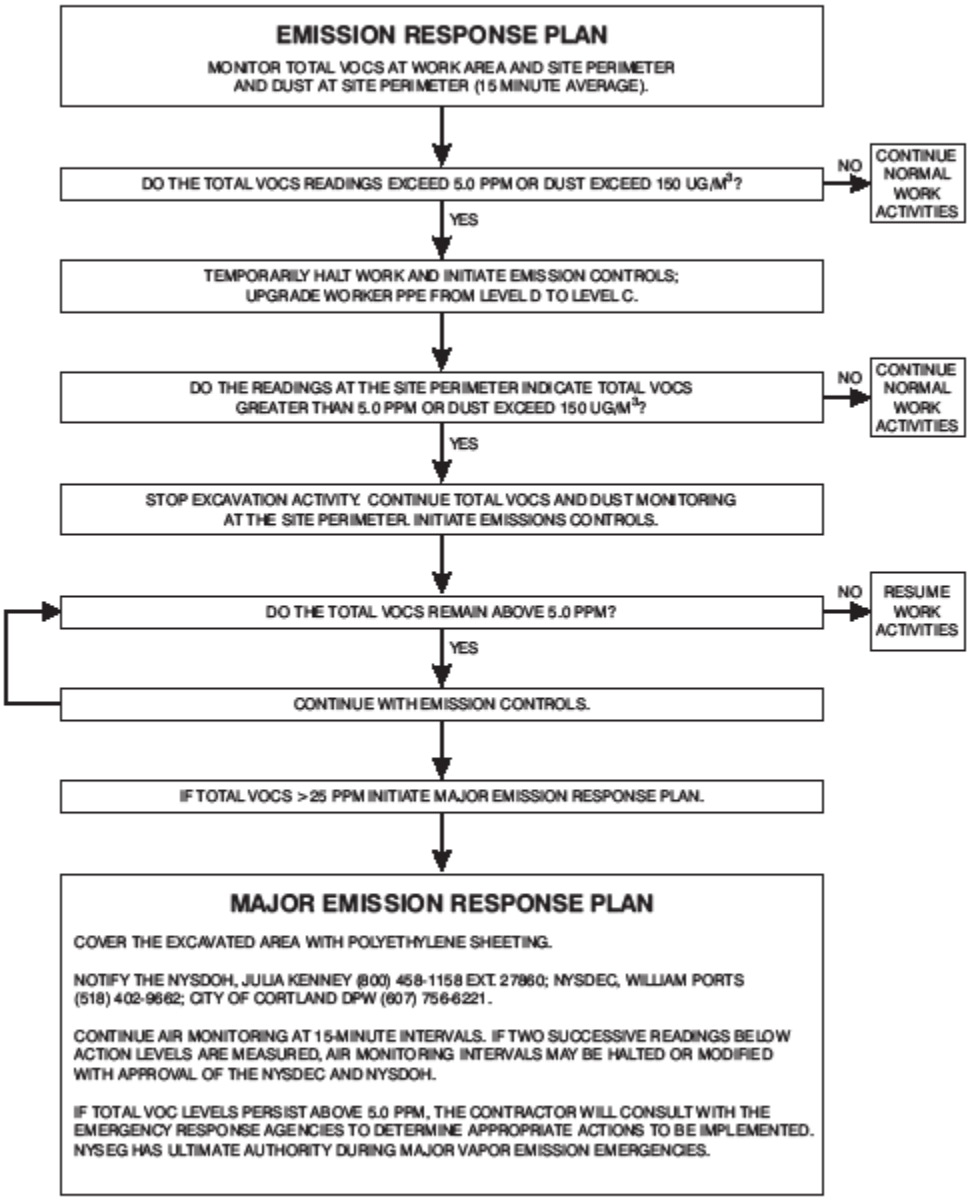
CHARLES STREET SITE



APPENDIX G

QUALITY ASSURANCE PLAN

QUALITY ASSURANCE PROJECT PLAN

FOR

REMEDIATION OF THE CHARLES STREET SITE

SITE #7-12-012

CITY OF CORTLAND, CORTLAND COUNTY, NEW YORK

Prepared For:

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Attachment 1 Chain of Custody Record
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1.0 INTRODUCTION

This *Quality Assurance Project Plan (QAPP)* provides a description of sampling and laboratory procedures/protocols to be used in support of the *Remedial Design Work Plan (Work Plan)* associated with the Charles Street Site, City of Cortland, Cortland County, New York. No pre-remediation or confirmation sampling programs are presented in the Charles Street *Work Plan*. However, sampling and analysis may be required for waste disposal characterization purposes. A *Sampling Analysis Plan* (*SAP*) for waste disposal characterization is included in the *Work Plan*. The fundamental purpose of the *QAPP* is to ensure that any quality analytical data generated to support the project will be consistent with the Data Quality Objectives (DQOs) as specified herein. To the extent that discrepancies exist between this *QAPP* and the *Work Plan*, the *Work Plan* shall control.

2.0 DATA QUALITY OBJECTIVES

Data quality objectives (DQOs) are statements, expressed in either qualitative or quantitative terms, which address the appropriate level of data quality for a project. The quality of data generated must be suitable to support the decisions used to achieve the overall goals as delineated in the *Work Plan*. The general project DQOs are summarized in this section, with detailed information given throughout this QAPP and associated sections of the specific project *Work Plan*. The overall DQOs of the project are:

- To ensure that samples collected are representative of the sample population;
- To provide detection limits for the selected analytical methods, which are below the established cleanup objectives or regulatory limits;
- To measure and document precision and accuracy using procedures established by the laboratories, the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) and U.S. Environmental Protection Agency (EPA) approved analytical methods; and
- To ensure that all soil/residues and wastewater analyses will be conducted by a NYSDOH ELAP and NYSDOH ELAP Contract Laboratory Program (CLP) certified laboratory for all applicable parameters referenced in this *QAPP*.

3.0 SAMPLE COLLECTION

3.1 Soil

This section describes the collection procedures and sampling equipment for soil samples. These potential schedules are based on the requirements for soil disposal.

All sampling equipment will be properly disposed or decontaminated before being reused (see Section 8.1.1). Samples will be collected and placed in pre-cleaned sample containers provided by the laboratory performing the analysis. All necessary preservations will be added to the sample containers at the laboratory prior to being shipped to the Site. Samples will be stored at 4 degrees Centigrade until delivered to, and analyzed by the laboratory. This will be accomplished by utilization of an on-site refrigerator and/or coolers with ice. (When collecting composite samples for TCLP volatile analysis, volatilization will be minimized by covering the sample compositing container and placing it within a cooler filled with ice between grab sample additions.)

3.2 Wastewater Sampling

This section describes the collection procedures sampling equipment before being transported to a permitted facility for proper treatment and disposal.

Samples will be transferred directly into pre-cleaned sample collection containers which are supplied by the laboratory performing the analyses. All necessary preservatives will be added to the sample containers at the laboratory prior to being shipped to the Site. Samples will be stored at 4 degrees Centigrade until delivered to, and analyzed by the laboratory. This will be accomplished by utilization of an onsite refrigerator and/or coolers with ice.

3.3 Sample Containers and Preservatives

Sample containers and preservatives will be provided by the contracted laboratories and stored on-site in a secure, clean, and dry location. Sample containers and preservatives by matrix and analysis are listed in the table below.

TABLE A

SAMPLE CONTAINERS & PRESERVATIVES

Analysis	Matrix	Container	Preservative
TCLP Semi-volatiles	Soil	500 ml glass *	4 degrees C
TCLP metals	Soil	500 ml glass *	4 degrees C
TCLP Pesticides/Herbicides	Soil	500 ml glass*	4 degrees C
Reactive Cyanide	Soil	500 ml glass*	4 degrees C
Reactive Sulfide	Soil	500 ml glass*	4 degrees C
TCLP Volatiles	Soil	20 ml glass	4 degrees C
PAHs	Soil	250 ml glass	4 degrees C
Total BTEX (benzene, toluene, ethylbenzene, xylenes)	Soil	125 ml glass	4 degrees C
Metals (lead, mercury)	Soil	250 ml glass **	4 degrees C
Metals (23)	Water	500 ml plastic	HNO_3 to pH <2
Semi-volatiles	Water	1000 ml amber glass	4 degrees C
Pesticides/Herbicides	Water	1000 ml amber glass	4 degrees C
Volatiles	Water	40 ml glass	4 degrees C or HCI to pH <2
Paint Filter	Water	500 ml glass	4 degrees C
Total Cyanide	Water	500 ml plastic	4 degrees C NaOH to pH >12
Percent Sulfur	Soil	250 ml glass **	4 degrees C
PCBs	Soil	500 ml glass ***	4 degrees C
Ignitability	Soil	500 ml glass ***	4 degrees C
Heat of Combustion	Soil	500 ml glass ***	4 degrees C
Reactivity (cyanide and sulfide)	Soil/Water	500 ml glass ***	4 degrees C
Corrosivity (as pH)	Soil/Water	500 ml glass ***	4 degrees C
Percent Solids	Soil	500 ml glass ***	4 degrees C
pH	Soil	500 ml glass ***	4 degrees C

* May be analyzed from same sample container and/or extract.
** May be analyzed from same sample container.
*** May be analyzed from same sample container.
Note: All glass containers will be sealed with Teflon lined caps. All waste samples for organic fractions will be collected in duplicate.

3.4 Sample Holding Times

The following identifies samples by type and matrix and their related holding times.

TABLE B

WASTE CHARACTERIZATION SAMPLES

Sample Type	Matrix	Holding Time *
TCLP Pest./Herb.	Soil	5 days (TCLP extraction); 7 days (preparative extraction); 40 days (after extraction)
TCLP Semi-volatiles	Soil	5 days (extraction); 40 days (after extraction)
TCLP Mercury	Soil	5 days (TCLP extraction); 28 days (after extraction)
TCLP Metals	Soil	180 days (TCLP extraction)
TCLP Volatiles	Soil	7 days (TCLP extraction); 7 days (after extraction)
Reactive Sulfide	Soil	7 days
Reactive Cyanide	Soil	14 days
PCBs	Soil	5 days (extraction); 40 days (after extraction)
Ignitability	Soil	N/A
Reactivity	Soil	Cyanide 14 days Sulfide 7 days
Corrosivity (as pH)	Soil	2 days
Percent Solids	Soil	N/A
* Samples will be analyzed on a priority basis and reported within 10 days of collection or the maximum holding time, whichever is less. Holding times begin from validated time of sample receipt (VTSR) at the laboratory.		

TABLE C

WASTEWATER SAMPLES

Sample Type	Matrix	Holding Time *
Semi-volatiles	Water	5 days (extraction); 40 days (after extraction)
Metals	Water	180 days
Total Cyanide	Water	14 days
Paint Filter	Water	N/A
Reactivity	Water	Cyanide 14 days Sulfide 7 days
Corrosivity (as pH)	Water	Analyze immediately
Volatiles	Water	7 days
* Samples will be analyzed on a priority basis and reported within 5 days of collection or the maximum holding time, whichever is less. Holding times begin from VTSR at the laboratory.		

4.0 SAMPLE CUSTODY, IDENTIFICATION & TRACKING

4.1 Holding Times and Sample Transport

Since the samples will be analyzed at priority turn around, no exceedances of holding time are expected. Holding times will be calculated from the validated time of sample receipt (VTSR) to the subsequent extraction, if necessary, or analysis. All samples will be delivered to the laboratory by same day courier or overnight delivery in sealed coolers with ice.

4.2 Chain of Custody

All samples will be accompanied by a Chain of Custody (COC) from the point of sampling to delivery of the samples to the laboratory. The COC will be a record of the locations where the sample was collected, the date and time collected, number of containers, type(s) of analyses requested, special remarks or requests, and the signature of each custodian of the samples. The completed chain of custody will be included in all hard copies of reports. See Attachment 1 for a sample Chain of Custody Form.

Upon sample receipt, laboratory personnel will be responsible for sample custody. The laboratory sample custodian will verify sample integrity and compare the cooler contents against the field chain of custody. If a sample container is broken or leaking, it will be noted on the COC form and NYSEG project personnel will be immediately notified. If any labeling or descriptive errors are observed by the sample custodian, NYSEG project personnel will be contacted immediately to resolve any discrepancies. After all discrepancies (if any) are resolved, the laboratory will acknowledge receipt of the samples (i.e., by signing and dating the COC) and the completed chain of custody will be included in all hard copies of reports and become a permanent part of the project records.

4.2.1 Sample Identification

Each sample collected during the project will have a unique identification number. This number, date of collection and type of analysis will be placed on each sample container after the sample is collected. See Attachment 2 for sample identification naming convention for soil and wastewater samples.

4.3 Laboratory Sample Tracking

Each laboratory has an internal tracking mechanism to ensure that each sample received has a unique identification number and that results generated and reported for each sample correspond to the identification number assigned to the laboratory.

5.0 CALIBRATION PROCEDURES

Each analysis will be performed in accordance with NYSDOH ELAP sanctioned methods or equivalent U.S. EPA analytical procedures. Each procedure specifies the method and frequency of calibration necessary to perform accurate and precise analyses. Each analytical instrument verifies the Minimum Detection Limit at least every six months as prescribed by the NYSDOH ELAP. The calibration of the instruments is verified at the beginning and end of each auto sampler run. Gas Chromatograph/Mass Spectrometers are tunes and calibrated every 12 hours, at a minimum.

All field equipment, for real time and speciated real time air analyses will be calibrated daily, in accordance with manufacturer's recommendations. All equipment will be calibrated more frequently if conditions warrant. The TVA meter used to measure volatile organic vapors will be calibrated to a benzene standard. The Mini Ram used to measure particulates will be calibrated to zero with filtered air. The portable GC unit will be used to measure the BTEX (benzene, toluene, ethylbenzene and xylenes) compounds and will be calibrated to a BTEX standard.

6.0 ANALYTICAL PROCEDURES

6.1 Laboratory Analyses

The following charts show the analytical method to be used for each analyte or group of analytes for the project:

TABLE E

ANALYTICAL METHODS

Analyte	Analytical Method
TCLP Extractions	SW 846 Method 1311
TCLP Volatiles	SW 846 Method 8260B
TCLP Semi-volatiles	SW 846 Method 8270C
TCLP Metals	SW 846 Method 6010B/7470A
TCLP Pesticides/Herbicides	SW 846 Method 8081A/8151A
Polycyclic Aromatic Hydrocarbons (Table F)	SW 846 Method 8270C
Total Volatiles	SW 846 Method 8260B
Total Semi-volatiles	SW 846 Method 8270C
Total Metals	SW 846 method 6010B/7470A
PCBs	SW 846 Method 8082
Reactive Sulfide	SW 846 Chapter 7.3.4.2
Reactive Cyanide	SW 846 Section 7.3.3.2
Percent Sulfur	ASTM D-129
BTU/lb	ASTM D-215
Flashpoint	ASTM D-93
Ignitability	SW 846 Method 1030
Reactivity	SW 846 Section 7
Corrosivity	SW 846 Section 7
Percent Solids	ASP Method D-V-Section IX
pH	SW 846 Method 9045C
Total Cyanide	SW 846 Method 9012
Paint Filter test	SW 846 9095

TABLE F

POLYCYCLIC AROMATIC HYDROCARBON (PAH) ANALYTE LIST

PARAMETER
Naphthalene
2-Methylnaphthalene
Acenaphthene
Acenapthylene
Fluorene
Phenanthrene
Anthracene
Fluoranthene
Dibenzofuran
Pyrene
Benzo (g,h,i) perylene
Benzo (a) anthracene *
Chrysene *
Benzo (b) fluoranthene *
Benzo (k) fluoranthene *
Benzo (a) pyrene *
Indeno (1,2,3 cd) pyrene *
Dibenzo (a,h) anthracene *
***Carcinogenic PAHs (cPAH)**

6.2 Laboratory Selection

The laboratory chosen for the project must be certified, and maintain certification, under the NYSDOH ELAP and NYSDOH ELAP CLP for analyses of solid and hazardous waste. Only NYSEG-approved analytical laboratories that have experience in MGP projects or similar projects will be considered for use. NYSEG will select the laboratory in the event samples are collected for laboratory analysis.

7.0 DATA REDUCTION VALIDATION AND REPORTING

7.1 Data Reduction

7.1.1 Field Data Collection

Real time field data collected during sampling events will include qualitative information regarding the texture, appearance, odors, and any other observations made while soil and water samples are being collected. Meteorological data and current site activity will be noted while collecting data for real time air monitoring. These observations will be recorded in the field logbook.

7.1.2 Laboratory Data Collection and Reduction

A significant portion of the analyses performed require the use of automated laboratory instrumentation. Raw data collected from the instrument detectors will be converted to standard units of mg/Kg for solid matrices and μg/L or mg/L for water. All raw data will be stored in electronic form and in laboratory notebooks, in case the analysis needs to be recreated. Raw data for all analyses will be archived for a minimum of four years.

7.2 Data Review

All analytical data will be verified for precision and accuracy utilizing the laboratory's in-house Quality Assurance/Quality Control programs. In addition, all data packages will be reviewed by NYSEG project personnel to ensure that all data deliverables have been properly provided.

7.3 Full Data Validation

The full third party data validation process consists of a formal systematic review of analytical results and QC documentation with regards to the parameters cited in Section 8.2. On the basis of this review, a third party data validator will make judgments and express concerns on the quality and limitations of the specific data and the validity of the data package as a whole. The data validator prepares documentation of his or her review using the standard USEPA Organics and Inorganics Regional assessment and Organics Regional assessment forms to summarize deficiencies and general laboratory

performance. These forms are accompanied by appropriate supplementary documentation which identifies specific problems. Since a full data validation would typically be used for the purpose of litigation, this level of review may surpass the scope of work necessary for the project. Therefore, any full data validation will be performed at NYSEG's discretion.

7.4 Data Usability Summary Report (DUSR)

A Data Usability Summary Report (DUSR) provides a thorough review and evaluation of analytical data without the formality of a full third party data validation. A DUSR for the analytical results will be generated in lieu of a full data validation to verify that the proper data deliverables and procedures have been rendered in accordance with the data quality objectives and at NYSEG's discretion.

7.5 Reporting

Final reports for analytical data will be reviewed and accepted by NYSEG. Reports for analyses performed under the NYSDEC ASP will contain a results sheet for the sample analyzed. These reports must include at a minimum:

- NYSEG sample ID number;
- Laboratory sample ID number;
- Sample collection date;
- Extraction or digestion date (if applicable);
- Data analyzed;
- Analytical method;
- Analytical results (with units clearly identified);
- Results of laboratory blank and field blanks;
- Results of spikes, matrix spikes, and duplicates;
- Surrogate recoveries (if applicable);
- Completed Chain of Custody forms; and
- Field log sheets (if available).

8.0 QUALITY CONTROL CHECKS

8.1 Sampling

8.1.1 Decontamination Procedures for Sampling

The following decontamination procedure will be followed for all non-disposable sampling equipment before being reused:

- Equipment will be washed thoroughly with a non-phosphate detergent.
- The equipment will then be rinsed with analyte-free water.
- The equipment will be rinsed with a reagent grade methanol solution diluted with analyte-free water.
- If the equipment is being used for the collection of samples for metals analyses, it will then be rinsed with a 10% reagent grade nitric acid solution.
- The equipment will be rinsed with analyte-free water.

After decontamination, equipment will be carefully stored to avoid contamination between sampling events.

8.2 Laboratory Quality Control (QC)

Each laboratory is NYSDOH certified for the analyses they will perform. Each analyst must complete a start-up proficiency procedure to demonstrate their capability to perform accurate and precise analyses on each type of instrument they operate. In addition, each laboratory must accurately analyze samples provided by NYSDOH on a semi annual basis to maintain certification. The laboratories have internal quality control officers that review all methodologies and implement corrective action, including reanalyzing samples which do not pass established laboratory quality control (QC) criteria.

Laboratory quality control procedures are specified in the analytical methods. These specifications include the type of QC check required, compounds and concentrations to be used, and QC acceptance criteria. QC checks will include (where specified by method):

- Calibration Standards;
- Methods Blanks;
- Matrix Spike/Matrix Spike Duplicates;
- Surrogate Spikes;
- Internal Standards;
- Laboratory Duplicates;
- Calibration Check Standards; and
- Laboratory Control Samples.

9.0 PREVENTATIVE MAINTENANCE

9.1 Field Instruments and Equipment

Equipment, instruments, tools, gauges, and other items requiring preventive maintenance will be serviced by qualified personnel in accordance with the manufacturer's specified recommendations or written procedures developed by the operators. Prior to any field sampling, each piece of field equipment will be inspected to ensure that it is operational. If the equipment is not operational, it must be repaired prior to use. All equipment which requires charging or batteries will be fully charged or have fresh batteries at the start of the project. An equipment repair/maintenance log will be kept for each field instrument. Any non-operational/non-repairable field equipment will be replaced.

9.2 Laboratory Instruments and Equipment

Each laboratory has an instrument/equipment maintenance program which includes procedures for daily, weekly, monthly, or annual routine maintenance. In addition, maintenance is performed if the accuracy and/or precision of the instrument is in question.

9.2.1 Instrument Maintenance

Preventative maintenance of laboratory instruments will be conducted in accordance with the manufacturer's guidelines or written procedures developed by the operators. All instrument service will be performed by qualified personnel. To minimize potential downtime, the laboratory will maintain a sufficient supply of critical spare parts for its instruments and, where practical, maintain a service contract for rapid instrument repair. Wherever possible, the laboratory will retain backup instrumentation. An instrument repair/maintenance log will be maintained for each instrument.

9.2.2 Equipment Monitoring

On a daily basis, the operation of the laboratory equipment (i.e., balances, ovens, refrigerators, water purification systems, etc.) will be checked and documented. Any discrepancies will be immediately reported to the appropriate laboratory personnel for resolution.

ATTACHMENT 1

NYSEG CHAIN OF CUSTODY RECORD Laboratory _____

_____

Project Location: _____
Samplers: _____
Affiliation: _____

Sample ID Code	Type	Matrix	Collection Date/Time	No. of Containers											Remarks

Matrix Code: L=Liquid; S=Solid; A=Air

Relinquished by: _____ Loc: _____ Date: _____ Time: _____
Received by: _____ Loc: _____ Date: _____ Time: _____

Seals Intact
Y N N/A

Relinquished by: _____ Loc: _____ Date: _____ Time: _____
Received by: _____ Loc: _____ Date: _____ Time: _____

Seals Intact
Y N N/A

Special Instructions/Remarks: _____

_____

Delivery Method: In Person Common Carrier (specify) Lab Courier Other (specify)

ATTACHMENT 2

SYSTEM CODING

SYSTEM CODING IS DERIVED FROM A 10 CHARACTER CODE WITH THE 11 CODE DECLARING SAMPLE TYPE.

HOW THE 10 CHARACTER CODING SYSTEM WORKS.

1 2	3	4	5 6	7 8	9 10

EX. OWEGO WELLPOINT 81-01 SH

O W G U S H 8 1 0 1 G
1 2 3 4 5 6 7 8 9 10

FIRST TWO CHARACTERS = SITE
THIRD CHARACTER = SOURCE
FOURTH CHARACTER = RELATIVE LOCATION
FIFTH AND SIXTH CHARACTER = YEAR OF LOCATION/WELL
(XX, IF NOT APPLICABLE)
NINTH AND TENTH CHARACTER = NUMBER OF SAMPLING POINT/
CONSECUTIVE #
IF MORE THAN ONE SAMPLE FROM SAME LOCATION
(XX, IF NOT APPLICABLE)

PAGE 1 & 2…….. SITE
PAGE 3 ……. SOURCE
PAGE 4 ……. RELATIVE LOCATION
PAGE 5, 6 & 7 ……. LOCATION
PAGE 8 ……. TYPE

ENVIRONMENTAL QUALITY ANALYSIS SYSTEM
CLASS: SITE

CODE	DESCRIPTION
AC	AUBURN CLARK STREET MGP
AF	AFTON ASH DISPOSAL SITE
AG	AUBURN GREEN STREET MGP HOLDER
AL	ALBION MGP
AM	AUBURN MCMASTER STREET MGP
BC	BORDER CITY MGP
CA	CANADAIGUA MGP
CE	CHARLES STREET HOLDER
CH	CORTLAND/HOMER MGP
CL	CLYDE MGP
CO	COOPERSTOWN MGP
CR	CORNING MGP
CS	CLIFTON SPRINGS MGP
DR	DAVIS ROAD ASH DISPOSAL SITE
DV	DANSVILLE MGP
EL	ELMIRA MGP
EW	ELMIRA WATER STREET MGP
GS	GOSHEN MGP
GV	GRANVILLE MGP
HN	HORNELL MGP
IC	ITHACA COURT ST MGP
IF	ITHACA FIRST STREET MGP
II	ITHACA CAYUGA INLET MGP STORAGE AREA
LP	LOCKPORT MGP
LS	LOCKPORT STATE STREET MGP HOLDER
LY	LYONS MGP
MC	MECHANICVILLE COONS CROSSING MGP DISPOSAL AREA
MD	MEDINA MGP
ME	MECHANICVILLE CENTRAL AVE MGP
MW	MECHANICVILLE WILLOW GLEN MGP DISPOSAL AREA
NO	NORWICH MGP
NW	NEWARK MGP
ON	ONEONTA MGP
OW	OWEGO MGP
PA	PALMYRA MGP
PB	PLATTSBURGH BRIDGE STREET MGP
PJ	PENN YAN JACKSON STREET MGP
PL	PLATTSBURGH SARANAC STREET MGP
PP	POZZOLANA PARK ASH DISPOSAL MGP
PY	PENN YAN MGP
RE	(FOR “REASON9999” LIMITS)
SF	SENECA FALLS MGP
WA	WARSAW MGP
WT	WATERVILLE MGP
WW	GENEVA WADSWORTH STREET MGP

ENVIRONMENTAL QUALITY ANALYSIS SYSTEM
CLASS: SOURCE

CODE	DESCRIPTION
A	AIR SAMPLE
D	DRINKING WATER
E	LEAK DETECTION SYSTEM
F	FLY ASH
G	GROUND WATER
H	LEACHATE COLLECTION SYSTEM
I	BIOLOGICAL
L	LABORATORY
M	STORMWATER DISCHARGE
O	(FOR “GROUND9999” LIMITS)
P	PROCESS STREAM
Q	LIQUID WASTE
S	SURFACE WATER
T	SEDIMENT SAMPLE
U	SURFACE SOILS
V	SUBSURFACE SOILS
W	SOLID WASTE
X	SLUDGE SAMPLE
Z	PIEZOMETER

ENVIRONMENTAL QUALITY ANALYSIS SYSTEM
CLASS: RELATIVE LOCATION

CODE	DESCRIPTION
A	AMBIENT
C	CROSSGRADIENT
D	DOWNGRADIENT
I	IN FILL (TAKEN OUT OF A PILE) OR IN SOURCE
L	LOWER
P	UPPER
S	(FOR “REASON9999” LIMITS)
U	UPGRADIENT
W	WASTEWATER
X	N/A

ENVIRONMENTAL QUALITY ANALYSIS SYSTEM
CLASS: LOCATION

CODE	DESCRIPTION
A	DENOTES A WELL
AI	AIR INDOOR
AO	AIR OUTDOOR
AS	AIR SAMPLING LOCATION
B	BORING
BD	BOTTOM ASH POND DISCHARGE – NOT TREATED
BI	SETTLING BASIN INFLUENT
CK	SINK
CN	CANAL
CR	COAL TAR TANK
D-	DEEP
DS	DISTRIBUTION SYSTEM
DU	REPLICATE
E	EAST
FB	FIELD BLANK
FL	FLOOR DRAIN
FO	DRINKING WATER FOUNTAIN
GD	GROUND WATER DRAIN
GH	GAS HOLDER
I-	INSIDE LOCATION AREA
L-	LOWER
LA	LAGOON
LD	LEAK DETECTION DRAIN
LE	ASH LEACHATE
LS	LIFT STATION – PUMPING STATION
MD	MATRIX SPIKE DUPLICATE
MH	MANHOLE
MS	MATRIX SPIKE
N-	NORTH
ND	(FOR “GROUND9999” LIMITS)
ON	(FOR “REASON9999” LIMITS)
OS	OIL STORAGE AREA

ENVIRONMENTAL QUALITY ANALYSIS SYSTEM
CLASS: LOCATION

CODE	DESCRIPTION
PB	PURIFIER BOX
PD	PERIPHERAL DRAINAGE DITCH – AROUND LANDFILL, NO DIRECT DISCHARGE
PO	POND
PW	PROCESS WATER TREATMENT PLANT DISCHARGE – FINAL DISCHARGE FROM TREATMENT FACILITY
R-	DENOTES REPLACEMENT WELL
RF	ROLLOFF CONTAINER
RO	ROOF DRAIN
S-	SOUTH
SD	SEDIMENTATION POND DISCHARGE
SE	STORAGE PILE
SF	SURFACE
SP	SPRING
SH	SHALLOW
SP	SEDIMENTATION POND
SR	WATER
SS	STREAM
ST	SANITARY TREATMENT PLANT DISCHARGE
SW	DRAINAGE SWALE AREA – LOW SPOT FOR WATER COLLECTION
TB	TRIP BLANK
TD	TOE DRAIN
TK	TRUCK
TP	TEST PIT
TR	TRANSFORMER
TT	TELLTALE
U-	UPPER
UD	UNDERDRAIN
W-	WEST
WK	WATER TANK
WO	WASTE OIL CONTAINMENT STRUCTURE
WS	WATER SUPPLY WELL
WT	WATER TREATMENT WASTES
XX	N/A
YR	YARD ROOF DRAINS

ENVIRONMENTAL QUALITY ANALYSIS SYSTEM
CLASS: TYPE

CODE	DESCRIPTION
A	GAS SAMPLER
B	BAILER
C	COMPOSITE OVER THE TIME AT ONE LOCATION
D	PROBE
G	GRAB-SINGLE SAMPLE
H	HNU SAMPLE
L	COMPOSITE OF GRAB SAMPLES COLLECTED AT MULT. LOCATIONS
Q	QUALITY ASSURANCE SAMPLE
V	OVA SAMPLE

APPENDIX H

SAMPLING AND ANALYSIS PLAN

SAMPLING AND ANALYSIS PLAN

FOR

REMEDIATION OF THE CHARLES STREET SITE

SITE #7-12-012

CITY OF CORTLAND, CORTLAND COUNTY, NEW YORK

Prepared For:

NEW YORK STATE ELECTRIC & GAS CORPORATION

James A. Carrigg Center
18 Link Drive
P.O. Box 5224
Binghamton, New York 13902-5224

Prepared by:

URS CORPORATION

77 Goodell Street
Buffalo, New York 14203

OCTOBER 2010

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1.0 SAMPLING AND ANALYSIS PLAN

This *Sampling and Analysis Plan (SAP)* has been developed to describe the objectives and procedures, if necessary, for the sampling and analyses of excavated materials and wastewater that will be produced during this project for disposal characterization purposes. In addition, the NYSEG *Charles Street Site Quality Assurance Project Plan* (*QAPP*) should be consulted where specific sampling and analysis procedures and methods are referenced.

Because of the importance of air monitoring to worker and community health and safety, an Air Monitoring Program has been described in the *Work Plan*. The environmental media which may be sampled during the project, and the purpose for collecting and analyzing environmental samples, includes the following:

- Soil/waste samples for proper off-site disposal; and
- Wastewater samples for proper off-site disposal.

The following sections of this *SAP* provide specific information regarding the rationale and methods for sampling and analyzing excavated materials and wastewater.

1.1 Quality Assurance/Quality Control (QA/QC) Requirements/Data Quality Objectives

QA/QC requirements are specified throughout the *QAPP*. Data quality objectives are also delineated in the *QAPP*.

1.2 Soil/Waste Sampling and Analysis Plan

1.2.1 Sampling Plan Rationale

The *Sampling and Analyses Plan* will be implemented to determine the concentration of compounds in material to be disposed off-site. These data will be used to determine the acceptance of the material at the off-site facility.

1.2.2 Laboratory Analytical Protocols

Analytical requirements will be determined by the facility permitted to accept excavated materials. The laboratory chosen for the project must be certified, and maintain certification, under the NYSDOH ELAP and NYSDOH ELAP CLP for analyses of solid and hazardous waste. Only NYSEG-approved analytical laboratories that have experience in MGP projects or similar projects will be considered for use. NYSEG will select the laboratory in the event samples are collected for laboratory analysis.

1.2.3 Soil/Waste Sampling Protocol

Sampling frequency will be determined as required by the facility permitted to accept excavated materials.

1.2.4 Soil/Waste Sampling Field Procedures

Samples will be placed into the appropriate containers specified in the *QAPP* using decontaminated stainless steel trowels or spoons. Organic debris (i.e., leaves) along with large pieces of gravel will be avoided. Sampling containers will be filled completely to avoid creating a head space where volatiles may escape. After each jar is filled, the threads will be wiped clean so the cap can be threaded on without creating an air gap.

All filled jars will be labeled with the following information as a minimum:

- project number;
- sampling time and date;
- sample number;
- sample location;
- analysis; and
- collector's initials.

The location, depth of sample, sample type, time of sample, and other associated data (i.e., color of the soil, odors, texture, etc.) will be documented in the field notebook when the sample is taken. Once all the soil samples are collected, the samples will be maintained at 4°C until the samples are delivered off-site for analyses. All used sampling devices will be kept together, separate from clean tools, so that they can be

cleaned according to appropriate decontamination and cleaning procedures as specified in the QAPP. In no event will a sampling device be used without full cleaning between samples.

1.2.5 Soil/Waste Sampling Field Equipment List

The following items constitute a minimum listing of required field equipment for collecting soil samples.

- chemical resistant boots, latex gloves, chemical resistant gloves and the appropriate level of personal protection for working conditions*;*
- sample containers as specified in the *QAPP;*
- Teflon-coated or stainless steel sample spoons and bowls;
- wooden stakes and spray paint (highly visible);
- field notebook;
- sample bottle labels; water resistant tape;
- ice cooler for sample storage; and
- chain-of-custody forms.

1.3 Wastewater Sampling and Analysis Plan

1.3.1 Sampling Plan Rationale

Wastewater resulting from construction activities and decontamination of equipment will be generated during the project. This wastewater will be transferred to holding containers that will be located onsite. This sampling and analysis plan will be implemented to properly characterize the wastewater for disposal at an off-site disposal facility permitted to accept it.

If the results of analysis meet the limits specified by the facility, the wastewater will be transferred into trucks for transport. If the wastewater is identified as material that exceeds local facility specifications, then an alternate permitted disposal facility will be used.

1.3.2 Laboratory Analytical Protocols

Analytical requirements will be determined by the facility permitted to accept wastewater.

1.3.3 Wastewater Sampling Protocol

As the holding container nears its capacity, a sample will be collected and analyzed for parameters specified by the facility permitted to accept the wastewater.

1.3.4 Wastewater Field Sampling Procedures

Wastewater will be sampled directly from each filled container prior to shipment off-site. Nitrile gloves will be worn to protect the sampling person and to avoid cross contamination through handling. Wastewater will be sampled by lowering a stainless steel or disposable polyethylene bailer into the container using a polyethylene cord. The sample contents will be immediately transferred into the appropriate sized container for each analysis as specified in the *QAPP*. Vials for volatile analyses will be filled completely so as to avoid creating a head space where volatiles may escape, and must be checked to ensure that no air gap or bubbles are present.

All filled jars must be labeled with the following information as a minimum:

- project number;
- sampling time and date;
- sample number;
- analysis; and
- collector's initials.

The sample chain-of-custody form will then be immediately filled out and kept with the sample. The sample will be maintained at 4°C until delivered to the analytical laboratory.

1.3.5 Wastewater Sampling Field Equipment List:

The following items constitute a listing of required field equipment for collecting wastewater samples.

- chemical resistant gloves and appropriate level of personal protection for working conditions;
- sample containers as specified in the *QAPP*;
- stainless steel or disposable polyethylene bailer;
- field notebook;
- sample bottle labels; and

- chain –of-custody forms.

APPENDIX I

TRAFFIC PLAN

TRAFFIC PLAN

FOR

REMEDIATION OF THE CHARLES STREET SITE

SITE #7-12-012

CITY OF CORTLAND, CORTLAND COUNTY, NEW YORK

Prepared For:

NEW YORK STATE ELECTRIC & GAS CORPORATION

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Prepared by:

URS CORPORATION

77 Goodell Street
Buffalo, New York 14203

OCTOBER 2010

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1.0 SCOPE OF WORK

This *Traffic Control Plan* is for traffic control within Charles Street during work to be performed at the NYSEG Charles Street Site, City of Cortland, Cortland County, New York. All traffic controls must be in accordance with the New York State Uniform Traffic Control Devices Manual, the New York State Department of Transportation, and any other applicable Federal, State, and Local Laws. Traffic controls shall be approved by the City of Cortland prior to their implementation and in accordance with the their ordinances including the "Maintenance of Traffic and Existing Facilities" contained within the *2007 City of Cortland Beautification Program Contractors' Sidewalk Guidelines*. This Traffic Plan is to be used in conjunction with the *Transportation of Solid or Liquid Material Plan* for the site.

Currently, traffic flow of Charles Street is one-way in a northerly direction. Charles Street adjacent to the site is within a 15 mph school zone of St. Mary's Elementary School. On the west side of Charles Street is a parking area for St. Mary's School. During school days, children are dropped off and picked up from Charles Street. NYSEG will request that for the duration of the construction work, traffic associated with St. Mary's School be re-directed to North Main Street.

2.0 GENERAL WORK CONDITIONS

All necessary supervision, training, permits, labor, personal protective equipment (PPE), equipment and materials will be provided as needed for the Work and comply with the Manual of Uniform Traffic Control Devices (MUTCD) and the New York State Supplement. The following will be provided and maintained for the duration of the Work: all necessary flag persons, barricades, warning lights and signs, and all necessary precautions for the protection and safety of the public, the workers, and the work. Construction operations will be conducted to insure minimum traffic delays.

Traffic controls, including the flag person, will ensure the following:

- A minimum of one properly equipped flag person will be provided within Charles Street for the duration of the phases of the remedial work which impedes traffic flow on Charles Street including: clearing, excavation, off-site disposal, backfill, concrete placement and planting; and, if included in the Design, asphalt paving, and storm sewer installation.
- Warning signs and/or traffic cones will be placed on both sides (north/south) of the work zone.
- The flag person will direct traffic to obey traffic signs and posted speed limits. The posted speed limit within the School Zone adjacent to the site is 15 miles per hour.
- Traffic control shall be conducted so as to cause a minimum of inconvenience to public travel and to permit safe and convenient access to properties on Charles Street and other impacted roadways. However, NYSEG will request that for the duration of the construction work, traffic associated with St. Mary's School be re-directed to North Main Street.
- The unlimited access of emergency vehicles will take priority over all other vehicles and/or work operations.
- Work-related trucks waiting to transport and/or deliver materials from/to the site will be staged on the east side of Charles Street. Truck engines are not allowed to idle in the residential area where the exhaust and/or noise could be a nuisance.

- All construction trucks are required to have audible and visual backup signals. However, backing up by construction vehicles will be kept to a minimum in the residential area where noise could be a nuisance.

- All fire hydrants, manholes, and catch basins will be kept accessible for use.

- All residential driveways on Charles Street will be accessible for use.

- All trucks are to travel only on designated routes when traveling from/to the site. Trucks will enter Charles Street from Clinton Street (south) and proceed in a northerly direction only. Once loaded the truck will turn east (right) onto Grant Street, turn south (right) onto N. Church Street, and proceed to Clinton Street where trucks will follow signs for NYS Routes 11/13.

APPENDIX J

TRANSPORTATION OF SOLID OR LIQUID MATERIAL PLAN

TRANSPORTATION OF SOLID OR LIQUID MATERIAL PLAN

FOR

REMEDIATION OF THE CHARLES STREET SITE

SITE #7-12-012

CITY OF CORTLAND, CORTLAND COUNTY, NEW YORK

Prepared For:

NEW YORK STATE ELECTRIC & GAS CORPORATION

James A. Carrigg Center
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1.0 SCOPE OF WORK

This *Transportation of Solid or Liquid Material Plan* is for the transportation of solid and/or liquid waste for NYSEG's Charles Street Site, City of Cortland, Cortland County, New York as detailed herein. All transportation must be in accordance with the Order on Consent Index No. D0-0002-9309 with New York State Department of Environmental Conservation, City of Cortland, and any other applicable Federal, State, and Local Laws.

2.0 WORK BY TRANSPORTER

The transporter shall provide all necessary supervision, training, permits, hazardous waste manifest (when required), labor, personal protective equipment (PPE), tools, equipment, consumable materials, and expendable materials, to transport solid and/or liquid waste to a disposal facility as detailed herein.

3.0 GENERAL WORK CONDITIONS

3.1 The transporter shall comply with all applicable provisions of NYSDEC Regulation, 6 NYCRR Part 364 "Waste Transporters Permit", Title 6 of the Official Compilation of Codes, Rules and Regulations.

3.2 The transporter shall comply with all applicable provisions of NYSDEC Regulation 6 NYCRR Part 372 "Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities", Title 6 of the Official Compilation of Codes, Rules and Regulations.

3.3 The transporter shall comply with all applicable provisions of New York State Department of Transportation (NYSDOT), the New York State Department of Motor Vehicle (NYSDMV), and/or any other applicable Federal, State, and Local Laws.

3.4 The transporter shall comply with applicable provisions of OSHA 29 CFR 1910.120 "Hazardous Waste Operations Health & Emergency Response".

3.5 The transporter shall develop and implement a written Health & Safety Plan for their drivers that addresses potential exposure to manufactured gas plant site residuals.

3.6 The transporter shall adhere to the following rules while working on a manufactured gas plant project site and waste disposal facility:

- Any truck found unacceptable by NYSEG's field representative and/or the Site's Health & Safety Officer will be rejected. Any cost for rejected trucks shall be borne by the transporter. If the NYSDEC project oversight finds any truck unacceptable, they should bring it to the attention of NYSEG field representative.
- The truck drivers shall report their arrival to NYSEG's field representative and/or the Site's Health & Safety Officer.
- Truck drivers are restricted to their trucks and the designated waiting areas. Drivers are not permitted access to the Site without express permission from a representative of NYSEG.
- Truck drivers will don **HARD HATS, SAFETY GLASSES, SAFETY SHOES, and GLOVES,** as a minimum for personal protection.
- The drivers of all trucks and roll off containers transporting hazardous solid waste or conditionally exempt manufactured gas plant site remediation waste will line the entire box (to top of side boards) with 6-mil thick polyethylene sheeting. Trucks transporting non-

hazardous waste may be lined as previously stated. All trucks will have watertight tailgates, which have a gasket between the box and tailgate or the driver will apply caulking between the box and tailgate.

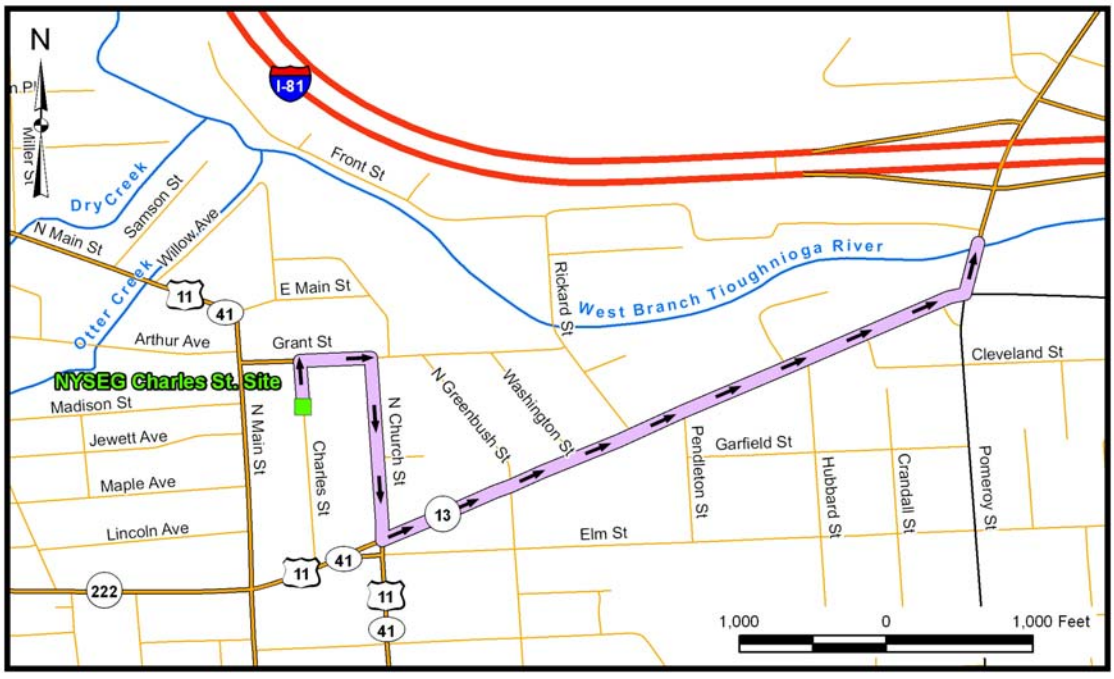
- All trucks require working audible and visual backup signals.
- When loading or when directed by NYSEG, the truck engine should be shut off. The truck may be restarted and driven away only after receiving the **"**all clear**"** direction from the loading operator, or a Site representative.
- Truck engines are not allowed to idle in the residential area where the exhaust and/or noise could be a nuisance.
- No trucks will be loaded above the side boards and no material will be spilling out of the truck. The trucks' exteriors will be cleaned (by others) from material being loaded before they leave the loading area.
- NYSEG remedial workers will reposition the tarp bars over the loads. Drivers will not be allowed to walk over loads.
- The drivers will cover trucks with tarps inside the loading area. Drivers will not be allowed to walk over loads.
- Obey traffic signs and notices (obey the posted speed limit). Charles Street adjacent to the site is one-way and within a 15 mph school zone.
- Obey rules posted on the site and/or any site specific Health & Safety Plan for all employees.
- Report any accidents to the NYSEG's Field Representative and/or the Site's Health & Safety Officer and cooperate with any subsequent accident investigation.
- No passengers are allowed in the loading area.
- Slow down and be extra cautious during times of poor weather (rain, fog, and snow) and during drop off and pick up times for St. Mary's school children.
- Extra care should be taken around blind corners (watch for construction equipment and pedestrians).
- Smoking, eating, and/or drinking are not permitted within the security fence. Smoking, eating, and/or drinking are permitted only in designated areas.
- After disposal of material, the transporter is responsible for properly decontaminating their truck or tractor, trailer or tanker.
- All trucks are to travel only on designated routes when traveling to or from the site.

4.0 TRUCK ROUTE

The truck route for arrival and departure at the Charles Street site will be as follows:

Arrival: From Interstate 81S Exit 11: turn right (west) onto Route 13/Clinton Ave. toward Cortland. Take a slight right and continue on Route 13 Clinton Ave. less than one mile. Turn right (north) onto Charles Street. The site is on the right.

Departure: From Charles Street (a one-way street heading north) turn east (right) onto Grant Street, turn south (right) onto N. Church Street, and proceed to Route 13/Clinton Ave. where they will turn west (left) onto Route 13/Clinton Ave. and follow that to Interstate 81 at Exit 11.



APPENDIX K

NYSEG HEALTH AND SAFETY PLAN

NYSEG

NEW YORK STATE ELECTRIC & GAS CORPORATION
James A. Carrigg Center, 18 Link Drive
Binghamton, New York 13902

HEALTH AND SAFETY PLAN

Associated With

Charles Street Site
City of Cortland, Cortland County, New York

October 2010

Prepared By:

Tracy L. Blazicek, CHMM
Remediation Project Manager

Approved By:

Rudolph J. Kunz, CIH
Lead Analyst – Safety

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Additional Response Contact List
Hospital Location Map
Emergency First Aid

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Naphthalene
BioSolve™

D Project Forms

Safety Meetings
Hot Work Permit
Heat Stress Monitoring Form
Spill Report
Public Liability Accident Report
Employee Injury Report
Incident Report

SITE EMERGENCY FORM

Do Not Endanger Your Own Life.
Survey the Situation Before Taking Any Action.

DIAL 911
FIRST FOR ALL EMERGENCIES

POTENTIAL CONSTITUENTS OF CONCERN

The constituents contained in MGP process residues and at MGP sites can be categorized within five primary chemical classes:

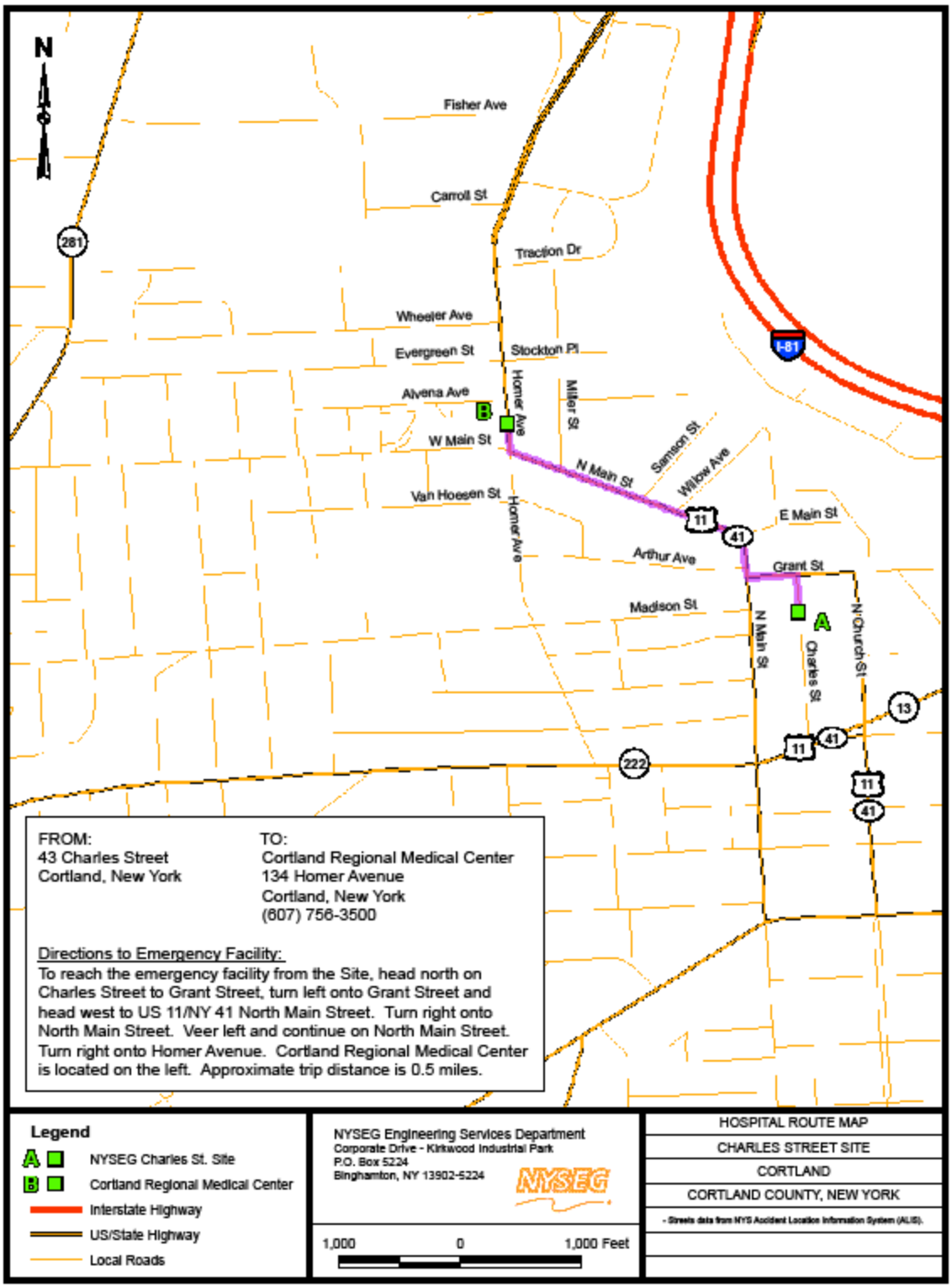
- Polycyclic aromatic hydrocarbons (PAHs);
- Volatile aromatics;
- Phenolics;
- Metals; and
- Non-metallic inorganics.

IN THE EVENT OF ANY EMERGENCY CONTACT CONSTRUCTION SUPERVISOR (HEALTH AND SAFETY REPRESENTATIVE) AND / OR PROJECT MANAGER

EMERGENCY CONTACT	
Ambulance	911 Non Emergency (607) 756-7564 TLC Emergency Medical Service
Fire	911 Non Emergency (607) 756-5613
Police	911 Non Emergency (607) 756-2811
Hospital Name	Cortland Regional Medical Center
Poison Control	800-222-1222 or Upstate Poison Center (315) 464-5375
Hospital Phone Number	Information (607) 756-3500 Emergency same as above
NYSEG Remediation Project Manager	Tracy L. Blazicek Work: (607) 762-8839 Cellular: (607) 237-5325

DIAL 911
FIRST FOR ALL EMERGENCIES

ADDITIONAL RESPONSE CONTACT LIST	
National Emergency	
USEPA National Response Team	(800) 424-8802
Utilities	
Dig Safely New York 5063 Brittonfield Parkway, East Syracuse, NY	811 or 1-800-962-7962
NYSEG (New York State Electric & Gas Corporation)	(518) 664-9534
City of Cortland Department of Public Works	(607) 756-6221
New York State Department of Environmental Conservation	
Oil Spill or Hazardous Material Spill	1-800-457-7362
NYSDEC Project Manager – William Ports	(518) 402-9662
Department of Health	
NYSDOH Senior Sanitary Engineer – Julia Kenney	(800) 458-1158 ext 27860
NYSEG MGP Remediation Department	
Manager Environmental Compliance – Joseph M. Simone	Work: (607) 762-7498 Cellular: (607) 427-7498
Remediation Project Manager – Tracy L. Blazicek	Work: (607) 762-8839 Cellular: (607) 237-5325
NYSEG Health & Safety – Rudy J. Kunz, CIH	Work: (607) 762-6150 Cellular: (607) 725-5337


N
Fisher Ave
Carroll St
Traction Dr
Wheeler Ave
Evergreen St
Stockton Pl
Alvena Ave
Homer Ave
Miller St
W Main St
N Main St
Samson St
Willow Ave
Van Hoesen St
Homer Ave
E Main St
Arthur Ave
Grant St
Madison St
N Main St
Charles St
N Church St
281
I-81
11
41
222
13
A
B
FROM:
43 Charles Street
Cortland, New York
TO:
Cortland Regional Medical Center
134 Homer Avenue
Cortland, New York
(607) 756-3500
Directions to Emergency Facility:
To reach the emergency facility from the Site, head north on Charles Street to Grant Street, turn left onto Grant Street and head west to US 11/NY 41 North Main Street. Turn right onto North Main Street. Veer left and continue on North Main Street. Turn right onto Homer Avenue. Cortland Regional Medical Center is located on the left. Approximate trip distance is 0.5 miles.
Legend
A NYSEG Charles St. Site
B Cortland Regional Medical Center
Interstate Highway
US/State Highway
Local Roads
NYSEG Engineering Services Department
Corporate Drive - Kirkwood Industrial Park
P.O. Box 5224
Binghamton, NY 13902-5224
NYSEG
1,000 0 1,000 Feet
HOSPITAL ROUTE MAP
CHARLES STREET SITE
CORTLAND
CORTLAND COUNTY, NEW YORK
- Streets data from NYS Accident Location Information System (ALIS).

EMERGENCY FIRST AID

SEE ATTACHMENT "A" FOR SPECIFIC FIRST AID PROCEDURES FOR CHEMICALS OF CONCERN

FIRST AID

Ingestion: DO NOT INDUCE VOMITING. Call Poison Control – follow instructions. Administer cardiopulmonary resuscitation (CPR), if necessary. Seek medical attention.

Inhalation: Remove person from contaminated environment. Administer CPR if necessary. Seek medical attention. DO NOT ENTER A CONFINED SPACE TO RESCUE SOMEONE WHO HAS BEEN OVERCOME UNLESS PROPERLY EQUIPPED AND A STANDBY PERSON IS PRESENT.

Skin Contact: Brush off dry material, remove wet or contaminated clothing. Flush skin thoroughly with water. Seek medical attention if irritation persists.

Eye Contact: Flush eyes with water for 15 minutes. Seek medical attention.

Contingency Plan: Report incident to Construction Supervisor (Health and Safety Officer) and Project Manager after emergency procedures have been implemented.

RESPONDER MUST HAVE A CURRENT CERTIFICATE TO ADMINISTER FIRST AID OR CPR

1. Survey the situation. Do not endanger your own life. DO NOT ENTER A CONFINED SPACE TO RESCUE SOMEONE WHO HAS BEEN OVERCOME UNLESS PROPERLY EQUIPPED AND A STANDBY PERSON IS PRESENT.

2. Call **911** for emergency or fire **IMMEDIATELY**. Explain the physical injury, chemical exposure, fire, or release.

3. Decontaminate the victim without delaying life-saving procedures.

4. If the victim's condition appears to be noncritical, but seems to be more severe than minor cuts, he/she should be transported to the nearest hospital by trained emergency Medical Services (EMS) personnel: let the doctor assume the responsibility for determining the severity of the injury. If the condition is obviously serious, EMS must transport the victim.

5. Notify the Construction Supervisor and Project Manager. Complete the NYSEG Incident Report within 24 hours.

EMERGENCY FIRST AID PROCEDURES	
To Stop Bleeding	**CPR**
1. Give medical statement. 2. Assure airway, breathing, circulation. 3. Use **DIRECT PRESSURE** over the wound with clean dressing or your hand (use non-permeable gloves). Direct pressure will control most bleeding. 4. Bleeding from an artery or several injury sites may require **DIRECT PRESSURE** on a **PRESSURE POINT**. Use pressure points for 30 – 60 seconds to help control severe bleeding. 5. Continue primary care and seek medical aid as needed.	1. Give medical statement. 2. Arousal: Check for consciousness. 3. Open airway with chin-lift. 4. Look, listen, and feel for breathing. 5. If breathing is absent, give 2 slow, full rescue breaths. 6. Check the pulse for 5 to 10 seconds. 7. If pulse is present, continue rescue breathing: **1 breath every 5 seconds.** 8. If pulse is absent, initiate CPR: **15 compressions for each two breaths.**

1.0 INTRODUCTION

This *Health and Safety Plan* is written to ensure the well being of all construction workers and the community surrounding the site. Accordingly, project staff and approved Contractors must follow the policies and procedures established in this *Health and Safety Plan*. All personnel assigned to this project must sign the Agreement and Acknowledgment Sheet, Section 11.0, to confirm that they understand and agree to abide by the provisions of this *Health and Safety Plan*.

All work will comply with the Occupational Safety and Health Act (OSHA) Standard, "Hazardous Waste Operations and Emergency Response," (29 CFR 1910.120) and "Excavations" (29 CFR 1926 Subpart P) and other federal, state and local procedures that require the development and implementation of a *Health and Safety Plan*. Generation of this document certifies that the workplace has been evaluated for the hazards as described. A hazard assessment has been performed and the adequacy of the personal protective equipment (PPE) selected is hereby certified per 29 CFR 1910.120(b)(1) and is duly noted by the signature(s) and date appearing on the cover page of this document.

This *Health and Safety Plan* addresses the safety issues associated with excavation and handling of manufactured gas plant site residues of varying physical and chemical characteristics involving the following site tasks:

- Excavation
- Heavy Equipment Operation
- Soil Transfer

The minimum level of protection for this site is Level D. For each task, the potential hazards for employee exposure to site contaminants and/or air monitoring results, will determine the level of protection. Modified Level D will be worn during tasks that may have the potential for skin contact with contaminated media (soil or water). Upgrade to Level C will occur when the possibility of exposure exists from the onset of specific tasks or results of real-time monitoring exceed established action levels listed in Table 3, Air Monitoring Action Levels. This *Health and Safety Plan* must be modified or amended when circumstances or conditions develop that are beyond the scope of this *Health and Safety Plan.*

The Project Manager must amend any changes in project work scope and/or site conditions as described in writing.

Table 1 presents an overview of the NYSEG health and safety programs in which all field personnel are required to participate. These include the medical surveillance and comprehensive training programs in accordance with OSHA "Hazardous Waste Operations and Emergency Response", 29 CFR 1910.120.

1.1 Site Description/Background Information

For site information refer to the NYSEG's *Remedial Design Work Plan For Remediation of the Charles Street Site, City of Cortland, Cortland, New York*.

TABLE 1
NYSEG HEALTH AND SAFETY PROGRAMS

Activity	Description	Action
Medical Surveillance	▪ The program tracks the physical condition of the Company's employees in compliance with OSHA standards	▪ Medical examinations and consultations are completed for all employees prior to donning respirator, annually, upon termination, and in the event of injury and/or illness resulting from exposure at the work site.
Training	▪ Training requirements and programs comply with the OSHA Hazardous Waste Operations and Emergency Response, 29 CFR 1910.120	▪ Field personnel must complete a minimum of 40 hours of hazardous waste activity instruction. ▪ Field personnel must complete a minimum of 3 days supervised field instruction. ▪ Field personnel assigned to the site will also receive 8 hours of refresher training each year. ▪ On-site managers and supervisors directly responsible for employees engaged in hazardous waste operations receive an additional 8 hours of supervisory training. ▪ Field personnel assigned to site also receive first aid/CPR.
Personnel Protective Equipment (PPE)	▪ Training requirements and programs comply with the OSHA Hazardous Waste Operations and Emergency Response, 29 CFR 1910.120	▪ Field personnel assigned to the site will also receive 8 hours of refresher training each year. ▪ Field personnel assigned to the site will receive refresher training for donning PPE. ▪ Field personnel assigned to the site will receive refresher training for donning and maintaining respirator.

2.0 HAZARD IDENTIFICATION AND CONTROL

Precautions must be taken to prevent injuries and exposures to the following potential hazards.

TABLE 2 (Continued on next page)
POTENTIAL HAZARDS AND CONTROL

Potential Hazard	Control
Exposure to Chemical Products (See Attach. "C" for MSDS) **PAHs** **VOCs**	▪ Stand up-wind of chemical products whenever possible. ▪ Minimize contact and contact time with chemical products. ▪ Avoid walking through discolored areas, puddles, leaning on drums, or contacting anything that is likely to be contaminated. ▪ Do not eat, drink, smoke and/or apply cosmetics in the hot or warm zones. ▪ Wear gloves when in contact with contaminated surfaces. ▪ Safety glasses must be worn at a minimum. ▪ Splash goggles must be worn when working with liquids. ▪ >2.5 ppm organic vapors in breathing zone sustained for five minutes, requires upgrade to Level C. ▪ >80-ppm organic vapors in breathing zone sustained for five minutes require excavation work to stop. ▪ If unknown materials are encountered, call the NYSEG air-quality and soil sampling manager.
Exposure to Surface/ Subsurface Airborne Dust **Heavy Metal**	▪ Stand up-wind whenever intrusive activities occur and generate visible signs of airborne dust and immediately implement spraying work surface ▪ Monitor air for airborne soil dust (surface or subsurface soil) with portable aerosol dust-direct reading instrument. ▪ >0.025 mg/M^3 in the breathing zone requires upgrade to Level C. ▪ >0.25 mg/ M^3 in the breathing zone requires work to stop. ▪ Utilize wet methods (spraying ground, wet drilling, etc.) when visible signs of airborne dust are generated.
Vehicular Traffic (Interior and Exterior)	▪ Wear traffic safety vest when vehicle hazard exists. ▪ Use cones, flags, barricades, and caution tape to define Exclusion Zone. ▪ Use vehicle to block Exclusion Zone. ▪ Ensure that heavy equipment is equipped with a back-up alarm.
Cleaning Equipment	▪ Wear appropriate PPE to avoid skin and eye contact with isopropyl alcohol, alconox, or other cleaning materials. ▪ Stand upwind to minimize any potential inhalation exposure. ▪ Dispose of spent cleaning solutions and rinses appropriately.

TABLE 2 (Continued from previous page)
POTENTIAL HAZARDS AND CONTROL

Potential Hazard	Control
Utility Lines Contact	▪ Contact Dig Safe New York to have utility lines marked prior to excavation/trenching ▪ Refer to site drawings or customer interviews if on private property for utility locations. ▪ Hand dig when within 2 feet of utility marker until utilities are observed to avoid breaking utility lines.
Inclement Weather	▪ Stop outdoor work during electrical storms and other extreme conditions such as extreme heat or cold temperatures. ▪ Take cover indoors or in vehicle. ▪ Listen to local forecasts for warnings about specific weather hazards such as tornadoes, hurricanes, and flash floods.
Noise	▪ Wear hearing protection when equipment such as a drill rig, jackhammer, cut saw, air compressor, blower or other heavy equipment is operating on the site. ▪ Wear hearing protection whenever you need to raise your voice above normal conversational speech due to a loud noise source; this much noise indicates the need for protection. ▪ Hearing protection is required when measured sound pressure levels (SPL) exceed 85 dB(A) where employees stand or conduct work. ▪ Conduct noise monitoring of suspected high noise operations at the beginning of the workday or start up of new operations to verify noise control/hearing protection requirements.
Ladders	▪ Make sure ladder rungs are sturdy and free of cracks. ▪ Use ladders with secure safety feet. ▪ Pitch ladders at a 4:1 ratio. ▪ Secure ladders at the top when possible. ▪ Use non-conductive ladders near electrical wires.
Electric Shock	▪ Maintain appropriate distance from overhead utilities: **10-foot minimum clearance from power lines required.** ▪ Use ground-fault circuit interrupters as required. ▪ Perform lockout/tagout procedures. ▪ Use three-pronged plugs and extension cords. ▪ Contact your local underground utility-locating service. ▪ Follow code requirements for electrical installations in hazardous locations.
Welding, Cutting, Brazing	▪ Conduct fire safety evaluation. ▪ Complete Hot Work Permit (Attachment B). ▪ Ensure flammable materials are protected from hot work, sources of ignition. ▪ Ensure fire watch/fire extinguisher is on standby hot work location.

TABLE 2 (Continued from previous page)
POTENTIAL HAZARDS AND CONTROL

Potential Hazard	Control
Physical Injury	▪ Wear hard hats and safety glasses when on-site. ▪ Maintain visual contact with the equipment operator and wear orange safety vest when heavy equipment is used on-site. ▪ Avoid loose-fitting clothing (driller and driller's helper). ▪ Prevent slips, trips, and falls; keep Exclusion Zone uncluttered. ▪ Keep your hands away from moving parts (i.e., augers). ▪ Test the emergency shut-off switch on the drill rig daily.
Back Injury	▪ Use a mechanical lifting device or a lifting aid where appropriate ▪ If you must lift, plan the lift before doing it. ▪ Check your route for clearance. ▪ Bend at the knees and use leg muscles when lifting. ▪ Use the buddy system when lifting heavy or awkward objects. ▪ Do not twist your body while lifting.
Heat Stress	▪ Increase water intake while working. ▪ Increase number of rest breaks and/or rotate workers in shorter work shifts; take breaks in shaded areas. ▪ Watch for signs and symptoms of heat exhaustion and fatigue. ▪ Plan work for early morning or evening during hot months. ▪ Use ice vests when necessary. ▪ Rest in cool, dry areas. ▪ In the event of heat stroke, bring the victim to a cool environment and initiate first aid procedures (Section 9.0).
Cold Stress	▪ Take breaks in heated shelters when working in extremely cold temperatures. ▪ Remove the outer layer of clothing and loosen other layers to promote evaporation of perspiration, upon entering the shelter. ▪ Drink warm liquids to reduce the susceptibility to cold stress (Section 10.0).
Insects	▪ Tuck pants into socks, if necessary. ▪ Wear long sleeves, if necessary. ▪ Use insect repellent.
Poisonous Plants (Such as Poison Ivy, Oak or Sumac)	▪ Don't enter areas infected with poisonous plants. ▪ Immediately wash any areas that come into contact with poisonous plants.

TABLE 2 (Continued from previous page)
POTENTIAL HAZARDS AND CONTROL

Potential Hazard	Control
Fire Control	▪ Smoke only in designated areas. ▪ Keep flammable liquids in closed containers ▪ Keep site clean; avoid accumulating combustible debris such as paper. ▪ Follow Hot work Safety Procedures when welding or performing other activities requiring an open flame. ▪ Isolate flammable and combustible materials from ignition sources. ▪ Ensure fire safety integrity of equipment installations.
Static Electricity	▪ Do not create static discharge in flammable atmospheres. ▪ Electrically bond and ground pumps transfer vessels, tanks, drums, bailers and probes, when moving liquids. ▪ Electrically bond and ground vacuum trucks and the tanks they are emptying. ▪ Do not splash fill containers with flammable liquids.
Soil Sampling	▪ Wear appropriate PPE to avoid skin, eye, and inhalation contact with contaminated soil. ▪ Stand upwind when conducting tasks and minimize possible inhalation exposure. ▪ Conduct air monitoring to determine level of respiratory protection. ▪ Utilize engineering controls such as portable venturi air movers to draw away or blow away chemical vapors.
First aid kit, blood borne pathogen kit, emergency eye wash/shower station, fire extinguisher and absorbent pads will be located on-site in the decontamination zone.	

3.0 AIR-QUALITY MONITORING PROGRAM

3.1 Overview

The objective of this *Air-Quality Monitoring Program* is to provide direct measurement of VOCs (volatile organic compounds) and total suspended particulates that could potentially be released during excavation, handing, and transportation of manufactured gas plant site residues at the site. The air-quality monitoring program consist of (1) Exclusion Zone air-monitoring for evaluating construction worker health and safety; and (2) community air-monitoring to determine the levels of VOCs (volatile organic compounds) and total suspended particulates at the perimeter of the Exclusion Zone.

This *Air-Quality Monitoring Program* meets or exceeds all criteria and guidance provided in the *New York State Department of Health Generic Community Air-monitoring Plan.* The provisions include real-time air monitoring for VOCs (volatile organic compounds)

and particulates (i.e., dust) at the downwind perimeter of the Exclusion Zone. The nearest receptor (irregardless of its relationship to wind direction or distance from the Exclusion Zone) will be an additional monitoring location unless it is agreed by the DEC's and NYSEG's on-site representatives that such a monitoring location is not necessary. Real-time air-monitoring and speciated real-time data will be used to guide appropriate action to reduce/minimize air emissions to acceptable levels. NYSEG has developed a *Vapor Emission Response Plan f*or the Charles Street Site (see Appendix I) to address any exceedance of acceptable levels.

3.2 Exclusion Zone Air-Monitoring Program

The air quality within the Exclusion Zone, including inside transporter's trailer and/or roll-off container, will be monitored to ensure worker health and safety in accordance with requirements specified in 29 CFR 1910.120 as described in this *Health And Safety Plan For the Charles Street Site.*

3.3 Community Air-Monitoring Program

3.3.1 Overview

NYSEG will undertake a community air-monitoring program during the project to provide direct measurement of VOCs (volatile organic compounds) and total suspended particulate which may be released during excavation and handling of manufactured gas plant site residues.

The air-monitoring program was established to address the following objectives:

- To insure concentrations of VOCs (volatile organic compounds) and total suspended particulate are minimized to protect human health and the environment.
- To provide an early warning system so engineering controls can be enacted to prevent unnecessary exposure of emissions resulting from project activities.
- To measure and document the concentrations of VOCs (volatile organic compounds), and total suspended particulate for determining compliance with the established air-monitoring limits.

The community air-monitoring is intended to be discrete program, which will be operated in conjunction with the Exclusion Zone air-monitoring program. The Exclusion Zone monitoring is established to protect worker health and safety during construction and materials handling. The community air-monitoring will include real time air quality data, which will be collected throughout the duration of all excavation activities and will include upwind, downwind, and nearest receptor measurements. Wind direction will be determined using a weather station or equivalent device.

3.3.2 Real-Time Air-monitoring – Volatile Organic Compounds

The total VOCs (volatile organic compounds) monitoring will be accomplished using a total volatile organic analyzer equipped with a photo ionization detector (PID) using a 10.2 eV lamp. Each day the analyzer will be calibrated to benzene with a 10-ppm isobutylene air standard. The volatile organic analyzer will be capable of calculating a 15-minute running average of the measured VOCs (volatile organic compounds)

concentrations. The 15-minute averages will be used to monitor air quality and will be recorded through out the day.

Real-time VOCs (volatile organic compounds) monitoring will start each day with an up wind measurement and immediately following any changes in wind direction. These measurements will be used for establishing baseline emissions due to natural and anthropogenic sources. The baseline value will be added to the air monitoring limits to compensate for the existing ambient conditions (i.e., VOC limit of 5 ppm + 1.2 ppm upwind = 6.2 ppm limit).

The total VOCs (volatile organic compounds) monitoring will operate continuously at the downwind perimeter of the Exclusion Zone. The nearest receptor (irregardless of its relationship to wind direction or distance from the Exclusion Zone) will be an additional monitoring location unless it is agreed by the DEC's and NYSEG's on-site representatives that such a monitoring location is not necessary. Readings at each location will be accomplished by pointing the intake tube of the analyzer toward the likely emission source, generally at the height of 3 feet above grade. The instrument will measure concentrations continuously and calculate four 15-minute averages per hour throughout the day. Each 15-minute average will be recorded on log sheets along with the date, time, sampling locations, wind direction, and weather conditions. A daily community air-monitoring report will be maintained on-site. The weekly data will also be submitted via email by Tuesday of the following week to Ms. Julia Kenney, NYSDOH at beei@health.state.ny.us; Mr. William Ports, NYSDEC at wfports@gw.dec.state.ny.us; and Mr. Tracy Blazicek, NYSEG at tlblazicek@nyseg.com.

Based on data published by OSHA (Occupational Safety and Health Administration), ACGIH (American Congress of Government Industrial Hygienists) and NIOSH (National Institute for Occupational Safety and Health) a short-term quality action level of 5 ppm for total VOCs (volatile organic compounds) has been established for air emissions in the Exclusion Zone. NYSEG will use an action level of 2.5 ppm above the existing ambient conditions (background) in the Exclusion Zone. Engineering control measures will be initiated for VOCs (volatile organic compounds) levels greater than 2.5 ppm at the work zone. If actions to control total VOCs (volatile organic compounds) emissions are not effective and concentrations continue to increase to 5 ppm (above background), the excavation and waste handling activities will be halted and actions will be initiated as specified under the *Vapor Emission Response Plan* (Section 5.3.7).

The 5-ppm action level (above background) at the perimeter of the Exclusion Zone is based on an estimated concentration for benzene, which is one of the VOCs (volatile organic compounds) included in the volatile organic analyzer reading. Since the volatile organic analyzer detects volatile compounds other than benzene, the 5-ppm action level is considered to be conservative.

In addition an action level of 2.5 ppm above background will be used in the Exclusion Zone where workers have the potential for continuous exposure. The 2.5-ppm limit is OSHA's short-term exposure limits (STEL) for benzene, which was established to insure worker health and safety (29 CFR 1910.1028). If the total VOCs (volatile organic compounds) concentration exceeds 2.5 ppm, the worker personal protective equipment will be upgraded from modified Level D to Level C, which requires the use of respirators as specified in the *Health and Safety Plan*.

3.3.3 Odor Monitoring Plan

The nature of manufactured gas plant site residues pose a concern regarding the generation of nuisance odors during excavation and material handling. As such, an odor control and monitoring plan has been developed for the project. For an odor complaint residents may speak with the NYSEG project coordinator or the NYSDEC on-site representative. To register an odor complaint with NYSEG residents may call a toll-free number that will be staffed 24-hours per day, seven days per week. The toll-free number will be established prior to the start of the project and posted on the site perimeter fencing. Calls to the toll-free number will generate a call from the answering service to project team members based on a call out list that will be prepared at the commencement of the project. Project team members will record the caller's concern and contact the appropriate site construction supervisor or project manager, who will assess the reason for concern and apply the appropriate engineering controls.

A project fact sheet will be reviewed by NYSDEC and NYSDOH before distribution to adjacent property owners explaining the remediation work to occur at the site, the potential for odors and how the phone system works. This will be distributed prior to beginning any excavation work. Additionally, door to door contacts of persons living and working immediately adjacent to the site will be made regarding planned work activities.

If the site personnel detect significant odor or a complaint is received, engineering controls will be implemented as outlined in the Vapor Emission Response Plan (Section 5.3.7) to reduce odor-causing emissions. Once odors become non-discernable, normal operations may resume. This determination will be subject to the approval of the on-site NYSDEC representative. If in the opinion of NYSDEC on-site representative the concentration of the site related odors are unacceptable, the NYSDEC on-site representative will instruct the NYSEG project coordinator to implement odor control measures.

3.3.4 Real-Time Air-monitoring – Total Suspended Particulates

In conjunction with the real-time volatile emission monitoring, direct-reading monitoring equipment for particulate matter will be used to collect real-time airborne particulate data on an every 15-minute basis. The instrument to be used for this sampling is a personal DataRam™ (field modified for active sampling) or the Thermo Andersen ADR-1200S Ambient Particulate Monitoring System both of which operate on the principle of light scattering. Both units respond to particles in the size range of 0.1 to 10 micrometers and in the concentration range of 0.01 to 400 mg/m^3. Particulate measurements will be based on a 30-second, time-weighted average. The personal DataRam™ will be calibrated daily with a filtered air sample. Record measurements at the upwind and downwind monitoring locations will be logged by the technician every 15-minutes. Equivalent back real-time air-monitoring equipment will be available on-site in the event of an equipment malfunction.

The *New York State Department of Health Generic Community Air-monitoring Plan* recommended action level of 0.15 mg/m^3 for particulate matter less than 10 micrometers in size (PM-10) above background will be used to determine whether modifications to given processes are required. If the downwind particulate measurement of less than 10 micrometers in size (PM-10) is greater than 0.10 mg/m^3 above the upwind background level, or if dust is observed leaving the project area, dust suppression techniques (i.e.,

misting surfaces with water or covering open piles) will be implemented to reduce the generation of fugitive dust as indicated on the *Emission Response Plan*.

3.3.5 Documentation for Air Quality Monitoring

An essential part of any sampling/analytical scheme is ensuring the integrity of the sample from collection to data reporting. Sample integrity includes the possession and handling of a sample that is traceable from the time of collection, through analysis and final disposition.

Sample Labels: Unique sample identification codes will be assigned at the time of collection to prevent misidentification of samples. The identification codes will include the following information:

- Project/name/number;
- Sample location;
- Date of collection;
- Time of collection;
- Initials of sampler; and
- Analytical method.

Field Log Book: All information pertinent to sampling will be recorded in a logbook. It is imperative that sufficient information be recorded so that the sampling event can be reconstructed without reliance on the collector's memory. Information will be entered into a bound notebook and as a minimum, entries will be include the following:

- Location of sampling point;
- Sample of identification code;
- Sample collection date and time;
- Sample methodology;
- Sample analysis;
- Collector's initials;
- field observations, if any; and
- Field measurements, if any.

Dedicated field logbooks will be maintained on site to document the daily calibration of the real-time air-monitoring equipment.

3.3.6 Vapor Emission Response Plan

The Charles Street Site Vapor Emission Response Plan contained within the *Odor, Vapor, and Dust Control Plan* (see Appendix F) will be triggered by an exceedance of the 15-minute average VOCs (volatile organic compounds) concentration of 5 ppm (above background) at the perimeter of the Exclusion Zone. If the Vapor Emission Response Plan is triggered all excavation activities will be stopped and the following actions will be taken:

- Continue total VOCs (volatile organic compounds) monitoring at the perimeter of the Exclusion Zone. If the total VOCs (volatile organic

compounds) level drops below 5 ppm (above background) then excavation activities can resume with the addition of engineering controls or modifications to the excavation process to minimize VOCs (volatile organic compounds) emissions. However, if the VOCs (volatile organic compounds) levels persist above 5 ppm, based on continual observance of the meter, then the construction supervisor will immediately implement engineering controls such as misting area with a vapor suppression solution of BioSolve®, covering, backfilling, etc., required to reduce emissions and at the same time notify the site project manager, and the Project Health & Safety Coordinator.

- If the total VOCs (volatile organic compounds) levels drop below 5 ppm (above background), after the implementation of additional engineering controls at the perimeter of the Exclusion Zone, then the excavation activity can resume provided process and work activities were adjusted to reduce emission levels.

- If the total VOCs (volatile organic compounds) levels continue to be greater than 5 ppm (above background) at the perimeter of the Exclusion Zone then all site activities must be discontinued. When the work is shut down, downwind air-monitoring as directed by the Project Health & Safety Coordinator will be implemented to ensure that the emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission Response Plan (Section 5.3.8).
- If the total VOCs (volatile organic compounds) levels are above 25 ppm at the perimeter of the Exclusion Zone, site activities must be shutdown and corrective measures taken.

Primary engineering controls, which may be implemented to reduce emission levels, include:

- Adding a vapor suppression solution of BioSolve® to impacted media (application in excavated areas will be a light mist)
- Limiting excavation size and the surface area of exposed contaminated soil
- Cover contaminated soil with polyethylene sheeting.

3.3.7 Major Vapor Emissions Response Plan

If after the cessation of the work activities and implementation of engineering controls total VOCs (volatile organic compounds) levels exceed 5 ppm (above background) at the nearest receptor or at the perimeter of the Exclusion Zone, then the following action will be immediately taken:

- Cover the excavated area with polyethylene sheeting or clean soil
- Notify the City of Cortland Department of Public Works at (607) 756-6221; NYSEG, Tracy Blazicek at (607) 762-8839; NYSDEC, Mr. William Ports at (518) 402-9662 and NYSDOH, Ms. Julia Kenney at (800) 458-1158 ext 27860.

- Total VOCs (volatile organic compounds) levels will be monitored at the nearest downwind residential or commercial structure.
- Continuously monitor air quality until VOCs (volatile organic compounds) levels drop below 5 ppm.
- If total VOCs (volatile organic compounds) levels persist above the 5-ppm (above background), the construction supervisor, Project Health & Safety Coordinator, NYSEG project manager will consult with each other and the Emergency Response agencies to determine the appropriate actions to be implemented. NYSEG project management personnel have ultimate authority during major vapor emissions emergencies. Work shall not resume without approval of NYSDEC.

3.4 Air Monitoring Action Levels

The NYSEG Manager Health and Safety approved the air monitoring action levels (Table 3), to indicate the chemical concentrations in the breathing zone that requires an upgrade in level of PPE. All workers on-site must have been properly fitted with PPE (i.e. respirators) and have been trained in their use (i.e., donning and doffing). Air monitoring measurements will be taken in the breathing zone of the worker most likely to have the highest exposure. Transient peaks will not automatically trigger action. Action will be taken when levels are consistently exceeded in a 5-minute period. Similarly, if chemical odors are detected that are a nuisance, bothersome, or irritating, an upgrade in respiratory protection can provide an extra level of comfort or protection when conducting site activities. Job tasks that require air monitoring, the applicable action levels that apply for those tasks, and the frequency of air monitoring are described in Table 4 and Table 5. Additional guidelines for frequency of air monitoring are presented in Table 6.

TABLE 3
AIR MONITORING ACTION LEVELS

Instrument*	Function	Measurement	Action
Photo ionization detector (PID) (10.2 Ev lamp) – Measures Total Organic Vapors			
Conduct air monitoring for volatile organic compounds during activities where contaminated media are present		> 0 – 2.5 ppm	Level D / Modified Level D required. If PID measures > 3 ppm, check for benzene with detector tubes.
		> 2.5 – 80 ppm	Upgrade to Level C.
		> 80 ppm	Secure Exclusion Zone and then leave Exclusion Zone. Stop Work, Contact PM and HSM.
DataRam™ and a Thermo Anderson ADR-1200s Ambient Particulate Monitoring system – Measures Total Suspended Particulate			
Conduct air monitoring for dust particulate when sustained (> 5 minute) levels of visible dust are generated and engineering controls such as wet methods are ineffective.		0 – 0.15 mg/M^3	Level D required.
		> 0.15 mg/M^3	Upgrade to Level C and implement engineering controls.
		Consistently > 0.15 mg/M^3	Secure Exclusion Zone and then leave Exclusion Zone, Stop Work, Contact PM and HSM.

TABLE 4
WORK ZONE SAMPLING REQUIREMENTS

Job Task	Instrument	Frequency
Intrusive Work Soil Transportation Decontamination Soil Sampling	PID, DM	Start up of each workday and will continue until daily activities have ceased.

Instruments: PID Photoionization Detector
DM Dust/Particulate Monitor

Note: "Start up of work at each new task location" means to monitor the air quality at each new operation on the site. The breathing zone is the area inside a 1-foot radius around the head.

TABLE 5
AIR MONITORING FREQUENCY GUIDELINES

Conduct periodic monitoring when:

1. It is possible that an immediately dangerous to life or health (IDLH) condition or a flammable atmosphere has developed, or

2. There is an indication that exposures may have risen over permissible exposure limits or published exposure levels since the last monitoring. Look for a possible rise in exposures associated with these situations:

   - **Change in site area** – work begins on a different section of the site.
   - **Change in contaminants** – handling contaminants other than those first identified.
   - **Visible signs of particulate exposure from intrusive activities such as drilling/boring and excavation**.
   - **Perceptible chemical odors or symptoms of exposure.**
   - **Change in on-site activity** – one operation ends and another begins.
   - **Handling leaking drums or containers**.
   - **Working with obvious liquid contamination** (e.g., a spill or lagoon).

TABLE 6 **(Continued on next page)**
SPECIFIC CRITERIA AND PROTOCOL FOR SPECIFYING HEALTH AND SAFETY FOR PROJECTS INVOLVING SPECIFIC CHEMICAL AGENTS OR OTHER INDUSTRIAL-SPECIFIC CONDITIONS

Potential Chemical Exposure or Exposure Scenario	Criteria and Protocol for Health and Safety Specification
Coal Tar	• Coal Tar can contain up to 160 aromatic compounds such as phenol, pyrol, and pyridine plus additional poly aromatic hydrocarbons (PAHs). IARC, NTP and OSHA list coal tar as a carcinogenic substance. • Coal tar is toxic by inhalation, ingestion and skin contact. The range of toxicity depends on the exposure, concentration and duration. Effects may include irritation to skin, mucous membranes and respiratory system upon exposure from direct contact short term contact to respiratory and skin diseases from repeated long term exposure. Symptoms include redness and itching to skin leading to a dermatitis from skin contact, severe eye irritation when contacted in the eye, and trouble breathing from inhalation. • Precautions to take to avoid exposure to Coal Tar are wearing appropriate PPE to avoid skin and eye contact when working with contaminated soil and water. Minimize breathing in contaminated soil by using wet methods to control dust or wear a cartridge respirator with HEPA filter. In the event of contact or suspected exposure, rinse the affected area with water, and seek medical attention.
Aromatic Hydrocarbons	• Health hazards associated with aromatic hydrocarbons are central nervous system depression by inhalation exposure and irritating to skin, eyes, and mucous membranes. • Potential for exposure can be controlled by setting appropriate action levels and following general safe work practices. Verification of specific aromatic hydrocarbons can be accomplished using colorimetric detector tubes when PID readings are in excess of 2.5 PPM.

TABLE 6 (Continued from previous page)
SPECIFIC CRITERIA AND PROTOCOL FOR SPECIFYING HEALTH AND SAFETY FOR PROJECTS INVOLVING SPECIFIC CHEMICAL AGENTS OR OTHER INDUSTRIAL-SPECIFIC CONDITIONS

Potential Chemical Exposure or Exposure Scenario	Criteria and Protocol for Health and Safety Specification
Polynuclear Aromatic Hydrocarbons (PAHs)	• PAHs are a class of compounds containing closed hydrocarbon rings. PAHs cause irritation to skin, eyes, and respiratory tract when direct contact occurs or inhalation of vapors or contaminated soil occurs. Some PAHs are probable human carcinogens while others are considered animal carcinogens and mutagens. • Avoid direct contact from PAHs to skin and eyes. This could be in the form of coal gasification by-products and associated contaminated soils. Avoid breathing off-gassing vapors of coal gasification by-products and associated contaminated soil. • Wear appropriate PPE when potential to skin, eye, or inhalation exposure can occur. This includes modified Level D, with upgrade to Level C depending on air monitoring results. Use cartridge respirator with organic vapor/HEPA cartridges. For supplied air, full-face positive pressure demand type must be worn. Utilize wet methods to minimize PAH contaminated dust generation when excavating/mixing processes are underway. • PAHs are combustible. Avoid contact with open flames or other direct heating sources. • Ensure proper personal decontamination is conducted after site activities. Wash/rinse face/hands and any other exposed skin. Immediately rinse affected skin or eyes if contact occurs, and seek medical attention. Move to fresh air when inhalation exposure occurs and seek medical attention.
Heavy Metals	• Main concern with heavy metals is inhalation exposure to the dust, as well as ingestion of heavy metal on food or from hand to mouth contact. • If the predicted exposure is in excess of 50% of the PEL, utilization of Level C should occur.

4.0 CHEMICAL HAZARD CONTROL

4.1 Personal Protective Equipment (PPE)

Based upon the hazards that may be encountered during site activities, PPE as follows was selected. Only PPE that meets the following American National Standards Institute (ANSI) standards are to be worn.

- Eye protection – ANSI Z87.1-1989
- Head protection – ANSI Z89.1-1997
- Foot protection – ANSI Z41-1991

Employees must maintain proficiency in the use and care of PPE that is to be worn.

Level D is the minimum acceptable level for this site. Levels pf protections are based on the activities of task to be conducted.

TABLE 7
PERSONAL PROTECTIVE EQUIPMENT (PPE)

Level	Requirements
Level D	▪ Work Clothes will require, as a minimum, short sleeve shirts and long pants (NO shorts and/or tank tops) ▪ Steel-toed boots ▪ Approved safety glasses or goggles ▪ Hard hat ▪ Fluorescent vest, when vehicular traffic is on or adjacent to the site ▪ Work gloves ▪ Nitrile gloves for water sampling or handling
Modified Level D	**One or more of the following:** ▪ Chemical resistant (acid or solvent) boot covers ▪ PE-coated Tyvek® suit, NBR outer and nitrile inner gloves if skin contact with contaminants is possible. ▪ Hearing protection (muffs and/or plugs).
Level C	▪ Level D and Modified Level D ▪ National Institute for Occupational Safety and Health (NIOSH)-approved half-face respirator with organic/vapor/HEPA cartridge during Work Plan Section 4.3.3 Former Building Crawl Space excavation).
Prior to use, all equipment must be inspected to ensure proper working condition.	

4.2 Site Control: Work Zones

Work zones will be established in order to:

- Delineate high-traffic locations,
- Identify hazardous locations, and
- Contain contamination within the smallest area possible.

Employees entering the work zone must wear the proper PPE for that area. Work and support zones will be established based on ambient air monitoring data, necessary security measures, and site-specific conditions. Work zones will be identified as Exclusion Zone; Contamination Reduction Zone; or Support Zone.

The following PPE requirements apply for Work Zones:

- Exclusion Zone requires Level D/Modified Level D/Level C PPE
- Contamination Reduction Zone requires Level D/Modified Level D PPE
- Support Zone requires none

Listed are general guidelines for delineation of work zones. Contamination Reduction Zone will be developed for decontamination procedures listed in Section 4.4.

- The Exclusion Zone is identified as the Excavation Areas and inside transporter's trailer and/or roll off container.
- The Contamination Reduction Zone will be the area where trucks will be loaded, the area for cleaning equipment and all other areas excluding the Exclusion Zone within the chain link fence.
- Support Zone will be the areas outside the chain-linked fence.

TABLE 8
SITE SECURITY MEASURES

WORKING IN STREET OR ROADWAY

- Wear traffic vest and hardhat when vehicle hazard exists.
- Use cones, flag-mounted cones, caution tape and/or barricades.
- Use vehicle strobe light and block area with truck.
- Develop traffic pattern plan for high traffic situations:
  - use flag person,
  - use flashing arrow sign,
  - use "Worker Symbol" signs liberally,
  - obtain lane closing permits, and
  - engage police details.

WORKING AT EXCAVATION/TRENCHING SITES

- "Competent person" is required per OSHA 29 CFR 1926 Subpart P.
- Safe guards open excavations by restricting unauthorized access.
- Highlight Exclusion Zone using prominent warning signs (cones, saw horses/barricades and signage) placed a minimum of 10' back from excavation opening.
- Maintain zone definition along perimeter with **continuous string** of yellow orange caution tape.

EXCAVATIONS LEFT UNATTENDED OR OVERNIGHT

Use one of the following methods to address these situations:

- Surround entire perimeter with plastic or cloth construction net fencing. Anchor fence to ground using steel posts driven into ground. Space out posts no greater than 8 feet apart. Fence height minimum 4-feet high. Fence material must be of a quality capable of withstanding a pressure of 200 pounds. Place fence a minimum of 10 feet back from excavation opening.
- Place 8-foot long barricades affixed with flashing lights end to end with 4-foot high construction net fence attached to barricades.
- Utilize temporary curbing or concrete "jersey" barriers affixed with flashing signal lights or other effective warning signs.

4.3 Personal Decontamination Procedures

Operations conducted at this site have the potential to contaminate field equipment and PPE. To prevent the transfer of contamination to vehicles, administrative offices and personnel, the procedures presented in Table 9 must be followed. Utilizing the equipment for that purpose will follow specific decontamination requirements. Employees then must wash up and change into street clothes, leaving any contaminated clothing on-site for appropriate disposal. Level D / Modified Level D PPE must not be brought to employee residences.

TABLE 9
PERSONAL DECONTAMINATION PROCEDURES

Item	Examples	Procedure
Disposable PPE	Tyvek® suits, inner latex gloves, respirator cartridges	▪ Place PPE in lined 55 gallon barrels in the personal contamination reduction shed. ▪ Change out respirator cartridges on a daily basis and place cartridges in lined 55 gallon barrels in the personal contamination reduction shed.
Non-disposable PPE	Respirators	▪ Wipe out respirator with disinfecting pad prior to donning. ▪ Decontaminate on-site at the close of each day with a solution of an approved sanitizing powder and water.
	Boots and gloves	▪ Decontaminate in the personal contamination reduction area with a solution of detergent and water; rinse with water prior to leaving area.

All water used in decontamination procedures should be stored in portable storage tanks until sufficient amounts are collected to facilitate disposal or treatment. Disposable sampling and PPE will be placed in plastic bags and temporarily stored in designated drums. These drums shall be disposed of according to regulatory guidelines, if necessary.

4.4 Decontamination Procedure

If Level C or Level B PPE is required, a Contamination Reduction Zone will be constructed in a centralized common area with a travel path from the Exclusion Zone demarcated with three-foot high cones. The decontamination procedure for the project site is a two-stage process.

STAGE 1
- Gross contamination removal with a brush.
- Decontaminate boots with a solution of detergent and water.
- Rinse boots with water and remove boots.
- Remove Tyvek suit and dispose in lined drum.
- Remove outer gloves and dispose in a drum.
- Walk to Stage 2.

STAGE 2
- Remove respirator.
- Remove cartridge and dispose in a drum.
- Clean respirator and insert into a bag.
- Remove inner gloves and dispose in drum.
- Wash hands with a solution of detergent and water.
- Rinse hands with water and dry hands with disposable towels.
- Waterless hand cleaners may be used to replace hand wash tubs.
- Walk out of decontamination area.

5.0 CONTINGENCY PLAN

For *Contingency Plan*, see *Remedial Design Work Plan for the Charles Street Site, Appendix "E".* The *Contingency Plan* is designed to address potential emergencies that may arise as a result of operations during the remediation project to be completed at the Charles Street Site, City of Cortland, Cortland County, New York.

The remediation contractor's Health and Safety Officer will be made aware of the emergencies and coordinate any response activities carried out at the site. The remediation contractor's Health and Safety Officer will serve as the overall Project Emergency Coordinator and have the ultimate authority in specifying and facilitating any contingency action.

If the remediation contractor's Health and Safety Officer is not able to perform these duties, he will specify another senior individual to serve in this capacity. The Project Emergency Coordinator will become familiar with contingency plans developed by each contractor and subcontractor.

6.0 PROJECT PERSONNEL

The following management structure will be instituted for the purpose of successfully and safely completing this project.

TABLE 10 (Continued on next page)
RESPONSIBILITIES OF ON-SITE PERSONNEL

Title	General Description	Responsibilities
Project Manager	Reports to Program Manager. Has authority to direct response operations. Assume total control over site activities.	▪ Prepares and organizes background review of the project, the work plan, the HASP, and the field team. ▪ Obtains permission for site access and coordinates activities with appropriate officials. ▪ Sees that the work plan is properly carried out and on schedule. ▪ Briefs the field personnel on specific assignments. ▪ Together with the SHSO sees that health and safety requirements are met. ▪ Prepares final report.
Construction Supervisor	Reports to Project Manager. Has authority to direct response operations. Assumes total control over site activities.	▪ Manages field operations. ▪ Executes the work plan and schedule. ▪ Enforces site control. ▪ Documents field activities and sample collection. ▪ Notifies when necessary, local public emergency officials. ▪ Submits NYSEG Public Liability Accident Report, NYSEG Report of Employee Injury, or NYSEG Incident Report and initiates follow up with Project Manager.

TABLE 10 (Continued from previous page)
RESPONSIBILITIES OF ON-SITE PERSONNEL

Title	General Description	Responsibilities
Site Health & Safety Officer	Advises the Project Manager on all aspects of health and safety on site. Stops work if site operations threaten worker or public health and safety. Informs health and safety specialist of any changes in site conditions or project status.	▪ Refreshes field personnel for donning PPE. ▪ Notifies field personnel when to upgrade their PPE ▪ Periodically inspects protective clothing and equipment. ▪ Sees that protective clothing and equipment are properly stored and maintained. ▪ Monitors the workers for signs of stress, including heat stress, cold exposure, and fatigue. ▪ Controls entry and exit at the access control points. ▪ Implements the HASP. ▪ Conducts periodic inspections to assess whether the HASP is being followed. ▪ Enforces the "buddy" system. ▪ Informed of emergency procedures, evacuation routes, and telephone number of local hospital, poison control center, fire department, and police department. ▪ Notifies, when necessary, local public emergency officials. ▪ Maintains communications with health and safety representative on site activities. ▪ Coordinates emergency medical care. ▪ Sets up decontamination lines and decontamination solutions appropriate for the chemical contaminants encountered. ▪ Controls the decontamination of equipment, personnel, and samples from contaminated areas. ▪ Facilitates the proper disposal of contaminated clothing and materials. ▪ Advises NYSEG health services and medical personnel of potential exposures. ▪ Notifies emergency response personnel in the event of an emergency.
Work Team	Reports to Construction Supervisor for on-site activities. Work parties must comprise at least two people for high hazard operations.	▪ Safely completes on-site tasks required to fulfill the work plan. ▪ Complies with the HASP. ▪ Notifies SHSO or supervisor of suspected unsafe conditions.

7.0 VISITOR/TRAINEE GUIDELINES

NYSEG is committed to providing a safe environment on all work sites for visitors, trainees, employees and/or passerby. In order to accomplish this, the following guidelines must be followed.

7.1 Visitors

Any person not actively participating in the work at the site is regarded as a "visitor" and must follow NYSEG's visitor/trainee guidelines. While on-site, visitors must be accompanied by a site representative.

Sites must be marked with signs, placards, and/or barricades to designate hazardous boundaries. Visitors will not be allowed on any site that is not adequately marked.

7.2 Trainees

Trainees are employees of NYSEG who have not yet completed NYSEG's required safety training program. New Hires and in-house company transfers will be considered trainees until safety training requirements are met.

Trainees will be permitted to visit NYSEG sites as observers as long as the following conditions are met:

- Trainees are supervised at all times while observing on-site.
- Trainees do not perform work functions of any type while on-site.
- Trainees do not handle any equipment, tools and/or supplies while on-site.
- Trainees do not enter any hazardous or Exclusion Zone or confined space areas while on-site.

Construction Supervisors will be responsible for informing trainees of the above conditions and for ensuring that the conditions are met. Construction Supervisors will also ensure that trainees will not be asked to violate the conditions listed above.

8.0 JOB SAFETY ANALYSIS

TABLE 11
HEAVY EQUIPMENT

Task – Job Steps	Job Hazard	Control and Safeguard
Heavy Equipment Operations: Excavators Loaders Trucks Dozers Etc.	1. Employee run over or hit by moving equipment 2. Physical hazards; a. hit in head b. foreign body in eye c. foot injury 3. Overhead utilities/overhead obstacles	1a. Back up signals on equipment; 1b. Traffic safety vest for all field personnel 1c. Foot traffic restricted in areas of operation; 1d. Establish standard hand signals for laborers assisting in equipment operations 2a. Hard hat; 2b. Safety glasses 2c. Steel toe shoes 3. Minimum of 10' distance, 1' distance if insulated

TABLE 12
EXCAVATION OF CONTIMINATED SOILS

Job Steps	Job Hazards	Safeguard and Precautions
Operate excavator or backhoe to remove contaminated soil	1. Underground utilities 2. Vehicle/equip. traffic 3. Toxic or hazardous Environments 4. Cave In 5. Fall hazard	1. Contact Dig Safely New York 2. Audible alarms (back-up, etc.) for heavy equipment 3a. Competent person supervising 3b. Level D personal protective equipment 3c. Test for LEL (10% LEL action level) and PPM (2.5 PPM on PID for action level to Level C) 3d. Prevent all skin contact 4a. Slope and shore per specification in OSHA standard 1926.650-652 5a. Secure opening of excavation when fall hazard exists (e.g. barricade openings)

TABLE 13
SOIL TRANSPORTATION

Job Steps	Job Hazards	Safeguard and Precautions
Soil Transfer and Soil Consolidation	1. Employee run over or hit by moving equipment.	1a. Back-up signals on equipment. 1b. Traffic safety vest for all field personnel. 1c. Restricted foot traffic in area. 1d. Establish hand signals for laborers assisting in equipment operations.
	2. Physical hazards (hit in head, foreign eye, foot injury, etc.)	2. Hard hat, safety glasses, steel toe shoes, and work gloves
	3. Overhead utilities / overhead obstruction	3. Minimum 10' distance.
	4. Dust problems	4a. Monitor for ambient dust per Work Plan. 4b. Wearing Level D PPE 4c. Spray dust with water.
	5. Noise level exceeding the OSHA PEL	5. Earmuffs and/or ear plugs effectively reduce noise levels
	6. Toxic vapors	6. Monitor for contaminants using real time air monitoring per Work Plan

9.0 CONFINED SPACE

See Attachment B for NYSEG Confined Space Entry Program. The program has been prepared in accordance with procedures outlines in OSHA Standard 29 CFR 1910.146.

When working in "permit required confined space", as defined by OSHA Standard 29 CFR 1910.146(b)(23), extreme caution shall be exercised.

The definition of a "confined space" is a space which by design has limited openings for entry and exit: unfavorable natural ventilation which could contain or produce dangerous air contaminants, and which is not intended for continuous worker occupancy.

The following guidelines shall be followed when performing confined space work:

- A permit shall be prepared by the contractor where required under OSHA Standard 29 CFR 1910.146. The permit shall be in a standardized format and shall identify all conditions which must be evaluated to ensure safe entry.

- There shall be no smoking in confined spaces and workers shall avoid, as far as practical, open flames or torches in or near confined spaces.
- Before entering, the air inside the confined space shall be monitored for combustible gases and oxygen levels, preferable with a combination of O^2/LEL meter. The air shall be intermittently monitored to verify a safe stable working atmosphere. If there is a possibility that toxic vapors or gases may be present, their concentration must be measured prior to entry into the confined space.
- A minimum of two people will be required for confined space work with one of those persons remaining outside to be alert to the needs of the workers inside, as well as to keep others out of the Exclusion Zone.

10.0 HEAT STRESS

Heat stress is a significant potential hazard associated with the work task performed and the type and degree of protective equipment used in hot weather environments. Local weather conditions may produce conditions which will follow one of two protocols depending on whether impermeable clothing (Tyvek, Saranex, rain gear, etc.) or permeable clothing (cotton coveralls) is worn. This section will apply to both hazardous and non-hazardous waste workers at the site.

10.1 Workers Wearing Permeable Clothing

The American Conference of Governmental Industrial Hygienist (ACGIH) have set Threshold Limit Values (TLVs) for worker exposure to heat stress in which it is believed that nearly all workers may be repeatedly exposed without adverse health effects. The TLVs assume that workers are acclimated, fully clothed in permeable clothing with adequate water and salt intake, and capable of functioning effectively under given working conditions without exceeding a deep body temperature of 100.4 degree Fahrenheit (F). Measurement of wet bulb globe temperature (WBGT) has been found to be the most adequately measurable environmental factor in which to correlate with deep body temperature and other physiological responses to heat. The following table reviews the work/rest regimen to be followed by all permeably clothed workers based upon routinely measured WBGT.

TABLE 14
HEAT STRESS – WORK/REST REGIMEN

Work/Rest Regimen	Workload		
	Light	Moderate	Heavy
Continuous Work	86 (76)	80 (70)	77 (67)
75% work – 25% rest, each hour	87 (77)	82 (72)	78 (68)
50% work – 50% rest, each hour	89 (79)	85 (75)	82 (72)
25% work – 75% rest, each hour	90 (80)	88 (78)	86 (76)

Values are given in degree F WBGT.

Rest means minimal physical activity. Rest should be accomplished in the shade. Any activity requiring only minimum activity can be performed during rest period.

( ) Parentheses indicate the 10 degree adjustment for working in impermeable protective clothing

10.2 Workers Wearing Impermeable Clothing

Workers who must wear impermeable clothing are held at a higher risk of suffering heat stress. Impermeable clothing impedes sweat evaporation, one of the body's major cooling mechanisms. It is the duty of each employee to alert or notify the Construction Supervisor (Site Safety & Health Officer) if symptoms of heat stress occur to their respective site personnel. Physiological and environmental monitoring of personnel wearing an impermeable protective equipment ensemble will commence when the ambient temperature rises above 70 degrees F. Environmental monitoring will be conducted continuously for as long as the ambient temperature stays above 70 degree F and physiological monitoring will be conducted immediately before and after each work period. Frequency of physiological monitoring will increase as the ambient temperature increases or if slow recovery rates are indicated. The break time must be sufficient to allow workers to recover from the effects of heat stress. This will be accomplished by measuring the recovery heat rate and oral temperature. The break time duration will be determined using the following methodology and criteria.

- Seat person being monitored,
- Measure pulse in the following sequence:
  - Pulse #1: 30 seconds to 1 minute after sitting, and
  - Pulse #2: 2 ½ to 3 minutes after sitting,

An excessive heat stress condition exists when any of the following conditions exists:

- Oral or ear temperature exceeds 99.5 degrees F,
- If pulse #2 is greater than 90 beats/minute, or
- Pulse #1 is greater than 100 beats/minute.

Worker cannot return to work until:

- Oral or ear temperature is below 99.5 degrees F.
- Pulse rate is below 90 beats/minute, and
- Recovery heart rate for workers with heart rates over 90 beats/minute is less than 10 beats/minute less than the original heart rate.

Adhering to the guidelines for heat stress prevention and monitoring will greatly minimize the possibility of the occurrence of heat stress. Site personnel must also be aware of the symptoms of heat-related disorders and be prepared to administer the appropriate treatments.

10.2.1 Heat Stress Prevention

Provide plenty of fluids. A 50 percent solution of fruit juice or similar solution in water, or plain water will be available. For workers performing work inside an exclusion zone, fluid intake may occur in the contamination reduction zone. Workers must first perform a partial decontamination process which will include removal of gloves and washing of hands and face prior to consumption of fluids.

Work in pairs. No activity where personnel are in Level C will be conducted alone.

Provide cooling undergarments. The amount and type of undergarments worn will be left to the preference of each individual unless prone to heat stress, especially heat rash. In this case, the worker can wear “long john” cotton type underwear to keep skin separated from chemical resistant clothing.

Adjustment of the work schedule. When practicable, the most labor-intensive tasks should be carried out during the coolest part of the day.

Shaded or cooled rest areas. Shaded or cooled rest areas will be provided when site environmental and/or workers physiological responses warrant.

10.2.2 Heat Stress Monitoring

Physiological monitoring of personnel wearing an impermeable protective ensemble will be conducted at regular intervals at the beginning and conclusion of the work period. Heart rate must be periodically measured for all site personnel when heat stress conditions (climate or wearing impermeable clothing) exist. Additional physiological monitoring such as body temperature and body water temperature (BWT) monitoring can be measured for extreme temperatures and when impermeable clothing is worn.

- Heart rate must be measured by the radial pulse for 30 seconds as early as possible in the resting period and repeated approximately 3 minutes into the rest period.

- The heart rate at the beginning of the rest period should not exceed 100 beats/minute. The heart rate also should not exceed 90 beats/minute after approximately 3 minutes of rest. If the heart rate does exceed the criteria, the next work period will be shortened by 33 percent, while the length of the rest period will remain the same. If heart rate still exceeds the criteria at the beginning of the next rest period, the following work will be shortened by 33 percent.

- Body temperature can be measured orally with a clinical or disposable thermometer, in accordance with manufacturer's instructions, as early as possible in the rest period (before drinking liquid). Oral or ear temperature at the beginning of the rest period should not exceed 99.5 degrees F. If it does, the next work period will be shortened 33 percent while the length of the rest period will remain the same. However, if the oral temperature exceeds 99.5 degrees F at the beginning of the next rest period, the following work period will be shortened 33 percent. A worker will not be permitted to wear semi-permeable or impermeable protective ensemble when his/her body temperature exceeds 99.5 degrees F.

- Body water loss due to perspiration can be measured by having the worker weigh him/her self at the beginning and end of each work day. Similar clothing should be worn at both weighing. Body water loss should not exceed 1.5 percent total body weight in a work day.

TABLE 15
HEAT STRESS MONITORING
SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING
FOR FIT AND ACCLIMATED WORKERS (1)

Adjusted Temperature (2)	Normal Work Ensemble (3)	Impermeable Ensemble (4)
90 deg. F or above	After each 45 minutes of work	After each 15 minutes of work
87.5 deg. F – 90 deg. F	After each 60 minutes of work	After each 30 minutes of work
82.5 deg. F – 87.5 deg. F	After each 90 minutes of work	After each 60 minutes of work
77.5 deg. F – 82.5 deg. F	After each 120 minutes of work	After each 90 minutes of work
72.5 deg. F – 77.5 deg. F	After each 150 minutes of work	After each 120 minutes of work
Record monitoring on Heat Stress Monitoring Form Attachment B		

(1) For work levels of 250 kilocalories per hour
(2) Calculate the adjusted air temperature (T adj) using the following equation:
T adj (degree F) = T (degree F) + (13 X percent sunshine)
Measure the air temperature (T adj) using a standard mercury-in-glass thermometer with the bulb shielded from radiant heat.
(3) A normal work ensemble consists of cotton coveralls with long sleeves and pants.
(4) An impermeable work ensemble consists of impermeable coveralls with long sleeves and pants.

10.2.3 Heat Stress Recognition and Treatment

Any person who observes any of the following forms of heat stress either in themselves or in another worker, will report this information to his or her immediate supervisor or the Construction Supervisor.

Heat rash (or prickly heat)

Cause: Continuous exposure to hot and humid air, aggravated by chafing clothing.

Symptoms: Eruption of red pimples around sweat ducts accompanied by intense itching and tingling.

Treatment: Remove sources of irritation and cool skin with water or wet cloths.

Heat Cramps or Heat Prostration

Cause: Profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.

Symptoms: Sudden development of pain and/or muscle spasms in the abdominal region.

Treatment: Remove the worker to the contamination reduction zone. Remove protective clothing. Decrease body temperature and allow a period of rest in a cool location.

Heat Exhaustion – SERIOUS

Cause: Overexertion in a hot environment and profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.

Symptoms: Muscular weakness, staggering gait, nausea, dizziness, shallow breathing.

Treatment: Perform the following while simultaneously making arrangements for transport to a medical facility.

Remove the worker to the contamination reduction zone. Remove protective clothing. Lie worker down on his/her back in a cool place, and raise the feet 6 to 12 inches. Keep warm, but loosen all clothing. If conscious, provide sips of a salt water solution consistency of one teaspoon salt in 12 ounces of water. Transport the worker to a medical facility.

Heat Stroke – EXTREMELY SERIOUS

Cause: Overexertion in a hot environment and profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.

Symptoms: No perspiration, dry mouth, pain in the head, dizziness, and nausea.

Treatment: Perform the following while making arrangements for transport to a medical facility.

Remove the worker to the contamination reduction zone. Remove protective clothing. Lie worker down in a cool place and raise the head and shoulders slightly. Cool without chilling. Apply ice bags or cold wet cloth to the head. Sponge bare skin with cool water or rubbing alcohol. If possible, place the worker In a tub of cool water. Do not give stimulants. Transport to a medical facility.

11.0 COLD STRESS

If work on this project begins in the winter months, thermal injury due to cold exposure can become a problem for field personnel. Systemic cold exposure is referred to as hypothermia. Localized cold exposure is generally labeled frostbite.

Hypothermia

Cause: A decrease in the patient core temperature below 96 degrees F. The body temperature is normally maintained by central (brain and spinal cord) and peripheral (skin and muscle) activity. Interferences with any of these mechanisms can result in hypothermia, even in the absence of what normally is considered "cold" ambient temperature.

Symptoms: Shivering, apathy, listlessness, sleepiness, and unconsciousness.

Frostbite:

Cause: A general and medical term given to areas of local cold injury. Unlike systemic hypothermia, frostbite rarely occurs unless the ambient temperatures are less than freezing and usually less than 2 degrees F.

Symptoms: A sudden blanching or whitening of the skin; the skin has a waxy or white appearance and is firm to the touch; tissues are cold, pale, and solid.

Prevention of cold related illness can be aided by educating workers on recognizing the symptoms of frostbite and hypothermia and by identifying and limiting known risk factors. The workers should be provided with enclosed, heated environments on or adjacent to the site, dry changes of clothing and warm drinks.

To monitor the worker for cold related illness, start (oral) temperature recording at the job site:

- At the Contractor's and/or Construction Supervisor's discretion when suspicion is based on changes in a worker's performance or mental status.
- At a worker's request.
- As screening measures, two times per shift, under unusually hazardous conditions (e.g., wind-chill less than 20 degrees F, or wind-chill less than 30 degrees F with precipitation).
- As a screening measure whenever any one worker on the site develops hypothermia.

Workers developing moderate hypothermia (a core temperature of 92 degrees F) should not return to work for at least 48 hours.

TABLE 16
PROGRESSIVE CLINICAL SYMPTOMS OF HYPOTHERMIA

Core Temperature (degree F)	Symptoms
99.6	Normal rectal temperature
96.8	Metabolic increases
95.0	Maximum shivering
93.2	Victim conscious and responsive
91.4	Severe hypothermia
89.6 - 87.8	Consciousness clouded, blood pressure difficult to obtain, pupils dilated but react to light, shivering ceases
86.0 - 84.2	Progressive loss of consciousness, muscular rigidity increases, pulse and blood pressure difficult to get, respiratory decreases
78.8	Victim seldom conscious
64.4	Lowest accidental hypothermia victim to recover

12.0 AGREEMENT AND ACKNOWLDEGMENT SHEET

NYSEG personnel have the authority to stop field activities if any activity is not performed in accordance with the requirements of this *Health and Safety Plan*. All NYSEG project personnel, contractor personnel, subcontractor personnel, and visitors are required to sign the Agreement and Acknowledgment Sheet prior to conducting field activities at this site.

TABLE 17
AGREEMENT AND ACKNOWLEDGMENT STATEMENT

- I have read and fully understand this *Health and Safety Plan* and my responsibilities.
- I agree to abide by the provisions of this *Health and Safety Plan.*

Name:	_____	Signature:	_____
Company:	_____	Date:	_____
Name:	_____	Signature:	_____
Company:	_____	Date:	_____
Name:	_____	Signature:	_____
Company:	_____	Date:	_____
Name:	_____	Signature:	_____
Company:	_____	Date:	_____
Name:	_____	Signature:	_____
Company:	_____	Date:	_____
Name:	_____	Signature:	_____
Company:	_____	Date:	_____
Name:	_____	Signature:	_____
Company:	_____	Date:	_____

SPECIFICATIONS

FOR

REMEDIATION OF THE CHARLES STREET SITE

SITE #7-12-012

CITY OF CORTLAND, CORTLAND COUNTY, NEW YORK

Prepared For:

NEW YORK STATE ELECTRIC & GAS CORPORATION

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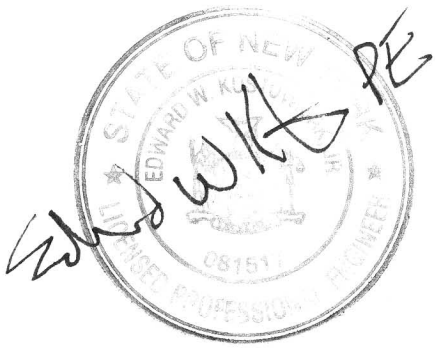

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SECTION 01010
SUMMARY OF WORK

PART 1 - GENERAL

1.1 Summary

1.1.1 The remedial objective for this Site is as follows:

- Prevent inhalation, ingestion and direct contact with contaminated soil.

1.1.2 The remedial action shall be conducted within the property boundaries of 43 and 45 Charles Street (onsite) and within Charles Street. All work shall be performed in a community-sensitive manner. Trucks used for the transport of equipment and material to and from the Site and for the hauling of contaminated soil and water from the Site are required to follow the routing plan that is presented in the *Transportation of Solid or Liquid Material Plan*.

1.1.3 The remedial action shall consist of the excavation of two feet of soil from within the onsite property boundaries to the eastern edge of Charles Street. Excavated material will be disposed off-site.

A demarcation layer and a minimum of two feet of clean cover material shall be placed over excavated areas for the protection of human health and the environment. The excavated areas shall be backfilled in preparation for the as yet to be determined future use of the site. At a minimum, replacement of the public sidewalk, street trees and green space is included in the Design. Potential land use may also include construction of a parking area, additional sidewalks, and/or landscaping within the green space. The final site cover may consist of a combination of soil, vegetation, concrete sidewalks, and asphalt parking areas. Specifications and Drawing Details have been included in the Design for these optional features. Future land use of the Site will be consistent with its current zoning.

Damage to the existing storm sewer system along the eastern edge of Charles Street, and/or Charles Street itself, shall be repaired/replaced as necessary. A catch basin tie-in shall be installed within Charles Street if a parking lot is constructed onsite as part of the Design. Any material excavated from within Charles Street during the course of the project for either construction of the catch basin and/or repair/replacement of existing storm sewers within Charles Street will be considered contaminated. Such material shall not be reused and will be disposed off-site.

1.1.4 The remediation Work is shown on the Drawings and summarized below:

- Excavate two feet of contaminated soil from the Site and dispose the excavated material off-site.
- Backfill the foundation areas.
- Backfill the site with a minimum of two feet of clean imported material.

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SUMMARY OF WORK

- Create onsite green space.
- Restore the public sidewalk.
- Restore the four street trees removed during Site Preparation.
- Sawcut a one-foot width of Charles Street to facilitate excavation of the entire site and replace the street curb and asphalt pavement.

1.1.5 All work shall be performed in compliance with these Technical Specifications and Contract Drawings and in strict adherence to all applicable federal, New York State, and local laws, rules, regulations, and codes.

1.2 Responsibilities

1.2.1 Contractor: The Contractor shall be responsible for providing all labor, supervision, materials, tools, equipment, transportation, permits, and insurance necessary to perform the following primary tasks:

- Complete all planning, permitting, and preparatory work required prior to the initiation of the project;
- Mobilize and establish temporary facilities;
- Clear, grub, and prepare the work areas. Remove vegetation, pavement, sidewalks, implement erosion and sediment control measures, erect security fencing, implement measures for the maintenance and protection of traffic, provide temporary staging areas, and complete surveys;
- Maintain uninterrupted traffic flow within Charles Street;
- Manage and protect utilities as necessary, both active and inactive;
- Install and operate community air monitoring system;
- Decommission the onsite piezometers;
- Perform decontamination activities;
- Perform dust, vapor, and odor management such as water and foam application;
- Perform excavation, backfill, and off-site disposal. Minimize noise and vibration;
- Install concrete sidewalk;
- Seed the green space area;

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SUMMARY OF WORK

- Replace the four street trees;
- Replace the street curb and asphalt pavement of Charles Street; and
- Demobilization.

1.2.2 Engineer: The Engineer is an agent of NYSEG and will be responsible for the following:

- Providing oversight of Site remedial construction processes and activities;
- Tracking the schedule progress;
- Facilitating on-site remedial construction progress meetings.

The Engineer is also responsible for monitoring and ensuring that the construction activities are being performed in accordance with the Drawings and Specifications. Other responsibilities include the following:

- Providing support to NYSEG during the remedial construction activities; and
- Ensuring that the requirements of the project are being achieved during the construction activities.

1.3 References

1.3.1 The following references are applicable to the work specified herein:

- International Building Code, New York Edition, 2000.
- New York State Department of Transportation Standard Specifications, latest edition.
- Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations Standards 29 CFR 1910.120 and 29 CFR 1926.
- Local ordinances for the City of Cortland.
- Soil Erosion and Sediment Control Measures as specified in the "New York Standards for Soil Erosion and Sediment Control".
- Draft DER-10 (Technical Guidance for Site Remediation and Investigation), 2010.
- 6 NYCRR Part 375, Environmental Remediation Programs, Subparts 375-1 to 375-4 and 375-6.

SECTION 01010
SUMMARY OF WORK

PART 2- PRODUCTS

Not Used

PART 3- EXECUTION

3.1 Government Agencies on Site

3.1.1 The Contractor shall understand that representatives of regulatory agencies from New York State and Cortland County and representatives of the City of Cortland may be onsite to observe and inspect the work.

END OF SECTION

SECTION 02110
SITE CLEARING AND PREPARATION

PART 1- GENERAL

1.1 Summary

1.1.1 The Work under this section shall include the following:

- Mobilization, Site preparation, temporary Site facilities, and utilities required for completion of the proposed remedial construction;
- Location and stake-out of existing active aboveground and underground utilities;
- Improvement of construction entrance and staging areas as required,
- Access Agreements: To be performed by NYSEG.
- Permits: To be obtained by NYSEG.

1.2 Quality Assurance

1.2.1 The Contractor shall coordinate Site clearing and preparation work with NYSEG, the Engineer, City of Cortland, local governments, private property owners, and/or the utility company(s) as appropriate.

1.2.2 The Contractor shall protect all Work and property.

1.3 Approvals

1.3.1 The Contractor shall obtain from NYSEG and the Engineer procedure approvals for the following elements of the Work.

1.3.2 Mobilization and Site Preparation Details: Utility hook-ups, decontamination facilities, staging areas, management of construction water; and a map of temporary facilities and truck access routes.

The Contractor shall conform to the truck routing plan provided in the *Transportation of Solid or Liquid Material Plan* that attempts to minimize community disturbance, as well as considers traffic patterns and load bearing capacity of the roads.

1.3.3 Tree Removal Procedures: Procedures proposed to be employed to remove the existing trees from the Charles Street right-of-way including the location for off-site disposal.

1.3.4 Regrading within Basement Areas: Plans for regrading materials deposited within the open basement areas, if necessary, to facilitate the compaction of backfill material.

1.3.5 Well Abandonment: Plans to remove in their entirety or abandon per NYSDEC regulations the existing onsite groundwater monitoring wells, as defined in Section 02610 – Well Abandonment.

SECTION 02110
SITE CLEARING AND PREPARATION

1.3.6 Noise and Traffic Mitigation Procedures: Methods to control traffic and prevent excessive noise levels as per the *Traffic Control Plan.*

PART 2- PRODUCTS

2.1 Materials

2.1.1 The Contractor shall furnish all materials required to complete the work of this Section.

2.2 Equipment

2.2.1 The Contractor shall furnish all equipment required to complete the work of this Section.

PART 3- EXECUTION

3.1 Clearing

3.1.1 The Contractor shall clear any debris and rubble in the Work areas and in those areas that will be used for construction support as approved by NYSEG and/or the Engineer.

3.1.2 The Contractor shall remove to grade the four trees located within the Charles Street right-of-way. A stump grinder shall be utilized with additional root material removed as part of Section 02300 – Earthwork and Backfill. Work shall be accomplished by qualified personnel trained and experienced in large tree removal.

3.1.3 The Contractor shall coordinate with local governments and applicable utility companies regarding managing utilities impacted by the proposed remedial activities. The Contractor shall meet all the requirements imposed by local governments and utility companies including but not limited to the following: supporting and/or protecting existing utilities, coordinating with utility companies regarding disconnecting or relocating existing utilities, backfilling and compacting excavation areas as required, and conducting any necessary vibration and settlement monitoring.

3.2 Debris Removal

3.2.1 The Contractor shall remove the cut trees and abandoned monitoring wells within the limits of Work area and characterize the debris as necessary for off-site disposal.

3.2.2 The Contractor shall be responsible for transportation and disposal of all generated wastes to an off-site properly licensed and permitted disposal facility approved by NYSEG. The facility and means of transport shall be in accordance with Section 02111 – Waste Management and Handling of Contaminated Material.

SECTION 02110
SITE CLEARING AND PREPARATION

3.3 Utility Location

3.3.1 The Contractor shall locate, identify and disconnect underground utilities and piping that may enter or exit the perimeter of the remedial excavation areas in preparation for remedial excavation activities. The Contractor shall contact the City of Cortland and Dig Safely New York to field-locate and mark utilities. NYSEG will field locate utilities known to them within the remedial excavation area.

3.4 Dust Control

3.5.1 The Contractor shall utilize dust control measures, as necessary, to prevent dust from leaving the Site in accordance with Section 02120 – Soil Erosion and Sediment Control, the NYSEG HASP and the *Community Air Monitoring Program*. In addition, the Contractor shall immediately apply dust control if requested by NYSEG, the Engineer, or the NYSDEC.

END OF SECTION

SECTION 02111
WASTE MANAGEMENT AND HANDLING OF CONTAMINATED MATERIAL

PART 1- GENERAL

1.1 Summary

1.1.1 This Section specifies the requirements for the management, handling, storage, characterization and off-site disposal of debris from clearing and well abandonment, excavated materials, liquid waste from decontamination, spent PPE, refuse and trash.

1.2 Definitions

1.2.1 Waste: Defined as any of the following materials:

- Soil from the implementation of the proposed remedial construction activities (i.e., excavation);
- Construction concrete, asphalt, trees, and debris generated by the implementation of the remedial construction activities (i.e., clearing, excavation);
- Liquid wastes generated by the implementation of the remedial construction activities (i.e., decontamination);
- Spent personal protective equipment (PPE) including plastic overboots, gloves, Tyvek coveralls, decontamination pad materials, etc.; and
- Standard refuse trash generated in support of the field operations.

1.3 Approvals

1.3.1 The Contractor shall obtain from NYSEG and the Engineer procedure approvals for the following elements of the Work.

1.3.2 Disposal Facilities: The Contractor shall identify appropriate transporter and off-site disposal facilities for approval by NYSEG. The Contractor shall utilize disposal facilities that are currently approved by NYSEG.

If it becomes necessary to use a disposal facility not currently approved for use by NYSEG, the Contractor shall bear the burden of proof that the facility(ies) is adequate and sufficient for NYSEG's needs. If requested, the Contractor shall provide additional information to support their selection. No wastes shall be transported to any facility that has not received NYSEG prior approval.

1.3.3 Disposal Documentation: Provide all manifests, Bills of Lading, weigh tickets, daily truck activity, tonnage removed by waste type, Certificates of Destruction and all other disposal documentation regarding the off-site disposal of the waste.

SECTION 02111
WASTE MANAGEMENT AND HANDLING OF CONTAMINATED MATERIAL

PART 2- PRODUCTS

Not Used

PART 3- EXECUTION

3.1 Excavation

3.1.1 Excavation of contaminated materials as detailed in Section 02300 – Earthwork and Backfill, shall be performed in a manner that will eliminate spills and the potential for contaminated material to be mixed with uncontaminated material.

3.1.2 After final completion of the project and when authorized by NYSEG and/or the Engineer, all soil erosion and sedimentation control measures shall be removed and disposed off-site by the Contractor at a disposal facility approved by NYSEG.

3.2 Contaminated Water

3.2.1 Handling and transportation of contaminated water shall be performed in a manner that will avoid spills and the potential for contaminated material to be mixed with uncontaminated material.

3.3 Disposal of Waste

3.3.1 The Contractor shall provide all labor, equipment, testing and materials needed to legally dispose of all waste. This work may include but will not be limited to the following:

- Conducting all necessary coordination with NYSEG and the Engineer;
- Providing sufficient number of transport vehicles or containers adequately sized to support the proposed remedial construction activities on a daily basis;
- Providing all labor, equipment, materials, transportation, disposal charges, testing and any other activities necessary to dispose of the waste, including any pre-conditioning of the wastes necessary to assure acceptance by the disposal facility;
- Management of the waste and associated containers or transport vehicles;
- Preparation of transport vehicles as necessary to eliminate problems associated with odor or dust generation;
- Management of the arrival and departure of transport vehicles in accordance with the *Traffic Control Plan* and the *Transportation of Solid or Liquid Material Plan* to ensure no delays with the implementation of the proposed remedial construction;
- Inspection of all transport vehicles removing waste from the Site to ensure that the haulers are properly permitted;

- Characterization of the waste in accordance with the acceptance criteria of the approved off-site disposal facilities, recognizing the sample analytical results already performed by NYSEG as presented in the NYSDEC ROD (March 2010) included as Appendix B to the *Work Plan*;
- Constructing a decontamination pad and provide inspection and decontamination, as necessary, to prevent tracking of liquids and solids off-site; and
- Transportation of the waste to properly permitted off-site disposal facilities that are pre-approved by NYSEG, in a manner consistent with all applicable Federal, State and local regulatory requirements.

3.4 Waste Management

3.4.1 All wastes generated from the implementation of the remedial construction activities as described in the Contract Documents shall be placed by the Contractor in containers approved by NYSEG (e.g., trucks, roll-off boxes, drums) provided by the Contractor unless otherwise approved by NYSEG and the Engineer.

3.4.2 The Contractor shall ensure that a suitable number and type of container(s) are available onsite at all times so as not to impede the progress of the work. The Contractor shall select the proper containers for each type of waste as approved by NYSEG and/or the Engineer. Stockpiling of excavated materials shall be minimized to the extent practicable and only then with prior approval from NYSEG and/or the Engineer.

3.4.3 Containers for wastes shall be watertight. A cover shall be placed over the units to prevent precipitation from contacting the stored material, and to prevent the loss of any contaminated material or soil during storage and transportation. The units shall be placed in locations approved by NYSEG and/or the Engineer. Liquid which collects inside roll-off units shall be removed and disposed of as contaminated liquid.

3.4.4 Liquid collected from the implementation of the remedial actions and liquids removed from other containers or generated from decontamination operations shall be containerized in approved tanks or 55-gallon drums.

3.4.5 The Contractor shall stabilize wastes as needed (bulking agents such as cement kiln dust, etc.) to meet the transportation and disposal facility requirements. All such bulking agents require prior approval by NYSEG and/or the Engineer.

3.5 Waste Characterization

3.5.1 The Contractor shall perform any required waste characterization sampling/testing, as well as all transportation and disposal of materials off-site. The Contractor shall prepare the containerized materials to be transported off-site, as necessary, to meet the acceptance criteria of the selected disposal facility. If required to do so, the Contractor shall characterize waste according to the requirements of the selected approved disposal facility(ies) in accordance with the *Sampling and Analysis Plan* and the *Quality Assurance Project Plan* for the site. All analytical testing shall be

performed at a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) certified laboratory, under proper chain-of-custody procedures.

3.6 Waste Transportation

3.6.1 Waste transportation requirements are specified in the *Transportation of Solid or Liquid Material Plan.*

3.7 Disposal Documentation

3.7.1 General: The Contractor shall manage all disposal documentation including but not limited to all necessary manifests, bill-of-ladings, weight tickets, and Certificates of Destruction.

3.7.2 Waste Profiles: The Contractor shall complete and submit necessary waste profiles to disposal facility(ies) for acceptance. The Contractor shall coordinate acceptance of waste types and forms with the disposal facilities and advise NYSEG as to any restrictions imposed by the disposal facility's operating hours.

3.7.3 The Contractor shall manage all disposal paperwork and prepare and supply all necessary manifests or bills-of-lading. The Contractor shall manage all weight tickets and Certificates of Destruction. At project completion, a summary report containing daily truck activity, tonnage removed by waste type, completed manifests, weight tickets and Certificates of Destruction shall be prepared by the Contractor for submission to NYSEG and/or the Engineer.

END OF SECTION

SECTION 02120
SOIL EROSION AND SEDIMENT CONTROLS

PART 1 - GENERAL

1.1 Summary

The work under this section shall consist of furnishing all labor, equipment and materials for providing soil erosion and sediment control (SESC) measures in accordance with the Technical Specifications, local and state ordinances and the Drawings.

1.2 Reference Standards

1.2.1 The "New York State Standards and Specifications for Erosion and Sediment Controls", latest edition.

1.3 Quality Assurance

1.3.1 The Contractor shall implement SESC measures prior to the commencement of intrusive remedial activities.

1.3.1 On a daily basis, or at any evidence of the failure of an SESC measure, the Contractor shall inspect all SESC measures. The Contractor shall repair and maintain the soil erosion and sediment measures in good working order until completion of the work.

1.3.2 No sediment shall be discharged or allowed to enter the storm drainage system adjacent to the Site.

1.4 Environmental Requirements

1.4.1 The Contractor shall protect adjacent properties and water resources from soil erosion and sediment damage throughout construction.

1.4.2 The Contractor shall provide adequate provisions for surface water drainage and for the protection of exposed surface soil.

PART 2 - PRODUCTS

2.1 Materials

2.1.1 The Contractor shall, at a minimum, use the following control measures to prevent soil erosion:

- siltation fence;
- inlet protection for catch basins; and
- All other controls described and/or required by the appropriate local soil erosion and sediment control jurisdiction.

SECTION 02120
SOIL EROSION AND SEDIMENT CONTROLS

PART 3 - EXECUTION

3.1 Preparation

The Contractor shall:

- Review site conditions;
- Review the scope of work as it applies to site conditions;
- Notify NYSEG and/or the Engineer of any changes that may require revisions to the provisions of this Section; and
- Maintain on-site records of all inspections, noting the date and time of the inspection, the antecedent weather conditions, the condition of all SESC measures, evidence of any erosion or the escape of any sediment from the site, and any actions taken.

3.2 Implementation

3.2.1 The Contractor shall install siltation fencing along the perimeter of the work area prior to initial site disturbance.

3.2.2 The Contractor shall pay specific attention to erosion control measures during work adjacent to public roads.

3.2.3 The soil erosion control measures shall be maintained until completion of the work unless otherwise directed by NYSEG and/or the Engineer.

3.2.4 The Contractor shall be responsible for correcting any damage done by inadequate or ill-maintained SESC measures. The repairs shall comply with all local regulations, Drawings, and Technical Specifications.

3.2.5 After final completion of the project and when authorized by NYSEG and/or the Engineer, all SESC measures shall be removed and disposed off-site by the Contractor at a disposal facility approved by NYSEG.

END OF SECTION

SECTION 02300
EARTHWORK AND BACKFILLING

PART 1- GENERAL

1.1 Summary

1.1.1 This Section includes the excavation, placement of the demarcation layer, and backfilling activities required for the site, and if included in the Design, for the trenching and backfilling of a new catch basin and tie-in to the existing storm sewer system.

1.2 Definitions

1.2.1 Excavated Material: Defined as material impacted with site contaminants, and that shall be excavated and disposed off-site of as part of the Work. All excavated material shall be disposed off-site in accordance with Section 02111 – Waste Management and Handling of Contaminated Material. Excavated materials include the following:

- soil from the onsite area;
- concrete and stones from foundation walls from the previous residences;
- concrete sidewalks, slabs and driveway aprons from the onsite area;
- asphalt driveways and driveway aprons from the onsite areas;
- asphalt roadway from Charles Street;
- tree stumps and roots from trees cleared and ground from the right-of-way; and
- soil or other materials excavated from below Charles Street, if required, during construction of the catch basin and storm sewer tie-in and repairs/replacement.

1.2.2 Backfill: Materials used to fill an excavation to specified grade comprised of off-site material meeting the requirements in paragraph 2.1 below:

- general fill to fill green spaces to the proposed subgrade;
- select fill to fill open basement areas;
- select fill for backfill of utility abandonments;
- topsoil;
- stone for storm sewer bedding and backfill; and
- stone for concrete sidewalk subbase.

1.2.3 Excavation: Removal of material encountered above the subgrade elevations and to lines and dimensions indicated in the Drawings.

- Authorized Additional Excavation: Excavation beyond those limits indicated in the Contract Documents shall be conducted only if authorized by NYSEG.

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EARTHWORK AND BACKFILLING

- Unauthorized Excavation (or Over-Excavation): Excavation below elevations indicated in the Drawings and/or beyond indicated lines and dimensions without direction by NYSEG.

1.2.4 Building foundations and debris: Buildings foundations below the proposed limit of excavation will remain onsite. Debris currently within the open basement areas of the previous onsite residences will remain onsite within the open basement areas. Debris such as concrete slabs and large rocks will be broken into pieces smaller than 6" (e.g., by the concrete breaker, etc) and redistributed within the open areas in order to facilitate the compaction of backfill material.

1.3 Project Conditions

1.3.1 Existing Utilities: The Contractor shall, as applicable, contact utility locating services, the City of Cortland, or other appropriate authorities and have them mark out existing utilities prior to excavation.

1.3.2 Traffic: The Contractor shall allow for unrestricted flow for a minimum width of one vehicle within Charles Street during the Work in accordance with the *Traffic Control Plan.*

1.3.2.1 Traffic control shall be conducted so as to accommodate emergency vehicles.

1.3.2.2 Traffic control shall be conducted so as to cause a minimum of inconvenience to public travel.

1.3.2.3 Traffic controls shall permit safe and convenient access to properties on Charles Street and other impacted roadways.

PART 2- PRODUCTS

2.1 Backfill Materials

2.1.1 Certification of Off-Site Material: All off-site backfill material delivered to the Site shall be obtained from a NYSEG approved source and shall be accompanied by documentation stating the backfill is certified "clean" from a virgin source or a blend of soils originating from virgin sources not subject to manufacturing operations and free of contaminants. Off-site material to be used for backfill shall meet the requirements of Part 375-6 unrestricted soil cleanup objectives. The Contractor shall provide the facility name, owner name and street address of backfill source(s) to the Engineer for review and approval prior to onsite use. Analytical data showing compliance with Part 375-6 objectives may be requested by the Engineer.

2.1.2 General Fill: This material shall consist of a clean fill described as a well graded gravelly or sandy soil that is naturally occurring or blended soil and aggregate mix conforming to the following gradation:

Sieve Size	Percent Passing
2 inches	100
3/4 inch	70 - 100
No. 4	30 - 80
No. 50	10 - 35
No. 200	5 - 12

Materials and debris within the existing building foundations shall be broken and re-distributed in the existing building foundation areas. This material shall be broken into pieces that will generally conform (through visual inspection) to the following gradation:

Sieve Size	Percent Passing
6 inches	100

2.1.3 Bedding Stone Fill: This material shall consist of a clean fill meeting New York State Department of Transportation (NYSDOT) Standard Specifications for Coarse Aggregate, Table 703-4 size designation Type 1 (or approved equivalent). This NYSDOT designation includes the following designation:

Sieve Size	Percent Passing
1-inch	100
1/2 inch	90 - 100
1/4 inch	0 – 15

2.1.4 Select Fill: This material shall consist of a clean fill meeting New York State Department of Transportation (NYSDOT) Standard Specifications for Coarse Aggregate, Table 703-4 size designation Type 2 (or approved equivalent). This NYSDOT designation includes the following designation:

Sieve Size	Percent Passing
1 1/2 inches	100
1 inch	90 - 100
½ inch	0 - 15
No. 200	0 – 1.0

2.1.5 Topsoil: Topsoil and seed shall conform to the requirements of New York Standards for Soil Erosion and Sediment Control.

2.1.6 Subbase Course: Materials for subbase course shall consist of stone meeting New York State Department of Transportation (NYSDOT) Standard Specifications for Course Aggregate. All material furnished shall be well graded from coarse to fine and free from organic or other deleterious materials. Material furnished for Type 2 shall consist solely of approved Stone which is the product of crushing ledge rock. The NYSDOT designation includes the following designation:

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EARTHWORK AND BACKFILLING

Sieve Size	Percent Passing
2 inches	100
1/4 inch	25 - 60
No. 40	5 - 40
No. 200	0 – 10

2.2 Demarcation Material

2.2.1 Demarcation layer shall consist of orange construction fencing with a minimum weight per foot of 0.85 lb/ft. The demarcation layer shall be placed in the locations shown on the Drawings.

PART 3- EXECUTION

3.1 Preparation

3.1.1 The Contractor shall protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

3.1.2 The Contractor shall prepare the Site for earthwork operations as specified in Section 02110 - Site Clearing and Preparation.

3.1.3 The Contractor shall protect and maintain soil erosion and sediment controls, which are specified in Section 02120 - Soil Erosion and Sediment Controls, during earthwork operations.

3.2 Excavation

3.2.1 Excavation Areas: As depicted on the Drawings, remedial excavation activities shall include the excavation of a minimum of two feet of existing materials within the property lines of the Site.

3.2.2 Limits of Excavation: All excavation boundaries shall be sloped or stepped in accordance with OSHA requirements and as necessary for equipment access.

Excavations shall proceed to the limits shown on the Drawings in accordance with the following criteria:

Open Cut Excavations: Where the excavation is to be sloped or stepped, the actual (vertical and horizontal) excavation limits are shown on the Drawings.

Soft-dig excavation methods shall be employed to the extent that existing infrastructure is not compromised.

SECTION 02300
EARTHWORK AND BACKFILLING

3.2.3 The Contractor shall locate and protect (including temporary disconnection as needed and if approved) all utilities, active underground piping, etc. during excavation, and backfill. The locations of known utilities are shown on the Contract Drawings; there may be other utilities present that are not shown.

3.2.4 Waste Characterization Sampling and Testing: The Contractor shall perform waste characterization sampling and testing for any excavated material to be disposed off-site, for material that is not already represented by such testing already performed by NYSEG and/or URS (i.e., such as would be required due to the disposal facility's required frequency of tests or due to apparent chemical contamination). Sampling shall be conducted in accordance with the *Sampling Analysis Plan*.

3.2.5 Unauthorized Excavation: The Contractor shall, at his own expense, fill unauthorized excavations as directed by NYSEG and/or the Engineer.

3.3 Storage of Soil Materials

3.3.1 Material removed from the Site shall be loaded into waiting trucks for off-site disposal. Stockpiling of cleared material shall be minimized to the extent practicable and only then with prior approval from NYSEG and/or the Engineer. Materials shall be staged only in NYSEG and/or the Engineer approved staging locations. Staging areas and stockpiles shall be kept neat and compact. Contaminated material shall be segregated from unclassified or clean material. All staged material shall be completely covered with tarps and geomembrane-lined at all times. All covers and liners shall be secured in place and maintained. Dust and odor control measures shall be implemented as required and directed by NYSEG and/or the Engineer. Stockpiling of materials will be minimized to the extent practicable on the site.

3.3.2 All backfill materials used for construction operations shall be brought in from off-site locations daily, as needed.

3.4 Demarcation Layer

3.4.1 Demarcation layer material shall be placed over excavated areas prior to backfilling.

3.5 Backfilling

3.5.1 For areas within proposed Green Space, excavations shall be backfilled with General Fill from the bottom of the excavation up to 6 inches below proposed final grade.

3.5.2 For areas within proposed sidewalk, excavations shall be backfilled with Select Stone Fill from the bottom of the excavation up to the subgrade.

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EARTHWORK AND BACKFILLING

3.5.3 Where directed and at NYSEG's option, the Contractor shall backfill with Select Fill instead of General Fill, in accordance with all requirements for Select Fill.

3.6 Compaction of Backfill

3.6.1 Place backfill materials in loose layers within the backfill areas and other additional approved areas, using approved material.

3.6.2 Bedding Stone Fill requires no compaction but shall be carefully inspected to ensure complete filling of backfill zones with no gaps or oversized material or aggregated material that may promote large voids.

3.6.3 General Fill shall be placed in 9-inch thick lifts and mechanically compacted to a minimum of 90 percent of the maximum dry density, as determined by ASTM D1557.

3.6.4 Select Fill and Subbase Course shall be placed in a maximum of 9-inch thick lifts and mechanically compacted to a minimum of 95 percent of the maximum dry density, as determined by ASTM D1557 and AASHTO T-180.

3.6.5 Care shall be taken so as to not disturb subgrade features during compaction.

3.7 Final Grading

3.7.1 The Contractor shall uniformly grade areas to a smooth surface, free of abrupt surface changes to generally restore pre-existing grades. The Contractor shall place the top lift of off-site backfill such that after placement of the topsoil (or Select Fill), there shall be a smooth transition between adjacent existing grades and newly constructed grades.

3.8 Topsoil Placement

3.8.1 Topsoil shall be placed in areas indicated on the Drawings without unnecessary compaction in a single 6-inch thick lift to final grades. Topsoil shall be immediately amended and fertilized as required, and seeded as specified in Section 02920 Lawns and Grasses.

3.9 Field Quality Control

3.9.1 The Contractor shall provide a qualified independent geotechnical engineering testing agency to perform in-place density testing for compaction of the backfill and shall notify NYSEG /Engineer in advance of performing field quality control testing for compaction.

Testing agency shall test compaction of soils in place according to ASTM D 2922, and ASTM D 3017, as applicable. Tests shall be performed on off-site General Fill. For each compacted backfill lift, perform at least one (1) test for every 2,500 square feet but no fewer than two (2) tests per backfill lift per individual backfill area.

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3.9.2 When the testing agency reports to the Contractor and NYSEG /Engineer that subgrades or backfills have not achieved degree of compaction specified, the Contractor shall either continue to compact the backfill further or scarify and moisten or aerate, or remove and replace soil to depth required; then recompact and retest until specified compaction is obtained.

3.9.3 The Contractor shall provide the results of all in-place density tests to NYSEG and/or the Engineer. The locations and elevations (relative to the ground surface) of each test shall be plotted on a figure that shall accompany each test result.

3.10 Protection

3.10.1 Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

3.10.2 Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

The Contractor shall scarify and replace material to depth as directed by NYSEG and/or the Engineer; reshape and recompact.

3.10.3 Where settling occurs before the Project correction period elapses, the Contractor shall remove the finished surfacing and remove any unacceptable material below the surface material; backfill with additional soil material, compact, and reconstruct surfacing.

The Contractor shall restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

END OF SECTION

SECTION 02610
WELL ABANDONMENT

PART 1- GENERAL

1.1 Summary

1.1.1 The four existing onsite piezometers shall be abandoned where indicated on the Drawings, specified, or otherwise required. The piezometers are 1 inch diameter PVC installed to an approximate depth of 24 feet.

1.1.2 The Contractor shall provide all materials, labor, and equipment to perform the Work specified in this Section in accordance with the Technical Specifications and Drawings.

1.1.3 This Section describes the abandonment of existing wells that are onsite. The abandonment of piezometers will require approval from NYSEG and/or the Engineer prior to abandonment taking place.

1.2 References

1.2.1 The publication listed below forms a part of this Specification to the extent referenced. The publication is referred to in the text by basic designation only. In case of contradiction, the most stringent code applies.

- New York State Department of Environmental Conservation (NYSDEC) CP-43 Groundwater Monitoring Well Decommissioning Policy.

1.3 Approvals

1.3.1 The Contractor shall obtain from NYSEG and/or the Engineer approval of the Drilling Contractor and their proposed method(s) to abandon the wells.

PART 2- PRODUCTS

2.1 Standard Grout Mixture

2.1.1 Per NYSDEC CP-43 the standard grout mixture shall be:
one 94 pound bag Type I Portland cement
3.9 pounds powered bentonite; and
7.8 gallons potable water.

PART 3- EXECUTION

3.1 Well Abandonment

3.1.1 Prior to the commencement of any abandonment activity, the Contractor shall notify NYSEG and/or the Engineer for approval.

3.1.2 The Contractor will abandon the piezometers in accordance with the NYSDEC Specification listed in Section 1.2.1 above.

END OF SECTION

SECTION 02630
STORM SEWER TIE-IN AND REPLACEMENT

PART 1 - GENERAL

1.1 Summary

1.1.1 The Contractor shall furnish and place Reinforced Concrete Pipe Class IV of the size specified, at the locations and to the lines and grades shown on the Drawings.

1.1.2 The Contractor shall build or install precast catch basins of the types and at the locations shown on the Drawings in accordance with these specifications or as approved by the Engineer.

1.1.3 The Contractor shall furnish and place Frames and Grates of model number specified, at the locations and to the lines and grades shown on the Drawings.

1.2 Performance Requirements

1.2.1 The storm pipe shall conform to NYSDOT Item Number 603.6112 – Reinforced Concrete Pipe Class IV.

1.3 Approvals

1.3.1 Product Data: For the following:

- Storm Pipe;
- Special Fittings;
- Catch Basins; and
- Castings.

1.3.2 Shop Drawings: For catch basins and stormwater inlets. Include manufacturer's recommended handling and storage instructions. Include plans, elevations, sections, details, frames and grates.

1.3.3 Manufacturer's written instructions for all installations including use of lubricants and cements.

1.3.4 Field Quality Control Reports: Tests and inspection.

1.4 Delivery, Storage, and Handling

1.4.1 Protect ends of concrete pipe from chips, breaks, and cracking.

1.4.2 Protect pipe, pipe fittings, and seals from dirt and damage.

1.4.3 Handle catch basins according to manufacturer's written instructions.

SECTION 02630
STORM SEWER TIE-IN AND REPLACEMENT

1.5 Project Conditions

1.5.1 Interruption of Existing Storm Drainage Service: The Contractor shall provide temporary service according to requirements indicated below:

- Notify the Engineer and the City of Cortland DPW no fewer than two days in advance of proposed interruption of service.
- Do not proceed with interruption of service without Engineer's and the City of Cortland DPW's permission.

PART 2 - PRODUCTS

2.1 Reinforced Concrete Pipe

2.1.1 Reinforced Concrete Pipe – Class IV: Per NYSDOT Item 603.6112 for Reinforced Concrete Pipe Class IV.

2.1.2 Joints: Connections for making field joints for Reinforced Concrete Pipe shall be made at existing joints to provide a secure and firm connection of the sections of pipe which may readily be made in the field.

2.2 Concrete

2.2.1 General: Cast-in-place concrete according to ACI 318/318R, ACI 350R, and the following:

- Cement: ASTM C 150, Type II.
- Fine Aggregate: ASTM C 33, sand.
- Coarse Aggregate: ASTM C 33, crushed gravel.
- Water: Potable.

2.2.2 Portland Cement Design Mix: 4,000 psi minimum, with 0.45 maximum water-cementitious materials ratio.

- Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
- Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (61,000 psi), deformed steel.

2.2.3 Ballast and Pipe Supports: Portland cement design mix, 3,000 psi minimum, with 0.58 maximum water-cementitious materials ratio.

- Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
- Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (61,000 psi), deformed steel.

SECTION 02630
STORM SEWER TIE-IN AND REPLACEMENT

2.3 Catch Basins

2.3.1 Standard Precast Concrete Catch Basins: ASTM C 478 (ASTM C 478M), precast, reinforced concrete, of depth shown on the Drawings, with provision for sealant joints.

- Base Section: Six (6)-inch minimum thickness for floor slab and six (6)-inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
- Joint Sealant: ASTM C 990 (ASTM C 990M), bitumen or butyl rubber.
- Pipe Connectors: ASTM C 923 (ASTM C 923M), resilient, of size required, for each pipe connecting to base section.

2.3.2 Frames and Grates: Sizing and specifications for fabricated steel grates, frames, and castings shall be specified as shown on the Drawings.

PART 3 - EXECUTION

3.1 Earthwork

3.1.1 Excavation, trenching, and backfilling are specified in the following Section:

- 02300 – Earthwork and Backfill.

3.2 Piping Applications

3.2.1 Gravity-Flow, Non-Pressure Sewer Piping: The Contractor shall use NPS 12 Reinforced Concrete Pipe drainage pipe and fittings.

3.3 Piping Installation

3.3.1 General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. The Contractor shall install piping as indicated, to the extent practical. Where specific installation is not indicated, the Contractor shall follow piping manufacturer's written instructions.

3.3.2 The Contractor shall install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Bell ends of piping shall be placed facing upstream. The Contractor shall install gaskets and seals according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

3.3.3 Fittings for changes in direction shall be installed as needed.

3.3.4 Reducing size of piping in direction of flow is prohibited.

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STORM SEWER TIE-IN AND REPLACEMENT

3.3.5 The Contractor shall install gravity-flow, non-pressure drainage piping according to the following:

- Piping shall be pitched down in direction of flow, at slopes and elevations indicated on the Drawings, or as otherwise indicated by the Engineer.
- Piping shall be installed with restrained joints at tee fittings and at changes in direction. Corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place concrete supports or anchors shall be used.

3.4 Pipe Joint Construction

3.4.1 The Contractor shall join gravity-flow, non-pressure drainage piping according to the following: Connections for making field joints for Reinforced Concrete Pipe sections shall be made at the closest existing pipe joint. The connection shall provide a secure and firm connection of the sections of pipe which may readily be made in the field.

3.5 Catch Basin Installation

3.5.1 The Contractor shall construct catch basins to sizes and shapes shown on the Drawings.

3.5.2 The Contractor shall set frames and grates to elevations shown on the Drawings.

3.6 Field Quality Control

3.6.1 The Contractor shall inspect interior of piping to determine whether line displacement or other damage has occurred. This shall be performed after approximately 24 inches of backfill is in place, and again at the completion of the Project. Defects requiring correction include the following:

- Alignment: Less than full diameter of inside of pipe is visible between structures;
- Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter;
- Crushed, broken, cracked, or otherwise damaged piping;
- Infiltration: Water leakage into piping; and
- Exfiltration: Water leakage from or around piping.

The Contractor shall replace defective piping using new materials, and repeat inspections until defects are within allowances specified. The Contractor shall re-inspect and repeat procedure until results are satisfactory.

3.6.2 The Contractor shall test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects. The Contractor shall implement the following quality control measures:

- Do not enclose, cover, or put into service before inspection and approval.

SECTION 02630
STORM SEWER TIE-IN AND REPLACEMENT

- Test completed piping systems according to authorities having jurisdiction.
- Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.

3.7 Cleaning

3.7.1 The Contractor shall clean the interior of piping of dirt and superfluous materials.

END OF SECTION

SECTION 02640
PLACEMENT OF CONCRETE

PART 1 - GENERAL

1.1 Summary

1.1.1 This section covers the provisions for the placement of Portland cement concrete as necessary for sidewalks, curbs, and/or driveway apron placement, if included in the Design.

1.1.2 Any curb, sidewalk, and driveway apron which is damaged or destroyed by the Contractor outside the line of work shall be removed and replaced by the Contractor at no additional cost to NYSEG.

1.1.3 The Work shall adhere to the Technical Specifications and Drawings unless otherwise approved by the City of Cortland, NYSEG or the Engineer.

1.1.4 The Contractor shall adhere to the specifications and drawings unless otherwise approved by NYSEG, the Engineer and the City of Cortland DPW. The Contractor shall contact the City of Cortland DPW for site inspection of forms prior to placement of concrete for sidewalks and curbs.

PART 2 - MATERIALS

2.1 Portland Cement Concrete

2.1.1 Concrete shall conform to the requirements of Specification Section 03010 - Cast-in-Place Concrete. Concrete shall be sealed per Section 3.8 of Specification Section 03010.

2.2 Steel Reinforcement

2.2.1 Driveway aprons and sidewalks shall be reinforced with welded wire fabric (mesh) 6 x 6 - W1.4/W1.4.

2.3 Expansion Joints

2.3.1 Expansion joints in Portland cement concrete sidewalks and driveway aprons shall be made with pre-molded bituminous joint filler conforming to the requirements of ASTM D1751.

PART 3 - EXECUTION

3.1 Preparation

3.1.1 Breaking, Removal, and Disposal:

3.1.1.1 All sidewalks and driveway apron removals shall be made within the lines

established by the Engineer in the field.

3.1.1.2 In general, removal and replacement shall be to the nearest construction joint. The Engineer shall determine where saw cutting is necessary. Full depth saw cutting shall be required when the line of removal is not an existing construction joint, so that the surface contact between the new and existing concrete will be a straight line.

3.1.1.3 All removed material shall be properly disposed off-site.

3.1.2. Preparation of Subgrade:

3.1.2.1 All excavation shall be made to the required depth. The subgrade or base to be placed shall be thoroughly compacted to a firm, even surface.

3.1.2.2 The subgrade shall be thoroughly compacted and any additional fill required to prepare the subgrade shall be placed, compacted and shaped to the proper elevation. The subgrade shall be finished to a width of six (6) inches on each side in excess of the width of the sidewalk, curb, or driveway apron.

3.1.3 Forms and Expansion Joints for Portland Cement Concrete:

3.1.3.1 All forms shall be set true to line and grade and held rigidly in position. The forms shall be of such construction and material that a smooth, even surface will result upon their removal. They shall be not less than two (2) inches in thickness and depth equal to depth of concrete. Wood forms shall be maintained in excellent condition at all times. Any warped, bent or otherwise damaged pieces shall immediately be discarded. Installation of forms shall conform to the requirements of Section 03010 - Cast-in-Place Concrete.

3.1.3.2 Expansion joints for sidewalks shall be one half (½) inch thick, spaced 30 feet apart for 5 foot wide sidewalks and 18 feet apart for 3 foot wide sidewalks. Joints shall recessed one half (½) inch below the finished surface.

In addition, expansion joints shall be constructed where sidewalks or driveway aprons abut catch basins, curbs or other permanent structures.

The joint material shall be in one piece shaped to the cross section of the curb; or sidewalk except that it shall be set back one-fourth (¼) inch for curbs and one-half (½) inch for sidewalks from the front and top surfaces.

3.2 Installation

3.2.1 General:

3.2.1.1 All mixing, placing, vibrating, finishing, curing, protection and any other information and procedures necessary for the completion of the work in this

SECTION 02640
PLACEMENT OF CONCRETE

Section shall conform to the applicable requirements of Section 03010 - Cast-in-Place Concrete.

3.2.1.2 All sidewalks and driveway aprons shall be constructed to match the existing structures or shall conform to the requirements and dimensions shown on the Drawings.

3.2.2 Placement of Portland Cement Concrete Sidewalks and Driveway Aprons:

3.2.2.1 Before any concrete may be placed, each section of the subgrade shall be checked by testing with a template of wood or metal. If the subgrade is dry, it shall be sprinkled with as much water as will be rapidly absorbed so as to permit a uniform moist and compact subgrade. After proper mixing, the concrete shall be placed and thoroughly compacted and tamped. It shall then be struck off with a template, leaving the top of the concrete flush with the top of the forms. The concrete shall be of the driest consistency possible to work with a sawing motion of the strike-off board or straight edge. After striking off to the established grade, it shall be compacted with a wood float. The surface shall be tested with a 10-foot straight edge and all irregularities of over one-eighth (⅛) inch shall be immediately eliminated.

3.2.2.2 The final finish shall be delayed sufficiently so as to allow the concrete to set to such an extent that an excess of fine material will not be worked to the top in the finishing operations. No dry cement or mixture of dry cement and sand shall be sprinkled on the surface. The concrete surfaces shall be wood floated to a true and even plane and steel troweled. The surface shall then be slightly roughened by using a soft broom, by dragging burlap across the surface or other acceptable means.

3.2.2.3 The sidewalk shall be marked off in blocks of the same length as the width of the sidewalk or to match adjacent concrete sidewalks.

3.2.2.4 The edges of the transverse joints shall be finished with an approved edging tool of one quarter (¼) inch radius. The edging tool shall also be used on all extreme outside edges. Such edging tool shall leave a smooth, finished edge of not over two (2) inches wide.

3.2.2.5 The thickness of new sidewalks shall be not less than four (4) inches. The thickness of new driveway aprons shall be at least six (6) inches. Driveway aprons include the entire driveway area from curb to back of walk. Sidewalks crossing driveways shall be considered driveway aprons and shall not be less than six (6) inches in thickness.

3.2.2.6 Welded wire mesh shall be placed at 2 inches from the bottom of the concrete.

3.2.2.7 The contractor must obtain approvals per the requirements 1.3 “Approvals” section of Section 03010 - Cast-in-Place Concrete.

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3.2.3. Approvals:

3.2.3.1 The Contractor shall remove any temporary pavement and sufficient underlying material and fine grade the subgrade.

3.2.3.2 In general, replacement shall be made to match the original construction whenever practical, as directed by NYSEG or the Engineer.

END OF SECTION

SECTION 02741
HOT-MIX ASPHALT PAVING

PART 1 – GENERAL

1.1 Summary

1.1.1 This section describes the methods of placing Hot-Mix Asphalt as necessary for restoration of Charles Street pavement courses and/or parking areas included in the Design.

1.1.2 The maintenance and protection of traffic, as described in the *Traffic Control Plan*, shall be performed safely by the Contractor.

1.1.3 Any pavement markings and striping required for the Design shall be performed as described in Section 09963 - Pavement Markings, Paint and Striping as shown on the Drawings.

1.2 Quality Assurance

1.2.1 Approval of Materials for Bituminous Concrete: Approval of the proposed sources of the coarse and fine mineral aggregates and the acceptance of the mineral filler, hydrated lime, bituminous materials, liquefiers, and any other materials that are used in the mix shall be obtained by the Contractor. No delivery of mixed material shall be made from any bituminous mixing plant until such approval is obtained.

1.2.2 Bituminous Materials: The Contractor shall furnish the Engineer with data on the temperature/viscosity relationship for each lot of asphalt to be used on the project. This data shall take the form of a graph approved by the Engineer and shall cover the range of temperatures and viscosities within which the asphalt may be used.

1.3 Approvals

1.3.1 Weight Tickets: All weight tickets for truck loads of plant mixed bituminous material shall have the time and date recorded thereon. The plant inspector shall sign this ticket and after recording the figures in his daily report, give it to the truck driver who shall in turn surrender it to the Engineer's inspector at the site of the work.

1.3.2 Material Samples: Upon request.

1.3.3 Job Mix formulas: As described herein.

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HOT-MIX ASPHALT PAVING

PART 2 – MATERIALS

2.1 Bituminous Concrete

2.1.1. Fine Aggregates:

2.1.1.1 General Requirements: All samples of fine aggregates shall be secured and sent to the laboratory for testing by the Contractor.

All approved operation sources shall be sampled when any of the following apply:

- The latest test for a source is two years old;
- A change in the character of processed fine aggregate occurs;
- The location of the source of raw material is shifted or a change in the character of raw material occurs; or
- Considered necessary by the Engineer.

Non-approved or rejected operating sources equipped with adequate and proper processing facilities shall be sampled and tested upon approval by the Engineer. Approval of such sources will depend on the results obtained by periodic sampling and testing.

Proposed new sources of material shall also be sampled. The results of tests on such samples shall be for information only and shall be interpreted as indicative of the potential fitness of the sources. Action in regard to acceptance or rejection of a source shall be taken only after processing facilities have been established, inspected and approved.

Materials meeting test requirements will be rejected if, in the judgment of the Engineer, service records indicate that they are unsound or otherwise unsatisfactory.

Fine aggregates shall consist of material conforming to the requirements for this section except for gradation and rotational analysis, and except that approved limestone screening may be used.

If undesirable material is furnished from acceptable sources of supply through faulty operation or any other cause whatsoever, the source of supply and objectionable material there from will be rejected by the Engineer.

All sources of fine aggregate shall be stripped of all inferior and objectionable material before operations are started and shall be kept stripped far enough from the working face to insure against undesirable material becoming mixed with the output.

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All natural sand shall be satisfactorily washed before using.

2.1.1.2 Fine Aggregate Details: Fine aggregate shall consist of sand, stone, screening, iron ore tailings, artificial sand that is prepared from an accepted source of dolomite rock and contains not less than 30 percent of magnesium carbonate, or a mixture of these, that shall conform to the gradation requirements (when dry) shown below. The aggregate shall consist of grains or particles of hard durable rocks, the surfaces of which are not coated with any injurious materials. Any fine aggregate will be rejected, if in the judgment of the Engineer, it contains sufficient deleterious or unsound material to be harmful.

If fine aggregate is found unsatisfactory when examined for organic impurities, it will be rejected. Fine aggregates so tested shall achieve a tensile or compressive strength at least one hundred percent of that developed by the Standard Ottawa Sand Mortar.

FINE AGGREGATE GRADATION TABLE	**BY WEIGHT**	
Description	Minimum %	Maximum %
Passing 3/8" Sieve	100	-----
Passing No. 4 Sieve	90	100
Passing No. 8 Sieve	75	100
Passing No. 16 Sieve	55	85
Passing No. 30 Sieve	25	60
Passing No. 50 Sieve	10	30
Passing No. 100 Sieve	1	10
Passing No. 200 Sieve (Wet)	----	3

2.1.2 Mineral Filler: Mineral filler for bituminous mixes shall consist of limestone dust, Portland cement, diatomaceous earth, flyash, or other approved material and shall be free from foreign or other objectionable material. It shall be dry and free from lumps and when tested by means of laboratory sieves, the mineral filler shall meet the following gradation requirements:

- Passing No. 30 sieve 100%
- Passing No. 80 sieve 85 to 100%
- Passing No. 200 sieve 65 to 100%

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In all bituminous mixing plants where mineral filler is added, or incorporated in the mix to satisfy gradation requirements, it shall be accurately weighed and introduced in the required amount into the mix through the weigh box. It shall not be passed through the drier, but shall be fed by elevator, separate storage bin or other acceptable means directly to the designated bin or mixer unit.

The excess portion of the approved fine and coarse aggregates which passes a No. 200 sieve may be considered filler and the added mineral filler shall be reduced proportionally.

2.1.3 Coarse Aggregates:

2.1.3.1 Throughout these Specifications where the term "Broken Stone" or "Broken Slag" is used, it is to be interpreted as being synonymous with the term "Crushed Stone" or Crushed Slag" respectively.

2.1.3.2 General Requirements: Representative samples of all coarse aggregates shall be sent to the Contractor's laboratory, as directed by the Engineer.

2.1.3.3 All approved operating sources shall be sampled when any of the following apply:

- The latest test for a source is two (2) years old;
- A change in the character of processed coarse aggregate occurs;
- The location of the source of raw material is shifted or a change in the character of raw material occurs; or
- Considered necessary by the Engineer.

Non-approved or rejected operating sources equipped with adequate and proper processing facilities shall be sampled upon approval by the Engineer. Approval of such sources will be conditioned on the results obtained by the periodic sampling and testing as prescribed by the Engineer.

Proposed unopened sources of material shall be sampled upon approval by the Engineer. The results of tests on such samples shall be for information only and shall be interpreted as indicative for the potential fitness of the sources. Action in regard to acceptance or rejection of a source shall be taken only after processing facilities have been established, inspected and approved.

Materials meeting test requirements may be rejected if, in the judgment of the Engineer, service records indicate that they are unsound or otherwise unsatisfactory.

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If undesirable material is furnished from acceptable sources of supply through faulty operation or any other cause whatsoever, the source of supply and any objectionable material will be rejected by the Engineer.

All sources of coarse aggregates shall be thoroughly stripped of all inferior and objectionable material before operations are started and shall be kept stripped far enough from the working face to insure against undesirable material becoming mixed with the output.

2.1.4 Coarse Aggregate Details: Coarse aggregates shall consist of well graded, uniformly mixed broken stone, crushed gravel, or broken slag, and shall meet the requirements given for these materials. Screened gravel and run of bank gravel will not be permitted for coarse aggregate.

If deliveries of coarse aggregates show segregation of sizes, material shall be mixed to the specified gradation before using.

Coarse aggregates shall contain not more than 30 percent of particles that are flat or elongated to the degree of 3:1 and shall contain not more than 10 percent of particles that are flat or elongated to the degree of 5:1. The method of measurement of flatness or elongation shall be as defined by ASTM Designation C 125. The sizes to be used for this determination shall be as directed by the laboratory in accordance with the intended usage of the aggregate.

The amount of deleterious substances contained in any primary size of crushed coarse stone or crushed coarse aggregates shall not exceed the following:

MAX. % OF DELETERIOUS SUBSTANCES

Description	% By Weight
Material Passing the No. 200 Sieve	0.7
Shale or Other Lightweight Materials	1.0*
Coal or Lignite	1.0
Clay Balls or Lumps	0.2
Other Deleterious Substances	1.0

**This requirement may be waived if service records and/or abrasion and soundness tests indicate to the Engineer that the aggregate is satisfactory. Coarse aggregates containing more that these specified amounts of deleterious substances shall be washed or otherwise processed until the Specifications are satisfied.*

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2.1.5 Sizes of Stone, Gravel, and Slag: Stone, gravel, and slag shall conform to the gradation requirements for the various sizes as shown in the following table:

GRADATION TABLE FOR COARSE AGGREGATES

	PERCENTAGE BY WEIGHT PASSING SQUARE OPENINGS				
Primary Sizes	**4”**	**3”**	**2½”**	**2”**	**1½”**
Screening*	-	-	-	-	-
1B	-	-	-	-	-
1A	-	-	-	-	-
1	-	-	-	-	-
2	-	-	-	-	100
3	-	-	100	90-100	35-75
4A	-	100	90-100	-	0-20
4	100	90-100	-	0-15	-
5	90-100	0-15	-	-	-
Primary Sizes	**1”**	**½”**	**¼”**	**1/8”**	**No. 80**
Screening*	-	100	90-100	-	-
1B	-	-	100	90-100	0-15
1A	-	100	90-100	0-15	-
1	100	90-100	0-15	-	-
2	90-100	0-15	-	-	-
3	0-15	-	-	-	-

**Screening shall include all of the fine material passing a ¼” screen.*

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All crushing plants shall be fitted with tailing chutes so that no stone will reach the bins other than that which passes through the proper screens.

All stone, gravel, or slag shall be of the required sizes when placed in the Work; breaking up of stone, gravel or slag by hammers or otherwise will not be permitted.

2.1.6 Crushed Stone: Crushed stone shall consist of clean, durable, sharp angled fragments of rock, including iron ore tailings, of uniform quality throughout. Gravel hardheads retained on a four-inch scalping screen and then crushed will be acceptable as crushed stone provided such crushed hardheads meet the gradation and the other requirements for the type of stone specified.

Los Angeles Abrasion Test, ASTM Designation C131 Percent Loss Max. by Weight	35%
Magnesium Sulfate Soundness Test, ASTM Designation C88 Percent Loss @ 10 Cycles, Max. by Weight	12%

2.1.7 Crushed Gravel: Crushed gravel shall consist of clean, sound, tough, hard gravel, free from coating, and shall be thoroughly washed. The gravel shall contain at least 75 percent of fractured particles in each primary size and shall meet the gradation requirements for coarse aggregates. A satisfactory fractured particle shall have at least one fractured face and the total area of face fracture shall exceed 25 percent of the maximum cross sectional area of the particle.

Los Angeles Abrasion Test, ASTM Designation C131 Percent Loss Max. by Weight	35%
Magnesium Sulfate Soundness Test, ASTM Designation C88 Percent Loss @ 10 Cycles, Max. by Weight	25%

2.1.8. Screened Gravel: Screened gravel shall consist of clean, sound, tough, hard stone free from coatings and shall be thoroughly washed. Screened gravel may consist of all uncrushed particles or of crushed particles up to 75 percent of the total in each primary size.

In making the abrasion test and the soundness test, uncrushed particles shall be used.

2.1.9 Slag aggregates, fine or coarse, shall not be used.

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2.1.10 Other products from recycled materials shall not be used.

2.2 Bituminous Materials

2.2.1. The bituminous material furnished shall be of approved quality and shall meet the requirements shown under its respective item in Table I or Table II below for the kind of material furnished. The material furnished shall be of one brand and shall show a uniform test, unless special permission to furnish other brands of materials is given, in writing, by the Engineer.

Where more than one grade of material is called for under any item, the Engineer may specify the grade required at the time of use.

Bituminous material shall be sampled by an independent testing company provided by the Contractor. Specific gravity at 70 degrees Fahrenheit shall be reported on any producer's certified test results for petroleum asphalt.

Bituminous material that has been rendered unfit for use by overheating or by long continued heating and bituminous emulsions which have separated because of freezing or mishandling will be rejected.

The method to be used for volume corrections for petroleum products shall be the Standard Abridged Volume Correction Tables for Petroleum Oils ASTM Designation D1250.

The method to be used for volume correction for tar products shall be the Standard Volume Correction Table for Tar and Coal-Tar Pitch, ASTM Designation D633. The coefficient of expansion at 60 degrees Fahrenheit for asphalt emulsions shall be 0.00025.

For purposes of measurement, a gallon shall be a volume of 231 cubic inches, and measurement shall be based on the volume of the bituminous material at a temperature of 60 degrees Fahrenheit.

2.2.2 Anti-Stripping Additive: When required an additive shall be added to the bituminous material which will cause it to coat and adhere more effectively to wet and unheated aggregates. The additive shall have no deleterious effect upon the bituminous material and shall be completely miscible in all types of bituminous materials.

Anti-Stripping additives shall be added only at the refinery except as ordered by the Engineer and shall be blended thoroughly throughout the bituminous material.

Bituminous material containing an anti-stripping additive shall conform to the Specifications for untreated material. In addition, it will be required to show not less than 95 percent area coated when subjected to a stone coating test.

2.2.3 The following tables give the detail requirements for each kind of Bituminous Material:

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Table I: Asphalt & Asphalt Filler

Table II: Asphalt Emulsions

TABLE I – ASPHALT & ASPHALT FILLER

Type	Paving Asphalt		
Grade	85-100	100-120	60-70
Water	0.0	0.0	0.0
Homogeneous	Yes	Yes	Yes
Pen. @ 77ºF., 100 G., 5 sec (3)	85-100	100-120	60-70
Pen. Ratio (39.2ºF/77ºF x 100)	30.0+	30.0+	30.0+
%Loss @ 325ºF., Max. (1)	1.0	1.0	1.0
%Pen. Of Res., Min.	60.0	60.0	60.0
%Sol. In $CC\ell_4$. Min. (2)	99.5	99.5	99.5
Flash Point, ºF., Min.	347	347	347
Duct. @ 77º F., Min.	60	60	60
Soft. Pt. ºF. (B&R)	-	-	-
Typical Uses	Hot & Cold Laid Plant Mix	Pen. Constr.	Hot Plant Mix

(1) 1.0% limit for petroleum asphalt; 3.0% for fluxed natural asphalt.
(2) 99.5% petroleum asphalt, 95.0+ for Bermudez: 81.0+ for Cuban; 66.0+ for Trinidad.
(3) Pen: @ 32ºF., 200 g., 60 sec. = 10+; pen. @ 115 F., 50 g., 5 sec. = 60: shall not foam at 400ºF.

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TABLE II – ASPHALT EMULSIONS

Grade			**C(1)**	**A**	
Material Designation	***MS-3** (2)*	***RS-1***	**RS-2**	**MS-1** (2)	**SS-1** (2)
Water %	30-35	40-45	30-40	32-37	40-45
Asphalt%	65	55	60	63	55
Homogeneous	Yes	Yes	Yes	Yes	Yes
Ash; % Max.	2.0	2.0	2.0	2.0	2.0
Furol Viscosity @ 77ºF.	-	20-100	-	Satisfactory	-
Furol Viscosity @ 122ºF.	100-500	-	100-400	-	-
Settlement, 7 Days Max.	-	3.0	3.0	3.0	3.0
Cement Mixing	-	-	-	-	2.0
Screen Test, % Max.	.1	.1	.1	.1	.1
Demulsibility, N/50 (35) Min.	-	60	60	-	-
Demulsibility, N/10 (50)	-	-	-	-	-
Asphalt Base for Emulsions:					
Pen. @ 77ºF. 100 G., 5 Sec.	100-250	100-250	100-250	(4)	100-250
Pen. Ratio: (39.2ºF./77ºF. x 100) , Min.	30	30	30	30	30
Sol. In $CC\ell_4$, % Min.	97.5	97.5	97.5	97.5	97.5
Ductility @ 77ºF., Min.	60	60	60	60	60
Flash Point., ºF., Min.	347	347	347	347	347
Pen. Of Distil, Res. @ 77ºF.	100-200	100-200	100-200	100-200	100-200
Oil in Distillate, % by Vol. (3)	5-11	0-2.0	0-2.0	0-10.0	0-10.0
Typical Use	Patching Plant Mix Traveling Plant Mix	Surface Treatment Penetration Spray Patch	Surface Treatment	Road Mix Base or Shoulder Stabilization	Granular Material Stabilization

(1) Requires heat application.
(2) Bituminous material will be required to pass the stone coating test as prescribed by the City of Cortland DPW.
(3) Based on total emulsion.
(4) Float test at 140ºF: 1200 seconds minimum.

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General Notes

Suppliers of asphalt emulsion shall submit, on request, a sample of the emulsion directed by the Engineer from a factory lot of material of not less than 20,000 gallons. The samples so submitted shall meet the requirements of the above Specifications. Any material accepted a the time of shipment that proves defective within 30 days after date of delivery will be rejected and no payment will be made therefore.

2.3 Paving Plants

2.3.1 Acceptance and Uniformity: Bituminous mixing plants shall be so designed, coordinated and operated as to produce a uniform mixture of the material. Each plant, whether fixed or portable, shall be inspected and approved by the City of Cortland Department of Public Works. The right is reserved to discontinue the use of any previously approved equipment at any time if unsatisfactory results occur during the progress of the Work.

2.3.2 Equipment for Preparation of Bituminous Materials: Tanks for the storage of bituminous material requiring heat shall be capable of heating the material under effective and positive control, at all times, to the temperatures required by the Specifications or ordered by the Engineer. Heating shall be accomplished by steam or oil coils, electricity or other means in such a manner that no flame will come in contact with the heating tank. Storage tank capacity shall be sufficient for at least one (1) day's run.

A circulating system for the bitumen shall be provided, of adequate size to insure the proper and continuous circulation between storage tank and mixer during the entire operating period. Separate tanks and separate pipe lines shall be provided if mixtures containing asphalt cement and liquid asphalt materials are to be mixed in the same mixer. Separate storage tanks and separate pipelines shall also be provided if tar products or emulsified asphalt are to be used as the binding medium in bituminous mixtures.

2.3.3 Dryers Feeders: All plants shall be equipped with at least one dryer for the mineral aggregates. It shall be of the cylindrical rotating type and be capable of drying and heating mineral aggregates in quantities in excess of the operating capacity of the plant. It shall also be capable of maintaining the specified temperatures so that there will be no unburned oily residue on the aggregate when it is discharged from the dryer.

The aggregates shall be fed to the dryer by such procedures and/or feeders, as approved by the Engineer that they will be substantially in the proportions specified for the finished mix. Both fine and coarse aggregate may be fed simultaneously into the dryer.

2.3.4 Screens: Each mixing plant shall be equipped with screens capable of screening all aggregates to the sizes required for proportioning the mix. The operating capacities of the screens shall be in excess of the full capacity of the mixer.

2.3.5 Aggregate Storage Bins: The bituminous mixing plant shall include storage bins of sufficient capacity to insure uniform and continuous operation. There shall be at least four storage bins so arranged as to insure separate storage of the fractions of the aggregates

required for proportioning the mix. Each bin shall be provided with an overflow chute that shall be of such size and location to prevent any backing up or overflow of material into other bins.

Bins shall also be provided with adequate telltale devices to indicate the position of the contained aggregate at the lower quarter points.

Adequate and convenient facilities shall be provided for obtaining representative aggregate samples from each bin for any selected batch.

2.3.6 Bituminous Control Unit: Satisfactory means, either by weighing, metering, or volumetric measurements, shall be provided to furnish the specified amount of bituminous material in the mix. Suitable means shall be provided by steam jacketing or other insulation for maintaining the specified temperatures of the bituminous materials in the pipelines, meters, weight buckets, spray bars and other containers and flow lines.

If metering or volumetric devices are used to proportion bituminous materials for plant mixtures, suitable valves and bypasses shall be provided so that each measuring device may be conveniently checked by actual weight.

2.3.7 Thermometric Equipment: An armored Fahrenheit thermometer with a range sufficient to cover the specified temperature range of the bituminous material shall be fixed in the bituminous feed line at a suitable location near the discharge valve at the mixer unit. An approved thermometric instrument shall also be placed at the discharge chute of the dryer and in the lower quarter of the fine bin so as to show the temperature of the heated aggregates. All the thermometers shall be accurate to two-and-one-half (2.5) degrees Fahrenheit.

2.3.8 Dust Collectors: Bituminous mixing plants shall be equipped with adequate dust collecting systems so that objectionable dust and fumes will be removed.

2.3.9 Testing of Plant Scales: All plant scales, including truck scales, shall be tested at the expense of the Contractor by a competent scales technician as follows:

- Prior to use in production work on this project;
- At intervals of not more than 30 calendar days thereafter; and
- At any time ordered by the Engineer.

Subsequent to each adjustment by a scales technician, the scale shall be sealed by the Sealer of Weights and Measures. The Contractor shall furnish, for use in testing proportioning scales, at least 10 Standard 50 pound test weights. For each scale, a cradle or platform approved by the City of Cortland Department of Public Works shall be provided for applying the test weights.

2.3.10 Safety Requirements: Adequate and safe stairways to the mixer platform and guarded ladders to other plant units shall be placed at all points required for accessibility to plant operations. All gears, pulleys, chains, sprockets and other dangerous moving parts shall be thoroughly guarded

and protected. Ample and unobstructed space shall be provided on the mixing platform. A clear and unobstructed passage shall be maintained at all times in and around the truck loading space. This space shall be kept free of drippings from the mixing platform.

Each mixing plant shall be equipped with adequate fire fighting equipment.

2.3.11 Plant Inspection: Each bituminous mixing plant site shall be provided with suitable buildings or rooms for use as an office and for testing purposes for the exclusive use of the Engineer and his inspectors. The plant shall provide in such buildings or rooms: an asphalt extraction apparatus and a suitable power driven sieving machine each with a capacity of at least 1,000 grams; scales and appropriate sieving equipment for each type of material to be produced; and a telephone. Suitability of all office and testing space and equipment will be subject to approval by the Engineer.

2.4 Batching Plants

2.4.1 All requirements under Paragraph - Paving Plants above, shall apply with the following additional requirements:

2.4.2 Weigh Box or Hopper: This equipment shall include means for accurately weighing each bin size of aggregate in a weigh box or hopper suspended on dial scales. The weigh box shall be of ample size to hold a full batch without hand raking or spillage. The gates on the aggregate bins and the hopper shall be so constructed as to prevent leakage when closed.

2.4.3 Aggregate Scales: Scales for any weight box or hopper shall be the springless dial type with a full complement of index pointers and of a standard make and design. They shall be accurate to one-half (0.50) percent, have minimum graduations not greater than one-quarter (0.25) percent and shall be readable and sensitive to one-eighth (0.125) percent or less -- the preceding percentages being based on total batch weight. Scales shall be so located as to be easily readable from the operators normal work station. The batching controls shall meet the following delivery tolerances, based on total batch weight, with respect to the various components weighed in each batch:

- Combined Aggregate Components ± 1.5%
- Mineral Filler ..... ± 0.5%
- Asphalt..... ± 0.1%

The total weight of the batch shall not vary more than plus or minus two (2) percent from the theoretical design weight.

2.4.4 Bituminous Bucket and Spray Bars: The asphalt cement may be introduced into the mixer by means of an asphalt bucket, by steam pressure and a spray bar or by a pressure pump and spray bar.

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If a bituminous bucket is used, it shall have a working capacity of not less than 11 percent by weight of the rated capacity of the mixer, it shall be heated in an approved manner by steam, oil; electricity or other approved means, and it shall be so arranged that it will deliver the bituminous material in a thin uniform sheet or in multiple streams the full length of the mixer. The bucket shall be suspended on adjustable dial scales so that the tare weight can be conveniently brought to zero reading at all times.

If spray bars are used to introduce the bituminous material into the mixer, they shall be so heated and constructed as to distribute the bituminous material uniformly upon the mineral aggregates.

2.4.5 Bituminous Measuring Devices: All measuring devices except scales shall be accurate to one-tenth (0.10) percent, have minimum graduations not greater then five-hundredth (0.050) percent, and shall be readable and sensitive to twenty-five-hundredth (0.25) percent or less -- the preceding percentages being based on total batch weight. They shall be so located as to be easily readable from the operator's normal work station.

If Bitumen is proportioned by weight, the scales shall be of the springless dial type of a standard make and design.

2.4.6 Mixer Unit: The mixer unit shall be of an approved twin shaft pugmill type. It shall be capable of producing a satisfactory uniform mixture within the limits specified and shall have a capacity of not less than two thousand pounds. The blades of the pugmill shall have a clearance from all fixed and moving parts not in excess of three-quarters (3/4) of an inch. Paddle blades reduced by wear in excess of 25 percent in face area from their new condition shall be replaced. The mixer shall be so constructed as to prevent leakage of contents until the batch is discharged.

The use of batteries of small batch mixers will not be permitted.

2.4.7 Time Locking Device: The mixer shall have an accurate time locking device to control the operation of a complete mixing cycle by locking the weight box gate, after the mixer is charged, until the dosing of the mixer discharge gate at the completion of the cycle. It shall lock the bituminous material feed throughout the dry mixing period and shall lock the mixer discharge gate throughout the dry and wet mixing periods. The dry mixing period is defined as the interval of time between the opening of the weigh box gate and the commencement of application of the bituminous material. The wet mixing period is the interval of time between the commencement of application of the bituminous material and the opening of the mixer discharge gate.

The control of the timing shall be flexible and capable of being set at intervals of not more than five seconds throughout the cycles up to three minutes. Changes in mixing time shall be made only when ordered by the Engineer.

The point of control of the time locking device shall be so located that it is readily accessible to the operator of the mixing plant.

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2.5 Continuous Mixing Plant

2.5.1 General: The Contractor may at his option use a continuous mixing plant of an approved type. All requirements under Paragraph - Paving Plants above shall apply with the following additional requirements.

2.5.2 Gradation Control Unit: The unit shall have interlocked feeders mounted under the compartment bins. Each bin shall have an accurately controlled individual gate to form an orifice for volumetrically measuring the material drawn from each respective bin compartment. The feeding orifice shall be of adequate dimensions to provide a positive feed without bridging; the dimension shall be adjustable by positive mechanical means that shall be provided with a lock. Indicators graduated to tenths of an inch shall be provided on each gate to show the calibrated gate opening. When added mineral filler is specified, a separate bin and feeder shall be furnished with its drive interlocked with the aggregate feeders. The interlocked feeders shall be equipped with a revolution counter reading to .01 of a revolution to facilitate the calibration of the aggregate flow.

Each compartment of the hot aggregate bin shall be equipped with an approved indicator that shall warn the operator before a compartment becomes empty.

2.5.3 Weight Calibration of Feeds: The plant shall be provided with means for calibrating the gate openings and bitumen flow by the use of weight test samples. The aggregates for the test samples shall be fed out of the bins through individual orifices and bypassed to a suitable test box, the material from each compartment being confined in a separate container or box section. The plant shall be equipped to handle conveniently test samples of adequate size to provide an accurate gate calibration commensurate with the aggregate size, the gate opening and the plant capacity set up.

An approved accurate platform scale with a minimum capacity of 340 pounds shall also be provided.

2.5.4 Synchronization of Feeds: Satisfactory means shall be provided to afford positive mechanical interlocking control between the flow of aggregate from the bins and the flow of bitumen from a positive displacement metering pump. The point of control of the metering pump capacity shall be so located that it is not accessible to the operator from the mixer platform.

2.5.5 Mixer Unit: The plant shall be equipped with a continuous, steam jacketed, twin shaft, pugmill type mixer that shall be capable of producing a uniform mixture within the job mix tolerances. The paddles shall be of a type adjustable for angular position on the shafts and shall be reversible to retard the flow of the mixture. The mixer shall be equipped with a discharge hopper having a capacity of approximately one (1) ton. The hopper shall be equipped with dump gates which will permit rapid and complete discharge of the bituminous mixture and shall be of a design approved by the City of Cortland DPW. The mixer shall carry a manufacturer's plate showing the net volumetric contents of the mixer at the several heights inscribed on a permanent gauge.

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2.5.6 Preparation of Bituminous Materials: Bituminous material shall be delivered to the mixer at a temperature within the range specified for the type material being mixed.

2.5.7 Preparation and Composition of Mixture: Each size of properly heated aggregate, the dry mineral filler if required, and the bituminous material shall be measured separately and accurately to the proportions in which they are to be mixed. The volume of the mineral aggregates and the asphalt cement, when placed in the mixer, shall not be so great as to extend above the tips of the mixer blades when these blades are in a vertical position nor such as to exceed the manufacturer's rated capacity of the mixer. In no case shall the total quantity of material mixed be less than 50 percent of the manufacturer's rated capacity of the mixer unit. After the properly heated aggregates and mineral filler, if required, have been charged into the mixer and thoroughly mixed for a period of not less than 15 seconds or as directed by the Engineer, the proper amount of bituminous material shall be added and the mixing continued for a period of at least 45 seconds to produce a uniform and homogeneous mixture in which all particles of the mineral aggregate are completely and uniformly coated with the bituminous material.

The introduction of the materials into the mixer and the mixing operation shall be carried out as outlined above unless the mixing operation, for the particular type of material that is being manufactured calls for some other method of procedure, in which case that particular specification for mixing operations shall be followed.

2.5.8 Job Mix Formula: For any bituminous mixture required in the Contract, the Contractor shall formulate and submit to the Engineer a job mix formula that satisfies the General Limits imposed in Table III "Composition of Mixtures for Plant Mixed Bituminous Concrete", below.

Once approved, the mix shall be kept within the Job Mix Tolerances set forth in Table III. The aggregate tolerances shall be based on the total weight of the aggregate and the asphalt cement tolerances shall be based on the total weight of the mix. However, in no case shall the Job Mix Tolerances fall outside the General Limits for a particular item.

If for any reason a change in materials occurs or is contemplated, a separate Job Mix Formula shall be used to fit each change in materials or conditions.

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TABLE III

COMPOSITION OF MIXTURES FOR PLANT MIXED BITUMINOUS CONCRETE

	Dense Base*		TYPE 1A (Hot Process)*		Type 1AC	
Screen Sizes	**General Limits% Pass**	**Job Mix% Tol.**	**General Lim-its% Pass**	**Job Mix% Tol.**	**General Limits% Pass**	**Job Mix% Tol.**
2”	100	0	-	-	-	-
1½”	90-100	0	-	-	-	-
1”	78-95	±5	100	0	-	-
½”	57-84	±6	95-100	+5	100	-
¼”	40-72	±7	65-85	+5	90-100	-
⅛”	26-57	±7	32-65	+4	45-70	±6
20	12-36	±7	15-39	+4	15-40	±7
40	8-25	±7	7-25	+3	8-27	±7
80	4-16	±4	3-12	+2	4-16	±4
200	2-8	±2	2-6	+2	2-6	±2
Typical Uses	**Base Course**		**Binder Course Temp. Pvmt.**		**Wearing Course**	
Asphalt Cement%	4.0-6.0	±0.4	5.8-7.0	+0.4	6.0-8.0	+0.4
Penetration of Asphalt Cement	85-100	NA	85-100	NA	85-100	NA
Placing Temperature	250-325	NA	225-300	NA	250-325	NA
Texture of Surface	Coarse	NA	Granular	NA	Smooth, Gritty	NA

NOTE: ** All aggregate percentages are based on the total weight of the aggregate.*
** All other percentages are based on the total weight of the mix.*
** 30% of the Aggregate that Passes the ¼ Sieve May be Glass Products.*

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2.6 Granular Subbase Course

2.6.1 Materials for Subbase Course shall consist of Stone. All material furnished shall be well graded from coarse to fine and free from organic or other deleterious materials.

2.6.2 Material furnished for Type 2 shall consist solely of approved Stone which is the product of crushing ledge rock.
Gradation:

Type	Sieve Size Designation	Percent Passing by Weight
2	2 inch	100
	¼ inch	25-60
	No. 40	5-40
	No. 200	0-10

2.6.3 Soundness: Material for Type 2 will be accepted on the basis of a Magnesium Sulfate Soundness Loss after 4 cycles, of 20 percent or less.

2.6.4 Plasticity Index: The plasticity index of the material passing the No. 40 mesh sieve shall not exceed five (5.0).

2.6.5 Elongated Particles: Not more than 30 percent, by weight, of the particles retained on a one-half inch sieve shall consist of flat or elongated particles. A flat or elongated particle is defined herein as one which has its greatest dimension more than three times its least dimension. Acceptance for this requirement will normally be based on a visual inspection by City of Cortland DPW.

All material shall meet the specified gradation prior to placement on the grade.

All processing shall be completed at the source.

2.7 Limestone Screening

2.7.1 Stone screening shall be limestone and may be crusher run provided 100 percent passes a one-half ($^1/_2$) inch screen, 15 percent to 35 percent passes a No. 20 screen, and a maximum of five (5) percent passes a No. 200 screen. Screening need not be washed, provided they contain no clay, loam, or other deleterious material.

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PART 3 - EXECUTION

3.1 Coordination with Other Agencies

3.1.1 Five days prior to, as well as during paving activities, the Contractor shall notify the City of Cortland Department of Public Works of his intent to pave and request approval of means and methods for placing pavement.

3.2 Removing Pavement

3.2.1 The Contractor shall break up, remove and satisfactorily dispose of all existing pavement required to be removed in order to construct the work.

3.2.2 Pavement shall be removed in two separate operations. In the first operation, the pavement shall be sawcut and removed to the width of the trench. In the second operation, the pavement shall be removed to an additional one (1) foot beyond the edge of the trench or excavation just before the restoration of pavement. In areas where the pavement has been undermined to greater extent than one (1) foot, the undermined area shall be restored by an approved method. Prior to the second operation the Contractor shall saw cut the pavement full depth along the lines of removal unless directed otherwise by the Engineer. Where, in the opinion of the Engineer, it is necessary or desirable to remove the pavement or pavement base beyond the limits given above, the Contractor shall remove same to the lines ordered by the Engineer.

3.2.3 All material shall be promptly removed from the Site and disposed of by the Contractor.

3.3 Weather Limitations

3.3.1 Permanent paving materials other than crushed concrete aggregate or stone blend base course may be placed only when the air temperature is 40 degrees Fahrenheit and rising or warmer and the surface on which the paving is to be laid is 40 degrees Fahrenheit or higher. All temperatures are to be measured in the shade. No pavement shall be placed on wet surfaces or during rain storms.

3.3.2 Bituminous pavement for temporary pavements, that are not and will not become part of a permanent pavement, will not be subject to the above regulations in regard to weather limitations. No pavement, however, shall be laid on a frozen subgrade.

3.4 Transportation and Delivery of Bituminous Concrete Mixtures

3.4.1 The mixture shall be transported from the mixing plants to the work site in tight vehicles previously cleaned of all foreign materials and each load shall be covered with canvas or other suitable material of sufficient size and thickness to protect it from weather conditions. No loads shall be sent out so late in the day as to interfere with spreading and compact-

ing the mixture during normal working hours. The mixture shall be delivered within temperature limits specified herein.

3.4.2 When the air temperature is near the minimum permitted for laying the pavement, the Engineer will require the Contractor to insulate the sides of steel bodied vehicles used for the transportation of plant mixed material.

3.4.3 Just before the vehicles are loaded, the inside surfaces of the vehicles used for the transportation of plant mixes shall be lightly coated with a whitewash of lime and water, soap solution or detergents approved by the Engineer. The use of any asphalt or tar solvents for coating the inside of the vehicles will not be permitted.

3.5 Placing Bituminous Concrete Pavement

3.5.1 Base and Binder Course Pavement: Base and binder course materials shall be placed and spread with spreading equipment acceptable to the Engineer. The base and binder course material shall be placed in lifts of a maximum unconsolidated depth which does not exceed the depth necessary to produce a compacted thickness of four-and-one-half (4½) inches. All defective areas in a foundation for a base/binder course shall be repaired, as directed, in advance of laying the base/binder course. Placing of the mixture by machine shall be continuous at a rate which will prevent the formation of cold joints.

3.5.2 Wearing Course Pavement: Paving materials shall be placed only where the surface to be covered is dry and clean. Paving materials shall be placed only when weather conditions, in the judgment of the Engineer, are suitable. The course shall be laid with finishing machines of approved type. If there are less than 1,500 square yards in the Contract, or the areas to be paved are small and scattered, a finishing machine may be dispensed with and the course spread by hand methods as directed by the Engineer. The equipment for spreading and finishing shall be mechanical, self powered pavers, capable of spreading and finishing the mixture true to the line, grade and crown required. Each finishing machine shall have an edging attachment to aid in securing a satisfactory joint between lanes.

3.5.3 During laying operations, the screeds shall be heated to maintain the required temperature as set forth in the Specifications for the mix. Screeds shall be of the vibrating type.

3.5.4 The term "screed" includes any cutting, crowding or practical action that is effective in producing a finished surface of the evenness and texture specified without tearing, shoving or gouging. When screed extensions are permitted by the Engineer for placement of the final wearing surface, such extensions shall be the same design as the main screed.

3.5.5 If, during construction, it is found that the spreading and finishing equipment leaves tracks or indented areas or other objectionable irregularities the use of such equipment shall be discontinued. Other satisfactory spreading and finishing equipment shall be provided by the Contractor.

3.5.6 The contact surfaces of all curbing, gutters, manholes, and of adjacent pavement edges shall be painted or sealed with approved bituminous material before placing the pavement material.

3.5.7 Upon arrival, the mixture shall be dumped into the approved mechanical spreader and immediately spread and struck off to the full width required and to such appropriate loose depth that when the work is completed, the compacted thickness required will be secured. Where hand spreading is necessary, the mixture, upon arrival, shall be dumped on acceptable dump sheets and immediately distributed into place by suitable tools and spread in a uniform loose layer of such depth as will result in a completed pavement having the thickness required.

Before any rolling is started, the finished surface shall be checked, any imperfections adjusted, and all unsatisfactory material from any source removed. Any deviation from standard crown or section shall be immediately remedied by placing additional material or removing surplus material as directed.

3.6 Compacting Bituminous Concrete Pavement

3.6.1 Compaction Method

3.6.1.1 After placing and while still hot and workable, the course shall initially be rolled with a 10-12 ton power-driven roller, an 5-10 ton tandem roller or a roller producing a compression with the rear wheels of not less than 250 pound per inch of tread. The rollers used for this rolling shall have steel wheels. During the initial rolling, the roller shall travel parallel to the centerline of the pavement beginning at each edge and working toward the center, overlapping on successive trips by one half the rear wheel of the roller. The rolling shall proceed continuously at the rate of not more than 25 tons of mixture per hour for each roller.

3.6.1.2 Immediately following the initial rolling, the bituminous course shall be compacted using vibratory compaction equipment to compact the various bituminous courses in accordance with these requirements. Vibratory rollers shall operate at a uniform speed not exceeding two-and-one-half (2½) miles per hour (220 feet per minute) on all pavement courses.

3.6.1.3 Immediately following the intermediate rolling, the courses shall be finish rolled with a 10-ton steel-wheel tandem roller. This final rolling shall be both longitudinal and diagonal as directed by the Engineer and shall remove all shallow ruts and ridges and other irregularities from the surface. Rolling shall be continued until all roller marks are eliminated.

3.6.1.4 No pavement course shall be compacted to thicknesses in excess of four and one-half (4½) inches. No rollers shall move at speeds in excess of three (3) miles per hour (264 feet per minute) unless otherwise approved.

3.6.1.5 All turning of the compaction equipment shall be completed on material which has had a minimum of one (1) roller pass.

3.6.1.6 The required numbers of passes listed in the table below are minimum and may be increased by the Engineer. A single (one) pass shall be defined as one movement of the roller over any point of the pavement in either direction. The required number of vibrating passes may be reduced by one-half (1/2) for dual vibrating drum rollers when the drums are tandem and are both vibrating. Static rolling shall continue until all ruts, ridges, roller marks or other irregularities are removed from the surface.

REQUIRED NUMBER OF PASSES (MINIMUM)

Pavement Courses	Vibratory Roller Vibrating Passes	Steel Wheel and Tandem Finish Roller Static Passes
Base	4	2
Binder	2	2
Wearing	2	2

3.6.1.7 In all places inaccessible to a roller, the required compaction shall be accomplished with mechanical tampers.

3.6.2 Supplemental Requirements

3.6.2.1 The wheels of the roller and paver shall be kept clean at all times. They may be kept moist with water or a mixture of water with not more than 10 percent lubricating oil as directed. Dirty water, petroleum solvents, or grease shall not be allowed to drop from the roller or paver onto the pavement.

3.6.2.2 If depressions remain after rolling, more of the paving material shall be added at such points and firmly rolled into place. After the rolling has been finished, the surface of the course shall have the required crown, density and compacted thickness and be at the grade established for the surface of the finished pavement At the direction of the Engineer, any unsatisfactory areas that develop shall be removed and replaced with suitable material at the expense of the Contractor.

3.6.2.3 The Contractor shall provide suitable means for keeping all small tools clean and free from bituminous accumulations. The surface of pavement shall be protected from drippings of oil, kerosene, etc. used for the cleaning of small tools.

3.6.2.4 Asphalt concrete wearing courses shall be compacted to a minimum density of 95 percent of the theoretical density as determined by tie following formula:

$$D = \frac{100}{\frac{\%\text{ of bituminous material}}{\text{S.G. of bituminous material}} + \frac{\%\text{ of mineral aggregate}}{\text{S.G. of aggregate}}}$$

3.6.2.5 Tests for conformance with the above minimum density shall be determined from bulk specific gravity computations made in accordance with the standard method of test for Specific Gravity of Compressed Bituminous Mixtures, AASTHO Designation TL66.

3.6.2.6 An independent testing laboratory provided by the Contractor shall collect pavement samples cut from the finished course or courses by the Contractor under the direction and from the locations as ordered by the Engineer. One (1) sample shall be taken for each day or fraction of a day when bituminous material is placed. In addition, samples shall be taken whenever a substantial change is made in the job mix formula. The samples shall be tested for density in accordance with AASHTO T 230. The average density of a minimum of five (5) samples shall be computed. If the computed average density of the samples is less than 90% of the theoretical density, the pavement shall be removed and replaced at the Contractor's expense.

3.7 Temporary Pavement Over Trenches

3.7.1 General: Temporary pavement, as described herein, shall be placed over trenches for the purpose of maintaining pedestrian and vehicular traffic over these trenches until the final pavement restoration commences. Temporary pavement shall be placed as soon as possible, but not later than the Friday following the backfilling of the trench.

3.7.2. Construction

3.7.2.1 After the trench has been properly backfilled, excavation shall be made over the trench area and the subgrade compacted so as to permit the placing of a one-and-one-half (1½) inch minimum compacted thickness of bituminous concrete. The subgrade shall be smooth and parallel to the desired surface of the finished temporary pavement.

3.7.2.2 The temporary pavement shall be Type 1A Bituminous Concrete as specified herein. The Bituminous Concrete shall be compacted with steel wheel tandem rollers. A minimum of two passes shall be required. In places inaccessible to rollers, the required compaction shall be accomplished with mechanical tampers.

3.7.2.3 The Contractor shall maintain the temporary pavement in satisfactory condition free of potholes until permanent pavement is installed. All manhole castings to be set flush with the road surface.

3.8 Permanent Bituminous Concrete Pavement

3.8.1 General: The work included under various items consists of furnishing and placing the base course, binder course, and wearing course pavement. All excavation, removal of any temporary pavement, fine grading, compacting, furnishing and placing of all materials re-

quired to establish grade for a new parking lot and roadways. All pavement surfaces to be paved shall be cleaned prior to the placement of additional pavement material.

3.8.2 Construction

3.8.2.1 The type of the bituminous concrete plant mix for the individual pavement courses shall be as specified on the Drawings, and in kind for replacement of roadway pavement on Charles Street.

3.8.2.2 Base Course materials for pavements shall be Bituminous Concrete (Dense Base Mix).

The Base Course shall be placed to the depth shown on the Drawings or in kind for replacement of roadway pavement.

3.8.2.3 The Binder Course shall consist of Bituminous Concrete Type 1A, placed to a minimum depth shown on the Drawings or in kind for replacement of roadway pavement.

3.8.2.4 Wearing course mix shall be bituminous concrete Top Course Type 1AC, compacted to a minimum thickness shown on the Drawings or in kind for replacement of roadway pavement.

3.8.2.5 The Bituminous Concrete wearing course shall not be placed until curbs and any driveway aprons have been placed.

3.8.2.6 A tack coat consisting of Asphalt Emulsion RS-1 shall be applied to the paved surface to provide bond between this surface and the bituminous concrete wearing course. This tack coat shall uniformly cover the surface of the area to be paved. It shall only be applied to areas which will be paved the same day at a rate of 0.05 to 0.15 gallons per square yard. In places where the distributor bars cannot reach, it will be necessary to apply the tack coat with a hand spray.

Adjacent areas such as curbs, aprons, grass, etc., shall be protected in a manner satisfactory to the Engineer. In the event that any of these adjacent areas are covered or splattered, the Contractor shall clean and restore them to their original condition.

3.8.2.7 Transportation and delivery, placing, and compacting of the bituminous concrete plant mix shall be as directed in the specifications.

3.9 Placement of Granular Subbase Course

3.9.1 The work under this section includes all excavation and the furnishing, placing and compacting of a granular subbase course for pavement as required for the Design in locations shown on the Drawings or as determined by field conditions and ordered by the Engineer. Depths shall be as stated in the Drawings and as follows:

- Parking Areas - Subbase construction consisting of 6" of Type 2 Subbase Course;
- Charles Street - Subbase construction of a 12" of Type 2 Subbase Course; or in kind to match the existing subgrade of Charles Street.

3.9.2 The granular subbase material shall be placed and compacted in a manner to minimize segregation. Uncontrolled spreading from piles dumped on the grade resulting in segregation will not be permitted. The course shall not be placed in excess of 500 linear feet without being compacted.

3.9.3 Should the subbase become mixed with the subgrade or any other material, through any cause whatsoever, the Contractor shall, at his expense, remove such mixture and replace it with the appropriate subbase material. No traffic, or hauling other than that necessary for bringing material for the next course, shall be permitted over this course.

3.9.4 After compaction, the top surface of this course shall not extend above, nor more than one-half (½) inch below true grade and surface at any location. The subbase course, at any location, shall be compacted, finished and completed to the stated tolerance, and approved by the Engineer, before any forms for concrete pavement or any succeeding course is placed at the location. Any depressions or holes shall be filled with approved subbase course material and the surface rerolled.

3.10 Limestone Screening

3.10.1 Limestone screening shall be furnished as ordered by the Engineer. Where directed by the Engineer, limestone screening shall be used to stabilize subgrade beneath temporary pavements.

3.10.2 The Contractor shall perform all excavation required, the grading and compaction of the subgrade, and the placing of the limestone screening as described below.

3.10.3 The screening shall be spread evenly and thoroughly rolled with an approved roller, weighing not less than 10 tons, until thorough consolidation is obtained. All depressions shall be filled with screening, and the process of rolling and filling shall continue until a thoroughly compacted uniform surface, satisfactory to the Engineer, is produced. No segregation of large or fine materials will be permitted, but the screening shall be sprinkled with water at times and in the amounts necessary to provide consolidation.

END OF SECTION

SECTION 02920
LAWNS AND GRASSES

PART 1 - GENERAL

1.1 Summary

1.1.1 This section provides specifications for seeding of green space areas.

1.2 Approvals

1.2.1 Seed: The Contractor shall provide certificates of material compliance and Certificate of Grass Seed before delivery of seed material. Certification of Grass Seed shall be from seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1.2.2 Topsoil: The Contractor shall meet the topsoil requirements of section 02300 Earthwork and Backfilling and provide certificates of material compliance prior to delivery of topsoil material.

1.2.3 Leaf Compost: If included in the Design, the Contractor shall provide certificates of material compliance, a sample in a one (1) gallon reclosable plastic bag displaying a fair and typical representation of the compost characteristics, and a material content data sheet prior to delivery of leaf compost material.

1.2.4 Warranty: The warranty period for seeding is one year from the date of Substantial Completion.

PART 2 - MATERIALS

2.1 General

2.1.1 Topsoil and seed shall conform to the requirements of New York Standards for Soil Erosion and Sediment Control.

2.2 Seed

2.2.1 General: Grass seed shall be fresh, dry, recleaned seed of latest crop. Material other than pure live seed shall comprise only non-viable seed, chaff, hulls, harmless inert matter and shall be free from noxious weeds. The mixture shall have less than one-quarter (¼) of one (1) percent weed content. Seed shall be mixed before delivery and shall consist of the mixture specified and in conformity with the following proportions by weight and meeting with the following standards of seed content. The percentage of purity shown on the label will be acceptable. The percentage of germination shall not be less than the minimum specified.

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2.2.2 Seed Mixture

Low Maintenance Lawn Mixture to be seeded as displayed on the Drawings. Apply at 200 lbs bulk lbs per acre, and then overseed with 50 lbs per acre annual rye. Upon approval by the Engineer seed oats or winter rye may be substituted for annual rye if planting later in the Fall than the approved low maintenance grass seeding date (dormant seeding).

LOW MAINTENANCE LAWN MIX	Mixture Tolerance		Germination	
Tolerance Proportions of Mixture	Minus	Plus	Germination	Minus
25% Cascade Chewings Fescue	3%	5%	85%	6%
23% Sheeps Fescue	3%	5%	85%	7%
13% Chariot Hard Fescue	3%	5%	85%	6%
13% Barcrown Slender Creeping Red Fescue	3%	5%	85%	
12% SR5250 Creeping Red Fescue	3%	5%	85%	
12% Gotham Creeping Red Fescue	3%	5%	85%	

2.2.2 Packaging: All grass seed shall be delivered in unopened standard size bags of the vendor showing weight, analysis and name of vendor. It shall be stored in such a manner that its effectiveness will not be impaired.

2.3 Topsoil

2.3.1 Source: Any topsoil utilized for the Work shall be supplied from an approved off-site source and shall meet the requirements of the New York Standards and Specifications for Erosion and Sediment Control; Part 375 restricted residential use criteria; and Section 713-01 of the New York State Department of Transportation Standard Specifications, latest edition.

2.4 Leaf Compost

2.4.1 General: Any leaf compost utilized for the Work shall be well-composted, stable, and weed-free leaf derived organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1/2-inch (12.5-mm) sieve; soluble salt content of [5 to 10] decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

- Organic Matter Content: 50 to 60 percent of dry weight; and

- Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source separated or compostable mixed solid waste.

2.4.2 Sources

2.4.2.1 Off-Site: Leaf Compost shall be approved prior to use, to meet the requirements of Section 713-01 of the New York State Department of Transportation Standard Specifications, latest edition.

2.4 Commercial Fertilizer

2.4.1 Composition: Commercial granular fertilizer shall have the following composition by weight: Nitrogen, 10 percent; Phosphoric Acid, 6 percent; Potash, 4 percent.

The Nitrogen shall be 50 percent organic (from organic sources, e.g., fish meal, dried blood, dried manure, activated sewage sludge, castor pomace, cottonseed meal, etc.) and 50 percent inorganic. The elements shall be available according to the methods adopted by the Association of Official Agricultural Chemists.

2.4.2 Packaging: Fertilizers shall be packed in the manufacturer's standard containers weighing not over 100 lbs each with the name of the material, net weight of contents and the manufacturer's name and guaranteed analysis appearing on each container.

2.5 Ground Limestone

2.5.1. Composition: Ground Limestone (Calcium Carbonate) shall have the following analysis: At least 50 percent shall pass a 200 mesh sieve; at least 70 percent shall pass a 100 mesh sieve; and 100 percent shall pass a 10 mesh sieve. Total carbonates shall not be less than 80 percent or 44.8 percent calcium oxide equivalent. For purposes of calculation, total carbonates shall be considered as Calcium Carbonate.

2.5.2 Packaging: Ground limestone packed in the manufacturer's standard containers shall weigh not over one 100 lbs each, with the name of the material, net weight of contents and the manufacturer's name and guaranteed analysis appearing on each container. Bulk shipments shall be accompanied by a certificate covering the names, weight and analysis as specified herewith for packaged material.

2.6 Superphosphate

2.6.1 Composition: Superphosphate shall be an approximate 0-20-0 formulation with an acceptable minimum of 18 percent available phosphoric acid.

2.6.2 Packaging:

2.6.2.1 Superphosphate packed in the manufacturer's standard containers shall weigh not over 100 lbs each, with the name of the material, net weight of contents and the manufacturer's name and guaranteed analysis appearing on each

container.

2.6.2.2 Bulk shipments shall be accompanied by a certificate covering the names, weight and analysis as specified for packaged material.

PART 3 - EXECUTION

3.1 General

3.1.1 A six inch layer of topsoil shall be placed over the backfill areas required to be seeded. The surface of the compacted backfill shall be scarified to a depth of 2 inches before topsoil is placed to permit bonding of topsoil with the backfill.

3.1.2 When delays in seeding operations carry the Work beyond the specified seasons or when conditions of high winds, excessive moisture or frost are such that satisfactory results are not likely to be obtained for the Work, the Contractor shall stop the Work. The Work shall be resumed with the Engineers approval when the desired results are likely to be obtained or when approved corrective measures and procedures are adopted.

3.1.3 The Contractor shall be liable for any damage to property caused by seeding operations and all areas disturbed shall be restored to the satisfaction of the Engineer.

3.1.4 One inch of water per week shall be applied on the entire seeded areas for adequate soil saturation as required by weather conditions and as ordered by the Engineer until final acceptance. Watering shall be done in a manner which will not cause erosion or other damage to the finished surfaces. Any surfaces which become gullied or otherwise damaged shall be repaired to reestablish the grade and conditions of the soil prior to seeding. After the repairs have been made, the areas shall be reseeded as specified

3.2 Grass Seeding

3.2.1 Time of Seeding: Seeding shall be performed from April 15 to May 15 and from August 20 to October 20 unless otherwise approved. The Contractor shall notify the Engineer at least 48 hours in advance of the time he intends to begin seeding and shall not proceed with such work until permission has been granted.

3.2.2 Final Preparations of Seed Bed

3.2.2.1 The areas to be seeded shall be scarified to a depth of two inches.

3.2.2.2 Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre (42 kg/92.9 sq. m) to form a continuous blanket 1-1/2 inches (38 mm) in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.

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3.2.2.3 Protect seeded areas from hot, dry weather or drying winds by applying compost mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 3/16 inch (4.8 mm) and roll surface smooth.

3.2.2.4 Ground limestone shall be evenly distributed at the rate of 2,000 lbs per acre and worked into the top three inches of the soil during the cultivation required for the final preparations of seed bed.

3.2.2.5 Commercial fertilizer (10-6-4) as specified shall be evenly distributed at the rate of 1,500 lbs per acre using an approved mechanical spreader and shall be worked into the top one inch of the soil.

3.2.2.6 In the event that it rains between the time the soil on any area is prepared and before it is seeded, the soil on all areas to be seeded shall be completely pulverized to a depth of one inch as directed and approved by the Engineer.

3.2.4 Sowing Seed

3.2.4.1 Grass seed shall be sown evenly at the rate of 150 lbs per acre. All seeding shall be done on dry or moderately dry soil and at time when the wind does not exceed a velocity of five miles per hour.

3.2.4.2 A mechanical seeder may be used such as a Brillion seeder, or equal, to distribute the seed. Rolling will not be necessary.

3.2.4.3 If the grass seed is to be sown by hand, the seed shall be evenly distributed and lightly raked into the top one-quarter (¼) inch of soil. After seeding and raking the soil surface shall be rolled with an accepted roller weighing at least 200 lbs.

3.3 Establishment of Seeded Areas

3.3.1 The Contractor shall maintain, mow, fertilize, water and protect the seeded areas until a uniform stand of grass approximately two-and-one-half (2½) inches high has been obtained. Any areas which have been damaged or fail to show a uniform stand of grass shall be scarified, refertilized and reseeded with the original seed mixture until all the designated areas are covered with grass.

3.3.2 Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 4 by 4 inches (100 by 100 mm).

3.3.2.1 Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

END OF SECTION

SECTION 02930
EXTERIOR PLANTS

PART 1- GENERAL

1.1 Summary

1.1.1 This Section includes activities related to tree planting during landscape work.

1.1.2 Related Sections:

- 02300 – Earthwork and Backfilling
- 02920 – Lawns and Grasses

1.1.3 The Contractor shall provide all labor, equipment and material necessary to plant shrubs and trees included in the Design and shall furnish, plant, dig, transplant, transport, maintain and replace all plants in accordance with specifications and Drawings or as directed by NYSEG and/or the Engineer.

1.1.4 The Contractor shall perform the work in accordance with the ordinances of the City of Cortland including the *City of Cortland Tree Ordinance* revised March 23, 2006.

1.2 Definitions

1.2.1 Balled and Burlapped Stock: Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not less than what is required by ANSI Z60.1 for the specified caliper size; wrapped, tied, rigidly supported, and drum-laced as recommended by ANSI Z60.1.

1.2.2 Finish Grade: Elevation of finished surface of planting soil.

1.2.3 Planting Soil: Imported topsoil mixed with soil amendments.

1.2.4 Shade Tree: Single-stem tree with a straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, complying with ANSI Z60.1 for type of trees required.

1.2.5 Street Tree: Trees, shrubs, bushes and all other woody vegetation on land lying between the sidewalk and the street or otherwise within the right-of-way.

1.2.6 Subgrade: Surface or elevation of subsoil below the demarcation layer remaining after completing excavation, before placing the minimum of 18 inches of backfill and 6 inches of planting soil.

1.3 Approvals

The Contractor shall obtain approvals for the following elements of the Work:

1.3.1 Product Data: For each type of product indicated.

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1.3.2 Qualifications: For landscape Installer.

1.3.3 Material Testing: For imported topsoil.

1.3.4 Planting Schedule: Indicating anticipated planting dates for exterior plants.

1.3.5 Care of Planting and Work Schedule: Identifying how and when all work specified under Section 611-3.05 of the New York State Department of Transportation Standard Specifications, latest edition will be accomplished. Exceptions to the approved schedule shall be subject to advance written approval by NYSEG and/or the Engineer.

1.3.6 Report of Suitability of Topsoil for Plant Growth: Recommending quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.

1.4 Quality Assurance

1.4.1 Installer Qualifications: A qualified landscape installer shall be utilized whose work has resulted in successful establishment of exterior plants.

1.4.2 Topsoil Analysis: Topsoil analysis shall be as described in Section 023000 – Earthwork and Backfilling.

1.4.3 Quality, size, genus, species, and variety of exterior plants shall be indicated on submittals, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock.", latest edition. Plant names shall agree with the nomenclature of “Standardized Plant Names” as adopted by the American Joint Committee on Horticultural Nomenclature 1942 Edition: Size and grading standards shall conform to those of the American Association of Nurserymen unless otherwise specified.

1.4.4 Tree Measurements: Measurement of tree sizes shall be in accordance with ANSI Z60.1.

1.4.5 Observation: NYSEG and/or the Engineer may observe trees either at place of growth or at the Site before planting for compliance with requirements for genus, species, variety, size, and quality. NYSEG and/or the Engineer retain the right to observe trees further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of Work. Rejected trees shall be removed from the Project site immediately.

1.4.6 NYSEG and/or the Engineer shall be notified by the Contractor of sources of planting materials in advance of delivery to the Site.

1.4.7 Dead plants, defects or omissions noted on the inspection shall be rectified by the Contractor without additional compensation.

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1.5 Delivery, Storage and Handling

1.5.1 The tops of trees shall be tied with heavy twine to protect branches during loading, shipping, and unloading. The Contractor is responsible for transportation of trees, and any damages to trees that ensue during loading, transport, and unloading. All trees with broken terminal leaders shall be rejected.

1.5.2 A burlap cover shall be tightly secured on the tops of all trees during shipment.

1.5.3 Any balls of the trees delivered to the site in a loose, broken or dried condition shall be rejected.

1.5.4 Trees delivered to the Site shall be planted within 72 hours from time of delivery. All others shall be rejected and promptly removed from the Site. If, due to no fault of the Contractor, he is unable to plant in a specified area, such as other Contractor's operations, wet soil conditions, or inclement weather, the Contractor shall take necessary steps to heel in the plant material with wood chips or salt hay, to the satisfaction of NYSEG and/or the Engineer.

1.6 Coordination

1.6.1 Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.6.2 Coordination with Lawns: Plant trees after finish grades are established and before planting lawns, unless otherwise acceptable to NYSEG and/or the Engineer. When planting trees after lawns, protect lawn and sidewalk areas and promptly repair damage caused by planting operations.

1.7 Warranty

1.7.1 Special Warranty: Warrant the exterior plants, for the warranty period indicated, against defects including death and unsatisfactory growth. Defects include, but are not limited to, the following:

1.7.1.1 Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.

1.7.1.2 Structural failures including plantings falling or blowing over

1.7.1.3 Faulty performance of tree stabilization

1.7.1.4 Deterioration of metals, metal finishes, or other materials beyond normal weathering

1.7.1.5 Diseases from the nursery

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1.7.2 Warranty Period for Trees: One year from date of Substantial Completion. Include the following remedial actions as a minimum:

1.7.2.1 Immediately remove dead plants and replace unless required to plant in the succeeding planting season

1.7.2.2 Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period

1.7.3 Provide extended warranty for period equal to original warranty period, for replaced plant material which is damaged, destroyed, or dies from whatever cause except theft or vandalism during the above period shall be replaced by the Contractor within 15 days upon written notice to the Contractor by NYSEG. It should be noted that due to planting seasons, the Contractor will be required to replace any dead plant within the two planting seasons, during the warranty period which may entail replacing the same plant more than once after final acceptance.

PART 2- PRODUCTS

2.1 Materials

2.1.1 The Contractor shall furnish nursery-grown trees complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement. Trees shall be suitable for planting are to be free of branches to a point about 50% of their height. The trunk shall be reasonably straight with leader intact and a well-balanced symmetrical branching habit.

2.1.2 Trees shall be as specified on the Drawings.

2.1.3 Trees shall have a ball size and height conforming to ANSI Z60.1, and shall be of the balled and burlapped stock variety. Trees shall be measured across the minimum lateral diameter of the root ball. The root balls shall be wrapped and laced as shown in the latest American Standard for Nursery Stock. Rope shall be a minimum of 3-ply sisal or approved equivalent.

2.1.4 Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch (19 mm) in diameter; or with stem girdling roots will be rejected.

2.1.5 Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

2.1.6 Bracing stakes shall be of white cedar, chestnut, or other approved wood with bark attached. Stakes shall be rough-sawn, sound, new hardwood free of knots, holes, cross grain, and other defeats. The length shall be 24 inches; the diameter at the middle shall

be not less than two (2) inches nor more than two and three quarter ($2^3/_4$) inches; the diameter at the top shall be not less than one and three-quarters ($1^3/_4$) inches and the diameter at the butt shall not exceed three (3) inches. They shall have a maximum allowable deflection of 10 percent. Stakes shall be pointed. All stakes shall be free from insects and fungi.

2.1.7 Guy and Tie Wires shall be ASTM A 641/A 641M, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch (2.7 mm) in diameter. Guy cable shall be five strand, 3/16-inch (4.8-mm-) diameter, galvanized steel cable with zinc-coated turnbuckles, a minimum of 3 inches (975 mm) long, with two 3/8-inch (10 mm) galvanized eyebolts.

2.1.8 Hose shall be fiber centered remnants or suitable second hand material of one and a half ($1^1/_2$) inch, five-eights ($^5/_8$) or three quarter ($^3/_4$) inch diameter, weighing approximately one-half ($^1/_2$) pound per linear foot, or other suitable material. The hose shall be black or any color, as approved by NYSEG and/or the Engineer.

2.1.9 Jute burlap shall weigh eight (8) ounces per square yard.

2.1.10 Twine used in the balling of trees shall be sisal rope or approved equal, not less than 3-ply for trees $4^1/_2$ inch or less in diameter.

2.1.11 Fertilizer and Superphosphate – Superphosphate (18% - 20% phosphoric acid) shall be incorporated with the topsoil at the time of planting, at a rate of two (2) pounds per one (1) inch of caliper of tree. Fertilizer (10-10-10, 50% organic nitrogen) shall be evenly distributed over the plant pit at the rate of one (1) pound per one (1) inch of caliper of tree, just prior to mulching.

2.1.12 Mulch shall be triple shredded 100% organic material and hardwood bark. Mulch should be of uniform texture and size with pieces no greater than 2 inches and appear a dark natural brown when dry. Mulch shall be free from deleterious materials and suitable as a top dressing for trees. No dies or chemicals.

2.1.13 Topsoil shall be in accordance with Section 02300 – Earthwork and Backfilling.

2.1.14 Anti-Desiccant shall be applied by the Contractor using an approved power sprayer to apply adequate film over trunks, branches, twigs and/or foliage, as directed by NYSEG and/or the Engineer. The anti-desiccant shall be an emulsion which will provide a protective film over plant surface, permeable enough to permit transportation. The anti-desiccant shall be "WILT-PROOF" supplied by Nursery Specialties Products, Inc., Croton Falls, N.Y., "VANEX" supplied by Vansul & Co., 193 William Street, Englewood, N.J., or approved equal. Anti-desiccants shall be delivered in the containers of the manufacturer and shall be mixed according to the directions.

2.1.15 Green plastic ties shall be a minimum of $^1/_2$ inch in width. They shall have a smooth surface, with the ability to stretch as the tree grows. Green plastic tie shall be used to secure the burlap wrap to major trees as described herein, or as directed by NYSEG and/or the Engineer.

SECTION 02930
EXTERIOR PLANTS

PART 3- EXECUTION

3.1 Examination

3.1.1 Areas to receive exterior plants shall be examined for compliance with Section 713-01 of the New York State Department of Transportation Standard Specifications, latest edition, and any other conditions or requirements affecting installation and performance. Installation shall begin only after any unsatisfactory conditions have been corrected.

3.2 Preparation

3.2.1 Utilities, and off-site sidewalks, pavements, lawns and existing exterior plants shall be protected from damage caused by planting operations.

3.2.2 Erosion control measures shall be installed as needed to prevent erosion or displacement of soil and discharge of soil-bearing runoff or airborne dust.

3.3 Tree Planting

3.3.1 Planting Pits: Excavate circular planting pits with side sloping inward at a 45 degree angle. Excavations with vertical sides are not acceptable. The pit diameter shall be three times the root spread. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of root ball. Ensure that root ball will sit on undisturbed base soil to prevent settling. If area under plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.

3.3.2 Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new existing improvements.

3.3.3 Notify NYSEG/Engineer if unexpected rocks or obstructions detrimental to trees are encountered in excavations.

3.3.4 The Contractor shall be responsible for placing the proper variety of tree at the locations indicated on the Drawings. All trees shall be labeled with the proper genus, species and cultivar for approval by Project Engineer. The Contractor shall be responsible for replacing any tree with the proper plant in the next succeeding planting season and maintain and guarantee that tree for one (1) year from the date of replacement if an error is determined by NYSEG and/or the Engineer.

3.3.5 All balled and burlapped stock trees shall be set plumb and in center of planting pit or trench with root flare 2 inches (50 mm) above adjacent finish grades.

3.3.6 Balled and burlapped trees shall be backfilled with topsoil carefully tamped around and under the base of each ball to fill voids. Any platforms shall be removed. All burlap,

wires, twine, etc. shall be removed from the tops 1/3 of all balls, but not out from under any of the balls.

3.3.7 The unit price bid for each plant shall include the furnishing by the Contractor of all topsoil necessary to complete planting operations.

3.3.8 Fertilizer and Superphosphate shall be placed prior to mulching if requested by NYSEG and/or the Engineer.

3.4 Tree Pruning

3.4.1 The Contractor shall prune, thin, and shape trees by competent workmen according to standard horticultural practices. Deciduous trees shall be pruned to reduce the vegetative growth by 1/3 of its total branching. Wood removed shall be inferior branches, competing branches, crossing branches, and dead and/or damaged wood. The natural branching habit of the plant shall be adhered to at all times. Unless otherwise indicated by NYSEG or the Engineer, tree leaders shall not be cut; only injured or dead branches are to be removed from flowering trees.

3.4.2 Trees used in street tree plantings and parking areas shall have all branches removed up to a height of six (6) feet.

3.5 Guying and Staking

3.5.1 Stakes shall be placed directly adjacent to the ball of the tree and driven a minimum of 18 inches below the unscarified subsoil. Stakes shall be 24 inches in length; the diameter at the middle shall be not less than two (2) inches nor more than two and three quarter ($2^3/_4$) inches; the diameter at the top shall be not less than one and three-quarters ($1^3/_4$) inches and the diameter at the butt shall not exceed three (3) inches.

3.5.2 Guy and Tie Wires shall be ASTM A 641/A 641M, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch (2.7 mm) in diameter. Guy cable shall be five strand, 3/16-inch (4.8-mm-) diameter, galvanized steel cable with zinc-coated turnbuckles, a minimum of 3 inches (975 mm) long, with two 3/8-inch (10 mm) galvanized eyebolts. Standard surveyor's plastic tape, white, 6 inches (150 mm) long shall be placed on each wire to increase visibility.

3.5.3 The wire shall be passed around the trunk of the tree and both ends of the wire secured to the stake as directed by NYSEG and/or the Engineer. A piece of reinforced rubber hose eight (8) to fourteen (14) inches long shall be used to protect the wire from damaging the trunk of the tree. The height of the attachment of the tree to the stake shall be $^2/_3$ up the height of the tree, or to the lowest branch, as indicated on the Drawings.

3.5.4 After staking and wiring has been completed, the tops of all stakes shall be cut approximately two (2) inches above the wires. All guy wires shall be maintained tight by the Contractor for the duration of the Contract.

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3.5.5 All staking and wiring operations shall be complete for each tree within 24 hours of planting. No new or additional planting will be allowed until all wiring and staking has been satisfactorily completed by the Contractor.

3.6 Edging

3.6.1 The Contractor shall establish a neat edge where planting areas meet grass areas as shown on the Drawings or as directed by NYSEG and/or the Engineer. Edging shall be done by competent mechanics in a workmanlike manner with spade or edging tool immediately after all planting and seeding is completed. Particular care shall be exercised in edging to establish good flowing curves as shown on the Drawings or as directed by NYSEG and/or the Engineer. Edging shall be maintained by the Contractor for the duration of the Contract.

3.7 Water and Mulch

3.7.1 At the time of planting, the soil around each plant shall be saturated with 25 gallons of water for each square yard of planting area. All trees shall be watered at a minimum of once per week, unless otherwise directed by NYSEG and/or the Engineer until final acceptance. Additional watering may be required to insure tree survival and establishment based on weather conditions.

3.8 Wrapping

3.8.1 All trees shall have burlap wrapping around the trunk from the ground level to the first set of branches. Trees of two (2) inch caliper and up shall be wrapped with a six (6) inch new burlap bandage securely tied at the top and bottom and at two (2) foot intervals along the trunk. Burlaps shall be secured by using green plastic tie as described previously in this section. The burlap bandage shall cover the entire surface of the trunk from the base to the first set of branches. The burlap bandage shall overlap approximately $^{1}/_{3}$ of its width. Burlap shall be maintained in place.

3.9 Protection

3.9.1 The Contractor shall, for the duration of the Contract, erect all barricades, signs, fences, etc., and provide watchmen as might be necessary for the protection of all trees until the Contract has been accepted.

3.10 Disposal

3.10.1 Surplus soil and waste material, including excess subsoil, unsuitable soil, trash and debris shall be removed and disposed of off site.

3.11 Maintenance

3.11.1 The Contractor shall maintain trees for the warranty period by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, tightening and repairing stakes

and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Pesticide spray shall be applied as required to keep trees and shrubs free of insects and disease. Damaged tree wrappings shall be restored or replaced.

3.11.2 At the end of the warranty period, the Contractor shall remove and dispose of all stakes, wire, hose, burlap and twine from all trees as approved by NYSEG and/or the Engineer. Also, holes left due to removal of stakes shall be filled with topsoil to the existing grade.

3.11.3 The cost of maintenance, replanting operations and removal of staking and wrapping shall be included in the plant bid price.

END OF SECTION

SECTION 03010
CAST-IN-PLACE CONCRETE

PART 1- GENERAL

1.1 Summary

1.1.1 This section includes the provisions for installing and supplying cast-in-place Portland cement concrete as necessary for the Work for sidewalks, driveway aprons, curbing, and foundations for chain-link fence post foundations, if included in the Design.

1.1.2 The work shall consist of providing normal weight Portland cement concrete.

1.1.3 Concrete sidewalks, concrete driveway aprons, curbing, and fence foundations included in the Design shall achieve 28-day compressive strength of 4,000 psi.

1.1.4 Reinforcement shall be provided as provided in Section 03210 – Steel Reinforcement.

1.2 Quality Assurance

1.2.1 Cast-in-Place Concrete: Testing shall be performed by the Contractor's independent testing company.

1.3 Approvals

1.3.1 Design Mix(es): The Contractor shall submit to the Engineer the design of the concrete mix for approval. No concrete shall be placed without an approved mix design.

1.3.2 Certified Test Reports and Source Material Acceptance: Certified test reports shall be submitted to the Engineer for review and shall be approved by the Engineer before delivery of materials for the items listed below:

- Cement;
- Aggregate;
- Admixtures;
- Materials for curing concrete;
- Joint sealing materials;
- Expansion Joint fillers; and
- If necessary, stamp pattern and color pigment.

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1.3.3 Delivery Tickets for Concrete: The Contractor shall provide certified delivery tickets for concrete showing the following information:

- Batch number;
- Mix by compressive strength with maximum aggregate size;
- Types and amounts of admixtures included;
- Air content;
- Required slump;
- Time of loading;
- Amount of water put in at batch plant;
- Date of delivery; and
- Revolution count of drum (where appropriate).

1.3.4 Samples: Samples of materials shall be given to the Engineer for approval for testing in accordance with ASTM requirements, as specified herein and upon request.

PART 2- PRODUCTS

2.1 Portland Cement

2.1.1 Types of Cement: Type 2.

2.1.2 Portland cement shall conform to the chemical and physical requirements of those respective types as contained in ASTM C 150. The requirement for false set as stipulated under ASTM C150, Table 2a, "Optional Physical Requirements" shall apply for all types. The gypsum shall be added to the clinker by means of an approved automatic mechanical device. At the option of the manufacturer, additions of those commercial produce known as "grinding aids" will be permitted as provided for by ASTM C150.

2.2 Storage

2.2.1 The cement shall be stored at source of supply in approved weather-tight silos. All silos shall be completely empty and clean before cement is deposited therein.

2.2.2 Cement remaining in bulk storage at the mill and/or distribution terminal for a period greater of than one (1) year after completion of tests shall be resampled and retested before shipment. However, cement which has been in bulk storage at mills and/or distribution terminals more than two (2) years from the time of original manufacture shall not be used. No cement stored by the Contractor over the winter shall be used.

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Bagged cement shall not be stored at mill or terminal locations for a period longer than six (6) months.

2.3 Shipment

2.3.1 Cement may be shipped in paper bags which conform to industry standards and which have the brand name, type of cement, and the name of the manufacturer plainly marked thereon.

2.3.2 A bag shall contain 94 pounds net. One (1) bag of cement shall be considered as containing one (1) cubic foot.

2.3.3 The temperature of cement at the time of shipment shall not exceed 170 degrees Fahrenheit.

2.4 Fine Aggregates

2.4.1 Fine Aggregate Details: Fine aggregate shall consist of sand, stone screenings except limestone screenings, iron ore tailings, artificial sand that is prepared from an accepted source of dolomite rock and contains not less than 30 percent of magnesium carbonate, or a mixture of these, that shall conform to the gradation requirements shown below. The aggregate shall consist of grains or particles of hard durable rocks, the surfaces of which are not coated with any injurious materials.

2.4.2 Gradation and Testing: Fine aggregate when dry shall conform to the following gradation requirements:

Sieve/Size	Percent Passing By Weight	
	Minimum	Maximum
3/8 inch	100	--
No. 4	90	100
No. 8	75	100
No. 16	55	85
No. 30	25	60
No. 50	10	30
No. 100	1	10
No. 200 (Wet)	0	3

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Fine aggregate shall meet the testing requirements indicated in the table below unless accepted by the Engineer on the basis of service records, petrographic examination, geological studies and/or quarry reports.

FINE AGGREGATE TESTING REQUIREMENTS

Test Method	
Magnesium Sulfate Soundness Test, ASTM C88; Max. percent loss by weight at 5 cycles	22%
Organic Plate, Lighter Than	3
Gardner Color, Lighter Than	11

2.5 Coarse Aggregates

2.5.1 General: Throughout these Specifications where the term "Broken Stone" or "Broken Slag" is used, it is to be interpreted as being synonymous with the term "Crushed Stone" or "Crushed Slag", respectively.

2.5.2 Coarse Aggregate Details:

2.5.2.1 Coarse aggregates shall consist of well graded, uniformly mined broken stone, crushed gravel, screened gravel, or broken slag, and shall meet the requirements given for these materials. Run of bank gravel will not be permitted for coarse aggregate.

2.5.2.2 If deliveries of coarse aggregate show segregation of sizes, material shall be mixed to the specified gradation before using.

2.5.2.3 Coarse aggregates shall contain not more than 30 percent of particles that are flat or elongated to the degree of 3:1 and shall contain not more than than 10 percent of particles that are flat or elongated to the degree of 5:1.

2.5.2.4 Deleterious Substances: The amount of deleterious substances contained in any primary size of crushed stone or crushed coarse aggregates shall not exceed the following:

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Substance	% By Weight
Material Passing the No. 200 Sieve	0.7
Shale or Other Lightweight Materials	1.0*
Coal or Lignite	1.0
Clay Ball or Lumps	0.2
Other Deleterious Substances	1.0

**This requirement may be varied if service records and/or abrasion and soundness tests indicate to the Engineer that the aggregate is satisfactory.*

Coarse aggregates containing more than these specified amounts of deleterious substances shall be washed or otherwise processed until the Specifications are satisfied.

2.5.3 Gradation of Course Aggregates

2.5.3.1 Coarse Aggregates shall conform to the gradation requirements of ASTM C 33.

2.5.3.2 All crushing plants installed on the Work shall be fitted with tailing chutes so that no stone will reach the bins other than that which passes through the proper screens.

2.5.3.3 All coarse aggregates shall be of the required sizes when placed in the Work, breaking up stone, gravel or slag by hammers or otherwise will not be permitted.

2.5.4 Crushed Stone

2.5.4.1 Crushed stone shall consist of clean, durable, sharp angled fragments of rock including iron ore tailings, of uniform quality throughout.

Gravel hardheads retained on a four (4)-inch scalping screen and then crushed will be acceptable as crushed stone provided such crushed hardheads meet the gradation and the other requirements for the type of stone specified.

2.5.4.2 Crushed stone as coarse aggregate shall meet the test requirements specified in the following table unless accepted by the Engineer on the basis of service records, petrographic examination, geological studies and/or quarry reports.

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CRUSHED STONE TESTS

Los Angeles Abrasion Test, ASTM Designation C131 Percent Loss Max., by Weight	35
Magnesium Sulphate Soundness Test ASTM Designation C88 Percent Loss at 10 Cycles Max., by Weight	18
*Freezing and Thawing Test Percent Loss at 25 Cycles Max., by Weight	10

** This test required only on aggregate used in Portland cement concrete where surfaces are exposed*

2.5.5 Crushed Gravel

2.5.5.1 Crushed gravel shall consist of clean, sound, tough, hard gravel, free from coatings and shall be thoroughly washed. The gravel shall contain at least 75 percent of fractured particles in each number size and than meet the gradation requirements for crushed stone. A satisfactory fractured particle shall have at least one (1) fractured face and the total area of face fracture shall exceed 25 percent of the maximum cross sectional area of the particles.

2.5.5.2 Gravel shall meet the test requirements of the following table unless accepted by the Engineer on the basis of service records, petrographic examination, geological studies and/or quarry reports.

GRAVEL TESTS

Los Angeles Abrasion Test, ASTM Designation C131 Percent Loss Max., by Weight	35
Magnesium Sulphate Soundness Test ASTM Designation C88 Percent Loss at 10 Cycles Max., by Weight	18
*Freezing and Thawing Test Percent Loss at 25 Cycles Max., by Weight	10

** This test required only on aggregate used in Portland cement concrete where surfaces are exposed*

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2.5.6 Screened Gravel

2.5.6.1 Screened gravel shall consist of clean, sound, tough, hard stone free from coatings and shall be thoroughly washed. Screened gravel may consist of all uncrushed particles or of crushed particles up to 75 percent of the total in each size number.

2.5.6.2 Screened gravel shall meet the test requirements specified above under "Crushed Gravel."

2.5.6.3 In making the abrasion test and the soundness test, uncrushed particles shall be used.

2.5.7 Slag shall not be used.

2.5.8 Basis of Acceptance: Acceptance of the source is determined on the basis of tests performed by the laboratory on samples representing the source, review of Quarry Reports, Geologic Source Reports, and Plant Flow Information, petrographic examination, and other geologic studies, and performance history where applicable.

2.6 Water

2.6.1 Mixing water and water for curing concrete shall be free from oil, acid, alkali vegetable matter, organic matter or other deleterious substances.

2.6.2 Tests shall be in accordance with AASHTO Des. T-26.

2.7 Concrete Admixtures

2.7.1 Air Entrainment

2.7.1.1 Air entraining admixture shall be added to the mix in sufficient quantity and in such a manner as to produce the desired air content uniformly throughout the concrete. Air entraining admixture shall conform to ASTM C260.

2.7.1.2 Mixtures shall have air content by volume of concrete of five (5) to seven (7) percent, based on measurements made immediately after discharge from the mixer.

2.7.2 Retardation: Where a retarding admixture is required, it shall be added to the concrete mix at the batching plant or as approved by the Engineer. The quantity to be used shall be in accordance with the manufacturer's recommendations, such that it will produce the desired retardation. When the temperature is below 60 degrees Fahrenheit, the quantity of retarding admixture shall be determined with special care. Consideration shall be given to all factors affecting the rate of hydration. In determining the quantity of retarding admixture under various conditions, the Contractor shall follow the manufacturer's recommendations.

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2.7.3 Accelerating Admixture: Where accelerating admixture is required, it shall be added to the concrete mix at the batching plant unless specified otherwise or directed by the Engineer.

The quantity to be used shall be in accordance with the manufacturer's recommendations. All of the approved manufacturer's direction shall be carefully followed. Accelerating admixture shall meet all the requirements of ASTM C494 Type "C". Accelerating admixture shall not be used where aluminum items are imbedded in the concrete or where sulfate resistance is needed.

2.7.4 Water Reduction: Retarding and water reducing admixtures, when required, shall conform to the requirements of ASTM C494.

2.8 Form Materials

2.8.1 General: Formwork shall conform to the requirements and recommendations of ACI 347. Materials shall be suitable for the use intended and adequate to support loads within tolerances recommended in ACI 347.

2.8.2 Wood Forms: Formwork shall be made of smooth faced undamaged plywood to provide continuous, straight, smooth as-cast surfaces.

2.8.3 Metal Forms: The metal used for forms shall be of such thickness that they will remain true to shape. All bolt and rivet heads shall be countersunk. Clamps, pins or other connecting devices shall be designed to hold the forms rigidly together and to allow removal without injury to the concrete. Metal forms that do not present a smooth surface or line up properly, shall not be used. Special care shall be exercised to keep metal forms free from rust, grease, and other foreign matter that would tend to discolor the concrete.

2.8.4. Forms Coatings:

2.8.4.1 The form surface in contact with concrete shall be coated with a form coating compound that will not bond with, stain, nor adversely affect concrete surfaces requiring bond or adhesion, nor impede the wetting of surfaces being cured with water or curing compounds.

2.8.4.2 Coating materials shall be approved by the Engineer prior to placing of concrete.

2.9 Curing Materials

2.9.1 Quilted Covers: Quilted covers shall conform to the requirements of AASHTO M73.

2.9.2 Polyethylene Coated Burlap Blankets: The blankets shall conform to the material requirements of AASHTO M171 (ASTM C171) for White Burlap-Polyethylene Sheet. Polyethylene coated burlap blankets shall be manufactured of new burlap, AB mill

quality, weighing not less than nine (9) ounces per square yard and with a white, opaque, polyethylene film four (4) mils thick impregnated or extruded into one side.

2.9.3 Polyethylene Curing Covers (White Opaque)

2.9.3.1 Polyethylene curing covers shall consist of single sheets manufactured from virgin resin, containing no scrap or additives, with a thickness of not less than four (4) mils (0.004 inches). The covers shall conform to the material requirements of AASHTO M17I (ASTM C171) for Polyethylene Film: White Opaque.

2.9.3.2 Polyethylene curing covers shall be sufficiently tough and durable to permit their use under the conditions encountered in the course of highway work, without tearing or otherwise becoming unfit. They shall be free of visible defects and shall have a uniform appearance. Rolls shall be wound on serviceable handling members extending beyond the edges of the roll, forming handles to facilitate applying the covers over the concrete.

2.9.4 White Pigmented Membrane-Forming Curing Compound: White pigmented membrane-forming curing compound shall confirm to ASTM C 309, Type 2.

2.10 Expansion Joint Filler

2.10.1 Filler shall conform to requirements of ASTM D1751.

2.10.2 Each piece shall be plainly marked with the manufacturer's name, and each lot delivered shall be accompanied by the manufacturer's affidavit attesting to the conformance with ASTM.

2.10.3 Samples of any or all materials used in the manufacture of the joint filler shall be furnished if requested by the Engineer.

PART 3- EXECUTION

3.1 Proportioning

3.1.1 Proportions of ingredients except admixtures for all cast-in-place Portland cement mixtures shall be determined by the Contractor and subject to Engineer’s approval, according to these Specifications unless otherwise indicated in the Contract Documents.

3.1.2 Aggregate and cement shall be proportioned by volume and weight. Proportions shall be as indicated in the following tables:

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PROPORTIONS BY VOLUME

Minimum Strength @ 28 days	Approximate Volumetric Mix
4,000 psi	1½ : 3

PROPORTIONS BY WEIGHT

Minimum Strength @ 28 days	Minimum Strength @ 7 days	Min. Lbs of Cement per Cu. Yd. of Concrete	Fine Aggr. Percent by wt. of Total Aggregate
4,000 psi	2,600 psi	700	31 to 39

3.1.3 The approximate volumetric mixes and weight mixes shown on the above tables are for guidance only. The exact proportions shall be determined by the Contractor by means of laboratory tests before the work is started, subject to Engineer's approval.

3.1.4 Portland cement shall be Type II unless otherwise specified and shall conform to the requirements of Portland cement in this Section.

3.1.5 Coarse aggregate shall be sieve size No. 57 for all thin closely reinforced concrete work such as floors and roofs less than seven (7) inches thick, walls less than nine (9) inches thick, all beams, girders, struts and columns. For all other concrete work aggregate size No. 467 shall be used unless otherwise specified. Coarse aggregate shall conform to the requirements of coarse aggregate in this Section.

3.1.6 The same source of aggregates shall be used for all faces of concrete structure exposed to view.

3.1.7 Admixture shall be added to the concrete mix if required by the Engineer and shall be considered as part of the solid volume of concrete. Air Entrainment admixtures shall be added within the limits specified in this Section.

3.2 <u>Slump</u>

3.2.1 Water shall be added in amounts that are required to obtain the slump specified. Slump shall be determined in accordance with the Standard Method of Slump Test for Consistency of Portland Cement ASTM C143.

3.2.2 Maximum slump shall be three (3) inches. The specified slump shall be uniformly maintained throughout the placement.

3.2.3 The Contractor shall be responsible for the production of concrete having the slump specified. A tolerance of one-half (½) inch above or below the slump specified will be

permitted. Concrete failing to conform to the slump requirements will be rejected for use in the Work.

3.3 Tests

3.3.1 The Contractor shall make test specimens of all concrete at intervals during the progress of the work in accordance with the "Standard Method of Making and Storing Specimens of Concrete in the Field" of the ASTM C31.

3.3.2 Concrete strength will be considered satisfactory if each set of cylinders tested meets the following requirements for the 28 days specified strength:

- The average strength of the concrete cylinders from the same set equals or exceeds the specified strength; and
- No individual concrete cylinder tested falls below the specified strength by more than 500 psi.

Should the requirements as stated above not be met, it shall be sufficient reason to order the removal of the Work which it represents and its replacement with satisfactory concrete, at no cost to NYSEG.

3.3.3 The Contractor shall provide the necessary labor and facilities (laborer, wheel barrow, shovel, wash water, etc.) to make the cylinders for testing.

3.3.4 It shall be the Contractor's responsibility to protect cylinders under the following curing conditions while in the field. Molds shall be placed on a rigid horizontal surface free from vibration and other disturbances. They shall be stored under conditions that maintain the temperature immediately adjacent to the specimens in the range of 60 degrees Fahrenheit to 80 degrees F. and prevent loss of moisture from the specimens. Specimens shall not be stored for the first 24 hours in contact with wet sand or wet burlap or under any conditions that will allow the mold to absorb water. Molds can be covered with a layer of polyethylene sheeting and then wet burlap placed over them.

3.3.5 The number of cylinders to be made shall be in accordance with the following table:

Total Cubic Yards of Concrete (each class) Placed During One Day	**Minimum No. of Cylinders**
Up to 100	3 for each 50 cubic yds. or fractional part
100 – 500	3 for each additional 100 cubic yds or fractional part *
Over 500	3 for each additional 200 cubic yds or fractional part *

** These are accumulative cylinders*

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Cylinders shall be picked up by the Contractor 24 hours after being made and transported to testing agency for compressive tests.

3.3.6 Except as otherwise specified, methods of test shall be as prescribed in the following requirements of the American Society for Testing Materials

Procedure	ASTM
Making and Curing Concrete Compression Test Specimens in the Field	C31
Sampling Fresh Concrete	C172
Compressive Strength of Molded Concrete Cylinders	C39

3.3.7 One cylinder of each set of three cylinders shall be tested after seven (7) days and the remainder after 28 days. The strength requirements for the seven (7) and 28 day tests are listed in the following table:

7-Day Test	28-Day Test
2,600 psi	4,000 psi

Based on tests of cylinders that have been moist cured in a laboratory. The 7-day tests are only made as an indication of the 28-day strength.

3.4. Forms

3.4.1 Set forms to the indicated alignment, grade and dimensions. Hold forms rigidly in place by a minimum of three (3) stakes per form place at intervals not to exceed four (4) feet. Corners, deep sections, and radius bends shall have additional stakes and braces, as required. Clamps, spreaders, and braces shall be used where required to ensure rigidity in the forms. Forms shall be removed without injuring the concrete. Bars or heavy tools shall not be used against the concrete in removing the forms. Any concrete found defective after form removal shall be promptly and satisfactorily repaired. Forms shall be cleaned and coated with form oil each time before concrete is placed. Wood forms may, instead, be thoroughly wetted with water before concrete is placed, except that with probable freezing temperatures, oiling is mandatory.

3.4.2 Sidewalks: Set forms for sidewalks with the upper edge true to line and grade with an allowable tolerance of 1/8 inch in any 10-foot long section. After forms are set, grade and alignment shall be checked with a 10-foot straightedge. Forms shall have a transverse slope 1/4 inch per foot with the low side adjacent to the roadway. Side forms shall not be removed for 12 hours after finishing has been completed.

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3.4.3 Cast In Place Concrete Curb: All forms shall be set true to line and grade and held rigidly in position. They shall be either of metal or of acceptable planned and matched lumber, and shall be of such construction as to allow for inspection for grade and alignment and that will produce a smooth surface on the finished curb.

The concrete shall be compacted by means of an approved immersion type, mechanical vibrator of a size and weight sufficient to vibrate the entire concrete mass thoroughly without damaging or misaligning the forms. The vibrator shall be introduced into the concrete at one-foot intervals for a period not to exceed two (2) seconds for each immersion. When directed the concrete shall be compacted by working or spading by hand along the faces of the rear and front forms or pavement edge for the full depth. All compacting shall be performed while the concrete is in a plastic state and shall be to such extent as will secure a dense mass with even and uniform surfaces free from aggregate pockets or honeycomb.

The back forms shall be left in place at least 24 hours or until the concrete has set sufficiently so that, in the judgment of the Engineer, they can be removed without injury to the curb. After the concrete has attained its initial set, the face forms shall be removed and the exposed faces of the curb shall be immediately tooled, rubbed down and finished to a smooth, true and uniform surface as directed but no plastering will be permitted. For this work, only skilled finishers shall be employed. All joints shall be retooled for the full depth subsequent to the completion of the facing work.

The Contractor shall protect the curb; keep it in true alignment and first class condition until the completion of the Contract. Any curb which is damaged at any time previously to the final acceptance of the Work or which is unsatisfactory shall be removed and replaced with acceptable curb at the Contractor's own expense.

3.4.4 Machine formed Concrete Curb: The equipment proposed for use by the Contractor shall demonstrate, to the satisfaction of the Engineer, the capability of placing the concrete in accordance with these Specifications.

Any curb placed outside the tolerance of ½ inch wide of the established line or ¼ inch of the established grade shall be removed and replaced by the Contractor at no additional expense to NYSEG.

3.5 Concrete Placement

3.5.1 Weather Limitations

3.5.1.1 Concrete shall be placed only when the air temperature is 40 degrees Fahrenheit and rising, or warmer, and when the temperature of surface of the ground or base is also at least 40 degrees F. Paving shall be discontinued when a falling air temperature reaches 40 degrees F. Air temperatures are to be measured in the shade; ground temperature shall be taken just below the surface. Materials containing frost shall not be used.

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3.5.1.2 When concrete is being placed during cold weather and the air temperature may be expected to drop below 35 degrees Fahrenheit, a sufficient supply of straw, hay or other approved blanketing material shall be provided along the Work and when ordered by the Engineer. The material so provided shall be spread over the pavement to a depth sufficient to prevent freezing of the concrete, and it shall be maintained as directed by the Engineer.

3.5.1.3 Any concrete laid during cold weather is done at the Contractor's risk and sections of concrete that are damaged, in the judgment of the Engineer, shall be removed and replaced by the Contractor at no additional cost to NYSEG.

3.5.2 Placing Concrete

3.5.2.1 Before any concrete is placed, each section of the subgrade shall be checked with a standard subgrade tester and any defects shall be remedied as directed and approved by the Engineer. This operation shall be continued as the work progresses. A standard subgrade tester shall be kept in place on the forms at the discharge end of the mixer at all times.

3.5.2.2 If the subgrade is dry, it shall be sprinkled with as much water as will be absorbed readily. When the subgrade contains loose dust, it shall be thoroughly wet down on the day or night preceding the laying of the concrete in order to permit the preparation of a uniform, moist and compacted subgrade.

3.5.2.3 During placing of concrete, a roller weighing not less than five (5) tons shall be maintained in readiness to reroll the fine grade where the surface has for any reason become uneven or defective.

3.5.2.4 Place concrete in the forms in one layer. When consolidated and finished, the sidewalks shall be of the thickness indicated. After concrete has been placed in the forms, a strike-off guided by side forms shall be used to bring the surface to proper section to be compacted. The concrete shall be consolidated with an approved vibrator, and the surface shall be finished to grade with a strike off.

3.5.2.5 After straight edging, when most of the water sheen has disappeared, and just before the concrete hardens, finish the surface with a wood float or darby to a smooth and uniformly fine granular or sandy texture free of waves, irregularities, or tool marks. A scored surface shall be produced by brooming with a fiber-bristle brush in a direction transverse to that of the traffic, followed by edging.

3.5.2.6 All slab edges, including those at formed joints, shall be finished with an edger having a radius of 1/8 inch. Transverse joints shall be edged before brooming, and the brooming shall eliminate the flat surface left by the surface face of the edger. Corners and edges which have crumbled and areas which

lack sufficient mortar for proper finishing shall be cleaned and filled solidly with a properly proportioned mortar mixture and then finished.

3.5.2.7 Finished surfaces shall not vary more than 5/16 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch.

3.5.3 Sidewalk Joints: Sidewalk joints shall be constructed to divide the surface into rectangular areas. Transverse contraction joints shall be spaced at a distance equal to the sidewalk width or 5 feet on centers, whichever is less, and shall be continuous across the slab. Longitudinal contraction joints shall be constructed along the centerline of all sidewalks 10 feet or more in width. Transverse expansion joints shall be installed at sidewalk returns and opposite expansion joints in adjoining curbs. Where the sidewalk is not in contact with the curb, transverse expansion joints shall be installed as indicated. Expansion joints shall be formed about structures and features which project through or into the sidewalk pavement, using joint filler of the type, thickness, and width indicated. Expansion joints are not required between sidewalks and curb that abut the sidewalk longitudinally.

3.5.3.1 Sidewalk Contraction Joints: The contraction joints shall be formed in the fresh concrete by cutting a groove in the top portion of the slab to a depth of at least one-fourth of the sidewalk slab thickness, using a jointer to cut the groove, or by sawing a groove in the hardened concrete with a power-driven saw, unless otherwise approved. Sawed joints shall be constructed by sawing a groove in the concrete with a 1/8 inch blade to the depth indicated. An ample supply of saw blades shall be available on the job before concrete placement is started, and at least one standby sawing unit in good working order shall be available at the job site at all times during the sawing operations.

3.5.3.2 Sidewalk Expansion Joints: Expansion joints shall be formed with 1/2 inch joint filler strips. Joint filler in expansion joints surrounding structures and features within the sidewalk may consist of preformed filler material conforming to ASTM D 1752 or building paper. Joint filler shall be held in place with steel pins or other devices to prevent warping of the filler during floating and finishing. Immediately after finishing operations are completed, joint edges shall be rounded with an edging tool having a radius of 1/8 inch, and concrete over the joint filler shall be removed. At the end of the curing period, expansion joints shall be cleaned and filled with cold-applied joint sealant. Joint sealant shall be gray or stone in color. The joint opening shall be thoroughly cleaned before the sealing material is placed. Sealing material shall not be spilled on exposed surfaces of the concrete. Concrete at the joint shall be surface dry and atmospheric and concrete temperatures shall be above 10 degrees C, 50 degrees F, at the time of application of joint sealing material. Excess material on exposed surfaces of the concrete shall be removed immediately and concrete surfaces cleaned.

SECTION 03010
CAST-IN-PLACE CONCRETE

3.5.4 Curb Joints

3.5.4.1 Cast-In-Place Curb: The concrete curb shall be cast in place in sections approximately 20 feet long and provisions made at each joint for expansion of ¼ inch. Where joint supports are used between curb and reinforced concrete pavement or concrete foundation course, construction joints shall be located at approximately 20 foot intervals and/or opposite each joint in the pavement. Expansion joints ¾ inch in thickness shall be located opposite each pavement expansion joint. Expansion joints ½ inch in thickness shall be installed in the curb at the beginning and end of all curb returns, all sharp curves, at each side of drainage structures or castings, at each side of driveway curb cuts and between curb and sidewalk or other abutting structures.

Expansion joint filler shall be premolded bituminous material conforming to M32. It shall be cut to fit the cross-section of the curb and shall be accurately installed and firmly secured in position.

3.5.4.2 Machine Formed Curb: Crack control joints shall be formed or saw cut to a width of 1/8 inch minimum, ¼ inch maximum and to a depth of 1 ½ inch. The cut or formed joints shall extend slightly below the surface of the adjacent pavement and shall be spaced at 1/8 inch intervals. When the curb, and curb & gutter is constructed next to concrete pavement, the curb and curb & gutter joints shall line up with the pavement joints or additional joints shall be provided in the curb and curb & gutter which line up with the pavement joints. The saw cut or formed joints shall be left unfilled.

Expansion Joints shall be $^{11}/_{16}$ inch wide and contain Premolded Resilient Joint Filler which conforms to ASTMD 1751. The filler shall be located at all immovable object, adjacent to expansion joints in the pavement, where shown on the project details or directed by the Engineer. Expansion joints shall not be required at regular intervals unless otherwise shown on the Drawings.

3.5.5 Protection of Concrete

3.5.5.1 During threatening weather, unhardened concrete shall be protected from rain and flowing water immediately following finishing.

3.5.5.2 Traffic shall be directed away from the concrete by the erection and maintenance of substantial barricades for the entire period during which the pavement is to remain closed to traffic. Traffic cones, barrels or other obstructions shall be placed at proper intervals so that traffic cannot enter onto the pavement.

SECTION 03010
CAST-IN-PLACE CONCRETE

3.5.6 Curing of Concrete

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3.5.6.1 Protect concrete against loss of moisture and rapid temperature changes for at least seven (7) days from the beginning of the curing operation. All equipment needed for adequate curing and protection of the concrete shall be on hand and ready for use before actual concrete placement begins. Protection shall be provided as necessary to prevent cracking of the pavement due to temperature changes during the curing period.

3.5.6.2 Mat Method: The entire exposed surface shall be covered with two (2) or more layers of burlap. Mats shall overlap each other at least six (6) inches. The mat shall be thoroughly wetted with water prior to placing on concrete surface and shall be kept continuously in a saturated condition and in intimate contact with concrete for not less than seven (7) days.

3.5.6.3 Impervious Sheeting Method: The entire exposed surface shall be wetted with a fine spray of water and then covered with impervious sheeting material. Sheets shall be laid directly on the concrete surface with the light-colored side up and overlapped 12 inches when a continuous sheet is not used. The curing medium shall not be less than 18 inches wider than the concrete surface to be cured, and shall be securely weighted down by heavy wood planks, or a bank of moist earth placed along edges and laps in the sheets. Sheets shall be satisfactorily repaired or replaced if torn or otherwise damaged during curing. The curing medium shall remain on the concrete surface to be cured for not less than seven (7) days.

3.5.6.4 Membrane Curing Method: A uniform coating of white-pigmented membrane-curing compound shall be applied to the entire exposed surface of the concrete as soon after finishing as the free water has disappeared from the finished surface. Formed surfaces shall be coated immediately after the forms are removed and in no case longer than one (1) hour after the removal of forms. Concrete shall not be allowed to dry before the application of the membrane. If any drying has occurred, the surface of the concrete shall be moistened with a fine spray of water and the curing compound applied as soon as the free water disappears. Curing compound shall be applied in two coats by hand-operated pressure sprayers at a coverage of approximately 200 square feet/gallon for the total of both coats. The second coat shall be applied in a direction approximately at right angles to the direction of application of the first coat. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel and shall be free from pinholes or other imperfections. If pinholes, abrasion, or other discontinuities exist, an additional coat shall be applied to the affected areas within 30 minutes. Concrete surfaces that are subjected to heavy rainfall within three (3) hours after the curing compound has been applied shall be resprayed by the method and at the coverage specified above. Areas where the curing compound is damaged by subsequent construction operations within the curing period shall be resprayed. Necessary precautions shall be taken to insure that the concrete is properly cured at sawed

joints, and that no curing compound enters the joints. The top of the joint opening and the joint groove at exposed edges shall be tightly sealed before the concrete in the region of the joint is resprayed with curing compound. The method used for sealing the joint groove shall prevent loss of moisture from the joint during the entire specified curing period. Approved standby facilities for curing concrete pavement shall be provided at a location accessible to the job site for use in the event of mechanical failure of the spraying equipment or other conditions that might prevent correct application of the membrane-curing compound at the proper time. Concrete surfaces to which membrane-curing compounds have been applied shall be adequately protected during the entire curing period from pedestrian and vehicular traffic, except as required for joint-sawing operations and surface tests, and from any other possible damage to the continuity of the membrane.

3.6 Backfilling

3.6.1 After curing, debris shall be removed and the area adjoining the concrete shall be backfilled, graded, and compacted to conform to the surrounding area in accordance with lines and grades shown on the Drawings.

3.7 Protection

3.7.1 Completed concrete shall be protected from damage until accepted. Repair damaged concrete and clean concrete discolored during construction. Concrete that is damaged shall be removed and reconstructed for the entire length between regularly scheduled joints. Refinishing the damaged portion will not be acceptable. Removed damaged portions shall be disposed of as directed.

3.8 Protective Coating

3.8.1 General: Protective coating, of linseed oil mixture, shall be applied to the exposed-to-view concrete surface after the curing period, if concrete will be exposed to de-icing chemicals within six (6) weeks after placement. Concrete to receive a protective coating shall be moist cured.

3.8.2 Application: Curing and backfilling operation shall be completed prior to applying two coats of protective coating. Concrete shall be surface dry and clean before each application. Coverage shall be by spray application at not more than 50 square yards/gallon for first application and not more than 70 square yards/gallon for second application, except that the number of applications and coverage for each application for commercially prepared mixture shall be in accordance with the manufacturer's instructions. Coated surfaces shall be protected from vehicular and pedestrian traffic until dry.

SECTION 03010
CAST-IN-PLACE CONCRETE

3.8.3 Precautions: Protective coating shall not be heated by direct application of flame or electrical heaters and shall be protected from exposure to open flame, sparks, and fire adjacent to open containers or applicators. Material shall not be applied at ambient or material temperatures lower than 50 degrees F.

3.9 Surface Deficiencies and Corrections

3.9.1 Thickness Deficiency: When measurements indicate that the complete concrete section is deficient in thickness by more than ¼ inch, the deficient section shall be removed, between regularly scheduled joints, and replaced.

3.9.2 High Areas: In areas not meeting surface smoothness and plan grade requirements, high areas shall be reduced either by rubbing the freshly finished concrete with carborundum brick and water when the concrete is less than 36 hours old or by grinding the hardened concrete with an approved surface grinding machine after the concrete is 36 hours old or more. The area corrected by grinding the surface of the hardened concrete shall not exceed five (5) percent of the area of any integral slab, and the depth of grinding shall not exceed ¼ inch. Pavement areas requiring grade or surface smoothness corrections in excess of the limits specified above shall be removed and replaced.

3.9.3 Appearance: Exposed surfaces of the finished work will be inspected by the Engineer and any deficiencies in appearance will be identified. Areas which exhibit excessive cracking, discoloration, form marks, or tool marks or which are otherwise inconsistent with the overall appearances of the Work shall be removed and replaced.

END OF SECTION

SECTION 03210
STEEL REINFORCEMENT

PART 1 - GENERAL

1.1 Summary

1.1.1 This section includes the provision for furnishing and installing welded steel wire fabric (mesh) to be embedded in concrete.

1.2 Delivery and Storage

1.2.1 All mesh shall be properly stored, at least 12 inches off the ground, kept clean, and protected from the weather as directed by the Engineer.

PART 2 - MATERIALS

2.1 Welded Wire Fabric (Mesh)

2.1.1 Welded steel wire fabric shall be 6 x 6 – W1.4/W1.4 and shall meet the requirements of ASTM A185. Cold drawn steel wire shall meet the requirements of ASTM A82.

PART 3 - EXECUTION

3.1 Installation

3.1.1 All reinforcement mesh shall be placed in the positions shown or required to fit the Work. Suitable spacing chairs or supports shall be furnished and placed where required. The concrete covering shall be as shown, specified, or ordered.

3.1.2 No concrete shall be deposited until the placing of the reinforcing wire has been inspected and approved.

3.1.3 Splices: Welded wire mesh shall have a minimum lap of eight (8) inches. Welding of reinforcing steel will not be permitted unless authorized by the Engineer.

END OF SECTION

SECTION 09963
PAVEMENT MARKINGS AND PAINT

PART 1 - GENERAL

1.1 Summary

1.1.1 If included in the Design, the Contractor shall mark, paint and stripe the pavement areas in accordance with the dimensions and lines as shown on the drawings, as specified and/or as directed by the Engineer.

1.1.2 This includes blacking out with a pavement marking paint existing markings that are to be modified, and the layout of all proposed markings. The Contractor shall lay out pavement markings with spray paint, after the parking lot has been surfaced. This paint shall be Fox Valley Super Stripe, or approved equal, "Traffic Paint". All layouts by the Contractor shall be done in white spray paint; no yellow is allowed.

PART 2 - MATERIALS

2.1 Materials

2.1.1 All permanent pavement markings paint shall be "Road-Plex" Traffic Coatings as manufactured by Con-Lux Coating, Inc. or approved equal.

2.1.2 Sufficient traffic cones or other barriers shall be provided to protect the painted areas. All areas determined unsatisfactory by the Engineer shall be re-performed until satisfactory. Unsatisfactory painted areas shall include, but not be limited to, those that are smeared, meandering and soiled areas.

2.1.3 The following requirements shall be implemented:

- The painted stall lines shall be white and four (4) inches in width; and
- Surfaces to be painted shall be dry, clean, free of loose paint, dirt, oil, gravel, grease, and other foreign matter. The temperatures shall be above 50 degrees F and the humidity shall be below 75 degree F.

2.2 Performance Requirements

2.2.1 Reflectance: The daylight directional reflectance of the white paint shall not be less than 80% when tested in accordance with Federal Test Method Standard 141B.

2.2.2 Flexibility: Will not crack, chip, or flake when applied on a metal panel and bent 180 degrees over a 1/8 inch mandrel.

2.2.3 Bleeding: The paint shall have a minimum bleeding ratio of 0.97 when tested in accordance with Federal Specification TT-P-1952b, Section 4.3.11. The asphalt saturated felt shall conform to Federal Specification HH-R-590.

SECTION 09963
PAVEMENT MARKINGS AND PAINT

2.2.4 Field Application and Storage: The paint shall dry to no tracking condition under traffic within 45 minutes maximum when applied at 15 mils ± 1 mil wet film thickness depending on temperature and humidity.

2.2.5 Dilution Test: The paint shall be capable of dilution with water at all levels without curdling or precipitation such that the wet paint can be readily cleaned up with water only.

2.2.6 Volatile Organic Compounds (VOC): 0.5 pounds per gallon (90 grams per liter) maximum.

2.2.7 Water Resistance: The paint shall be weather and traffic resistant; it shall not blister or lose its adhesion, or soften or deteriorate after examination.

2.2.8 Wet Adhesion: Over 5,000 cycles when tested in accordance with Federal Specification TT-P-1511A, Paragraph 4.3.9.2.

2.2.9 Abrasion Resistance: ASTM D 968 – Method A – Falling Sand Abrasion; shall pass 125 liters of sand to remove 4 mil dry film.

2.2.10 Surface Application: The binder shall be satisfactorily applied so as to deposit a wet film thickness of 14-16 mils, equivalent to 300-345 lineal feet of 4-inch line per gallon.

2.2.11 Composition – White:

- Pigment 41-43% composed of Titanium Dioxide 29-31%, selected extenders 69-71%. (Minimum 1.5 lbs of Titanium Dioxide per gallon);
- Vehicle – Acrylic Emulsion of 32-34%, water 66-68%;
- Viscosity – 75-85 Kregs Unit;
- Weight/Gallon – 12.0 pounds ±0.2 pounds/gallon; and
- Fineness of Grind 2-3 minimum Hegman.

PART 3- EXECUTION

3.1 Cleaning

3.1.1 Before applying coatings or other surface treatments, clean substrates of substances that could impair bond of coating systems.

3.1.2 Schedule cleaning and coating application so dust and other contaminants from cleaning process will not fall on wet, newly coated surfaces.

END OF SECTION

SECTION 10436
POST AND PANEL SIGNS

PART 1 - GENERAL

1.1 Summary

1.1.1 If included in the Design, establish the minimum requirement to furnish and install post mounted signs as per the National Manual of Uniform Traffic Control Devices and New York State Supplement or as shown on the Drawings.

1.1.2 If included in the Design, the Contractor will install two signs on the Site indicating any restrictions on parking and green space use. The wording of the signs shall be as indicated on the Drawings.

PART 2 – MATERIALS

2.1 Signs

2.1.1 Materials

2.1.1.1 Two signs shall be U.V. screen-printed on 0.080" (2mm) thick heavy-duty baked aluminum.

2.1.1.2 The size and wording of the signs is as indicated on the Drawings.

2.1.1.3 Eight foot galvanized posts, 3 ½ inches x 5/16 inch plated bolts, nuts and washers.

2.1.2 The Contractor shall not place signposts directly over any existing underground utility lines. The Contractor shall drive a sign (channel) post 30 inches into the ground. The post is to be placed outside any sidewalk areas and 36 inches from the face of the concrete curb to the face of the signpost. The post shall be driven plumb and a driving cap or other method will be used to prevent damage to top of channel post.

PART 3 – EXECUTION

3.1 Installation

3.1.1 Signs are to be mounted on "U" type channel galvanized posts. Posts are to be 3 ½ inches wide and 2 ½ lbs/ft. Posts are to be buried a minimum of 3 feet below ground surface with a minimum ground clearance of 7 feet to the bottom edge of the sign.

3.1.2 Signs are to be mounted with hex bolts, nuts, lock washers, and nylon washers between the bolt and sign face. All fastening hardware shall be stainless steel.

END OF SECTION

REMEDIAL DESIGN

FOR

CHARLES STREET SITE

CITY OF CORTLAND, CORTLAND COUNTY, NEW YORK

PREPARED BY:

URS Corporation

77 Goodell Street, Buffalo, New York 14203
(716)856-5636 phone - (716)856-2545 fax

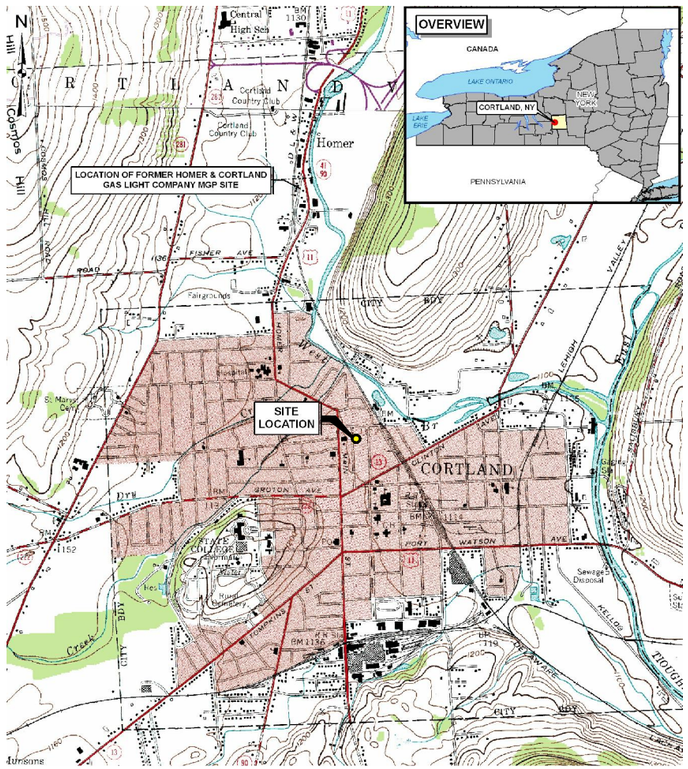
PREPARED FOR:

NEW YORK STATE ELECTRIC & GAS CORPORATION

JAMES A. CARRIGG CENTER
18 LINK DRIVE
P.O. BOX 5224
BINGHAMTON, NEW YORK 13902-5224

OCTOBER 2010

LOCATION MAP



SOURCE: USGS 7.5 Minute Quadrangles - Cortland, NY - 1955 and Homer, NY - 1988.

2,000 0 2,000 Feet

LEGEND - EXISTING

- CATCH BASIN
- CHAINLINK FENCE
- 1119 CONTOUR
- G GAS LINE
- GATE GATE
- HYDRANT
- P PROPERTY LINE
- R.O.W. RIGHT–OF–WAY
- PZ-02 PIEZOMETER
- SANITARY MANHOLE
- SAN SANITARY SEWER
- 1114.8 SPOT ELEVATION
- ST STORM SEWER
- STRUCTURE, DRIVEWAY, SIDEWALK
- PIN SURVEY CONTROL PIN
- TREE
- UP UTILITY POLE
- W WATERLINE
- WATER VALVE/CURB BOX
- WOOD FENCE
- FENCE

LEGEND - PROPOSED

- CATCH BASIN
- 1119 CONTOUR
- CONCRETE
- LIGHT POLE
- SIGN (POST MOUNTED)
- RESTORED AC PAVEMENT
- STAMPED AND COLORED CONCRETE SIDEWALK (OPTIONAL)
- CLEAN FILL LIMITS
- DEMARCATION LAYER
- TREE
- UPRIGHT CONCRETE CURB

ABBREVIATIONS

AC	ASPHALT CONCRETE
CB	CATCH BASIN
CONC	CONCRETE
ELEV	ELEVATION
FT	FEET
HSE	HOUSE
HYD	FIRE HYDRANT
INV	INVERT
MH	MANHOLE
N	NORTH
NO	NUMBER
OHW	OVERHEAD WIRE
PZ	PIEZOMETER
ROW	RIGHT–OF–WAY
S	SOUTH
SAN	SANITARY
TEL	TELEPHONE
TYP.	TYPICAL
S	SOUTH
UK	UNKNOWN
UP	UTILITY POLE
W	WEST

GENERAL NOTES

1. THE LOCATION OF UTILITIES SHOWN ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION ACTIVITIES ALL UTILITY COMPANIES SHALL BE NOTIFIED IN ORDER TO VERIFY OR AMEND THEIR LOCATIONS AND/OR EXISTENCE.
2. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR NOTIFICATION OF UTILITIES IN ACCORDANCE WITH NEW YORK STATE "DIG SAFELY" PROGRAM.
3. PROPERTY SURVEY WAS PROVIDED BY REAGAN LAND SURVEYING ON AUGUST 20, 2010. ELEVATION SURVEY PROVIDED BY NYSEG ON 5/21/2010. SURVEY CONTROL IS BASED UPON NAD 83, NYS PLANE CENTRAL, U.S.FEET VERTICAL AND NORTH AMERICAN VERTICAL DATUM (NGVD 88).
4. EXISTING GASLINE AND R.O.W. LOCATIONS PROVIDED BY NYSEG. EXISTING WATERLINE AND STORM SEWER LOCATIONS OBTAINED FROM CITY OF CORTLAND RECORD PLAN INFORMATION.
5. EXISTING CONDITIONS ON DWG–2 ARE SHOWN FULL TONE AND ARE SHOWN HALFTONE ON SUBSEQUENT DRAWINGS.

INDEX OF DRAWINGS

DRAWING NO.	DESCRIPTION
	TITLE SHEET
1	INDEX OF DRAWINGS, LOCATION MAP, LEGEND AND NOTES
2	EXISTING SITE CONDITIONS
3	SITE PREPARATION AND EXCAVATION PLAN
4	PROPOSED SITE PLAN
5	EXCAVATION CROSS SECTIONS
6	POTENTIAL DETAILS (OPTIONAL)
7	STORM SEWER PROFILE AND DETAILS
8	MISCELLANEOUS OPTIONAL DETAILS
9	COVER PLAN AND DETAILS
ATTACHMENT 1	PROPERTY SURVEY

NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

REVISIONS

DESIGNED BY: EWK
DRAWN BY: RAL
CHECKED BY: AMM
PROJ. ENGR. CWP

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JOB NO. 11176227

CHARLES STREET

CITY OF CORTLAND
CORTLAND COUNTY, NEW YORK

REMEDIAL DESIGN

INDEX OF DRAWINGS, LOCATION MAP, LEGEND AND NOTES

Scale: AS SHOWN | Date: OCT. 2010 | DWG–1

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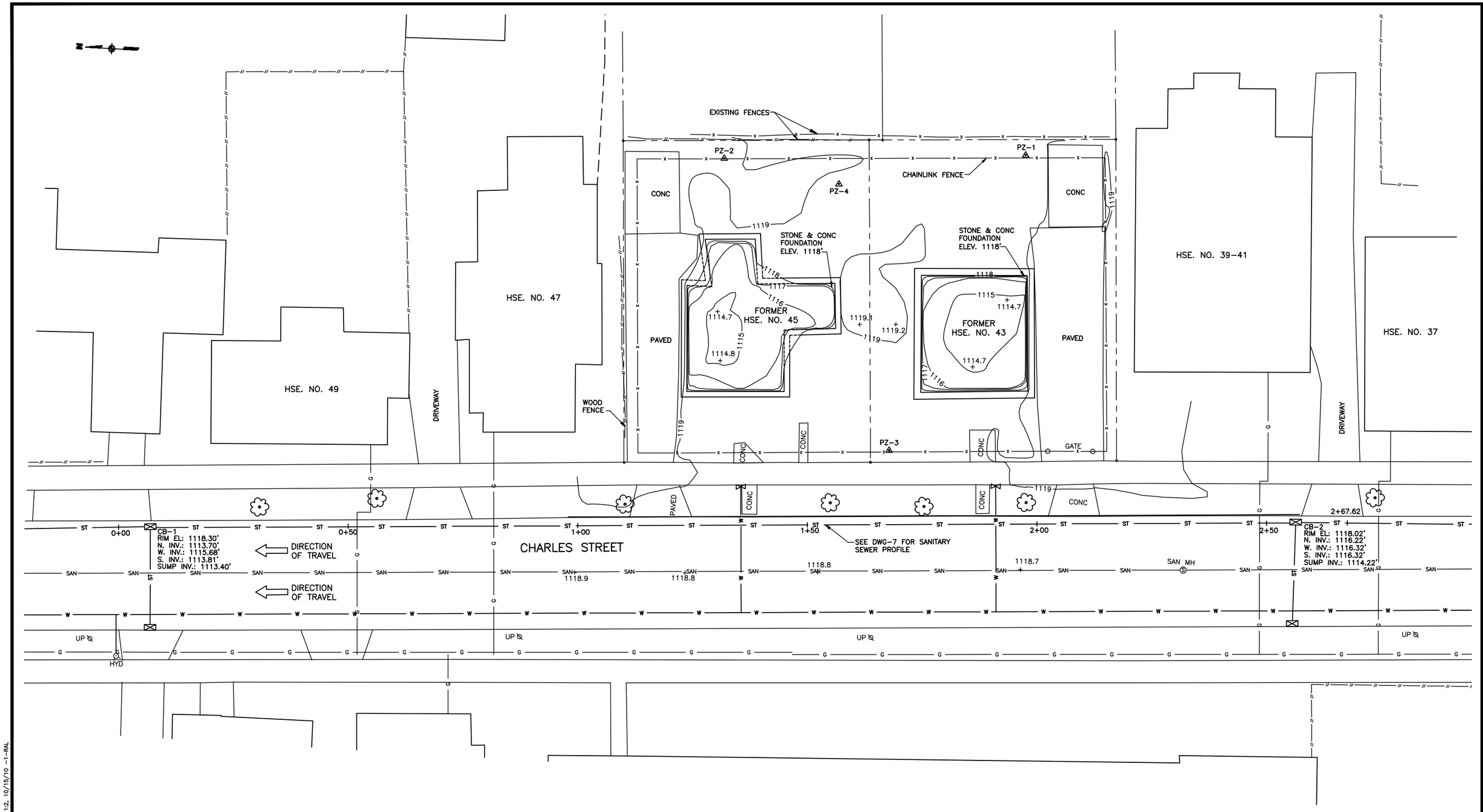

NOTE:

DATUM: NAD 83, NYS PLANE CENTRAL, US FEET
VERTICAL DATUM: NAVD 88
PROPERTY SURVEY SUPPLIED BY REAGAN LAND SURVEYING ON 8/20/2010. (ATTACHMENT 1)
ELEVATION SURVEY SUPPLIED BY NYSEG ON 5/21/2010.

10' 0 10'
SCALE IN FEET

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NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

REVISIONS

DESIGNED BY: EWK
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STATE OF NEW YORK — EDWARD W. KUSTOSKI — 091517 — LICENSED PROFESSIONAL ENGINEER

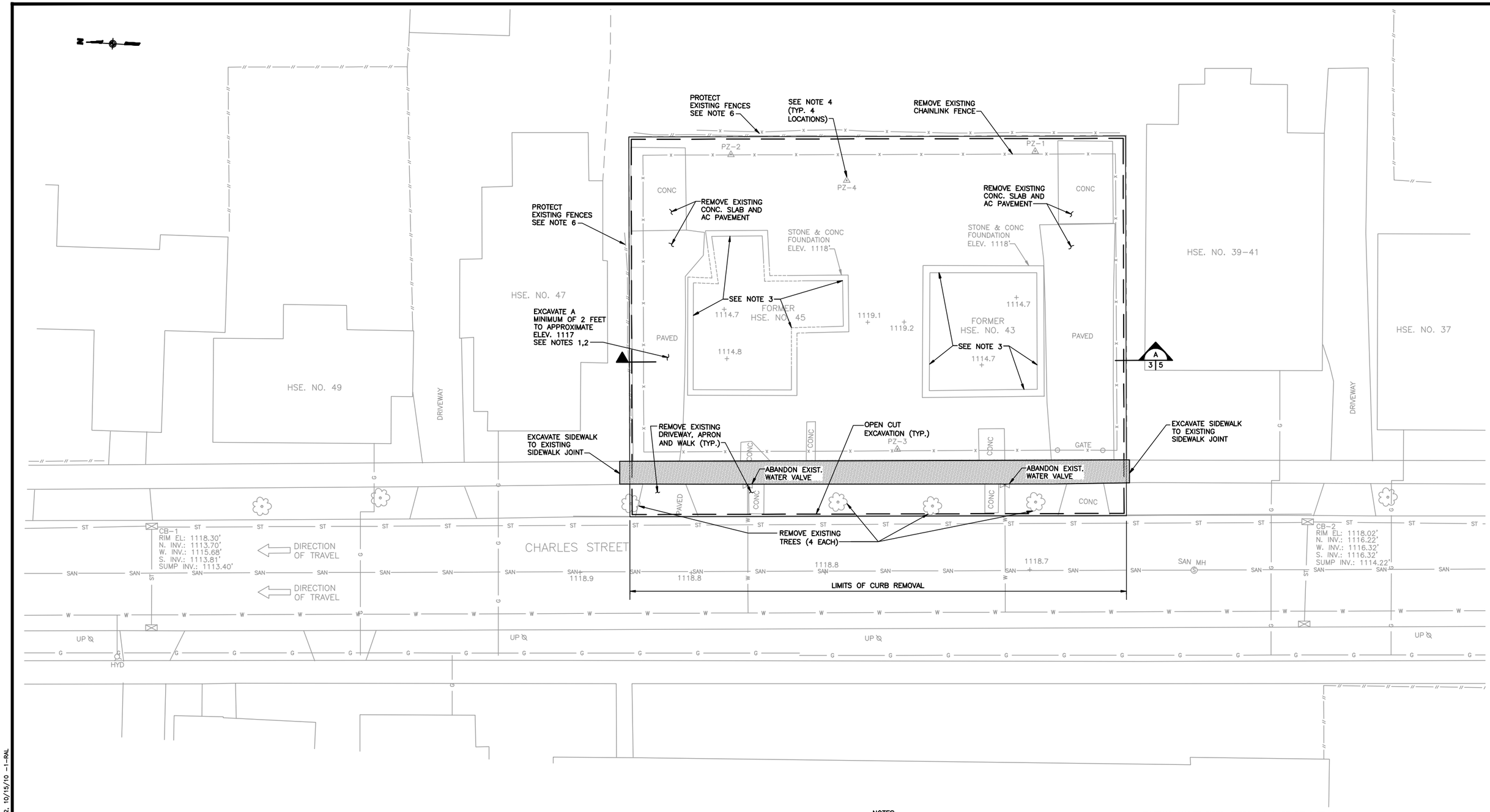
CHARLES STREET

CITY OF CORTLAND
CORTLAND COUNTY, NEW YORK

REMEDIAL DESIGN

EXISTING SITE CONDITIONS

Scale: AS SHOWN | Date: OCT. 2010 | DWG-2



LEGEND:

— — — VERTICAL EXCAVATION CUT LINE

NOTES:

1. EXCAVATION AREA INCLUDES WITHIN ENTIRE 43 AND 45 CHARLES STREET PROPERTY LINES.
2. EXCAVATED MATERIAL WILL BE TRANSPORTED OFF-SITE FOR DISPOSAL.
3. REMOVE EXISTING STONE AND CONCRETE FOUNDATIONS TO ELEVATION 1117.
4. EXISTING ONSITE PIEZOMETERS SHALL BE REMOVED IN THEIR ENTIRETY OR ABANDONED PER NYSDEC DECOMMISSIONING PROCEDURES.
5. DEMARCATION LAYER WILL BE PLACED TO THE EXTENT OF THE VERTICAL EXCAVATION CUT LINE OVER EXCAVATED AREA.
6. PROTECT EXISTING FENCES. REPLACE AS REQUIRED IN-KIND AFTER FINAL GRADING IS COMPLETE.

10' 0 10'
SCALE IN FEET

NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

REVISIONS

DESIGNED BY: EWK
DRAWN BY: RAL
CHECKED BY: AMM
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JOB NO. 11176227

CHARLES STREET

CITY OF CORTLAND
CORTLAND COUNTY, NEW YORK

REMEDIAL DESIGN

SITE PREPARATION AND EXCAVATION PLAN

Scale: AS SHOWN | Date: OCT. 2010 | DWG-3

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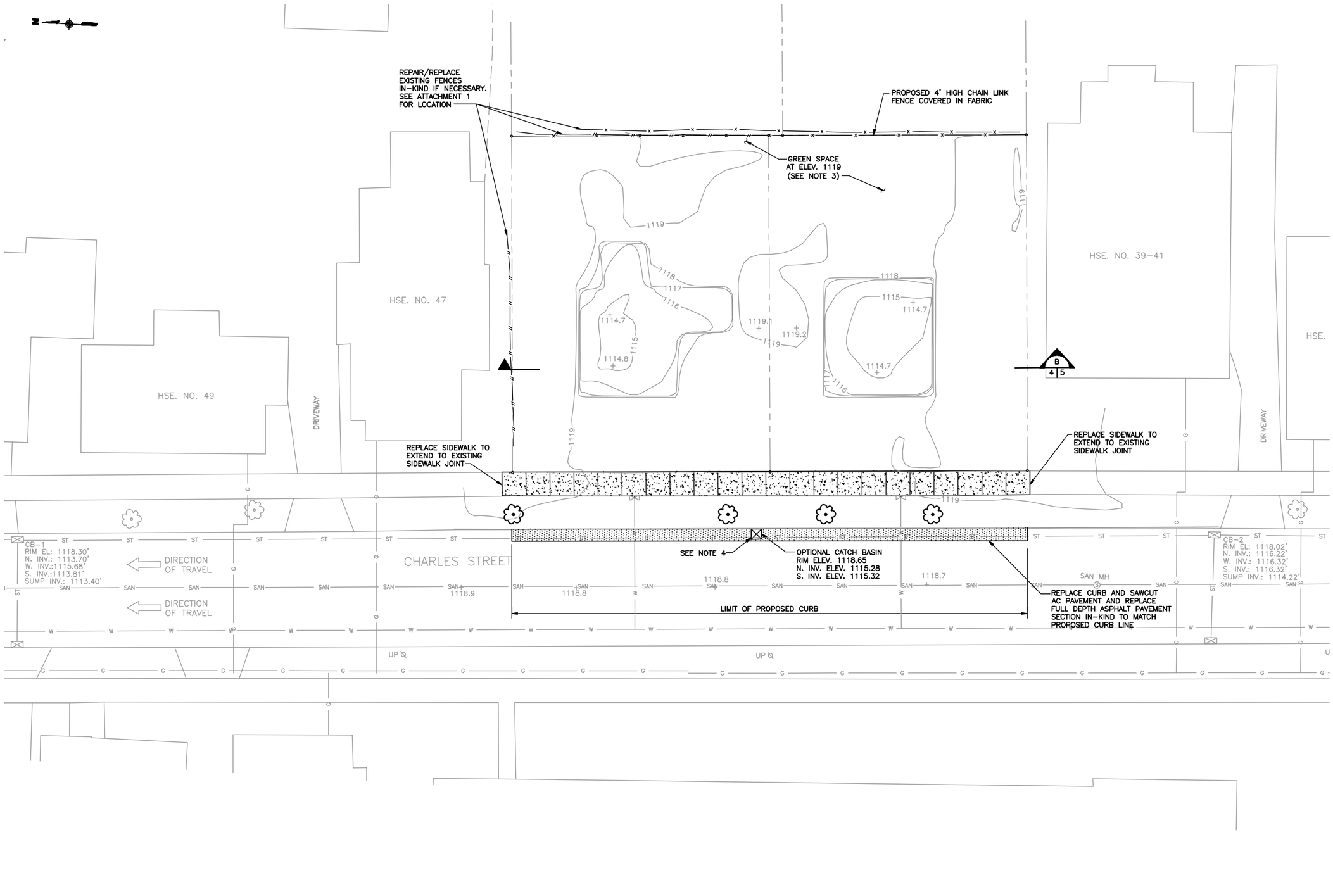

LEGEND:

- REPLACED CONCRETE SIDEWALK
- OPTIONAL CATCH BASIN
- PROPOSED TREE

NOTES:

1. INSTALL CONSTRUCTION FENCING AT SIDEWALK EXCAVATION LIMITS WITH "SIDEWALK CLOSED" SIGNS (R9-9).
2. OPEN EXCAVATION WITHIN CHARLES STREET WILL BE COVERED OVERNIGHT.
3. APPROXIMATE GROUND SURFACE ELEVATION 1119'.
4. OPTIONAL – INSTALL NEW CATCH BASIN AND RECONNECT TO EXISTING 12" CONC. STORM SEWER. SEE DWG-7 FOR DRAINAGE PROFILE AND DETAILS.

10' 0 10'
SCALE IN FEET

NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

REVISIONS

DESIGNED BY: EWK
DRAWN BY: RAL
CHECKED BY: AMM
PROJ. ENGR. CWP

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JOB NO. 11176227

CHARLES STREET
CITY OF CORTLAND
CORTLAND COUNTY, NEW YORK

REMEDIAL DESIGN

PROPOSED SITE PLAN

Scale: AS SHOWN | Date: OCT. 2010 | DWG-4

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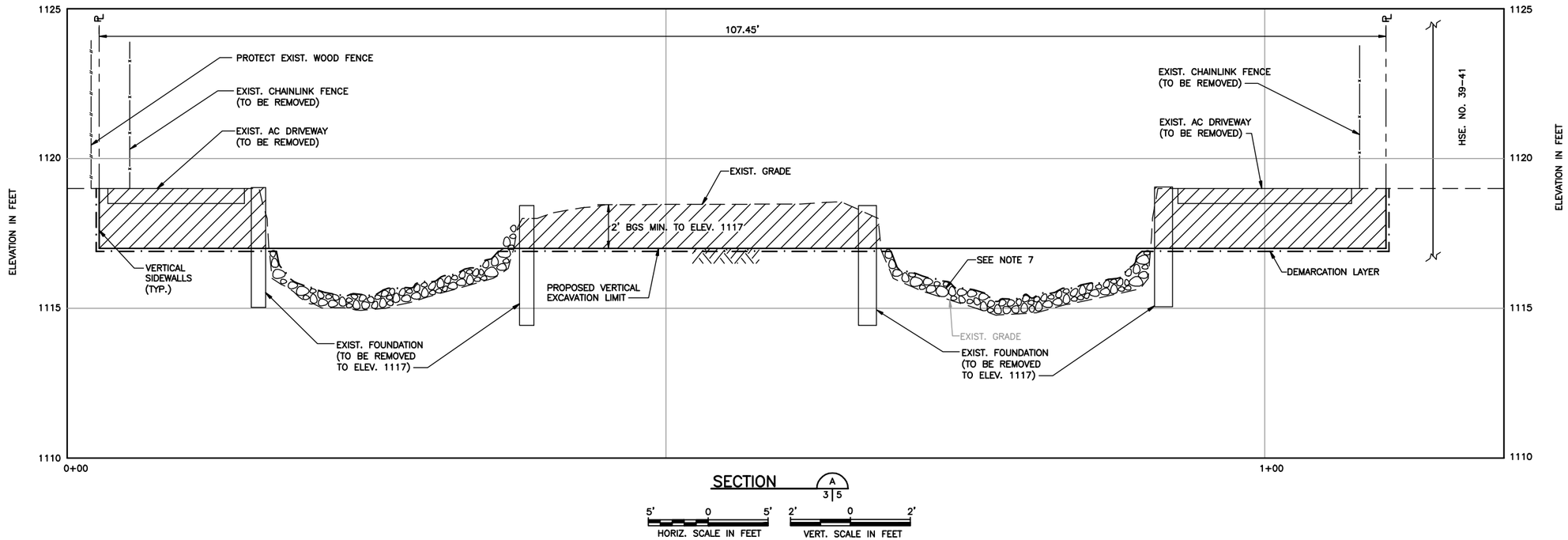
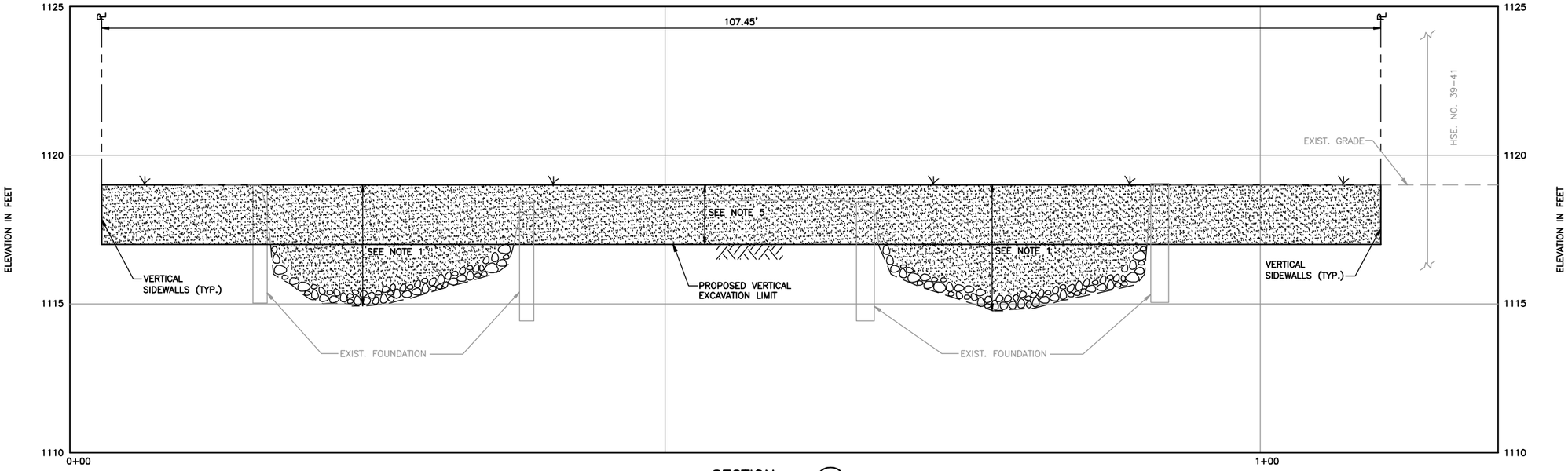


SECTION A 3|5

5' 0 5' HORIZ. SCALE IN FEET

2' 0 2' VERT. SCALE IN FEET



SECTION B 4|5

5' 0 5' HORIZ. SCALE IN FEET

2' 0 2' VERT. SCALE IN FEET

NOTES:

1. BACKFILL TO AN ELEVATION OF 1119 IN ALL AREAS.
2. SEE DWG-2 FOR EXISTING SITE CONDITIONS.
3. SEE DWG-3 FOR SITE PREPARATION AND EXCAVATION PLAN.
4. SEE DWG-4 FOR PROPOSED SITE PLAN.
5. PROVIDE A MINIMUM OF 2' OF COVER FROM PROPOSED VERTICAL EXCAVATION LIMIT TO PROPOSED FINAL GRADE IN ALL LOCATIONS.
6. SOME ITEMS NOT SHOWN FOR CLARITY.
7. BOULDERS/STONES TO BE BROKEN IN PLACE PER SPECIFICATION 0210.

LEGEND:

FILL

CUT

BOULDERS/STONES (EXISTING)

NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

REVISIONS

DESIGNED BY: EWK
DRAWN BY: RAL
CHECKED BY: AMM
PROJ. ENGR. CWP

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(716)856-5636 - (716)856-2545 fax

JOB NO. 11176227

CHARLES STREET

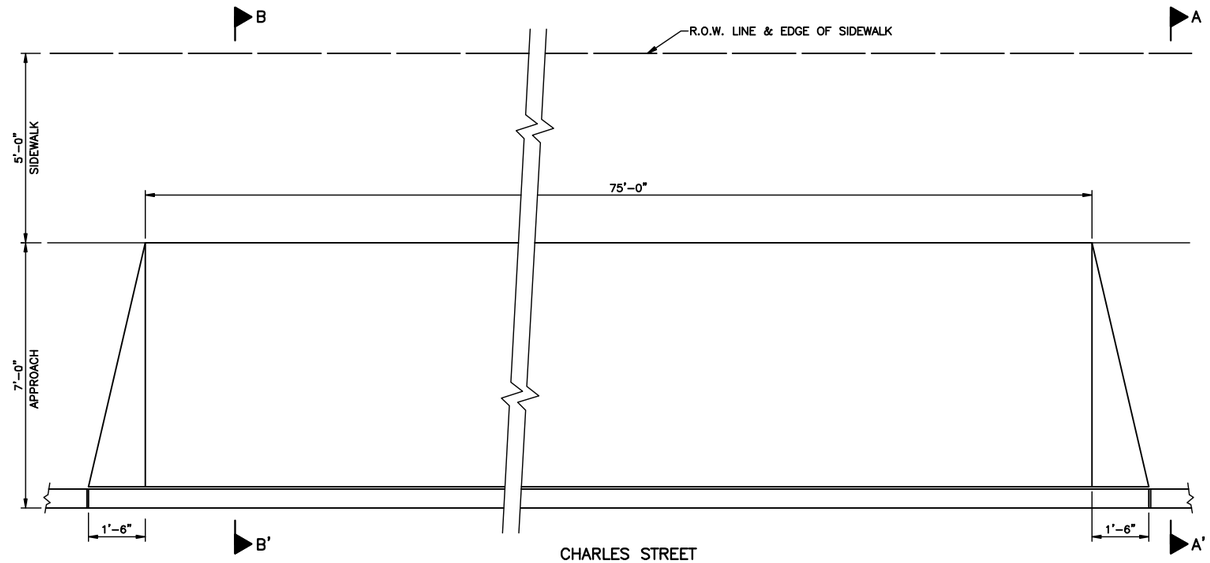
CITY OF CORTLAND
CORTLAND COUNTY, NEW YORK

REMEDIAL DESIGN

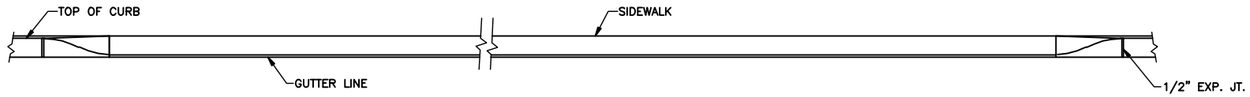
EXCAVATION CROSS SECTIONS

Scale: AS SHOWN | Date: OCT. 2010 | DWG-5

N:\11174.305.00000\CAD\FINAL\DWG-5.dwg, 1:2, 10/15/10 -1-RAL



PLAN



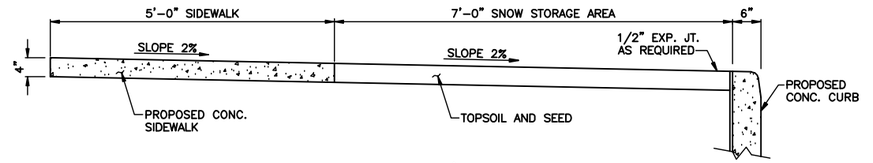
FRONT ELEVATION

PARKING LOT DRIVEWAY APPROACH DETAIL 1/4|6

NOT TO SCALE

NOTE:

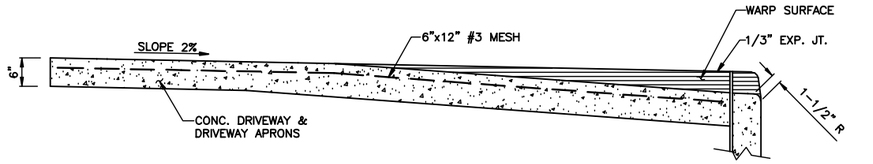
SEE SECTIONS A–A' & B–B'.



SECTION A–A'

0' 1' 2'

SCALE: 3/4"= 1'-0"



SECTION B–B'

0' 1' 2'

SCALE: 3/4"= 1'-0"

METAL REINFORCEMENT FOR CONCRETE PAVEMENT NOTES:

1. ALL MEMBERS SHALL MEET THE SPECIFICATIONS FOR SPECIFICATION SECTION 03210.
2. ALL MEMBERS OF WELDED MATS SHALL MEET THE RESPECTIVE DETAILED SPECIFICATIONS FOR STEEL FABRIC OR STEEL BARS AFTER FABRICATION.
3. ALL MEMBERS MAY BE PLAIN UNDEFORMED SECTION PROVIDING THAT THEY ARE WELDED AT ALL INTERSECTIONS.
4. END MATS MAY CONSIST OF DEFORMED MEMBERS PROVIDING THAT THEY ARE SECURELY FASTENED IN AN APPROVED MANNER AT ALL INTERSECTIONS AROUND THE OUTSIDE OF MATS AND AT EVERY ALTERNATE INTERSECTION WITHIN THE MAT.
5. ALL MATS SHALL BE OF RIGID CONSTRUCTION AND ANY MEMBERS BENT OR DISPLACED IN HANDLING SHALL BE STRAIGHTENED AND REFASTENED BEFORE PLACING.
6. ALL INTERMEDIATE MATS SHALL BE OF THE SAME LENGTH THROUGHOUT THE ENTIRE CONTRACT AND THE OVERHANG OF ANY LONGITUDINAL MEMBER SHALL NOT EXCEED SIX INCHES.
7. CONCRETE SHALL BE SCREEDED OFF A UNIFORM 2–1/2 INCHES BELOW THE FINAL FINISH SURFACE BEFORE PLACING THE REINFORCEMENT.

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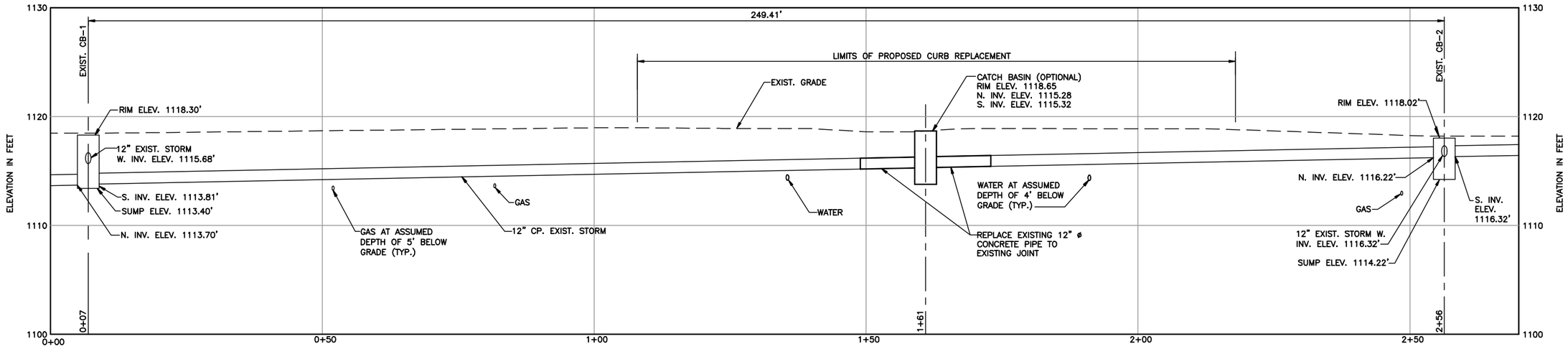
CHARLES STREET

CITY OF CORTLAND
CORTLAND COUNTY, NEW YORK

REMEDIAL DESIGN

POTENTIAL DETAILS (OPTIONAL)

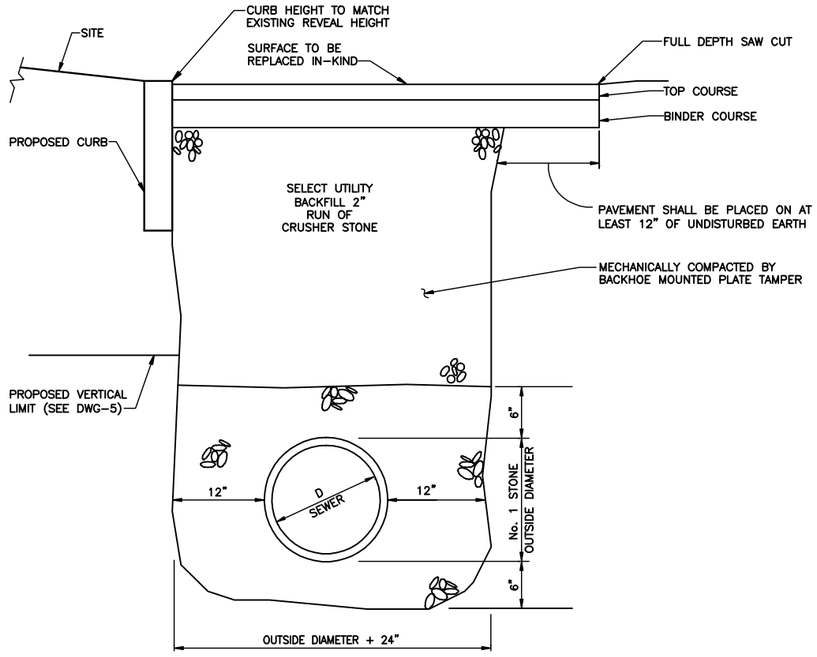
Scale: AS SHOWN | Date: OCT. 2010 | DWG–6



PROFILE

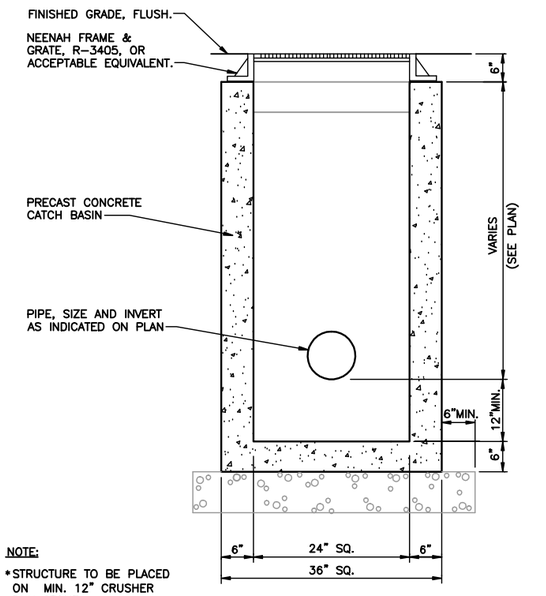
10' 0 10'
HORIZ. SCALE IN FEET

5' 0 5'
VERT. SCALE IN FEET



TYPICAL STORM SEWER TRENCH DETAIL

NOT TO SCALE



NOTE:

*STRUCTURE TO BE PLACED ON MIN. 12" CRUSHER RUN STONE.

PRECAST CATCH BASIN (OPTIONAL)

NOT TO SCALE

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CHARLES STREET

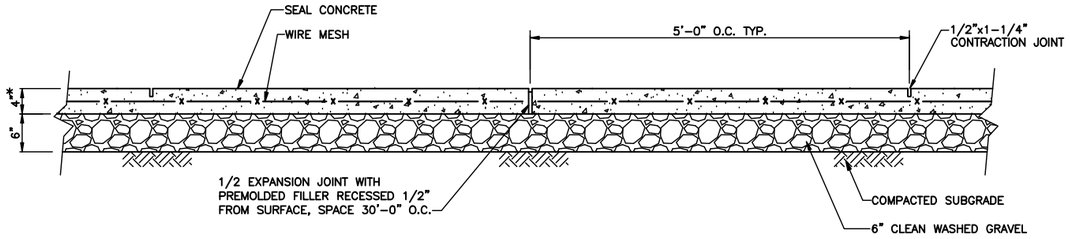
CITY OF CORTLAND
CORTLAND COUNTY, NEW YORK

REMEDIAL DESIGN

STORM SEWER PROFILE AND DETAILS

Scale: AS SHOWN | Date: OCT. 2010 | DWG-7

N:\11174305.00000\CAD\FINAL\DWG-7.dwg, 1:2, 10/15/10 -1-RAL



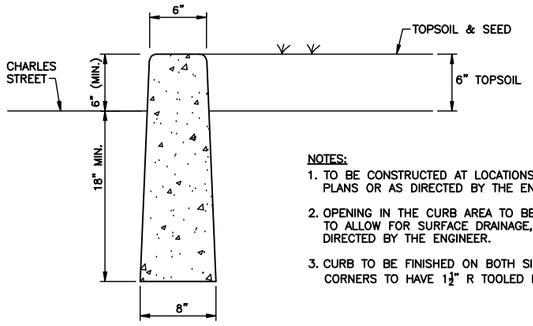
TYPICAL CONCRETE SIDEWALK SECTION

0' 1' 2'

SCALE: 1"= 1'-0"

SOURCE: 2007 CITY OF CORTLAND BEAUTIFICATION PROGRAM CONTRACTORS' SIDEWALK GUIDELINES.

* SIDEWALK SHALL BE 6" THICK WITHIN THE LIMITS OF ANY DRIVEWAY APPROACH.

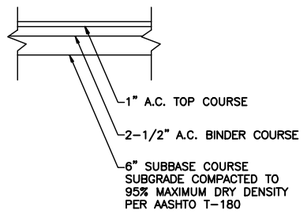


NOTES:

1. TO BE CONSTRUCTED AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.
2. OPENING IN THE CURB AREA TO BE PROVIDED TO ALLOW FOR SURFACE DRAINAGE, OR AS DIRECTED BY THE ENGINEER.
3. CURB TO BE FINISHED ON BOTH SIDES. CORNERS TO HAVE 1½" R TOOLED FINISH.

TYPICAL CURB

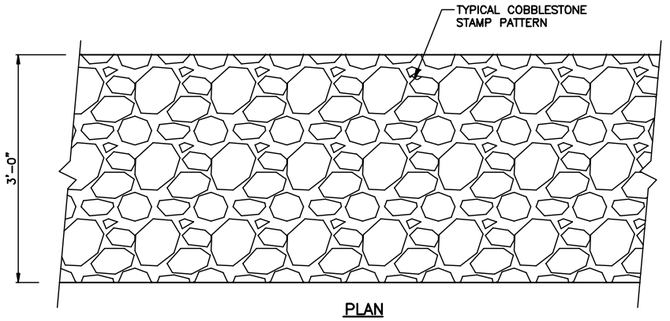
NOT TO SCALE



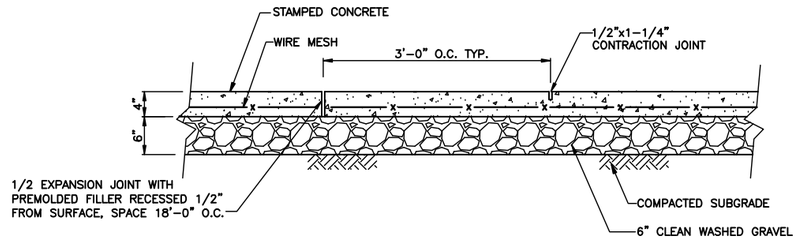
PARKING LOT PAVEMENT SECTION (OPTIONAL)

0' 1' 2'

SCALE: 3/4"= 1'-0"



PLAN

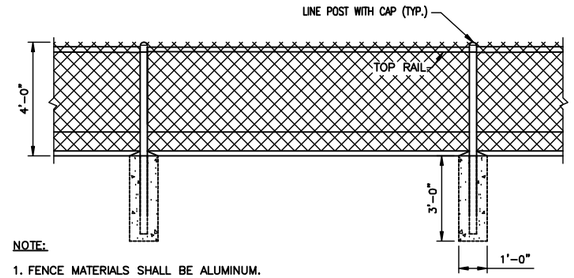


SECTION

STAMPED CONCRETE SIDEWALK DETAIL (OPTIONAL)

0' 1' 2'

SCALE: 1"= 1'-0"



NOTE:

1. FENCE MATERIALS SHALL BE ALUMINUM.

CHAINLINK FENCE

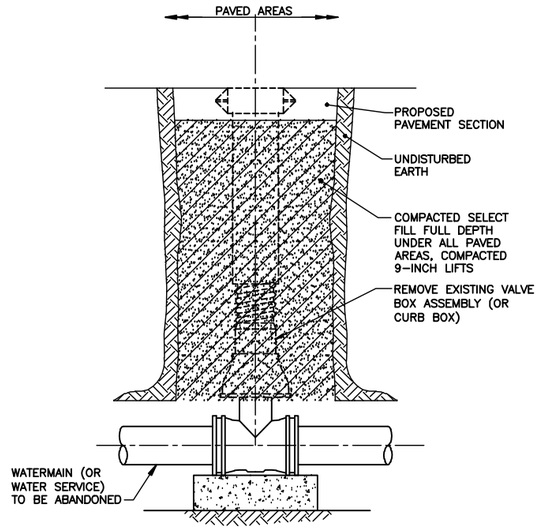
0' 3' 6'

SCALE: 3/8"= 1'-0"

LINE POSTS UNIFORM SPACING			
FENCE HEIGHT	POST DIAMETER	WEIGHT	SPACING
4'	2" O.D.	2.72 LBS/L.F.	10' O.C. MAX.

FABRIC SIZE		
FENCE HEIGHT	MESH SIZE	MESH WEIGHT
4'	2"	6 GAUGE (0.192 IN.)

ACCESSORY	ALUMINUM
FABRIC TIES FOR TOP AND BRACE	3/16" ALUMINUM WIRE AT 24" C.C. MAX.
FABRIC TIES FOR LINE POSTS	3/16" ALUMINUM WIRE AT 14" MAX. OR ½" X .06" CLIPS AT 14" MAX.
FABRIC TIES FOR TENSION WIRE	3/16" ALUMINUM WIRE AT 12"
BOTTOM TENSION WIRE	3/16" ALUMINUM WIRE



EXISTING VALVE BOX (OR CURB BOX) ABANDONMENT

NOT TO SCALE

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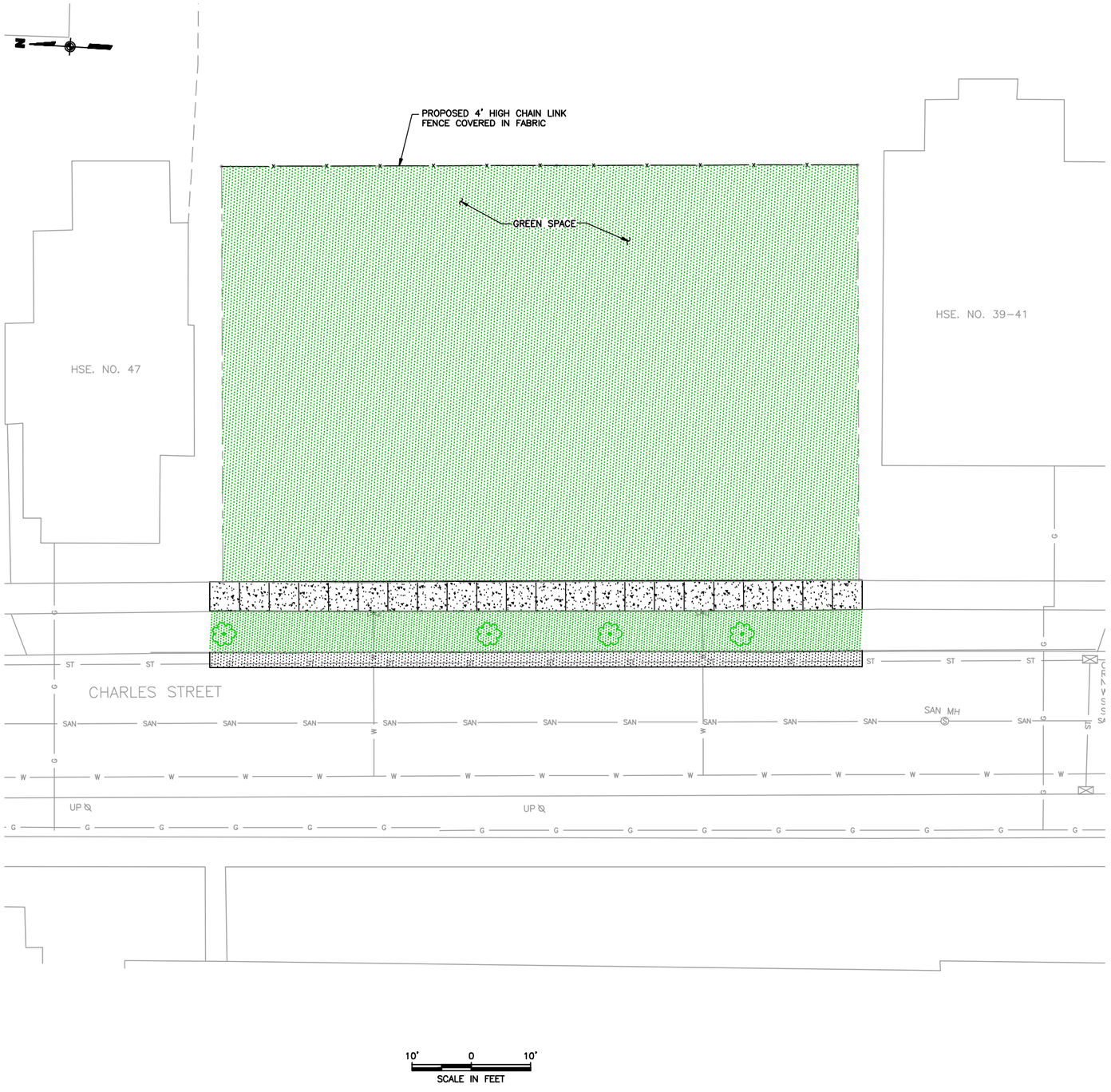
CHARLES STREET

CITY OF CORTLAND
CORTLAND COUNTY, NEW YORK

REMEDIAL DESIGN

MISCELLANEOUS DETAILS

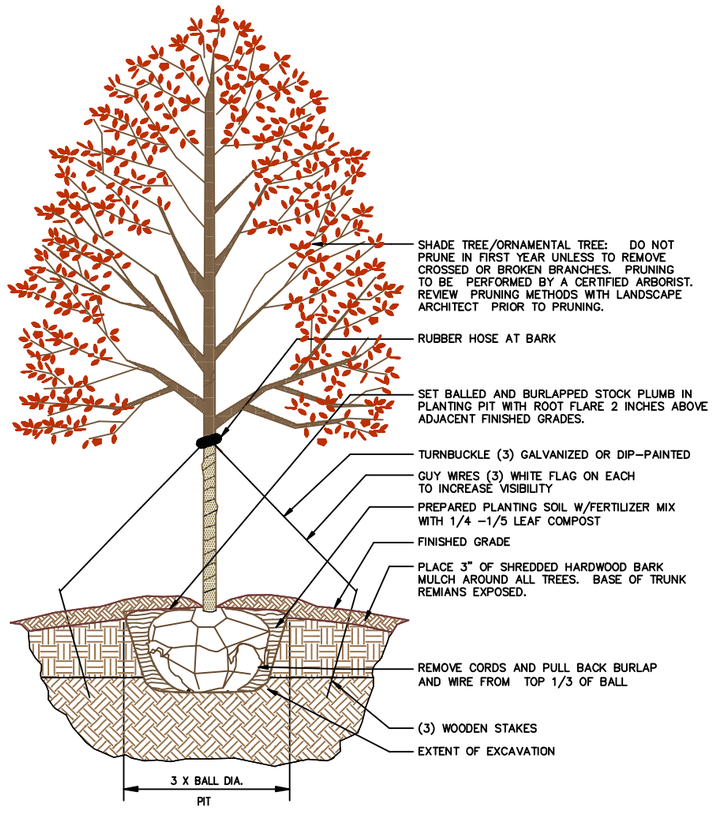
Scale: AS SHOWN | Date: OCT. 2010 | DWG-8



LEGEND:

- PROPOSED CONCRETE SIDEWALK
- PROPOSED GRASS AREA
- RESTORED AC PAVEMENT IN CHARLES STREET
- PROPOSED TREE

PLANTING SCHEDULE				
QUANTITY	TYPE	COMMON NAME	CALIPER	HEIGHT
4	STREET TREES	RED SUNSET MAPLE	3"	40-45'
8,276 SQ. FT	GRASS	LOWMOW GRASS	-	6-8"



PLANTING DETAIL
DECIDUOUS TREE
NOT TO SCALE

NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

REVISIONS

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DRAWN BY: RAL
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CHARLES STREET

CITY OF CORTLAND
CORTLAND COUNTY, NEW YORK

REMEDIAL DESIGN

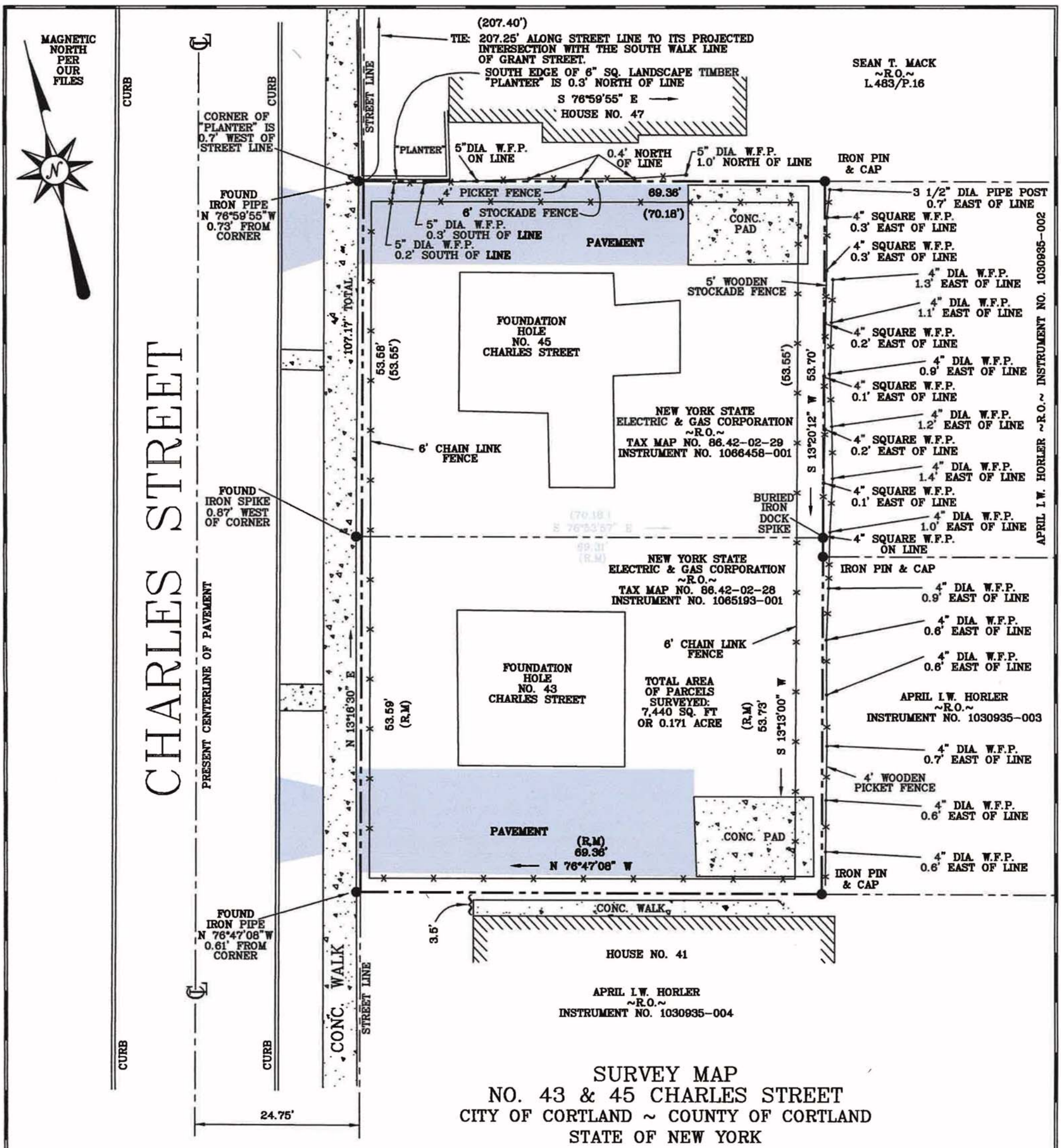
COVER PLAN AND DETAILS

Scale: AS SHOWN | Date: OCT. 2010 | DWG-9

ATTACHMENT 1

PROPERTY SURVEY MAP
NO. 43 & 45 CHARLES STREET

MADE BY REAGAN LAND SURVEYING, DATED 8/20/2010.



SURVEY MAP
NO. 43 & 45 CHARLES STREET
CITY OF CORTLAND ~ COUNTY OF CORTLAND
STATE OF NEW YORK

TAX MAP NO. 86.42-02-28
INSTRUMENT NO. 1065193-001
TAX MAP NO. 86.42-02-29
INSTRUMENT NO. 1066458-001

(CURRENT OWNER : NEW YORK STATE ELECTRIC & GAS CORPORATION)

NOTE:

UPDATED ABSTRACTS OF TITLES FOR EACH LOT NOT EXAMINED. PREMISES SURVEYED ARE SUBJECT TO ANY EASEMENTS RIGHTS AND/OR RESTRICTIONS OF RECORD THAT AN UP TO DATE SEARCH MAY REVEAL.

REFERENCE MAPS:

- "SURVEY MAP NO. 43 CHARLES STREET..." MADE BY REAGAN LAND SURVEYING, DATED 1/29/2004.
- "MAP SHOWING LANDS OF STELLA J. GIBBONS..." MADE BY MILTON A. GREENE, P.L.S., DATED 2/18/1998.

LEGEND:

●	EXISTING MONUMENT AS SHOWN
R.O.	REPUTED OWNER
(....)	RECORD DISTANCE
(R,M)	RECORD DISTANCE, MEASURED DISTANCE
—x—	FENCE
W.F.P.	WOODEN FENCE POST

REAGAN LAND SURVEYING
P.O. Box 1124
Dryden, New York 13053
Phone/Fax (607) 844-8837

NOTE: Any revisions to this map must comply with section 7209, Subdivision 2 of the New York State Education Law. All certifications hereon are valid for this map and copies thereof only if said map or copies bear the embossed seal of the licensed land surveyor whose signature appears hereon. This map is not valid when used in conjunction with a "Survey Affidavit" or "Certificate of No-Change".

Date Surveyed:	Drawn By:	Scale:	Job No.:
8/2010	A. PUZO	1"=15'	10-160

I hereby certify to : NEW YORK STATE ELECTRIC & GAS CORPORATION;

that I am a licensed land surveyor, New York State License No. 049892 and that this map correctly delineates an actual survey on the ground made by me or under my direct supervision, that it was prepared in accordance with the current code of practice for land title surveys adopted by the New York State Association of Professional Land Surveyors; and that I found no visible encroachments either way across property lines except as shown hereon.

Signed: Michael J. Reagan Dated: AUG. 20, 2010

PROFESSIONAL LAND SURVEYOR MICHAEL JOHN REAGAN NO. 049892 STATE OF NEW YORK