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Report. HW. 734051. 2004-09-30. RFP - Downgradient Trench Replacement

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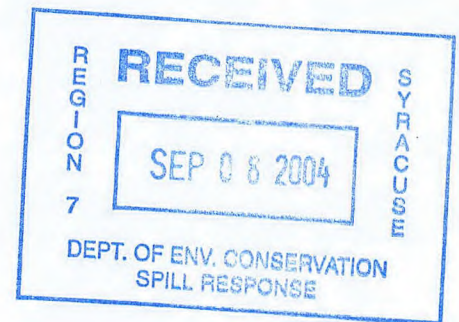


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REPORT

Groundwater Collection Trench Installation

Request For Proposal And Bid Instructions



**General Electric Company
Miller/Duva Site
Clay, New York**

September 2004

REQUEST FOR PROPOSAL AND BID INSTRUCTIONS
GROUNDWATER COLLECTION TRENCH INSTALLATION

General Electric Company
Miller/Duva Site
Clay, New York

1.0 INTRODUCTION

General Electric Company (GE) hereby extends this Request for Proposal (RFP) and Bid Instructions as an invitation to contractors to submit a lump sum price to provide remedial construction services related to the installation of a groundwater collection trench at the above referenced site.

The remainder of this request is organized as follows:

Section 2.0 contains general background information regarding the Project Site;

Section 3.0 describes the Scope of Work in general terms;

Section 4.0 provides detailed bidding instructions;

Section 5.0 contains proposal evaluation criteria and the anticipated contract award date;

Attachment A contains Contract Drawings and Materials and Performance Specifications;

Attachment B contains the Proposal Summary Form; and

Attachment C contains GE's Remedial Action Contract.

Blasland, Bouck & Lee, Inc. (BBL) has prepared material and performance specifications and contract drawings related to this project and will serve as the on-site construction engineer for this project, providing oversight of construction activities on behalf of GE. BBL will also prepare a report at the completion of this project that documents construction activities. References to "Engineer" or "GE Representative" in this RFP apply to BBL's role for this project.

2.0 RELEVANT SITE BACKGROUND

General Electric is currently performing remedial activities at the Miller Duva Site (Site) under the oversight of the New York State Department of Environmental Conservation (NYSDEC). Soil and groundwater at the site contains volatile organic compounds (VOCs). To intercept and treat the groundwater, groundwater is collected on the south side of the site within an existing downgradient collection trench (DGCT), and pumped to an on-site groundwater treatment system.

The DGCT is approximately 360-feet long and has been in operation since 1992. As a result of maintenance issues, the DGCT will be excavated and replaced in kind. The depth of the bottom of the DGCT currently ranges from approximately 7 to 11 feet below ground surface (bgs). A 6-inch-diameter high-density polyethylene (HDPE) perforated collection pipe (collection pipe) is located 6 to 10 feet bgs within the collection trench. The collection pipe is surrounded by crushed stone, filter fabric and fine gravel. The collection pipe was designed and installed to facilitate groundwater to flow by gravity to a 42-inch diameter by 15-foot-deep collection trench manhole (manhole). The manhole is located on the eastern end of the DGCT. Groundwater is pumped via two submersible pumps from the manhole to the on-site groundwater treatment system.

3.0 SCOPE OF WORK

The Project consists of constructing a new DGCT to improve groundwater collection and treatment. The construction activities that comprise the work associated with this project are defined in the following documents prepared by BBL and are included in **Attachment A**:

- **Contract Drawings: Groundwater Collection Trench Installation; and**
- **Materials & Performance Specifications.**

A description of the scope of work that will be performed is provided below:

3.1 WORK SCOPE DESCRIPTION

The new DGCT will be installed at the same location as the existing DGCT. The excavated filter fabric and pipe associated with the existing DGCT will be disposed of off-site by GE and the excavated soil and gravel will be reused on-site as backfill where appropriate. Any remaining soil, stone and/or gravel not utilized during reconstruction activities will be spread immediately north of the DGCT and graded along its entire length without damaging existing structures (i.e., monitoring wells) or trees.

The DGCT will include 360-linear-feet of 6-inch-diameter perforated HDPE collection pipe installed near the bottom of the trench in approximately 6 to 8 vertical-feet of washed pea stone. The collection pipe will be installed at a continuous slope of 0.5 percent (%) starting at the western end of the trench and ending at the existing collection manhole. The collection pipe will be fitted with clean-outs at the center and western end to facilitate future maintenance activities. The trench will be lined with filter fabric to inhibit sedimentation of the pea stone.

After reviewing the design of the existing collection manhole and the submersible pumps, it was determined that the minimum operating water level in the manhole could be lowered by two feet to improve hydraulic performance. Therefore, the perforated pipe in the new DGCT will be installed two feet deeper than the existing design. Four 1-inch-diameter piezometers will be installed in the new DGCT to improve monitoring capabilities. The entire work area will be graded, covered with approximately 6 inches of clean topsoil, and seeded at the end of the project as part of surface restoration activities.

During construction activities, water must be removed from the trench as necessary in a manner as not to interfere with the excavation and DGCT construction. Collected water may be diverted to the existing collection manhole and treatment system, however, it will be the successful bidders responsibility to ensure that the existing pumps or the integrity of the manhole are not compromised by silt, stone and other excavated debris.

For the purpose of facilitating the review of bids and to structure payments to the Contractor, the Work has been divided into several payment items. These payment items are summarized in the Proposal Summary Form included in **Attachment B** and also in the Remedial Action Contract included in **Attachment C**. The payment items are lump sum progress payments issued on the

completion status, as agreed to by GE and subject to the retainage provisions of the Remedial Action Contract.

GE may require a Performance and Payment Bond from the Contractor. The amount of such bond would be equal to the Contract Price. Payment for the bond, if required by GE, shall be on a unit rate basis.

Continued operation of the groundwater collection and treatment system is not a part of the Work associated with this Project. However, Contractor must, as part of the Work, ensure that the collection trench and the penetration into the collection manhole are complete, operational, and ready for the groundwater treatment system start-up activities (by others) within 30 days of the initiation of DGCT construction activities.

4.0 BIDDING INSTRUCTIONS

4.1 MANDATORY PRE-BID MEETING

There will be a mandatory pre-bid meeting at the Site on **September 9, 2004** to afford the Bidders with an opportunity to become familiar with general conditions at the Project Site. This meeting will begin at **11:00 am**. Up to three representatives from each bidder will be allowed to participate in the pre-bid meeting.

Bidders are instructed to meet at the West Taft Road entrance to be escorted by Engineer to the Site. The pre-bid meeting should not require more than one hour to complete.

Dress is casual and should be appropriate to the local Site and weather conditions. Work boots are required. Hardhats and safety glasses are not required.

4.2 PROPOSAL DUE DATE

Proposals are due no later than **4:00 p.m. on September 17, 2004** unless modified in an addendum to this Request for Proposals. One copy of the bidder's Proposal should be sent to each of the following:

Steven R. Meier
General Electric Company
320 Great Oaks Office Park, Suite 319
Albany, New York 12203

Phone: (518) 862-2711
Fax: (518) 862-2702

Timothy E. Miller, P.E.
Blasland, Bouck, & Lee, Inc.
6723 Towpath Road, PO Box 66
Syracuse, NY 13214-0066

Phone: (315) 446-2570, x535
Fax (315) 446-5807

Revisions to the bidder's Proposal will be accepted if received by GE prior to the due date and time specified above. Such revisions should be sent to the individuals listed above. The Bidders may confirm receipt of their Proposals by contacting either Tim Miller or Steven Meier.

4.3 PROPOSAL CONTENTS

The Proposal Summary Form presented in **Attachment B** shall be utilized for the bid. All costs shall include any applicable taxes. The bidder is asked to provide a total lump sum cost to complete the entire Scope of Work for the Project.

As instructed in the Proposal Summary Form, the bidder shall (a) identify and provide resumes for all Key Personnel that would be assigned to complete the Work and (b) identify any subcontractors which may be used and provide a brief description of their services.

The bidder shall provide labor, equipment and material rates to be used for added or omitted work by its own forces. A 5 percent markup may be applied to the actual cost of any added or omitted work performed by subcontractors.

Familiarity with the scope of work and contract documents, as well as acceptance of the Terms and Conditions of the Remedial Action Contract are a prerequisite to submitting a response to the Request for Proposal. A copy of the applicable agreement is provided in **Attachment B**. All firms are required to certify that the firm has reviewed the document and will enter into the attached agreement if selected. The certification form is also provided in **Attachment B**.

4.4 REMEDIAL ACTION CONTRACT

The bidder shall review the proposed Remedial Action Contract included in **Attachment C**. Moreover, the bidder shall identify any and all provisions of the contract which it considers unacceptable by hand-annotating the appropriate page(s) with language acceptable to the bidder and include the page(s) with its Proposal. Upon execution of the Remedial Action Contract with the successful bidder, GE will issue a Purchase Order, which will incorporate said contract.

4.5 CONSTRUCTION SCHEDULE

GE desires to have the Project complete by **October 29, 2004**. The bidder is requested to provide a project timeline in its proposal that includes all related planning, preparation, construction, and site restoration activities with a contract award date of September 24, 2004 and the requested completion date of October 29, 2004. The bidder is also requested to clearly specify on the timeline and the Proposal Summary Form the time required to initiate work at the Project Site from award of the Project.

4.6 USE OF THE PROJECT SITE & WORKING HOURS

The Project Site is in proximity to four residential properties. Therefore, the Contractor shall confine its operations at the Project Site to those areas necessary to complete and/or gain access to the Work. The Contractor shall not unreasonably encumber the Project Site with any materials or equipment, and shall not render the Project Site unusable by GE. To minimize traffic on the cap, the contractor shall follow a designated route for all traffic to and from the DGCT. The route shall be determined by on-site BBL personnel.

Additionally, work hours shall be restricted to weekdays between 7:30 am and 5:30 pm. It is each Contractor's responsibility to conform work activities in accordance with any and all applicable state and local noise ordinances and regulations. Adequate lighting and all other necessary facilities for carrying out and inspecting the Work shall be provided and maintained by each Contractor in all areas where such Work is being done.

4.7 SUPERVISION AND DISCIPLINE

The Contractor shall ensure that competent personnel and subcontractors are used to perform all of the Work at the Project Site. The Contractor shall provide a competent Superintendent who is authorized to act on its behalf, and has been approved by GE. Such Superintendent shall be on the Project Site at all times when the Work is being performed. Contractor shall be solely responsible for all construction means, methods, techniques, sequences and procedures, and for supervising the work of subcontractors and material men and coordinating all portions of the Work. Contractor shall at all times enforce discipline and good order among all persons employed on the Project by Contractor and its subcontractors and material men and Contractor shall not employ on the Project any unfit person or anyone not skilled in the work assigned to them.

4.8 HEALTH AND SAFETY

The Contractor alone shall be responsible for the health and safety of its personnel and its subcontractors. The Contractor shall, as applicable, provide documentation that all personnel who are assigned to work at the Project Site have 40-hour training and annual refresher training pursuant to OSHA regulations. Personnel will be properly trained and have appropriate medical clearance to wear necessary protective equipment, as required.

Prior to the start of construction, the Contractor shall submit a Health and Safety Plan (HASP) for review by the Engineer and GE. At a minimum, the HASP shall address the following topics:

1. Designation of Work-Specific Areas, including exclusion zone and contamination reduction zone designated on the site map and then designated in the field. Field measures will include the use of a temporary barrier (e.g., orange barricade fence) with appropriate signage that identifies the specific area and details its restricted access and PPE requirements. Signage shall also be placed at the entrance/exit of the exclusion zone that details personnel and equipment decontamination procedures.
2. Description of Work Site Hazards, including hazardous materials present, physical hazards present, and evaluation of expected risks.
3. Protective Measures, including contact protection, respiratory protection as appropriate, eye protection, and airborne dust prevention. Personal Protective Equipment (PPE) shall be specified at a minimum to be modified Level D.

4. Health and Safety Program and Procedures, including on-site organization, training program, monitoring program, equipment and personnel decontamination procedures, entry and exit procedures, on-site health and safety concerns, and medical program.
5. Emergency Response Provisions, including a listing of equipment and personnel to be dispatched in the event of an emergency and to remove conditions creating any hazard to life, limb, or property.

The Contractor shall provide a Health and Safety Officer to implement, monitor, and enforce its HASP. The Health and Safety Officer shall ensure that mandatory "tailgate" health and safety meetings are conducted every morning of each work day. The Health and Safety Officer shall have working experience appropriate for the Work. The Health and Safety Officer shall have a sound working knowledge of any and all applicable federal and state occupational safety and health regulations.

The Contractor shall provide documentation certifying that all on-site personnel have read and understood the provisions of the plan. Any personnel found to be disregarding provisions of the HASP shall leave the Site at the request of the Engineer.

4.9 AIR MONITORING ACTIVITIES

Work area monitoring will be conducted by the Contractor to document airborne constituents. The monitoring devices to be used, at a minimum, are a combustible gas/oxygen meter, a photoionization detector (PID), MIE MiniRAM portable dust monitor, and an LEL/Oxygen (O₂)/Carbon Monoxide (CO)/Hydrogen Sulfide (H₂S) monitor. The results of air monitoring will be recorded by the onsite health and safety supervisor (or designated alternate). Air monitoring equipment will be calibrated daily, prior to the start of work activities.

During operations that may cause airborne particulate (e.g., excavation, backfilling and grading), a Real-Time Aerosol Monitor (mini-RAM) will be used to measure concentrations of total particulate (dust) material. Airborne monitoring for particulate (dust) shall be conducted during construction activities in accordance with the New York State Department of Health's (NYSDOH's) Community Air Monitoring Program, dated June 2000.

Volatile organic vapors will also be monitored in the breathing zone during construction activities. Volatile organic vapor monitoring will be conducted using a photoionization detector (PID).

Air monitoring will be conducted periodically with the LEL/O₂/CO/H₂S meter when intrusive (i.e., excavation) activities are being performed. Dust control requirements are detailed in Section 4.10.

4.10 DUST CONTROL MEASURES

Dust control measures will be implemented to mitigate dust generation during the project and may include techniques presented in the NYSDEC TAGM 4031, entitled, "Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites," dated October 27, 1989. Such techniques include, but are not limited to, spraying water on equipment and excavation surfaces; spraying water on buckets during excavation and dumping; and covering excavated areas and materials after the excavation activity ceases.

4.11 CONTRACT WORK AREA PREPARATION

Each Contractor shall be responsible for determining the need for sheeting of excavations (in addition to that which is required under the Contract) as required to ensure proper safe working conditions, proper support of surrounding materials, and to promote the proper progression of the Work. Following completion of site activities, the area shall be restored to original condition unless otherwise specified in the Contract Documents.

4.12 TRENCH DEWATERING

During construction activities, water must be removed from the trench as necessary in a manner as not to interfere with the excavation and DGCT constructions. Collected water may be diverted to the existing collection manhole and treatment system, however, it will be the successful bidder's responsibility to insure that the existing pumps or the integrity of the manhole are not compromised by silt, stone and other excavated debris. Also, it will be the successful bidder's responsibility to provide power to any dewatering pumps or other equipment.

4.13 DECONTAMINATION OF EQUIPMENT

As part of everyday work activities associated with the Contract, the Contractor shall provide a personnel decontamination area (as specified in the Contractor's HASP). The personnel decontamination area (within the contamination reduction zone) shall include those facilities necessary to decontaminate personnel upon exit of the work area (exclusion zone), in accordance with the Contractor's HASP, and in accordance with local, state, and federal laws and regulations.

The Contractor will establish procedures for decontamination of all vehicles and equipment used for construction activities. These procedures shall be reviewed by GE and the Engineer prior to initiation of construction activities.

The extent and method of cleaning shall be at the discretion of the Contractor; however, equipment and materials shall be observed by the Engineer prior to its departure from the Site. In addition, GE reserves the right to require additional decontamination if deemed necessary. Recleaning shall be at no additional expense to GE.

Personnel engaged in decontamination activities shall use PPE including disposable clothing in accordance with the Contractor's HASP.

4.14 WEEKLY PROGRESS AND COORDINATION MEETINGS

The Contractor shall, throughout the Project, conduct a weekly progress and coordination meeting at the Project Site with the Engineer. Such meetings shall, to the extent practicable, be held on the same day and time each week. The purpose of the weekly progress and coordination meetings is to review and update the Construction Schedule, and discuss any construction, health and safety, or other issues.

4.15 INSURANCE COVERAGE

The bidder may indicate on the Proposal Summary Form and/or in its Proposal any reduced costs, which would result from GE's acceptance of insurance coverage different from those, specified in the Remediation Contract included in **Attachment C**. Any reduced insurance coverage must also be clearly specified in the bidder's Proposal in some manner.

4.16 MANAGEMENT OF WASTE MATERIALS

Solid wastes including trench filter fabric, pipe, and PPE will be generated during the Project. All solid waste shall be properly labeled and containerized in DOT approved 55-gallon drums or roll-off containers by the Contractor. The appropriate containers will be supplied by GE and the solid wastes will be disposed of off-site by GE.

Water collected during trench dewatering activities may be diverted to the existing collection manhole. However, care should be taken to prevent silt, stone and other excavated debris from entering the manhole.

Materials (gravel and soil) that have been in contact with VOCs in water will be generated during the Project. It is anticipated that these materials removed during the trench replacement can be reused as backfill at the site and/or graded in areas of the site that are hydraulically controlled by the DGCT.

Any costs associated with the characterization, transportation and/or disposal of contaminated materials and solid waste will be the responsibility of GE, however, proposals should include all costs associated with the placement of any materials in appropriate containers and any staging of these containers.

4.17 ENVIRONMENTAL MEDIA

The primary constituents of concern at the Site are VOCs including cis-1,2-Dichloroethene, 1,1,1- Trichloroethane, Trichloroethene, Toluene, 1, 1-Dichloroethane, Tetrachloroethene, and Vinyl Chloride.

4.18 LABORATORY ANALYTICAL SERVICES

Analytical results for all clean imported fill materials will be required as specified in MP-Section 02205 SELECTED FILL. Bidders are instructed to identify and specify the laboratory or laboratories in their Proposals. GE is currently using Severn Trent Laboratories, Inc, (STL) of Buffalo, New York (716-691-2600) for analytical services related to this Site, and continued use of STL is deemed acceptable. The use of any other laboratory for such services will need to be approved by GE in advance. Bidders are instructed to prepare their Proposals accordingly.

4.19 SUPPORT FACILITIES

The services currently available at the facility for use by the Contractor are very limited. Therefore, Bidders shall assume that the Scope of Work includes providing and maintaining drinking water, wash water supply and collection facilities and portable sanitary facilities for use by all persons working on the Project. The Contractor shall be responsible for supplying and maintaining the necessary support facilities and the Bidders are instructed to prepare their Proposals accordingly. The support facilities shall be located in an area of the Project Site acceptable to GE. Electrical service is available at the site for the recharging of handheld equipment. The contractor shall supply their own power for all other construction related activities (i.e. dewatering). Bidders are instructed to prepare their Proposals accordingly.

4.20 COMPLETENESS OF DOCUMENTS

The bidder in preparing its Proposal shall use a complete Request for Proposals. GE does not assume any responsibility for errors or misinterpretations resulting from the use of an incomplete Request for Proposals.

4.21 ADDENDA

GE may, during the bidding period, advise the bidder by addenda of changes, additions and/or clarifications in the Scope of Work. All addenda shall be incorporated into the bidder's Proposal as if they were originally a part of the Request for Proposals.

4.22 ADDITIONAL PRECAUTIONS

Relevant information currently available regarding the location of underground obstructions is included in the technical drawings provided in **Attachment A**. However, the Contractor is responsible for verifying and reviewing the location of any underground obstructions.

The Contractor shall take the necessary precautions to protect all existing facilities in the construction area at the site. These include, but are not limited to, monitoring wells, catch basins, roads, pumping systems and instrumentation and controls, underground and overhead electrical power supplies and utilities. To minimize traffic on the cap, the contractor shall follow the designated route to and from the DGCT. Any damage to such facilities shall be immediately repaired by the Contractor at no additional cost to GE. Any materials spilled, must be cleaned up immediately and immediate notification must be provided to GE's on-site representative.

Existing above and below-ground facilities have been indicated on the contract drawings based on the best available information. Prior to excavation, the bidder should locate and identify any underground and overhead obstructions in the immediate work areas by contacting a utility mark out service, contacting representatives of local utilities not included in the mark out service, completing a visual inspection of the site during the mandatory site walk, and by reviewing the contract drawings. The contractor must review the utility survey results with the Engineer and obtain approval from the Engineer before proceeding with the excavation. The Contractor shall also immediately notify the Engineer when facilities encountered are not indicated on the contract drawings or when facilities indicated on the contract drawings are not in the location shown.

5.0 PROPOSAL EVALUATION AND CONTRACT AWARD

5.1 PROPOSAL EVALUATION

Bidder's Proposal will be evaluated based on the following criteria:

- The acceptability of the contractual terms and conditions contained in GE's standard Remedial Action Contract;
- Costs to complete the Work;
- Bidder's proposed schedule to commence and complete the Work at the Project Site; and
- Completeness of the Bidder's proposal.

5.2 BIDDER INTERVIEWS

Formal interviews are not anticipated. However, the bidder may be contacted by telephone to provide answers to questions that may arise based upon review of the bidder's Proposal.

5.3 PROJECT AWARD

Project award is expected to occur within 7 calendar days of the proposal due date, unless otherwise modified in writing through addenda issued during the bidding period. Bidder's Proposal shall be valid for at least 45 days beyond the due date. GE reserves the right to reject any and all Proposals and to award the Project to other than the lowest cost bidder.

ATTACHMENT A

Contract Drawings: Groundwater Collection Trench Installation

Materials and Performance Specifications

Contract Drawings

***Groundwater Collection
Trench Installation***

**General Electric Company
Miller/Duva Site
Clay, New York**

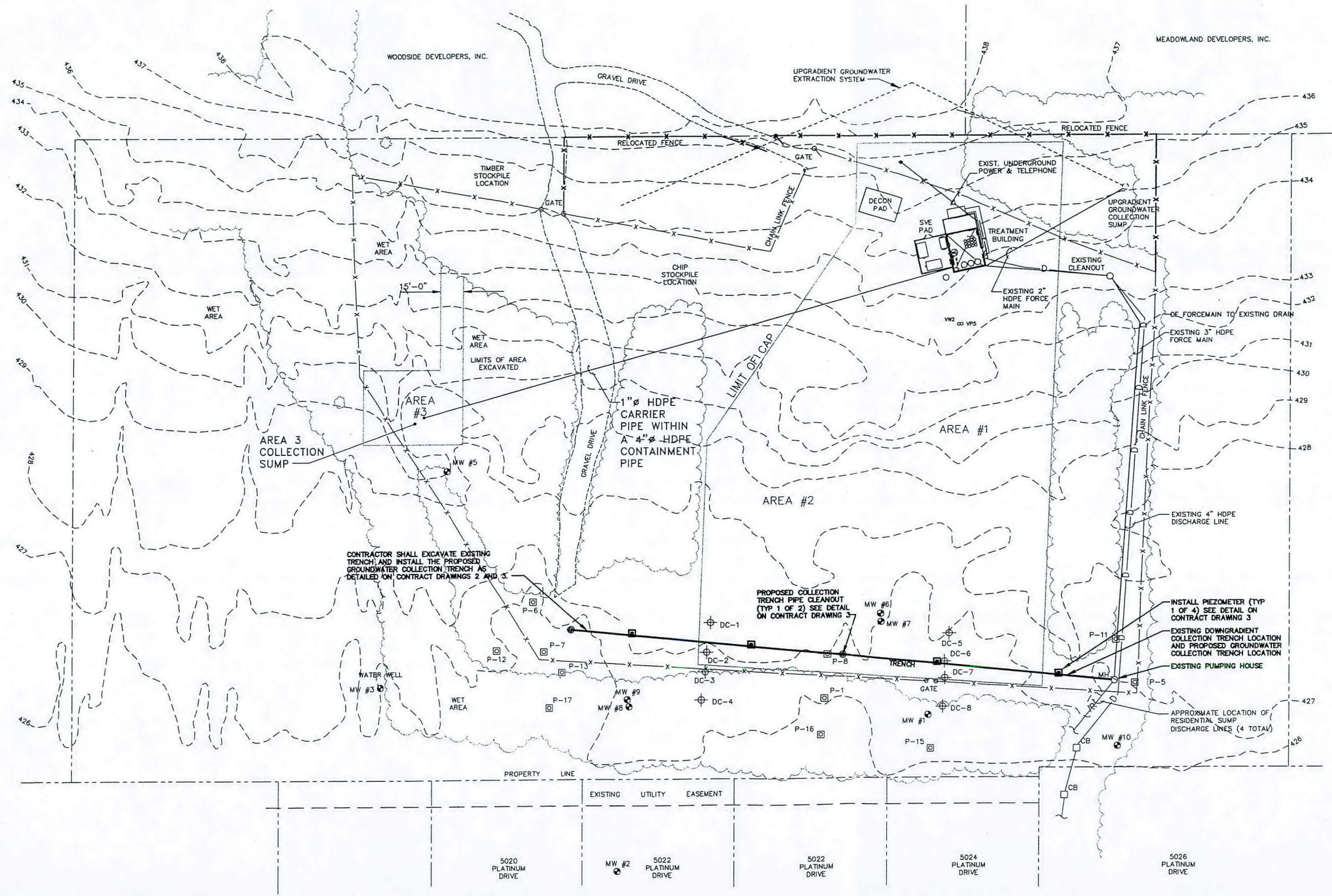
September 2004

***Material and Performance
Specifications***

***Groundwater Collection
Trench Installation***

**General Electric Company
Miller/Duva Site
Clay, New York**

September 2004



- LEGEND:**
- x—x—x— CHAIN LINK FENCE
 - - - - - CONTOUR LINES (APPROXIMATE)
 - - - - - PROPERTY LINES
 - D- EXISTING GROUNDWATER DISCHARGE LINE
 - R- EXISTING RESIDENTIAL SUMP DISCHARGE LINES
 - MW #10 MONITORING WELL
 - P-11 PIEZOMETER
 - ⊕ DC-8 DUNN CORP. PIEZOMETER LOCATION
 - ⊕ MH MANHOLE
 - CB CATCH BASIN
 - PROPOSED PIEZOMETER LOCATION
 - PROPOSED CLEAN-OUT LOCATION

- NOTES:**
1. BASE MAP SUPPLIED BY TreaTek-CRA COMPANY (1994).
 2. CONTOURS ARE APPROXIMATE ONLY.
 3. THE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITIES WITH REPRESENTATIVES OF GENERAL ELECTRIC COMPANY (GE) PRIOR TO COMMENCING ON-SITE ACTIVITIES.
 4. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD.
 5. THE CONTRACTOR SHALL PROVIDE ALL LOCAL PERMITS AND MAKE ARRANGEMENTS FOR LOCAL INSPECTIONS (AS NECESSARY).
 6. THE CONTRACTOR SHALL INSTALL COMPONENTS IN NEAT AND WORKMANLIKE MANNER; ALIGN, LEVEL AND ADJUST FOR SATISFACTORY OPERATION; AND INSTALL SO THAT PARTS ARE EASILY ACCESSIBLE FOR INSPECTION, OPERATION, AND MAINTENANCE AND REPAIR. DEVIATIONS FROM INDICATED ARRANGEMENTS ARE SUBJECT TO REVIEW AND APPROVAL BY REPRESENTATIVES OF GE PRIOR TO INSTALLATION AND/OR OPERATION.
 7. THE CONTRACTOR SHALL HANDLE ALL SPOIL MATERIAL AS DIRECTED BY REPRESENTATIVES OF GE.
 8. THE LOCATION OF UNDERGROUND UTILITIES AND OTHER UNDERGROUND STRUCTURES ARE APPROXIMATE ONLY. OTHER UNDERGROUND UTILITIES MAY EXIST, THE LOCATION OF WHICH AT THIS TIME ARE PRESENTLY UNKNOWN. THE CONTRACTOR SHALL UNDERTAKE MEASURES TO LOCATE UTILITIES KNOWN AND UNKNOWN IN THE FIELD PRIOR TO INITIATING WORK UNDER THIS CONTRACT.
 9. THE CONTRACTOR SHALL RESTORE ALL SURFACES DAMAGED OR DESTROYED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT TO THEIR PRE-CONSTRUCTION CONDITION OR AS DIRECTED BY REPRESENTATIVES OF GE IN A TIMELY MANNER.
 10. THE CONTRACTOR SHALL UTILIZE SILT CONTROL, SUCH AS PLASTIC FILTER FABRIC AND/OR HAY BALES, WHERE NECESSARY, TO ALLOW SEDIMENT AND SUSPENDED SOLIDS TO SETTLE OUT OF RUN-OFF WATERS THAT COME IN CONTACT WITH CONSTRUCTION AREAS BEFORE SUCH WATERS ENTER ANY STORM SEWER SYSTEM OR SURFACE WATERS.
 11. ALL EXCAVATIONS SHALL BE OBSERVED BY REPRESENTATIVE OF GE PRIOR TO PLACING BACKFILL.
 12. ALL ELECTRICAL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF NFPA-70 NATIONAL ELECTRICAL CODE (NEC).
 13. CONTRACTOR SHALL PREPARE AS-BUILT SITE PLAN SHOWING LOCATION OF PIEZOMETERS, TRENCHES, AND CLEAN-OUTS. A FINAL SURVEY SHALL BE PREPARED SHOWING THE ELEVATIONS OF ALL PIEZOMETERS.
 14. SOIL, GRAVEL, STONE, FILTER FABRIC, AND THE COLLECTION PIPE ASSOCIATED WITH THE EXISTING DOWNGRADEMENT COLLECTION TRENCH WILL BE EXCAVATED. THE FILTER FABRIC AND PIPE SHALL BE DISPOSED OF OFF-SITE AND EXCAVATED SOIL AND GRAVEL WILL BE REUSED AS BACKFILL AS APPROPRIATE. REMAINING SOIL, STONE, AND/OR GRAVEL NOT UTILIZED DURING RECONSTRUCTION ACTIVITIES WILL BE SPREAD UPGRADIENT OF THE PROPOSED TRENCH LOCATION.
 15. THE ENTIRE WORK AREA SHALL BE COVERED WITH 6-INCHES OF TOPSOIL AND SEEDED AT THE END OF THE PROJECT.

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Graphic Scale

0 40' 80'

GRAPHIC SCALE

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

No.	Date	Revisions	Init

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

Professional Engineer's Name DAVID R. GERBER	State NEW YORK	Date Signed
Professional Engineer's No. 073001	Project Mgr. TEM	Designed by TEM/DMS
		Drawn by KDM

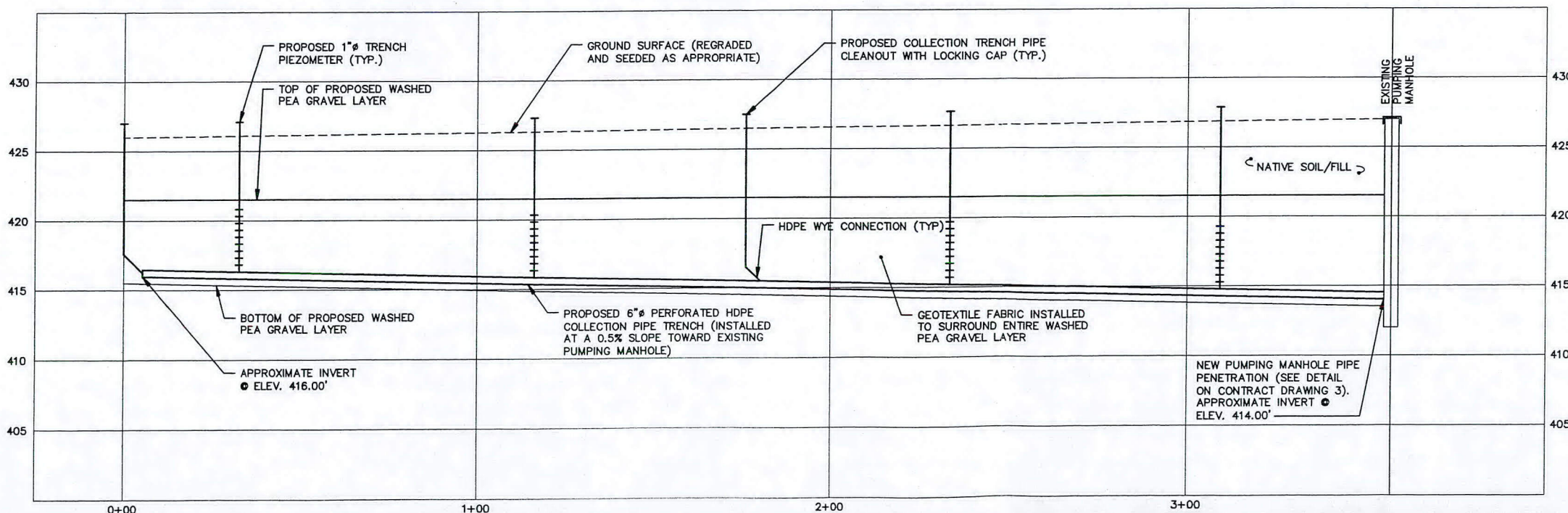
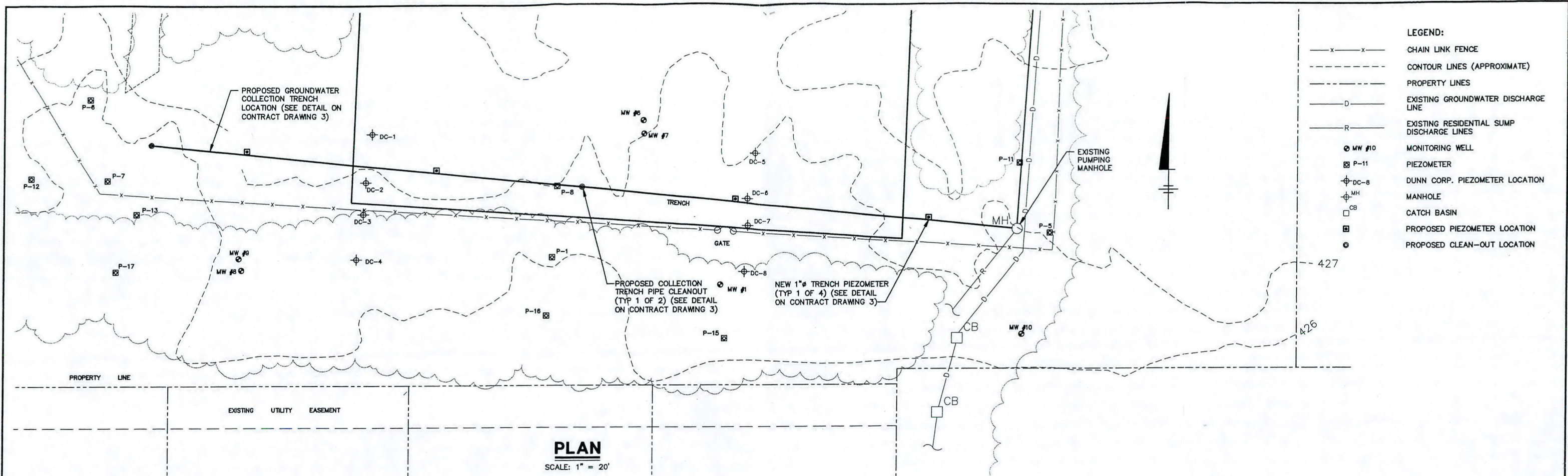


MILLER/DUVA SITE • TOWN OF CLAY, NEW YORK
SITE CODE 07-34-051

SITE PLAN

GENERAL

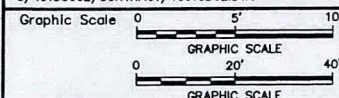
BBL Project No. 401.35	1
Date AUGUST 2004	
Blasland, Bouck & Lee, Inc. Corporate Headquarters 6723 Towpath Road Syracuse, NY 13214 315-446-9120	



MECHANICAL SPECIFICATIONS

1. GROUNDWATER COLLECTION TRENCH PIPE SHALL BE 6-INCH-DIAMETER ADS HDPE 481 CORRUGATED, PERFORATED DRAINAGE PIPE. PERFORATIONS SHALL BE A MAXIMUM OF 0.984 INCHES IN LENGTH BY A MAXIMUM OF 0.118 INCHES IN WIDTH.
2. ALL HDPE TO HDPE PIPE CONNECTIONS SHALL BE MADE UTILIZING SPLIT COUPLINGS BOUND BY WRAPPING 2" WIDE POLYETHYLENE TAPE SUPPLIED BY PIPE MANUFACTURER IN ACCORDANCE WITH PIPE MANUFACTURER INSTRUCTIONS.
3. GEOTEXTILE FABRIC SHALL BE EQUIVALENT TO MIRAFI 1100N. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS.
4. CLEAN-OUTS AND PIEZOMETERS SHALL BE EQUIPPED WITH LEAK RESISTANT LOCKING WELL COVERS MANUFACTURED BY BOART LONGYEAR OR EQUIVALENT.
5. ADDITIONAL SPECIFICATIONS GOVERNING TRENCH EXCAVATION AND INSTALLATION ACTIVITIES ARE INCLUDED IN MATERIAL AND PERFORMANCE SPECIFICATIONS 02201, 02204, 02205, AND 02207 (PROVIDED UNDER SEPARATE COVER).

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8/28/04 SYR-B5-KMD D.J.P. S.D.L.
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THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

No.	Date	Revisions	Init

Professional Engineer's Name
DAVID R. GERBER
Professional Engineer's No.
073001
State
NEW YORK
Date Signed

Project Mgr.
TEM
Designed by
TEM/DMS
Drawn by
KDM

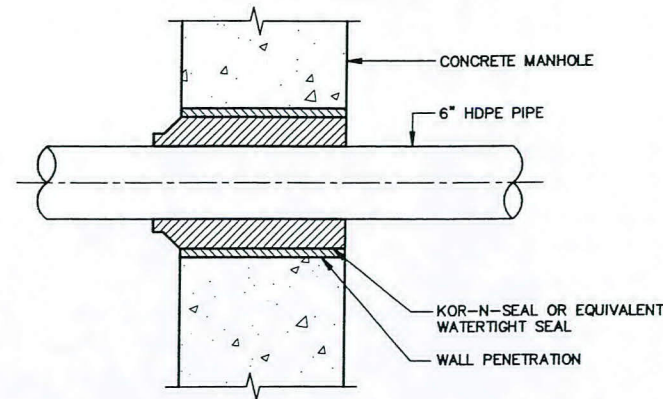
SECTION A-A'

SCALE: 1" = 20' HORIZ.
1" = 5' VERT.

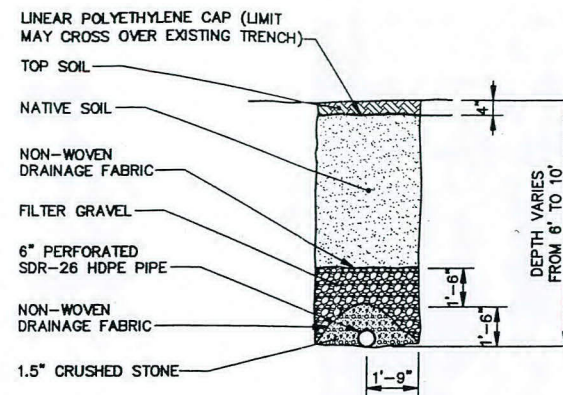
BBL
BLAIR, BOUCK & LEE, INC.
engineers, scientists, economists

MILLER/DUYA SITE • TOWN OF CLAY, NEW YORK
SITE CODE 07-34-051
**PROPOSED GROUNDWATER COLLECTION
TRENCH PLAN, PROFILE AND SPECIFICATIONS**
GENERAL

BBB Project No.
401.35
Date
AUGUST 2004
Blair, Bouck & Lee, Inc.
Corporate Headquarters
6753 Telegraph Road
Syosset, NY 11551
516-480-9120

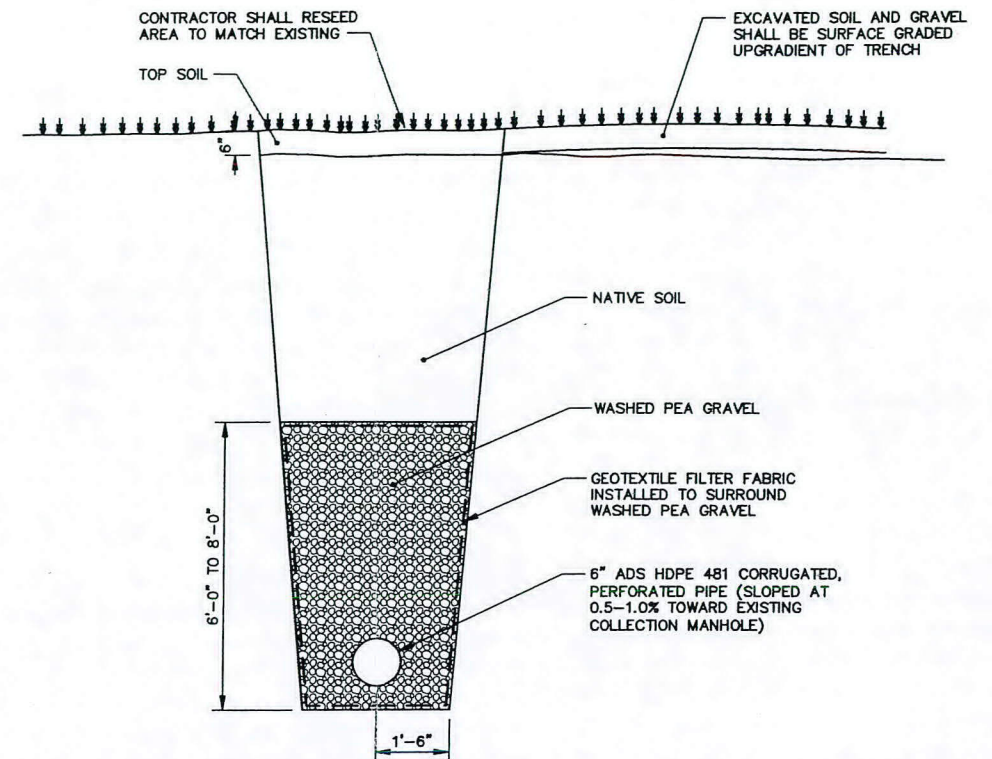


**TYPICAL MANHOLE PIPE
PENETRATION DETAIL**
NOT TO SCALE

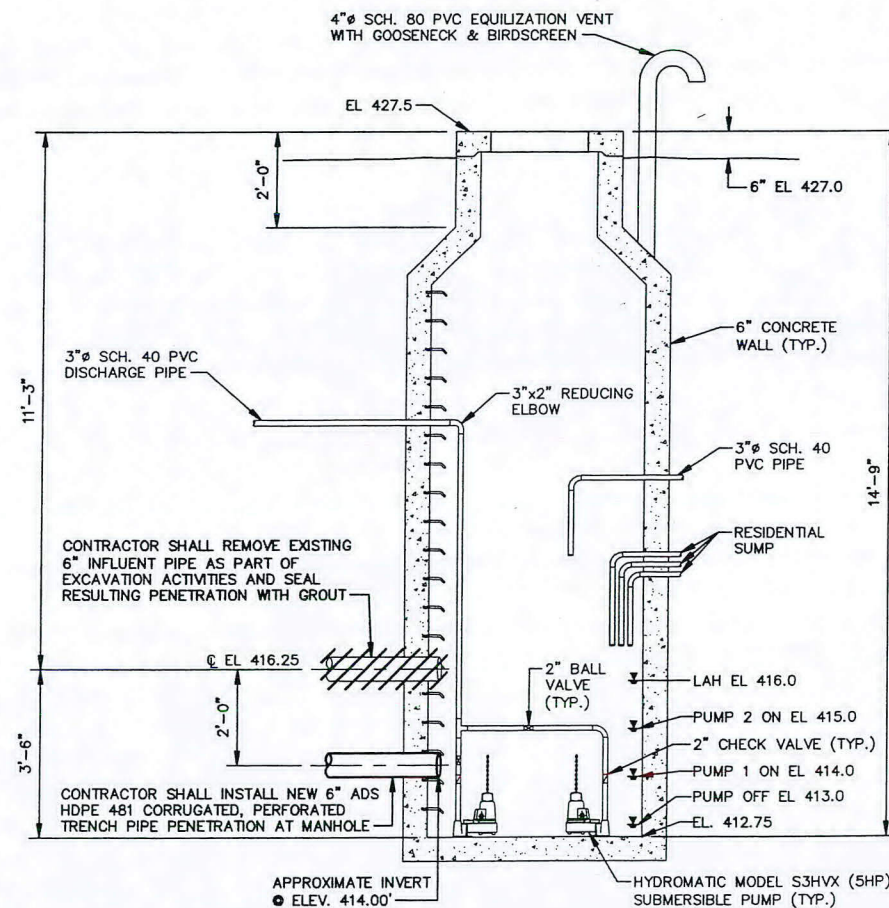


NOTE:
THE EXISTING LINEAR POLYETHYLENE CAP WILL NOT NEED TO BE REPLACED
IN THE EVENT THAT THE CAP IS EXCAVATED AND/OR DAMAGED DURING
CONSTRUCTION ACTIVITIES.

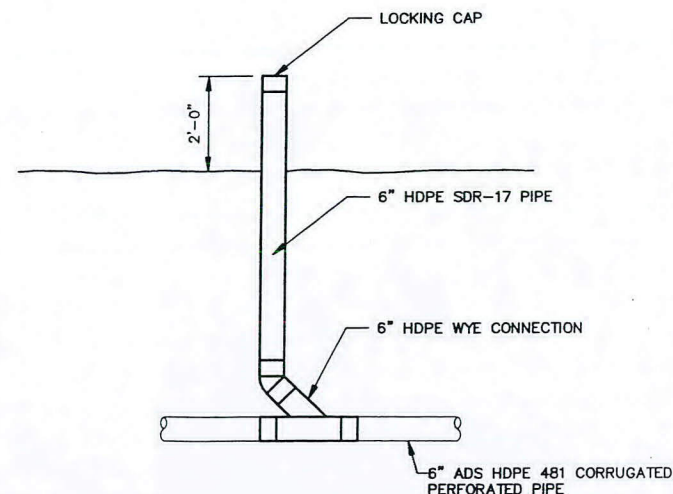
**EXISTING DOWNGRADIENT
COLLECTION TRENCH DETAIL**
NOT TO SCALE



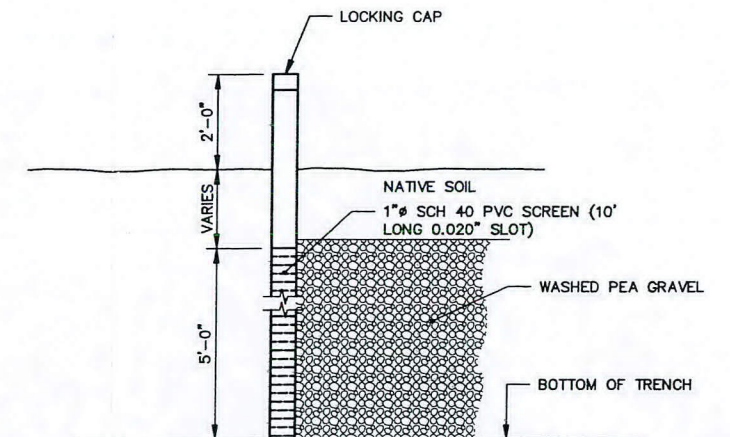
**PROPOSED GROUNDWATER
COLLECTION TRENCH DETAIL**
NOT TO SCALE



EXISTING COLLECTION MANHOLE DETAIL
NOT TO SCALE



TYPICAL TRENCH CLEAN-OUT DETAIL
NOT TO SCALE



TYPICAL PIEZOMETER DETAIL
NOT TO SCALE

X: 40135X00.DWG
L: ON=*, OFF=REF
P: PAGESET/SYR-CDL
8/30/04 SYR-85 SDL DJP SDL
C/40135002/CONTRACT/40135002.DWG

Graphic Scale		Professional Engineer's Name DAVID R. GERBER	
		Professional Engineer's No. 073001	
		State NEW YORK	
		Date Signed	
THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.		Project Mgr. Designed by Drawn by TEM TEM/DMS SDL	
NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW			

BBL
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

MILLER/DUVA SITE • TOWN OF CLAY, NEW YORK
SITE CODE 07-34-051

MISCELLANEOUS DETAILS

BBL Project No.
401.35
Date
AUGUST 2004
Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

**General Electric Company
Miller/Duva Site
Clay, New York**

Groundwater Collection Trench Installation

Table of Contents

Materials and Performance Specifications

02201	Earthwork
02204	Trenching, Backfilling and Compacting
02205	Selected Fill
02207	Site Restoration

MATERIALS AND PERFORMANCE – SECTION 02201EARTHWORKPART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. Excavation and backfilling including the loosening, removing, refilling, on-site transporting, loading, and stockpiling or storage, of all materials classified as "earth" necessary to be removed for the construction and completion of all work under the Contract.
2. Excavation to the widths and depths shown on the Contract Drawings or as specified.

B. Related Work Specified Elsewhere

1. Trenching, Backfilling and Compacting;
2. Selected Fill; and
3. Restoration of Surfaces

C. Definitions

1. Excavation (or Trenching)
 - a. Grubbing, stripping, removing, storing and rehandling of all materials of every name and nature necessary to be removed for all purposes incidental to the construction and completion of all the work under construction.
 - b. All sheeting, sheetpiling, bracing and shoring, and the placing, driving, cutting off and removing of the same.
 - c. All diking, ditching, fluming, cofferdamming, pumping, bailing, draining, well pointing or otherwise disposing of potentially contaminated water.
 - d. The removing and disposing of all surplus materials from the excavations in the manner specified.
 - e. The maintenance, accommodation and protection of travel.
 - f. The supporting and protecting of all curbs, sidewalks, pavements, overhead wires, poles, pipes, sewers, conduits, or other structures or property in the vicinity of the work, whether over or underground or which appear within or adjacent to the excavations, and the restoration of the same in case of settlement or other damage.

MATERIALS AND PERFORMANCE – SECTION 02201

EARTHWORK

- g. All temporary bridging and fencing and the removing of same.

2. Earth

All materials such as sand, gravel, clay, loam, ashes, cinders, pavements, muck, roots or pieces of timber, soft or disintegrated rock, not requiring blasting, barring, or wedging from their original beds, and specifically excluding all ledge or bedrock and individual boulders or masonry larger than ½-cubic yard in volume.

3. Backfill

The refilling of excavation and trenches to the line of filling as specified on the Contract Drawings or as directed, and the compacting of all materials used in filling or refilling by rolling, ramming, or as may be required and approved by the Owner.

4. Spoil

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

5. Embankments

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

6. Limiting Subgrade

- a. The underside of the pipe barrel for pipelines.
- b. The underside of footing lines for structures.

7. Excavation Below Subgrade

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

- D. Applicable Codes, Standards and Specifications in accordance with the American Society for Testing and Materials (ASTM)

MATERIALS AND PERFORMANCE – SECTION 02201

EARTHWORK

PART 2 - PRODUCTS

2.01 DESCRIPTION

A. Wood Sheeting and Bracing

1. Shall be sound and straight; free from cracks, shakes and large or loose knots; and shall have dressed edges where directed.
2. Shall conform to National Design Specifications for Stress Grade Lumber having a minimum fiber stress of 1200 pounds per square inch.

B. Steel Sheeting and Bracing

1. Shall be sound.
2. Shall conform to ASTM A 328 with a minimum thickness of 3/8 inch.

C. Trench Boxes

1. Shall be sound.
2. Shall conform to OSHA requirements.

PART 3 - EXECUTION

3.01 UNAUTHORIZED EXCAVATION

1. Whenever excavations are carried beyond or below the lines and grades shown on the Contract Drawings, or as given or directed by the Engineer, all such excavated space shall be refilled with special granular materials, concrete or other materials as the Engineer may direct. All refilling of unauthorized excavations shall be at the Contractor's expense.
2. All material which slides, falls or caves into the established limits of excavations due to any cause whatsoever, shall be removed and stockpiled at the Contractor's expense and no extra compensation will be paid the Contractor for any materials ordered for refilling the void areas left by the slide, fall or cave-in.

3.02 STORAGE OF EXCAVATED MATERIALS

1. Excavated materials to be disposed shall be stored in roll-off boxes for disposal by the Contractor as directed by General Electric Company. Un-contaminated spoil and backfill material shall be stored/stockpiled in locations approved by the Owner/Engineer so as not to endanger the work, and so that easy access may be had at all times to all parts of the excavation. Stored/stockpiled materials shall be kept neatly piled and trimmed, so as to cause as little inconvenience as possible to public travel or adjoining property holders.

MATERIALS AND PERFORMANCE – SECTION 02201

EARTHWORK

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

3.03 SHEETING AND BRACING (if necessary, ordered, or required)

A. Installation

1. The Contractor shall furnish, place, and maintain such sheeting, bracing and shoring as may be required to support the sides and ends of excavations in such manner as to prevent any movement which could, in any way, injure the pipe, structures, or other work; diminish the width necessary for construction; otherwise damage or delay the work of the Contract; endanger existing structures, pipes, or pavements; or cause the excavation limits to exceed the right-of-way limits.
2. In no case will bracing be permitted against pipes or structures in trenches or other excavations.
3. Sheeting shall be driven as the excavation progresses and in such manner as to maintain pressure against the original ground at all times. The sheeting shall be driven vertically with the edges tight together, and all bracing shall be of such design and strength as to maintain the sheeting in its proper position.
4. The Contractor shall be solely responsible for the adequacy of all sheeting and bracing.

B. Removal

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

3.04 BACKFILLING

A. General

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

MATERIALS AND PERFORMANCE – SECTION 02201

EARTHWORK

2. Backfilling shall be done with suitable excavated materials which can be satisfactorily compacted during refilling of the excavation.
3. Any settlement occurring in the backfilled excavations shall be refilled and compacted.

B. Unsuitable Materials

1. Stones, pieces of rock, or pieces of pavement greater than 1½ inches dimension shall not be used in any portion of the backfill.
2. Frozen earth shall not be used for backfilling.

C. Compaction and Density Control

1. The compaction shall be as specified for the type of earthwork, i.e., structural, trenching or embankment.
 - a. Where compaction is required, the entire backfill shall be compacted to obtain 90 percent density.
 - b. The compaction specified shall be the percent of maximum dry density.
 - c. The compaction equipment shall be suitable for the material encountered.
2. As directed by Engineer, to assure adequate compaction, an in-place density test shall be made by an approved testing laboratory.
 - a. The moisture-density relationship of the backfill material shall be determined by ASTM D698, Method D. Compaction curves for the full range of materials used shall be developed.
 - b. In-place density shall be determined by the methods of ASTM D 1556 or ASTM D 2922 and shall be expressed as a percentage of maximum dry density.
3. Where required, to obtain the optimum moisture content, the Contractor shall add, at its expense, sufficient water during compaction to assure the specified maximum density of the backfill. If, due to rain or other causes, the material exceeds the optimum moisture content, it shall be allowed to dry, assisted if necessary, before resuming compaction or filling efforts.
4. The Contractor shall be responsible for all damage or injury done to pipes, structures, property or persons due to improper placing or compacting of backfill.

MATERIALS AND PERFORMANCE – SECTION 02201

EARTHWORK

3.05 OTHER REQUIREMENTS

A. Hauling Material on Streets

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

B. Dust Control

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

C. Test Pits

For the purpose of obtaining detailed locations of underground obstructions, the Contractor shall make excavations in advance of the work.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02204

TRENCHING, BACKFILLING AND COMPACTING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

Excavation and backfill as required for pipe installation or other construction in the trench in accordance with the applicable provisions of the section entitled Earthwork, unless modified herein.

B. Related Work Specified Elsewhere

1. Earthwork; and
2. Selected Fill.

PART 2 - EXECUTION

2.01 EXCAVATION

- A. The trench excavation shall be located as shown on the Contract Drawings or as specified. Under ordinary conditions, excavation shall be by open cut from the ground surface.
- B. Trenches shall be excavated to maintain the depths as shown on the Contract Drawings or as specified for the type of pipe collection system to be installed.
- C. The alignment and depth of the trench shall be determined and maintained by the use of a string line installed on batter boards above the trench, a double string line installed along side of the trench or a laser beam system.
- D. Trenches shall not be opened for more than 300 feet in advance of pipe installation nor left unfilled for more than 100 feet in the rear of the installed pipe when work is in progress without the consent of the Engineer. Open trenches shall be protected and barricaded as required. There will be no trenches left open at the close of each working day unless properly protected.
- E. Bridging across open trenches shall be constructed and maintained where required, or as specified or directed.

2.02 SUBGRADE PREPARATION FOR PIPE

- A. Where pipe is to be laid on the undisturbed bottom of the excavated trench, mechanical excavation shall not extend lower than the finished subgrade elevation at any point.

MATERIALS AND PERFORMANCE – SECTION 02204TRENCHING, BACKFILLING AND COMPACTING

- B. Where pipe is to be laid on special granular material, the excavation below subgrade shall be to the depth specified or directed. The excavation below subgrade shall be refilled with special granular material as specified or directed, shall be deposited in layers not to exceed 6 inches and shall be thoroughly compacted prior to the preparation of pipe subgrade.
- C. Pipe subgrade preparation shall be performed immediately prior to installing the pipe in the trench. Where bell holes are required, they shall be made after the subgrade preparation is complete and shall be only of sufficient length to prevent any part of the bell from coming in contact with the trench bottom and allowing space for joint assembly.

2.03 STORAGE OF MATERIALS

- A. Where conditions do not permit storage of materials adjacent to the trench, the material excavated from a trench length, as may be required, shall be relocated by the Contractor, at its cost and expense, as soon as excavated to an on-site stockpile area designated by the Owner. The material subsequently excavated shall be used to refill the trench where the pipe had been built, provided it is of suitable character. The excess material shall be transported to locations approved by the Owner/Engineer. The Contractor shall, at its cost and expense, bring back adequate amounts of satisfactory excavated materials as may be required to properly refill the trenches.
- B. If directed by the Engineer, the Contractor shall refill trenches with Selected Fill or other suitable materials and excess excavated materials shall be stockpiled as contaminated or non-contaminated spoil.

2.04 REMOVAL OF WATER

- A. The Contractor shall at all times provide and maintain proper and satisfactory means and devices for the removal of all water entering the trench, and shall remove all such water as fast as it may collect, in such a manner as shall not interfere with the prosecution of the work. Collected water may be diverted to the existing collection manhole, however, it will be the Contractor's responsibility to ensure that the existing pumps or the integrity of the manhole are not compromised by silt, stone and other excavated debris. Also, it will be the Contractor's responsibility to provide power to any dewatering pumps or other equipment.

2.05 PIPE EMBEDMENT

- A. All pipe shall be protected from lateral displacement and possible damage resulting from superimposed backfill loads, impact, or unbalanced loading during backfilling operations by being adequately embedded in suitable pipe embedment material. To ensure adequate lateral and vertical stability of the installed pipe during pipe jointing and embedment operations, a sufficient amount of the pipe embedment material to hold the pipe in rigid alignment shall be uniformly deposited and thoroughly compacted on each side, and back of the bell, of each pipe as laid.

MATERIALS AND PERFORMANCE – SECTION 02204TRENCHING, BACKFILLING AND COMPACTING

- B. Embedment materials placed above the centerline of the pipe to a depth of 12 inches above the top of the pipe barrel shall be deposited in such manner as to not damage the pipe. Compaction via hand tamping shall be as required for the type of embedment being installed.

2.06 BACKFILL ABOVE EMBEDMENT

- A. The remaining portion of the pipe trench above the embedment shall be refilled with suitable materials as specified.
 - 1. Where trenches are in open fields, the backfilling may be done by placing the material in the trench and mounding the surface.
 - 2. Hand tamping shall be required around buried utility lines or other subsurface features that could be damaged by mechanical compaction equipment.
- B. Backfilling of trenches beneath, across or adjacent to drainage ditches shall be done in such a manner that water will not accumulate in unfilled or partially filled trenches and the backfill shall be protected from surface erosion by approved means.
- C. All settlement of the backfill shall be refilled and compacted (if necessary) as it occurs.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02205SELECTED FILL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

Selected fill materials shall be used in either embedment or backfill as specified or as directed by the Engineer.

B. Related Work Specified Elsewhere

1. Earthwork;
2. Trenching, Backfilling and Compaction; and
3. Restoration of Surfaces.

1.02 SUBMITTALS

- A. The name and location of the source of the selected fill material.
- B. Samples and test reports of the selected fill material.
- C. The Contractor shall submit to BBL for review and acceptance information to be obtained at the Contractor's expense which verifies that all fill material does not contain detectable levels of organic chemical contaminants, and has metals concentrations consistent with site-specific background or below the levels presented in the New York State Department of Environmental Conservation's (NYSDEC's) Technical and Administrative Guidance Memorandum (TAGM) #4046, most current version.
- D. Following identification of the source of fill material and review of information provided under item C above, BBL may collect a sample of each type of fill material at the source. If BBL determines that samples of the fill material are required, the samples will be collected and will be analyzed for Polychlorinated Biphenyls (PCBs) by United States Environmental Protection Agency (USEPA) SW-846 Method 8082; Total Petroleum Hydrocarbons (TPH) by USEPA SW-846 Method 8015; total cyanide by USEPA SW-846 Method 9010; and Resource Conservation and Recovery Act (RCRA) Metals (i.e., arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) plus nickel by USEPA SW-846 Method 6010, except mercury which will be analyzed by USEPA SW-846 Method 7471.

PART 2 - PRODUCTS

2.01 LISTING OF MATERIALS

A. Washed Pea Stone

Washed pea stone shall have the following gradation by weight:

MATERIALS AND PERFORMANCE – SECTION 02205SELECTED FILL

<u>Percent Passing</u>	<u>Sieve</u>
100%	¾ inch
90-95%	½ inch
8-12%	¼ inch
2-4%	⅛ inch

B. Top Soil

Top soil shall be unfrozen friable clayey loam, free from clay lumps, stones, roots, sticks, brush and foreign objects.

PART 3 - EXECUTION

3.01 GENERAL

- A. Materials displaced through the use of the above materials shall be stockpiled on site by the Contractor at a location approved by the Owner/Engineer and transported and disposed of off site by the Contractor.
- B. Any settlements in the finished work shall be made good by the Contractor at its cost and expense.

- END OF SECTION -

MATERIALS AND PERFORMANCE – SECTION 02207

RESTORATION OF SURFACES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. All types of surfaces disturbed, damaged or destroyed during the performance of the work under or as a result of the operations of the Contract, shall be restored and maintained, as specified herein.
2. The quality of materials and the performance of work used in the restoration shall produce a surface or feature equal to (at minimum) the condition of each before the work began, as approved by the Engineer.

B. Related Work Specified Elsewhere

- A. Earthwork; and
- B. Trenching, Backfilling and Compaction.

1.02 SUBMITTALS

A schedule of restoration operations shall be submitted by the Contractor to the Owner/Engineer for review.

1.03 SCHEDULE OF RESTORATION

- A. After an accepted schedule has been agreed upon, it shall be adhered to unless otherwise revised with the approval of the Engineer.
- B. The replacement of surfaces at any time, as scheduled or as directed, shall not relieve the Contractor of responsibility to repair damages by settlement or other failures.

PART 2 - EXECUTION

2.01 LAWNS AND IMPROVED AREAS

- A. The area to receive topsoil shall be graded to a depth of not less than 6 inches or as specified, below the proposed finish surface. If the depth of existing topsoil prior to construction was greater than 6 inches, topsoil shall be replaced to that depth.
- B. When required to obtain germination, the seeded areas shall be watered in such a manner as to prevent washing out of the seed.
- C. Seed mixtures shall be of commercial stock of the current season's crop and shall be delivered in unopened containers bearing the guaranteed analysis of the mix.
- D. Any washout or damage which occurs shall be regraded and reseeded until a good sod is established.

MATERIALS AND PERFORMANCE – SECTION 02207RESTORATION OF SURFACES

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

2.02 OTHER TYPES OF RESTORATION

- A. Shrubs, and landscape items damaged or destroyed as a result of the construction operations shall be replaced in like species and size. All planting and care thereof shall meet the standards of the American Association of Nurserymen.
- B. Fences destroyed or removed as a result of the construction operations shall be replaced in like size and material and shall be replaced at the original location.
- C. Monitoring wells, piezometers, and underground residential sump pump lines destroyed or removed as a result of construction operations shall be replaced in like size and material and shall be replaced at the original location.
- D. Cap area destroyed during construction operations shall be restored and graded in such a way to prevent the ponding of stormwater.

- END OF SECTION -