STAUFFER MANAGEMENT COMPANY
SKANEATELES FALLS SITE
SKANEATELES FALLS, NEW YORK

FINAL REMEDIAL DESIGN REPORT FOR SITE WIDE SOILS / DEBRIS REMEDIATION

VOLUME 2 OF 5
Project Technical Specifications
(Appendix M)

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SPEC Consulting Project #99-004

SMC
Skaneateles Falls Site
CONTRACT SPECIFICATIONS

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1.2 CONTRACT DESCRIPTION

A. Contract Type: SMC Environmental Construction

1.3 WORK BY OWNER

A. Work under this contract will include:

1. Excavation, staging, sampling and disposal of contaminated sediments, soils and debris.
2. Site grading and backfill
3. Site erosion and sediment control
4. Site infrastructure
5. Drum removal and off-site disposal sampling

B. Items noted NIC (Not in Contract) included ground dewatering equipment and treatment and will be supplied and installed by Owner during construction.

C. Owner will remove and retain possession of the following items before start of work:
- No Items

1.4 OWNER SUPPLIED PRODUCTS

A. Owner's Responsibilities:

1. Arrange for and deliver Owner reviewed Shop Drawings, Product Data, and Samples, to Contractor.

2. Arrange and pay for Product delivery to site.

3. On delivery, inspect Products jointly with Contractor.

4. Submit claims for transportation damage and replace damaged, defective, or deficient items.

5. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:

1. Review Owner reviewed Shop Drawings, Product Data, and Samples.

2. Receive and unload Products at site; inspect for completeness or damage jointly with Owner.

3. Handle, store, install and finish Products.

4. Repair or replace items damaged after receipt.

1.5 CONTRACTOR USE OF SITE

A. Access to Site: 6:00am to 7:00pm; unless approved by Owner.

B. Construction Operations: as shown on Construction Drawings.

1.6 FUTURE WORK

A. Provide access for future installation of groundwater recovery wells.

1.7 WORK SEQUENCE

A. Construct Work as shown in contract plans, coordinate construction schedule and operations with Owner and Engineer:

1.8 OWNER OCCUPANCY

A. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.

B. Schedule the Work to accommodate owner occupancy.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01040

PROJECT COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:

1. Coordination.

2. Administrative and supervisory personnel.

3. General installation provisions.

4. Cleaning and protection.

B. Progress meetings, coordination meetings and pre-installation conferences are included in Section "Project Meetings".

C. Requirements for the Contractor's Construction Schedule are included in Section "Submittals".

1.3 COORDINATION

A. Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.

1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.

2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such

administrative activities include, but are not limited to, the following:

1. Preparation of schedules.

2. Delivery and processing of submittals.

3. Progress meetings.

4. Project Close-out activities.

1.4 SUBMITTALS

A. Staff Names: Within 15 days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.

1. Post copies of the list in the Project meeting room, the temporary field office, and at each temporary telephone.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

D. Recheck measurements and dimensions, before starting each installation.

E. Install each component during weather conditions as specified and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

F. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Engineer for final decision.

3.2 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:

1. Excessively high or low temperatures.
2. Water or ice.
3. Solvents.
4. Chemicals.
5. Puncture.
6. Abrasion.
7. Heavy traffic.
8. Contact between incompatible materials.
9. Destructive testing.
10. Unprotected storage.
11. Improper shipping or handling.

*** END OF SECTION ***

SECTION 01045

CUTTING AND PATCHING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for cutting and patching.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Coordination" for procedures for coordinating cutting and patching with other construction activities.

2. Division 2 Section "Selective Demolition" for demolition of selected portions of the building for alterations.

3. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

    a. Requirements of this Section apply to mechanical and electrical installations. Refer to Division 15 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures well in advance of the time cutting and patching will be performed if the Owner requires approval of these procedures before proceeding. Request approval to proceed. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required. Show how it will be performed and indicate why it cannot be avoided.

2. Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.

3. List products to be used and firms or entities that will perform Work.

4. Indicate dates when cutting and patching will be performed.

5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

6. Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.

7. Approval by the Engineer to proceed with cutting and patching does not waive the Engineer's right to later require complete removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.

1. Obtain approval from the Structural Engineer before cutting and patching the following structural elements:

a. Foundation construction.

b. Bearing and retaining walls.

c. Structural concrete.

d. Structural steel.

e. Lintels.

f. Timber and primary wood framing.

g. Structural decking.

h. Stair systems.

i. Miscellaneous structural metals.

j. Exterior curtain-wall construction.

k. Equipment supports.

l. Piping, ductwork, vessels, and equipment.

m. Structural systems of special construction in Division 13 Sections.

B. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:

a. Primary operational systems and equipment.

b. Air or smoke barriers.

c. Water, moisture, or vapor barriers.

d. Membranes and flashings.

e. Fire protection systems.

f. Noise and vibration control elements and systems.

g. Control systems.

h. Communication systems.

i. Conveying systems.

j. Electrical wiring systems.

k. Operating systems of special construction in Division 13 Sections.

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Engineer's opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner.

1. If possible retain the original Installer or fabricator to cut and patch the exposed Work listed below. If it is impossible to engage the original Installer or fabricator, engage another recognized experienced and specialized firm.

a. Processed concrete finishes.

b. Stonework and stone masonry.

c. Ornamental metal.

d. Matched-veneer woodwork.

e. Preformed metal panels.

f. Firestopping.

g. Window wall system.

h. Stucco and ornamental plaster.

i. Acoustical ceilings.

j. Terrazzo.

k. Finished wood flooring.

l. Fluid-applied flooring.

m. Carpeting.

n. Aggregate wall coating.

o. Wall covering.

p. Swimming pool finishes.

q. HVAC enclosures, cabinets, or covers.

1.5 WARRANTY

A. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

PART 2 PRODUCTS

2.1 MATERIALS, GENERAL

A. Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible if identical materials are unavailable or cannot be used. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.

1. Before proceeding, meet at the Project Site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Avoid cutting existing pipe, conduit, or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining construction. Where possible, review proposed procedures with the original Installer; comply with the original Installer's recommendations.

1. In general, where cutting, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine, such as a Carborundum saw or a diamond-core drill.

4. Comply with requirements of applicable Division 2 Sections where cutting and patching requires excavating and backfilling.

5. Where services are required to be removed, relocated, or abandoned, by-pass utility services, such as pipe or conduit, before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3. Where removing walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

   a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch after the area has received primer and second coat.

4. Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

D. Plaster Installation: Comply with manufacturer's instructions and install thickness and coats as indicated.

1. Unless otherwise indicated, provide 3-coat work.

2. Finish gypsum plaster to match existing adjacent surfaces. Sand lightly to remove trowel marks and arrises.

3. Cut, patch, point-up, and repair plaster to accommodate other construction.

3.4 CLEANING

A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

END OF SECTION

SECTION 01050

FIELD ENGINEERING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Survey and field engineering.

B. Quality control.

C. Submittals.

D. Project record documents.

1.2 QUALITY ASSURANCE

A. Employ a Land Surveyor registered in the State of New York and acceptable to Engineer, to perform every work of this section. C.T. Male, PC……is currently providing site survey services for SMC.

B. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate for Field Engineering Services

C. Employ a Professional Engineer of the discipline required for specific service on Project, licensed in the State of New York.

1.3 SUBMITTALS FOR REVIEW

A. Submit name, address, and telephone number of Surveyor and Engineer before starting survey work.

B. On request, submit documentation verifying accuracy of survey work.

C. Submit a copy of site drawing and certificate signed by the Land Surveyor that the elevations and locations of the Work are in conformance with Contract Documents.

1.4 PROJECT RECORD DOCUMENTS

A. Maintain a complete and accurate log of control and survey work as it progresses.

B. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

C. Submit Record Documents under provisions of Section 01720.

1.5 EXAMINATION

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect/Engineer of any discrepancies discovered.

1.6 SURVEY REFERENCE POINTS

A. Contractor to locate and protect survey control and reference points.

B. Control datum for survey is that established by Owner provided survey and indicated on Drawing.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.

1.7 SURVEY REQUIREMENTS

A. Provide field engineering services. Utilize recognized engineering survey practices.

B. Establish a minimum of two permanent benchmarks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

C. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.

2. Grid or axis for structures.

3. Building foundation, column locations, ground floor elevations.

D. Periodically verify layouts by same means.

1.8 SURVEYS FOR MEASUREMENT AND PAYMENT

A. Perform surveys to determine quantities of cost plus work, including control surveys to establish measurement reference lines. Notify Engineer prior to starting work.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01051

GRADES, LINES, AND LEVELS

PART 1 GENERAL

1.1 ELEVATIONS:

A. The elevations shown on the drawing and referred to in the specifications were established from the Project Bench Marks. All of the work shall be built to the lines and grades shown on the Plans as ordered by the Engineer.

1.2 LINES AND GRADES:

A. The Engineer will furnish the Contractor with the basic lines and grades as he, the Engineer, deems necessary, but this shall not be construed to mean all lines, grades, elevations and measurements.

B. The Contractor shall be responsible for the accuracy of his work and shall maintain all reference point stakes, etc., throughout the life of the Contract. Damaged, destroyed or inaccessible reference points, bench marks or stakes shall be replaced by the Contractor. Existing or new control points that will be or are destroyed during construction shall be reestablished and all reference ties recorded therefore shall be furnished to the Engineer. All computations necessary to establish the exact position of the work from control points shall be made and preserved by the Contractor.

C. All instruments, equipment, stakes and other material necessary to perform the work shall be provided by the Contractor.

D. All stakes used shall be a type approved by the Engineer, clearly and permanently marked so as to be legible at all times. It shall be the Contractor's responsibility to maintain these stakes in their proper position and location at all times.

E. The Owner or the Engineer may check all or any portion of the stake-out survey work or notes made by the Contractor and any necessary correction to the work shall be immediately made. Such checking by the Owner or the Engineer shall not relieve the Contractor of any responsibilities for the accuracy or completeness of his work.

END OF SECTION

SECTION 01095

REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. Indicated: The term "indicated" refers to graphic representations, notes or schedules on the Drawings, or other Paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.

C. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Engineer," "requested by the Engineer," and similar phrases.

D. Approve: The term "approved," where used in conjunction with the Engineer's action on the Contractor's submittals, applications, and requests, is limited to the Engineer's duties and responsibilities as stated in the Conditions of the Contract.

E. Regulation: The term "Regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. Furnish: The term "furnish" is used to mean "supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations."

G. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations."

H. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

I. Installer: An "Installer" is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

    1. The term "experienced," when used with the term "Installer," means having a minimum of five previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of the authority having jurisdiction.

    2. Trades: Use of titles such as "carpentry" is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

3. Assignment of Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in the operations to be performed. The specialists must be engaged for those activities, and assignments are requirements over which the Contractor has no choice or option. Nevertheless, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.

    a. This requirement shall not be interpreted to conflict with enforcement of building codes and similar regulations governing the Work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.

J. Project Site is the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

K. Testing Laboratories: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with the standard in effect as of the date of the Contract Documents.

C. Conflicting Requirements: Where compliance with two or more standards is specified, and the standards may establish different or conflicting requirements for minimum quantities or quality levels. Refer requirements that are different, but apparently equal, and uncertainties to the Engineer for a decision before proceeding.

    1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. Refer uncertainties to the Engineer for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.

    1. Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations, as referenced in Contract Documents, are defined to mean the associated names. Names and addresses are subject to change and are believed to be, but are not assured to be, accurate and up to date as of date of Contract Documents.

    ACI American Concrete Institute
    P.O. Box 19150

	Detroit, MI 48219	(313) 532-2600
AI	Asphalt Institute Research Park Drive P.O. Box 14052 Lexington, KY 40512-4052	(606) 288-4960
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018	(212) 354-3300
API	American Petroleum Institute 1220 L St., NW Washington, DC 20005	(202) 682-8000
ASC	Adhesive and Sealant Council 1627 K Street, NW, Suite 1000 Washington, DC 20006	(202) 452-1500
ASME	American Society of Mechanical Engineers 345 East 47th St. New York, NY 10017	(212) 705-7722
ASTM	American Society for Testing and Materials 1916 Race St. Philadelphia, PA 19103	(215) 299-5400
NACE	National Association of Corrosion Engineers P.O. Box 218340 Houston, Texas 77218	(713) 492-0535
NAPA	National Asphalt Pavement Assoc. Calvert Building, Suite 620 6811 Kenilworth Ave. Riverdale, MD 20737	(301) 779-4880
NFPA	National Fire Protection Assoc. One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101	(617) 770-3000
NPCA	National Paint and Coatings Assoc. 1500 Rhode Island Ave., NW Washington, DC 20005	(202) 462-6272
SSPC	Steel Structures Painting Council 4400 Fifth Ave. Pittsburgh, PA 15213	(412) 268-3327

F. Federal Government Agencies: Names and titles of federal government standard or Specification producing agencies are often abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard or Specification producing agencies of the federal government. Names and addresses are subject to change but are believed to be, but are not assured to be, accurate and up to date as of the date of the Contract Documents.

EPA Environmental Protection Agency
401 M St., SW

	Washington, DC 20460	(202) 382-2090
NIST	National Institute of Standards and Technology (U.S. Department of Commerce) Gaithersburg, MD 20899	(301) 975-2000
NYCRR	Official Compilations of Code Rules and Regulations of the State of New York New York State Fire Prevention and Building Code 162 Washington Avenue Albany, NY 12231	(518) 474-4073
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor) Government Printing Office Washington, DC 20402	(202) 523-6091

1.4 GOVERNING REGULATIONS/AUTHORITIES

A. The Engineer has contacted authorities having jurisdiction where necessary to obtain information necessary for preparation of Contract Documents. Contact authorities having jurisdiction directly for information and decisions having a bearing on the Work.

1.5 SUBMITTALS

A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

*** END OF SECTION ***

SECTION 01101

SPECIAL PROVISIONS

PART I GENERAL

1.1 SUMMARY

A. These Special Provisions apply to all work to be performed under this Contract.

1.2 DEFINITIONS

A. Addendum or Addenda shall mean the additional contract provisions issued in writing by the Owner prior to the receipt of bids.

B. Bid shall mean the offer or proposal submitted, signed and sealed, in the form prescribed in the Contract Documents setting forth the prices for the Work to be performed.

C. Bonds shall mean any or all of the following performance, payment, labor and material bonds and other instruments of security furnished by the Contractor and his surety or sureties in accordance with the Contract Documents.

D. Change Order shall mean the formal document executed by the Owner incorporating any Modifications into the Contract.

E. Clarification shall mean a written notice issued by the Engineer to the Contractor for the purpose of clarifying or interpreting the Contract Documents, or to authorize minor change or alteration in the Work which will not result in a change in the Contractor's cost or completion time.

F. Construction Water shall be defined as follows:

1. Surface water resulting from precipitation or run-on during construction that has not come in contact with potentially contaminated sources.

G. Contract or Contract Documents shall mean any or all of the following: Invitation to Bid, Bid, Agreement, Special Provisions, Technical Specification, Payment Items, Contract Drawings, and all interpretations or Addenda thereto issued by the Owner or by the Engineer with the approval of the Owner. Drawings and not mentioned in the Specifications or mentioned in the Specifications and not shown on the Drawings, shall have the same effect as if shown or mentioned, respectively, in both.

H. Contract Drawings shall mean those plans and drawings, which show the scope and character of the Work and are specifically referred to as such in these Documents or in any Addendum or Addenda.

I. Contractor shall mean the Party of the Second Part to this Contract or the person, persons, partnership or corporations entering into this Contract for the performance of the Work required by it, and the legal representatives of said party or the agents appointed for said party in the performance of the Work.

J. Elevation or any abbreviation of the word shall mean the distance in feet above or below the datum established for the Project.

K. Engineer shall mean the Consulting Engineer or Engineers engaged by the Owner for the project and shall include any properly authorized assistants acting for the Consulting Engineer within the scope of the particular duties assigned to them.

L. Impacted Soil - On-site soils that have been impacted by chemicals of concern (NYSDEC, 1996) identified in the Record of Decision (ROD) and AROD 2001 for the site.

M. Invert shall mean the inside bottom of a pipe or the surface upon which sewage or water flows along the plan centerline of the completed Work.

N. Modification shall mean a written order to the Contractor, signed by the Engineer and the Owner on which is stated the addition, deletion or revision in the Work, together with any adjustment in Contract price or Contract time. One or more Modifications may be incorporated into a Change Order for making payments to the Contractor.

O. New York State Department of Environmental Conservation (NYSDEC) shall mean the agency providing regulatory oversight for this project.

P. Owner shall be defined as the Stauffer Management Company (SMC) or any duly authorized agents.

Q. Proceed Order shall mean a written order issued by the Owner to the Contractor to proceed with certain Work pending the resolution of disputes.

R. Project shall mean activities associated with implementation of the final remedial design.

S. Site shall mean the area included within the property lines shown on the Contract Drawings, and other such areas adjacent thereto as may be designated by the Owner in writing.

T. Specifications shall mean any or all of the following: the Special Provisions, Technical Specifications, Payment Items and any Addenda pertaining thereto.

U. Subcontractor shall mean any person, firm or corporation other than employees of the Contractor, who or which contracts with the Contractor to furnish, or actually furnishes labor, or labor and materials, or labor and equipment, or labor, materials and equipment at the Site.

V. Subgrade shall mean the bottom line or surface to which excavations are necessarily made for purpose of building the Work in accordance with the Contract Drawings, not including the additional depth of excavation required for any special foundation that may be ordered.

W. Surety or Sureties shall mean the Bondsmen or party or parties who have made secure the fulfillment of the Contract by a Bond and whose signatures are attached to said Bond.

X. Work shall mean everything expressly or implicitly required to be furnished and done by the Contractor under this Contract.

Y. Written Notice. The term "notice" as used herein shall mean and include all written notices, demands, instructions, claims, approvals and disapprovals required to obtain compliance with contract requirements. Written Notice shall be deemed to have been duly served if: I) delivered in person to the individual or to a member of the firm or to an officer of the corporation at the location specified in the Contract Documents, or 2) if delivered at the last business address known to him who gives the notice, or 3) if sent by registered mail, ordinary mail, facsimile followed by ordinary mail, certified mail, postage paid, return receipt requested, by nationally recognized overnight carrier (against receipt) or telegraph to the last business address known to the person who gives the notice.

1.3 EMERGENCY CALLS

A. The Contractor shall provide the Owner with the phone numbers of at least three (3) responsible persons, to be used during non-working hours and weekends, who shall be in a position to dispatch personnel and equipment to the project in the event of an emergency.

1.4 STAGING PLAN

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

1.5 NON-DISCLOSURE

A. The Contractor shall agree that any and all information, written or otherwise, obtained as a result of this Contract shall not be disclosed to any persons or parties, without the prior written consent of the Owner. This paragraph shall survive and remain in force after expiration of the Agreement.

1.6 NIGHT, WEEKEND, AND HOLIDAY WORK

A. Unless otherwise especially permitted, no work shall be done between the hours of 8:00 p.m. and 7:00 a.m., nor on Saturdays, Sundays, December 25 (or designated holiday for Christmas Day), January 1 (or designated holiday for New Year's Day), Thanksgiving Day and the day after; July 4 (or designated holiday for July 4); and the Monday designated holidays for Memorial Day and Labor Day, except as necessary for the proper care and protection of work already performed. If it shall become absolutely necessary to perform work at night, the Engineer shall be informed a reasonable time in advance of the beginning of performance of such work. Only such work shall be done at night as can be done satisfactorily and in a safe manner. Good lighting and all other necessary facilities for carrying out and inspecting the work shall be provided and maintained at all points where such work is being done. Minimum permissible illumination intensities are identified in 29 CFR 1910.120. All Contractor requests to perform night, Saturday, Sunday or Holiday work shall be made in writing to the Engineer.

1.7 NYSDEC OFFICE

A. The Contractor shall furnish and maintain office space for the exclusive use of NYSDEC oversight personnel or representatives. The Contractor shall provide one telephone answering and message recording machine, and one telephone facsimile-copying machine with paper supply as requested by the NYSDEC oversight personnel or representatives. The Contractor shall install an individual direct line telephone for the exclusive use of the NYSDEC's telephone and a separate direct telephone line (different phone numbers) for the exclusive use of the NYSDEC's facsimile copying machine. This office space shall be suitably heated. Sanitary and potable water services shall be available at or near the NYSDEC office space.

1.8 EXISTING UTILITIES

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

B. The Contractor shall notify the proper utility companies at least seventy-two (72) hours before construction is started adjacent to such utilities. Proof of such notification shall be filed with the Engineer. Failure to provide such proof shall be cause for an automatic cessation of the work. Utilities shall be protected in the manner prescribed by the utility company. No additional

compensation other than stated in the Payment Items herein will be made for coordination or requirements of others relative to existing utilities.

1.9 EXISTING MONITORING WELLS AND PIEZOMETERS

A. The approximate locations of existing monitoring wells and piezometers at or near the site are shown on the Contract Drawings. Monitoring wells RP2, RP3, LFP1, and LFP2, located within the existing landfill, are to be removed as part of this Contract per SPEC Consulting protocol previously approved by NYSDEC . All other monitoring wells and piezometers shall be protected from damage. Any wells and/or piezometers that are damaged by the Contractor shall be repaired or replaced, at no additional cost, as directed by and to the satisfaction of the Engineer who will oversee rehabilitation or replacement. The Owner's cost associated with bringing the Engineer on-site for oversight of rehabilitation or replacement work will be deducted from payments due the Contractor.

1.10 BORROW MATERIALS

A. Contractor shall submit an affidavit from the owner of the source of each type of borrow material stating that to the best of his knowledge, the site of the source material was never used as a disposal site for chemical, toxic, hazardous or radioactive materials and it is not now or ever has been listed as a suspected depository for chemical, toxic, hazardous, or radioactive materials by any federal, state, or other governmental agency, department, or bureau.

B. The Contractor at a location or locations identified by the Engineer shall sample each different type of off-site material incorporated into the work. Each grab or composite sample shall be analyzed for EPA SW846 methods 8260 (VOCs), 8270 plus toluic Acid (SVOCs), 8082 (PCBs), and metals to meet the site specific contaminants of concern for soils listed in table 1.1 of the AROD. Additionally the material shall be analyzed for EPA SW846 methods 8081A (Pesticides) and 8151 (Herbicides) and RCRA metals (totals). A five (5) gallon representative sample of the borrow material shall be sent to the site for the purpose of grain size analysis and standard proctor test and Laboratory detection limits for each analyte shall be less than the regulatory levels identified. Laboratory data shall be submitted to the Owner and Engineer immediately upon receipt and prior to use of the material on-site. The NYSDEC approval of imported material is required to be obtained by the Owner for each different type of material prior to import to the site by the contractor. Prior to contractor delivering imported borrow material onto the site, the owner will obtain necessary NYSDEC acceptance of contractor proposed imported materials. The Engineer shall be the sole judge as to what constitutes each different type of material; however, the definition of "different" shall include, but not necessarily be limited to, variances in the physical properties of the same material, as well as the same material derived from separate borrow sources or separate areas in the same borrow pit. If the materials are found to be unacceptable by the Engineer, the Contractor shall remove and dispose of the materials at the Contractor's expense.

1.11 UTILIZATION OF ON-SITE MATERIALS

A. The Contractor is not permitted to utilize on-site material for purposes of meeting his material requirements without written permission from the Owner and approval by NYSDEC. Any request to use on-site material shall be made in writing and shall include a cost benefit analysis and material profile per specification of the intended materials used and sampling protocol to meet NYSDEC site specific soil contaminant parameters.

1.12 SITE ACCESS

A. The Contractor shall be responsible for adhering to the requirements of access agreements obtained by the Owner for purposes of this Contract.

B. No additional payment shall be made to the Contractor for delays associated with access agreements.

C. The Contractor shall be responsible for obtaining and adhering to access agreements required for work within the Onondaga County Highway Department and New York State Department of Transportation (NYSDOT) right-of-way along Jordan Road.

1.13 MAINTENANCE AND PROTECTION OF TRAFFIC PERMITS

A. A Highway Work Permit application will be submitted to the New York State Department of Transportation (NYSDOT) and/or Onondoga County Highway Department by the Owner for work to be performed in Jordan Road. The final permit is subject to NYSDOT approval of the Contractor's Maintenance and Protection of Traffic Plan (MPT). The Contractor shall prepare and submit the MPT Plan at the direction of the Owner. The Owner shall provide no additional payment or extension of time to the Contractor in the preparation and implementation of or in the NYSDOTs acceptance of the Highway Work Permit application.

B. The Contractor shall address all NYSDOT requirements including, but not limited to, the MPT Plan, meeting all protective liability insurance coverage, compensation insurance and disability coverage, and bonds or certified checks in amounts designated by the NYSDOT to guarantee restoration of the highway right-of-way, as required by the NYSDOT. The Contractor shall be responsible for all work performed within the NYSDOT right-of-way.

1.14 TRAFFIC CONTROL AND PRE-CONSTRUCTION SURVEY

A. Prior to the start of any on-site construction activities, the Contractor and the Engineer shall make a joint condition survey of roads to be utilized by the Contractor. The condition survey shall be performed using a video camera in VHS format. During the video survey, the Engineer and Contractor will verbally document any existing damage and the location of the damage.

B. The Contractor shall provide for traffic control, as necessary for the Contractor to perform the Contractor's work, and submit relevant plans and procedures according to local, state, and federal requirements. The cost of such traffic control is to be borne solely by the Contractor.

1.15 SPECIAL CONSTRUCTION REQUIREMENTS

A. The Contractor shall visit the site before bidding the work to become familiar with the conditions affecting the work. Any special construction requirements in excess of those identified in the Contract Documents shall be the responsibility of the Contractor and no additional payment will be made to the Contractor because of lack of knowledge of such conditions. It must be understood that the party or parties inspecting the site must assume all risks and liabilities.

1.16 NOTICES

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

Mr. Thomas Haldas, P .E.
Environmental Services and Operations
Stauffer Management Company
1800 Concord Pike
Wilmington, Delaware 19897

A copy shall also be provided to:

Mr. Joseph Burke, P.E.
SPEC Consulting, LLC
18 Computer Drive West
Albany, NY 12205

1.17 DECOMMISSIONING/DECONTAMINATION

A. The Contractor shall decommission/decontaminate the equipment and areas used during this Contract as required by the Owner and restore all areas to conditions equal to or better than those that existed prior to the Work.

B. The Contractor shall restore all areas outside of the limits of the AEC's where potentially contaminated materials were handled to pre-remediation conditions. The Owner may require sampling to verify clean up to pre-remediation conditions. All sampling, analysis and restoration to pre-remediation conditions shall be at the Contractor's expense.

1.18 ORDER OF PRECEDENCE

A. The following documents shall constitute integral parts of this Contract, the whole to be collectively known and referred to as the Contract Documents or the Contract, and in the case of discrepancies among any parts of the Contract Documents, preference shall be given in the following order:

1. Addenda (later dates taking precedence over earlier dates)

2. Special Provisions

3. Terms and Conditions

4. Invitation to Bid

5. Bid

6. Payment Items

7. Technical Specifications (Division I through 16)

8. Contract Drawings (detailed drawings taking precedence over general drawings) The Table of Contents, Headings and Titles contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light on the interpretation of the provisions to which they refer.

1.19 NEW YORK STATE SPECIFICATIONS

A. Where New York State Department of Transportation (NYSDOT) specifications are referenced, the following apply:

1. All work contemplated under this Contract is to be covered by and be in conformity with NYSDOT's "Standard Specifications for Construction and Materials" dated January 2, 1990, and all addenda, except as modified on these plans and notes contained herein.

2. Any reference to NYSDOT Standard Specifications is limited in scope to Technical Engineering and construction work, materials, details, procedures, etc. All references to the State, NYSDOT, or administrative officers or employees thereof are null and void with respect to legal or contractual responsibilities.

3. For clarification, where the State of New York or the NYSDOT or administrative officers or employees, thereof are names in the Standard Specifications, such references shall be taken to mean either the Engineer or Owner.

4. The Contractor shall obtain materials to be incorporated into the work from NYSDOT approved sources. The Contractor shall obtain and submit a Manufacturer's Materials Certification to the Engineer for each material item, as specified -shop drawings, product data and samples of the general requirements, indicating that the respective item meets the applicable NYSDOT or special specification included in this contract.

5. The Contractor is advised that the Method of Measurement and Basis of Payment for individual NYSDOT item numbers do not reflect the Owner's Method of Measurements and/or Basis of Payment.

1.20 SAMPLING AND ANALYSES DURING CONSTRUCTION

A. Any sampling and analyses necessary to protect the health and welfare of the Contractor's employees and/or agents and community shall remain the sole responsibility of the Contractor. Additionally, any sampling and analyses required to characterize materials, construction water, and the adequacy of processes selected and utilized shall remain the sole responsibility of the Contractor. The Contractor shall submit analytical results to the Engineer with copies to NYSDEC.

1.21 SURFACE AND SUBSURFACE CONDITIONS

A. Protection, Existing Structures

1. It shall be the sole responsibility of the Contractor, and at its expense, to protect adjacent and other property or premises from damage of any kind during the progress of the Work. The Contractor shall erect and maintain guards around its Work in such a way as to afford protection to the public. The Contractor shall be held responsible for improper, illegal, or negligent conduct of itself, and its subcontractors, employees and agents in and about said Work or in the execution of the Work covered by this Contract.

2. It shall be the sole responsibility of the Contractor, and at its expense, to sustain in their places and permanently protect from direct or indirect injury any and all pipelines, subways, pavements, sidewalks, curbs, railways, buildings, trees, poles, wells, and other property in the vicinity of his Work, whether over- or underground, or which appear within the trench or excavations, and it shall assume all costs and expenses for direct or indirect damage which may be occasioned by injury to any of them.

3. The Contractor's liability shall also include the damage or injury sustained by any structure whatsoever due to settlement of trenches or excavations or to settlement or lateral movement of the sides of such trenches or excavations, whether such movement occurs during or after excavation or backfilling of such trenches or excavations. The responsibility to so support and protect all such structures from damage or injury shall continue, without limitation, throughout the Contract period and during the period of guarantee.

4. The Contractor shall at all times have available onsite suitable and sufficient material and shall use the same as may be necessary or required for sustaining and supporting any and all such structures which are uncovered, undermined, weakened, endangered, threatened, or otherwise materially affected.

5. In case injury occurs to any portion of a pipeline or structure, or to the material surrounding or supporting the same, through blasting or similar operations, the Contractor shall immediately notify the Engineer, and, at its expense, shall remove such injured Work and shall rebuild the pipeline or structure and shall replace the material surrounding and

supporting the same, or shall furnish such material and perform such work of repairs or replacements as the Engineer may order. In the case of utilities, the Contractor shall immediately notify the utility company, and provide all assistance for the repair of the utility by the utility company unless authorized to undertake such repairs directly by the utility company. Any damage whatsoever shall be promptly, completely, and satisfactorily repaired by the Contractor at its expense to the satisfaction of the owner of the utility.

B. Existing Subsurface Structures

1. General

a. Certain existing subsurface structures likely to be encountered during the performance of the Work embraced in this Contract or located in close proximity to the Work hereunder as to require special precautions and methods for their protection, such as sewers, drains, water mains, and conduits, together with appurtenances, are shown on the Contract Drawings. The sizes, locations, and depths shown are approximate.

b. It is the obligation of the Contractor to verify the accuracy and completeness of the information shown, and the Contractor agrees that it shall neither have nor assert against the Owner or Engineer any claim for damages or relief from any obligation of this Contract by reason of the inaccuracy, inadequacy, incompleteness, or other deficiency of the information given or the failure to furnish additional or further information in the possession of the Owner or Engineer, except as set forth in subsection (b) and (c) below.

c. Contractor is hereby given notice that subsurface structures and facilities may be located on the site which are either not identified or are misallocate on the Contract Documents.

d. Where any existing subsurface structure such as a sewer, drain, gas pipe, water pipe, conduit, or other structure is found which is not anticipated by the Contract Documents or which is found to be materially different in size, location, or depth from that anticipated by the Contract Documents, the Contractor shall immediately notify the Engineer, and also the superintendent of the utility, before disturbing the structure.

e. Contractor shall use due care to avoid damage to subsurface facilities not identified or misallocated on Contract Documents.

f. If ordered by the Engineer, such structure shall be uncovered and supported by the Contractor, at its cost and expense, as constituting a part of the Contract, and the Contractor shall not become entitled to claim any damages for or on account of the presence of such structure or the uncovering and supporting of same.

2. Existing subsurface structures that require changes in the Work of the Contract.

a. The Engineer will determine whether changes should be made in the Contract Documents for construction of the Work of the Contract to avoid the subsurface structure, whether the Work of the Contract can proceed without changes in the Contract Documents, or whether the structure should be removed, realigned, or changed.

b. Any increase in cost of the Work resulting from any changes in the Contract Documents necessitated by the unanticipated presence or difference in size, location, or depth of the subsurface structure will be adjusted in the manner provided herein for changes in Contract amount.

3. Existing subsurface structures that require changes in the existing structure.

a. Where the size, location, or depth of the existing subsurface structure has been anticipated and the Contract Documents require removal, realignment, or change, all Work under this Contract shall be done in accordance with the Contract Documents in mutual cooperation with the utility or other parties concerned.

b. Where the presence of the subsurface structure or its size, location, or depth is not anticipated by the Contract Documents, any work by the Contractor required to remove, realign, or change the structure shall be done under the provisions for changes in the Work for the removal, realignment, or change and shall be done as mutually agreed by the Contractor, Engineer, Owner, and utility or other parties concerned.

4. Interruption of Service

a. Where it is necessary to interrupt water, gas, or other public utility service to remove, realign, or change a subsurface structure, the Work shall proceed with expedience and shall be continuous after interruption of service until completion of the removal, realignment, or change and return of the utility service to its normal state.

C. Subsurface Conditions Other Than Structures Found Different

1. Reference is made to the Article 4 -Site Conditions of the Terms and Conditions of these Contract Documents and the obligations of the Contractor to perform all necessary subsurface investigations prior to bidding. Furthermore, the Contractor shall not be entitled to rely upon the subsurface investigation performed by the Owner or the Engineer. In the event that the Contractor encounters subsurface physical conditions other than structures at the site which conditions differ significantly and substantially from those shown on or described or indicated in the Contract Documents and which could not have been reasonably foreseen or anticipated from the information made available by the Owner or the Engineer or from an appropriate investigation, inspection and examination by the Contractor (including subsurface investigation) or from a full and complete study and evaluation by the Contractor of all information available to the Contractor, it shall give immediate notice to the Engineer of such conditions before they are disturbed. The Engineer will thereupon promptly investigate the conditions. If conditions do differ significantly and substantially from those, which should have been reasonably foreseen or anticipated by the Contractor as above provided, a change in the Contract will be determined.

2. Any increase or decrease of cost resulting from any such change in the Contract necessitated by reason of such latent subsurface conditions shall be adjusted in the manner provided herein for changes in Contract amount.

D. Protection of Utilities

1. All utilities whose facilities may be affected by the Work of the Contract shall be notified by the Contractor at least 72 hours in advance of the start of any operations which might affect such facilities.

2. The removal, replacement, support, or other handling of private and public utilities coming within the lines of the Work shall be accomplished by the Contractor at its expense in accordance with arrangements satisfactory to the owner or operator of the utility involved. The Contractor, at its expense, shall remove, replace, or support all utilities as required.

3. The Contractor shall not permit nor cause any hindrance to or interference with any individual, municipal department, public service corporation, or other company or companies in protecting its or their mains, pipes, poles, posts, or other structures, nor in shifting, removing, or replacing the same. The Contractor shall allow said individual, department, company, or companies to take all such measures as they may deem prudent to protect their structures.

E. Replacement of Property

1. The Contractor shall replace all pavement, driveways, fences, shrubs, lawns, trees, and any other public or private property damaged as a result of the Work under this Contract. All such replacement shall be done in accordance with the applicable specifications and no separate or extra payment will be made unless specifically provided for in the Payment Items. In all cases said replacement shall be at least equal to the original conditions.

1.22 INSPECTION OF WORK

A. Owner's Representative

1. The Engineer will be the Owner's representative during the construction period. A representative of the Engineer will make visits to the Site to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in substantial compliance with the Contract Documents. On the basis of his on- site observations the Engineer will keep the Owner informed of the progress of the Work and will endeavor to guard the Owner against defects and deficiencies in the Work of Contractors. The Engineer may disapprove Work as failing to conform to the Contract Documents. Whenever the Engineer considers it necessary or advisable for the proper carrying out of the intent of the Contract Documents, the Engineer shall have authority to require the Contractor to make special examination or testing of the Work (whether or not fabricated, installed or completed).

2. The Engineer is empowered to determine the amount, quality, acceptability, and fitness of all parts of the Work, to interpret the Contract Documents, to review provisions of the Specifications to meet unforeseen conditions or circumstances revealed or arising during the course of the Work, and to decide all other questions in connection with the Work, but this authority shall not give rise to any duty or responsibility of the Engineer to the Contractor, the subcontractor, or any of their agents or employees to do so.

B. Access to Work

1. The Owner, its Engineers, Inspectors, Agents, other employees, and any other parties who may enter into contracts with the Owner for doing work within the territory covered by this Contract shall, for all purposes which may be required by their contracts, and representatives of State and Federal regulatory agencies shall for any purpose have access to the Work and the premises used by the Contractor, and the Contractor shall provide safe and proper facilities there for. The Contractor shall, whenever so requested, provide to the Engineer access to the proper invoices, bills of lading, etc., and shall provide scales and assistance for measuring and testing any of the materials.

C. Covering of Work

1. No backfilling or covering of underground Work, or covering of Work, in structures shall be done without authorization by the Engineer. Any Work covered without such authorization shall be uncovered to such extent as directed or removed and replaced by the Contractor at its expense. If covering of the Work is ordered stopped, no more Work shall be done until such order is withdrawn.

1.23 PATENTS AND LICENSING AGREEMENTS

A. The Contractor shall protect, defend, indemnify, and save harmless the Engineer from all liabilities, judgments, costs, damages, and expenses which may in any way come against either of them by reason of the use of any material, machinery, devices, equipment, or processes furnished or used in the performance of the Work for which patents or licensing agreements exist or by reason of the use of designs furnished by the Contractor for which patents or licensing agreements exist.

B. In the event that any claim, suit, or action at law or in equity of any kind whatsoever is made or brought against the Owner involving any such patents or licensing agreements, the Owner shall have the right to retain from the money due and to become due the Contractor a sufficient amount of money as shall be considered necessary by the Owner to protect itself against loss until such claim, suit, or action shall have been settled and evidence to that effect shall have been furnished to the satisfaction of the Owner.

1.24 PAYMENTS AND COMPLETION

A. Estimated Quantities

1. The Contractor agrees: 1) that it will make no claim of any nature against the Owner or Engineer because of a difference between the quantities for unit price items of Work actually furnished and the estimated quantities stated in the Bid even though the estimated quantities prove grossly different from the quantities actually used, and 2) that the quantity of any unit price item of Work may be increased or decreased as may be deemed necessary without alteration or modification of the Contract.

B. Prices

1. The prices herein agreed to for the performance of the Work shown and as specified shall include not only the doing of the Work but also the furnishing of all labor, tools, and materials there for, whether the same are required directly or indirectly, unless otherwise specified.

2. Where Work is to be measured for payment by units of length, area, volume, or weight (as stated in the Bid), only the net amount of Work actually done, as it shall appear in the finished Work and as measured only within the payment limits described in the Contract Documents or as is ordered, shall be paid for, local customs to the contrary notwithstanding.

3. Where a lump sum price is bid for an item in the Bid, the lump sum price shall be for the Work complete as described in the item and shall include the cost of all specified or implied equipment, materials, and labor incidental to the Work, complete and ready for service and in accordance with the Contract Documents.

C. Breakdown of Lump Sum Items

1. At least thirty days prior to the submission of its first application for a progress payment, the Contractor shall present to the Engineer for its review a detailed schedule showing the breakdown of all lump sum bid prices in the Contract. Such schedule shall contain the amount estimated for each part of the Work and an estimate of quantities for each part of the Work. Work to be performed by subcontractors shall be separately identified. Upon request of the Engineer, said schedule shall be apportioned by the Contractor for labor and for materials. The Contractor shall revise such schedule until the same shall be satisfactory to the Engineer and shall not be changed after the Engineer has approved the same without the express written consent of the Engineer. The approved schedule will be used in the preparation of the current estimate but will not be considered as fixing the basis for additions to or deductions from the Contract.

D. Current Estimates

1. The Owner will establish dates during the respective months of the Project on which the Owner will accept applications for payment.

2. At least ten days before each date set for consideration for payment, the Contractor shall submit to the Engineer for review an application for payment, filled out and signed by the Contractor and covering the Work completed as of the date of the application, in satisfactory form and supported by such data as the Owner and Engineer may require.

3. The Engineer will, within ten days after receipt of each application for payment, either indicate in writing its recommendation of payment and present the application to the Owner or return the application to the Contractor, indicating in writing his reasons for not recommending payment. In the latter case, the Contractor shall make the necessary corrections and resubmit the application.

4. The Engineer's recommendation of any payment request shall constitute its advice to the Owner: that to the best of its knowledge, information, and belief, based on the Engineer's on-site observations of the Work in progress and on its reliance upon application for payment and supporting data, the Work has progressed to the point indicated; that the quality of the Work appears to be in substantial compliance with the Contract Documents (subject to any subsequent tests and qualifications stated in his final review); and that the Contractor is entitled to the payment of the amount recommended.

5. Where Work has been included in the current estimate recommended by the Engineer for payment, and where such Work is later found to be defective, and where such defective Work has not been corrected, the Engineer will recommend to the Owner that the value of such uncorrected Work be deducted from the amount due or to become due the Contractor.

6. The Engineer may decline to act upon requests for monthly payment if lists of vendors and subcontractors, shop drawings, samples, work schedules, instruction manuals, and breakdowns of lump sum bid items necessary for orderly prosecution of the Work, are not submitted as required.

E. Title to Materials, Equipment and Supplies

1. The Contractor warrants and guarantees that it will have good title to all materials, equipment, and supplies delivered to the Site for use in the Work.

2. Nothing in this Section is intended, or shall be construed, as relieving the Contractor from its obligations under this Contract, and the Contractor shall have the sole continuing responsibility to install the materials, equipment, and supplies purchased or furnished in accordance with the provisions of this Contract, to protect the same, to maintain them in proper condition, and to forthwith repair, replace, and make good any damage thereto or loss thereof, without cost to the Owner until such time as the Work covered by the Contract is accepted by the Owner in accordance with this part titled " Acceptance of Work."

3. The Contractor warrants and guarantees that no materials, equipment, or supplies delivered to the Site for use in the Work will have been acquired by the Contractor (or any other person performing work at the Site or furnishing materials, equipment or supplies for the project) subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller (or otherwise imposed on the Contractor by any person).

F. Payments for Materials Delivered to Site

1. In making estimates of the value of the Work done and materials incorporated in the Work, the Contractor may, subject to the approval of the Owner or as required by law, include in the current estimates the delivered cost, as modified below, of equipment and non-perishable materials which have been tested for adequacy and which have been delivered to the Site and adequately protected from fire, theft, vandalism, the effect of the elements, and any damage whatsoever, or similarly placed in approved storage facilities adjacent thereto. Such materials and equipment shall at all times be available for inspection by the Engineer and the Owner.

2. No progress payment shall, however, be made for said material and equipment until each of the following conditions has been fulfilled:

a. The Contractor shall have furnished to the Engineer invoices establishing the value of the said materials and equipment with the full amount the Contractor agrees to pay the vendor. Such invoices shall be furnished at least ten days in advance of the date of preparation of monthly estimates as established by the Engineer.

b. The Engineer shall have inspected said material and equipment and recommended payment there for.

c. The Contractor shall have furnished to the Owner the fire insurance policies, as provided in this Contract and with the broad form extended coverage endorsement, for said material and equipment in an amount equal to 100% of the value thereof and which policies shall be maintained, at the sole cost and expense of the Contractor, until said material and equipment has been incorporated into the Project.

d. Contractor shall submit with each application for payment, satisfactory evidence that all suppliers, materialmen and subcontractors have been paid all amounts previously invoiced with respect to their services and agreeing to defend and hold Owner harmless from any liens and encumbrances placed against the Project on account of Contractor's failure to promptly pay its suppliers, materialmen and subcontractors. Satisfactory evidence shall be: a canceled check in the correct amount and including identification of the invoice or invoices paid; a letter or telegram, from the vendor and signed by his properly authorized employee, stating the amounts and invoices that have been paid; or a receipted invoice.

e. Should the above evidence of payment not be furnished, the Engineer will recommend the deduction of any funds included in previous estimates for such materials and equipment for which said evidence has not been furnished from the current estimate or subsequent current estimates.

f. Any payment made for materials and equipment delivered will not relieve the Contractor of any responsibility for furnishing all the necessary equipment and materials required for prosecution of the Work in the same manner as if such payments had not been made.

G. Owner's Payment of Monthly Estimates

1. The Owner will, within thirty days of presentation to it of an approved application for payment (current estimate), pay the Contractor the approved amount of such estimate, less the retainage percentage, if any, set forth in the Agreement.

2. In lieu of all or part of the cash retainage, the Owner may accept securities negotiable without recourse, conditions or restrictions, a release of retainage bond, or an irrevocable letter of credit provided by the Contractor. The Owner may accept only securities, bonds or instruments acceptable under the laws of the State where the Owner is resident and/or the work is performed in lieu of any or all of the cash retainage.

3. Acceptance by the Contractor of the monthly payment shall constitute his warranty that it will pay each of his subcontractors and vendors all monies due them as required by applicable State and Federal Laws and Regulations.

H. Owner's Right to Withhold Payments

1. The Owner may withhold from the Contractor so much of any approved payments due it as may in the judgment of the Owner be necessary to assure the payment of any claims, liens or judgments against the Contractor, resulting from performance or non performance of the Work of the Contract, which have not been suitably discharged. The Owner shall have the right, as agent for the Contractor to apply any such amounts so withheld in such manner as the Owner may deem proper to satisfy such claims, liens or judgments. Such application of such money shall be deemed payments for the account of the Contractor.

2. The Owner may also withhold from the Contractor so much an amount of any payments due it as may in the judgment of the Owner be necessary:

    a. To protect the Owner from loss due to previous payment for Work subsequently found to deviate from the Contract requirements and which has not been corrected by the Contractor, and
    b. To protect the Owner from loss due to previous payment for materials and/or equipment delivered to the Site for which evidence of payment to vendors has not been furnished by the Contractor.

I. Deductions for Uncorrected Work

1. If the Owner deems it expedient to accept uncorrected Work, the Contract price shall be decreased by an amount, determined by the Owner, which is equal to the difference in value of the Work as performed by the Contractor and the value of the Work had it been satisfactorily performed in accordance with the Contract, or which is equal to the cost of performing the corrective Work, whichever shall be the higher amount.

1.25 ADDITIONAL INSURED

A. Engineer shall be added as an additional insured with respect to Contractor's Commercial General Liability and Commercial Automotive Liability Coverage.

B. The failure to comply, or the full compliance with all of the insurance provisions herein shall in no way act to relieve Contractor from its obligations of indemnifications to Engineer as discussed in Item 1.39 of this Section.

1.26 CONTRACTOR'S STATUS

A. Contractor's Responsibility and Liability for Injuries to Persons or Damage to Property

1. The Contractor shall be solely responsible and liable for the safety and protection of property, including but not limited to, the premises, its appurtenances and equipment and for the safety and protection of all persons entering on, in or about the Site including, but not limited to, the employees of the Owner, Engineer, Contractor, subcontractors, or State Employees and their designated representatives. The Contractor shall be solely responsible for all physical injuries, including death, to any such persons and for all damage to any such property occurring on account of the Work under this Contract, whether or not due to the negligence, fault, or default of the Contractor, its officers, employees, or agents, or of a subcontractor, its officers, employees, or agents.

2. To the fullest extent permitted by the law of the State in which the work is performed, the liability of the Contractor under this Contract shall be absolute and shall not be dependent upon any question of negligence on his part or on the part of its officers, agents, servants, or employees. Neither the approval by the Engineer of the methods of doing the Work, nor the failure of the Engineer to call attention to improper or inadequate methods or to require a change in methods, nor the neglect of the Engineer to direct the Contractor to take any particular precautions or to refrain from doing any particular thing shall excuse the Contractor from its obligations hereunder in case of any such injury to person or damage to property.

3. The provisions of this paragraph are intended for the sole benefit and protection of the Owner and Engineer and shall not create any cause of action in favor of any person, corporation or entity, other than the Owner and Engineer.

B. Contractor's Duty of Indemnification

1. The Contractor shall fully protect, defend, indemnify, and save harmless the Engineer, their officers and agents, against all liability, judgments, costs, damages and expense, including reasonable attorneys' fees, upon any claims for injuries to, or death of, any persons or damage to any property occurring on account of the Work hereunder, whether such damages or injuries to be attributable to the negligence of the Contractor, its officers, employees, agents, the Owner, Engineer, or others, provided, however, that to the extent precluded by statute, this clause shall not be deemed to provide indemnity against the sole negligence of the Owner.

2. The Contractor shall fully protect, defend, indemnify, and save harmless the Engineer against all liability judgments, costs, damages, and expenses, including reasonable attorneys' fees, upon all claims relating to labor and material furnished in connection with the Work hereunder or on account of the failure, omission, or neglect of the Contractor or its Subcontractors, their officers, employees, or agents to do or perform any of the covenants, acts, matters, or other duties required by this Contract.

3. The provisions of this Section shall not be deemed to provide indemnity of the Engineer for the liability of the Engineer, its agents or employees, to the extent that the liability of the Engineer, its agents or employees arises out of (a) or (b) below.

    a. The preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications, or

    b. The negligent giving or failure to give, directions or instructions required by contract or statute of the Engineer, its agents or employees as part of the Work, where such giving or failure to give directions or instructions, is the primary and principal cause of the bodily injury or property damage.

C. Claims

1. If the Contractor claims: I) that any Work it has been ordered to do is extra work, or 2) that it has performed or is going to perform extra work, or 3) that any action or omission of the Owner or the Engineer is contrary to the terms and provisions of the Contract, it shall:

    a. Promptly comply with such order;

    b. File with the Owner and the Engineer within fourteen days after being ordered to perform the Work claimed by it to be extra work or within fourteen working days after commencing performance of the extra work, whichever date shall be the earlier, or within fourteen working days after the said action or omission on the part of the Owner or the Engineer occurred, a written notice of the basis of its claim and a request for a determination thereof;

    c. File with the Owner and the Engineer, within thirty days after said alleged extra work was required to be performed or said alleged extra work was commenced, whichever date shall be earlier, or said alleged action or omission by the Owner or the Engineer occurred, a verified detailed statement, with documentary evidence, for the items and basis of its claim;

    d. Produce for the Owner's examination, upon notice from the Owner, all of the Contractor's and its subcontractors' (of any tier) books of account, bills, invoices, payrolls, subcontracts, time books, progress records, daily reports, bank deposit books, bank statements, checkbooks, and canceled checks showing all of its actions and transactions in connection with, or relating to, or arising by reason of, its claim, and submit itself, persons in its employment, and persons in its subcontractor's employment for examination under oath by any person designated by the Owner to investigate any claims made against the Owner under the Contract, such examination to be made at the offices of the Owner or the Owner's agent:

e. Proceed, prior to and subsequent to the determination of the Owner with respect to any such disputed matter, with the performance of the Contract diligently and in accordance with all instructions of the Owner and the Engineer.

2. The Contractor's failure to comply with any or all of the foregoing provisions of this Section shall be deemed to be: I) a conclusive and binding determination on its part that aid order, work, action, or omission does not involve extra work and is not contrary to the terms and provisions of the Contract; and 2) a waiver by the Contractor of all claims for additional compensation or damages as a result of said order, work, action or omission.

3. No person shall have power to waive or modify any of the foregoing provisions. In any action against the Owner to recover any sum in excess of the sum certified by the Owner to be due under or by reason of the Contract, the Contractor must al1ege in its complaint and prove at the trial compliance with each and al1 the provisions of this Section.

4. Nothing in this Section shall in any way affect the Owner's right to obtain an examination before trial or a discovery and inspection in any action that might be instituted by, or against, the Owner or the Contractor.

D. No Claims Against Individuals

1. No claim whatsoever shall be made by the Contractor against any trustee, beneficiary, officer, agent, or employee of the Owner for, or on account of, anything done or omitted to be done in connection with the Contract.

2. This Section shall also apply with equal force and effect to the directors, officers and employees of the Engineer provided, however, that this Section shall not apply to partners or other persons who by law would be liable for the acts of the legal entity, whether the Owner or Engineer, it being the intent of this Section that claims against the legal entity itself shall not be precluded.

E. Safety and Protection

1. In addition to the published safety rules and practices of the Owner, if any, applicable to activities at the work site the Contractor shall comply with all applicable laws, ordinances, rules, regulations, and orders of public bodies having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss, including, without limitation, the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596), as amended, and under NYS Department of Labor Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54) and the Labor Laws of the State within which the project is located and the codes, rules and regulations promulgated therewith. The Contractor shall erect and maintain as required by the conditions and the progress of the Work, all necessary safeguards for safety and protection and shall comply with al1 applicable recommendations of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc.

2. In compliance with the foregoing the Contractor shall have on site while any work is being performed an appropriately trained, responsible member of its organization whose duty shall be compliance with the above referenced laws, ordinances, rules, regulations and orders and the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in advance in writing by the Contractor to the Owner.

3. The Contractor shall be responsible for providing to all its employees, agents and subcontractors or any other person under its control all safety equipment including but not limited to, hard hats, safety helmets, safety eye wear, respirators, and protective clothing

required by law and the project specific health and safety plan, and shall be responsible for insuring the proper use thereof.

4. The Contractor shall place a post adjacent to the principal entry point into each excavation. Following each inspection of the excavation as required by 29 CFR 1926 (Subpart P) the Contractor shall prominently post in a manner protected from loss or damage by weather or other conditions, a certification of inspection. Such certification shall be 8 ½" x 11" and shall be headed:

   "Excavation Safety Inspection"

   and shall set forth in letters and figures at least 2 inches high and V4 inch in thickness the time and date of the last inspection of the excavation. The certification shall also state that no evidence was found on inspection of: 1) a situation that could result in possible cave ins, 2) indication of failure of protective systems, 3) hazardous atmospheres, or 4) other hazardous conditions. The certification shall be signed by a competent person (as defined in 29 CFR 1926.650).

5. The duties, responsibilities and liability of the Contractor as set forth herein shall be deemed incorporated in and applicable to each and every separate division, section and provision of the Contract Documents as if set fort fully therein.

6. The Contractor shall keep upon the Site, at each location where Work is in progress, a completely equipped first-aid kit and stretcher and shall provide ready access thereto at all times when personnel are employed on the Work.

7. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, appliances and methods.

8. The Contractor shall comply with requirements of this Part and Section 02006 - Health and Safety.

F. Emergencies

In emergencies affecting the safety of persons on the Work or property at the Site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Owner, shall act, at its discretion, to prevent threatened damage, injury or loss. The Contractor shall give the Engineer prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby. If the Contractor believes that additional Work done by he/she in an emergency which arose from causes beyond his/her control entitles it to an increase in the Contract price or an extension in the Contract time, it shall make claim as provided for in this Contract.

G. Contractor to Check Contract Documents

The Contractor shall verify all dimensions and quantities in the Contract Documents. Any discrepancies found between the Contract Documents and Site conditions or any errors or omissions found shall be immediately reported to the Engineer, who shall promptly correct such error or omission in writing. Any Work done by the Contractor after his/her discovery of such discrepancies, errors, or omissions shall be done at the Contractor's risk.

1.27 APPLICABLE STANDARDS

A. Reference to codes, manuals or standard specifications of any technical society, organization or association or to the code of any governmental authority. Whether such reference be specified or implied, shall mean the latest code, manual or standard specification in effect at the time of opening of the Bids, except as may be otherwise specifically provided in the Contract Documents.

B. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to ENGINEER, or any of Engineers consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of the Contract Documents.

1.28 TIME PROVISIONS

A. Commencement and Completion of Work: Time of Essence

1. The Contractor shall commence the Work within ten days following the date of notice to proceed and fully complete the Work within the time specified in the Bid. The Contractor shall notify the Engineer, in writing, of its intention to enter upon the Site of the Work at least five days in advance of such entry.

2. Time is of the essence of this Contract.

B. Rate of Progress

1. The rate of progress of the Work shall be as nearly uniform as practicable and shall be such that all Work under the Contract will be completed within the time specified, or before such later date to which the time of completion may have been extended by the Owner.

2. The Contractor shall within ten days following the execution of this Contract prepare and submit to the Engineer for approval, two copies of a practical and feasible Work schedule showing the order and date on which the several salient features (including equipment) will be started and completed.

3. The Work schedule shall be in the form of a critical path or bar graph.

4. The Contractor on each Contract shall adhere to the approved Work schedule for its Contract. In the event a Contractor does not adhere to its Work schedule and causes other Contractors to be damaged, the Contractor causing the delay shall defend, indemnify, and save harmless the Owner and Engineer from all actions and charges of the other Contractors against the Owner or Engineer caused by said delay including all costs, disbursements and attorney's fees.

5. The Contractor shall update and resubmit its own schedule every month, unless the Engineer requests less frequent updating.

C. Extension of Time

1. If the Contractor is obstructed or delayed in the prosecution or completion of the Work by the neglect, delay or default of the Owner, Engineer or of any other contractors for adjoining or contiguous work, or by any damage that may happen thereto, by the unusual action of the elements, or by the abandonment of the Work by the employees in a general strike, or by any delay on the part of the Owner or Engineer doing work or furnishing material, the Contractor shall have no claim for damages against the Owner or Engineer for any such cause or delay, but may in such case be entitled to an extension of time specified herein for the completion of the Work, provided, however, that claim for such extension of time be made by the Contractor in writing within thirty calendar days from the time when such alleged cause for delay shall occur. Any extension granted shall constitute the sole and only redress to the Contractor for any claims of any nature whatsoever caused or in any way related to such delay.

2. An application for an extension of time must set forth in detail the source and the nature of each alleged cause of delay in the completion of the Work, the date upon which each such cause of delay began and ended, and delay attributable to each of such causes. The Contractor shall, however, be entitled to an extension of time for such causes only for the number of calendar days of delay which the Owner may determine to be due solely to such causes, and then only if the Contractor shall have strictly complied with all of the requirements of this Section.

3. The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the Work as determined by the Owner irrespective of the number of causes contributing to produce such delay. If one of several causes of delay operating concurrently results from any act, fault or omission of the Contractor or of his subcontractors or materialmen, and would of itself (irrespective of the concurrent causes) have delayed the Work, no extension of time will be allowed for the period of delay resulting from such act, fault or omission.

1.29 CHANGES

A. Owner's Changes in the Work

1. The Owner at any time without notice to any Surety may make changes in the Work of the Contract by making alterations therein, by making additions thereto, or by omitting Work there from, and no such action shall invalidate the Contract, relieve or release the Contractor from any guarantee under the Contract, affect the terms or validity of any bond, relieve or release any Surety, or constitute grounds for any claim by the Contractor for damages or loss of anticipated profits. All Work required by such alterations, additions, or omissions shall be executed under the terms of the Contract not withstanding the extent thereof. Said changes alterations, additions or omissions shall not constitute a cardinal change in the Contract.

2. Other than in an emergency endangering life or property or pursuant to a Field Order, the Contractor shall not make any change in the Work nor furnish any labor, equipment, materials, supplies, or other services in connection with any change except pursuant to, and after, receipt of a written authorization from the Owner in the form of a Change Order, Modification, or Proceed Order. The Contractor shall not be entitled to any increase in the Contract price or extension of the Contract time, and no claim there for shall be valid, unless such written authorization has been so issued to the Contractor.

3. The Engineer may authorize minor changes in the Work that do not alter the character, quantity, or cost of the Work as a whole. A Field Order may accomplish these changes. The Contractor shall carry out such Field Orders promptly and without any adjustment of the Contract price or Contract time.

B. Adjustments in Price

1. Any increase or decrease in the Contract price resulting from changes in the Work ordered by the Owner shall be determined as provided in this Section:

   a. By such applicable unit prices, if any, as set forth in the Contract; or

   b. If no such unit prices are so set forth, then by unit prices or by a lump sum mutually agreed upon by the Owner and the Contractor; such unit prices or lump sum being arrived at by estimates of reasonable value prepared in general conformance with the outline set forth in (c) below.

c. If no such unit prices are so set forth and if the parties cannot agree upon unit prices or a lump sum, then determination shall be made as the sum of the following amounts for all Work necessary for the changes:

I. Cost of materials delivered to the job Site for incorporation into the Contract Work.

II. Wages paid to workmen and foremen and wage supplements paid to labor organizations in accordance with current labor agreements.

III. Premiums or taxes paid by the Contractor for workmen's compensation insurance, unemployment insurance, FICA tax and other payroll taxes as required by law.

IV. Sales and use taxes paid as required by law.

V. Allowances for necessary use of construction equipment (exclusive of hand tools and minor equipment), as approved by the Engineer.

VI. An amount for overhead.

VII. An amount for profit.

2. Construction equipment rental rates shall be in accordance with those published in that issue of the Associated Equipment Distributors (AED) Rental Guide, current at the time the work is done. In the event that rental rates for equipment used in the performance of extra work are not listed in the AED Rental Guide, rental rates will be approved for payment, which are consistent with those prevailing in the construction industry in the area of the Work. Monthly, weekly, or daily rates shall apply, prorated to the actual time the equipment is in use; the classification of monthly, weekly, or daily rate to be used shall be determined by the length of time the piece of equipment under consideration was in use on the total project under Contract plus either the time used in the performance of the extra work or the time used in the performance of the extra work plus additional subsequent time used on the total project under contract. Gasoline, oil and grease required for operation and maintenance will be paid for at the actual cost. When, in the opinion of the Contractor as approved by the Engineer, suitable equipment is not available on the Site, the moving of said equipment to and from the Site will be paid for at actual cost.

3. The Contractor shall submit evidence satisfactory to the Engineer to substantiate each and every item included in an estimate prepared pursuant to Item 1.43.B.I.b. or a determination pursuant to Item 1.43.B.I.c.

4. The amounts allowed for overhead and profit for a change resulting in an increase in Contract price may be less than, but shall not exceed, the applicable percentages as follows:

a. For work done directly by the Contractor, the sum of overhead amount plus profit amount shall not exceed 20% of the cost.

b. For work done by subcontractors of any tier, the sum of total overhead amounts of the subcontractors and Contractor, plus total profit amounts for the subcontractors and Contractor, shall not exceed 25% of the cost. Subcontractors shall be limited to 15% and Contractors shall be limited to 10% for combined overhead and profit.

5. Overhead is defined as all expense not included in the amounts outlined in Item 1.43.B.I.c.i. through 1.43.B.I.c.v. including administration, superintendence, insurance not outlined in Item 1.43.B.I.c.i. through Item 1.43.B.I.c.v., material used in temporary structures, additional premiums placed upon the labor and performance bonds of the Contractor and small hand tools.

6. Where Work necessitated by the change involves overtime, no payroll taxes, overhead or profit will be allowed on the premium portion of overtime pay.

C. Proceed Order

1. If the Owner and the Contractor cannot agree upon an equitable adjustment of the Contract price prior to performance of the change in the Work, a Proceed Order will be issued authorizing the change, and Contractor shall proceed with the work thereof by the most economical methods. Upon completion of the change in the work and a determination of the adjustment in the Contract price, a Change Order will be issued.

END OF SECTION

SECTION 01105

PERMITS AND APPROVALS

PART 1: GENERAL

1.1 SUMMARY

Where the Contractor is responsible for obtaining permits, he shall also be responsible for any permit fees associated therewith.

The Contractor is advised to allow adequate amounts of time for agency review and approvals needed to be obtained by the Owner and Contractor.

A. The Contractor shall prepare, submit, and obtain Owner's acceptance for any documentation, including but not limited to test protocols, test results, and details of construction, required to be furnished under any permit or approval whether such information be required before, during, or after construction of the applicable work. Included will be the actual number of resubmissions required to obtain permitting agency approval.

   The Contractor shall be aware that shop drawing acceptance by the Engineer and the Owner shall not relieve the Contractor of any permit requirement. The Contractor shall schedule his work to accommodate permitting and approving agency turnaround time. Should the Contractor proceed with work affected by permitting or approving without having permitting or approving agency approval, said work shall be at the Contractor's risk. Should the permitting or approving agency require changes to the construction of the work, and those changes are accepted by the Engineer and Owner, additional costs, if any will only be authorized through a change order. Contractor costs incurred to remove unauthorized work shall be solely borne by the Contractor.

PART 2: PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 GENERAL

A. Contractor shall follow-up on and complete additional requirements for applicable permits and approvals required for the work.

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including SMC Contract General Conditions and Supplementary Conditions and other SMC Technical Specifications apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for project meetings including but not limited to the following:

1. Pre-Construction Conference
2. Progress Meetings
3. Coordination Meetings
4. Public Meetings

1.3 PROJECT MEETINGS

A. The Contractor, Owner, Engineer, and those subcontractors whose presence is necessary, shall attend periodic meetings for the purpose of discussing the progress and execution of the work. These meetings shall be held bi-weekly and shall be held at a time and place as designated by the SMC on-site Representative.

B. The proceedings of these meetings will be recorded by the SMC Representative and a copy will be subsequently furnished to the Contractor. It will be the Contractor's responsibility to distribute copies, as may be required, to his subcontractors.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01210

PRECONSTRUCTION CONFERENCE

PART 1 GENERAL

1.1 DESCRIPTION

A. General:

Date, Time and Location: Conference will be held after execution of the Contract and before construction is started at the site. The Owner will fix the date, time and location of the meeting in accordance with requirements of the General Conditions.

1. Owner shall prepare agenda, preside at meeting, and prepare and distribute a transcript of proceedings to all parties.

2. Contractor(s) shall provide data required, contribute appropriate items for discussion, and be prepared to discuss all items on agenda.

B. Required Attendance:

1. Contractor(s) and major Subcontractors.

2. Owner's representative.

3. Engineer.

4. Representatives of government agencies.

C. Agenda:

1. Agenda will include, but will not necessarily be limited to, the following:

   a. Designation of responsible personnel.
   b. Subcontractors.
   c. Coordination with other Contractors.
   d. Construction Schedule.
   e. Processing of Shop Drawings.
   f. Processing of field decisions and Change Orders.
   g. Requirements for copies of Contract Documents.
   h. Insurance in force.
   i. Schedule of Values.
   j. Schedule of Payments.
   k. Use of premises.
   l. Contractor(s) responsibility for safety and first aid procedures.
   m. Security.
   n. Housekeeping.
   o. Field Offices.
   p. Surveying and Record Drawings.
   q. Restoration

** END OF SECTION **

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including;

1. Contractor's progress schedule.
2. Submittal schedule.
3. Daily construction reports.
4. Shop Drawings.
5. Product Data.
6. Sampling & Analysis Laboratories.
7. Bills of lading.

B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

1. Permits.
2. Applications for payment.
3. Performance and payment bonds.
4. Insurance certificates.
5. List of Subcontractors, Professional Engineer and Surveyor to be used to perform work at the site.

C. The Schedule of Values submittal is included in Section "Applications for Payment."

D. Inspection and test reports are included in Section "Quality Control Services."

1.3 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related elements of the Work so processing

will not be delayed by the need to review submittals concurrently for coordination.

a. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.

a. No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer sufficiently in advance of the Work to permit processing.

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Engineer using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.

1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar- chart type Contractor's construction schedule. Submit within 15 days of Notice to proceed.

B. Work Stages: Indicate important stages of construction for each major portion of the Work, including testing and installation.

C. Distribution: Following response to the initial submittal, print and distribute copies to the Engineer, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

D. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.5 DAILY CONSTRUCTION REPORTS

A. Prepare a daily construction report, recording the following information concerning events at the site; and submit duplicate copies to the Engineer, weekly.

1. List of subcontractors at the site.
2. Approximate count of personnel at the site.
3. High and low temperatures, general weather conditions.
4. Accidents and unusual events.
5. Meetings and significant decisions.
6. Stoppages, delays, shortages, losses.
7. Emergency procedures.
8. Testing.
9. Excavation quantities / Disposal

1.6 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions and catalog cuts. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

   a. Manufacturer's printed recommendations.

   b. Compliance with recognized trade association standards.

   c. Compliance with recognized testing agency standards / DOH Certification

   d. Application of testing agency labels and seals.

   e. Notation of dimensions verified by field measurement.

   f. Notation of coordination requirements.

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

3. Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.

4. Submittals: Submit 5 copies of each required submittal; submit 2 additional copies where required for maintenance manuals.

   a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

5. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.

   a. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.

   b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.7 MATERIAL SAFETY DATA SHEETS (MSDS):

A. Each Contractor shall comply with "Right to Know" requirements of Chapter 551 of Laws of New York, 1980, concerning notification of the use of toxic substances.

1. Any product or substance used by each Contractor or its Subcontractors which is listed in sub-part Z of OSHA Part 1910 Title 29 of Code of Federal Regulations entitled "Toxic and Hazardous Substances" shall be identified to the Engineer by the submission of a standard Material Safety Data Sheet.

2. The MSDS included at the end of this section, or a manufacturer's standard form (OSHA-20) shall

be submitted to the Engineer before the material is brought on site.

1.8 ENGINEER'S ACTION

A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Engineer will review each submittal, mark to indicate action taken, and return promptly.

1. Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp: The Engineer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. Final Unrestricted Release: Where submittals are marked "No Exceptions Taken," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.

2. Final-But-Restricted Release: When submittals are marked "Make Corrections Noted," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.

3. Returned for Resubmittal: When submittal is marked "Revise and Resubmit", "Rejected", or "Submit Specified Item", do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.

a. Do not permit submittals marked "Revise and Resubmit", "Rejected", or "Submit Specified Item" to be used at the Project site, or elsewhere where Work is in progress.

4. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required".

PART 2 PRODUCTS

2.1 Not Applicable.

PART 3 EXECUTION

3.1 Not Applicable.

*** END OF SECTION ***

SECTION 01310

CONSTRUCTION SCHEDULES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Format.

B. Content.

C. Revisions to schedules.

D. Submittals.

1.2 RELATED SECTIONS

A. Section 01010 - Summary of Work

B. Section 01300 - Submittals:

C. Section 01340 - Shop drawings, product data, and samples.

1.3 REFERENCES

A. AGC (Associated General Contractors of America) publication "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry".

1.4 FORMAT

A. Prepare schedules as a horizontal bar chart with separate bar for each major portion of Work or operation, identifying first work day of each week.

B. Scale and Spacing: To provide space for notations and revisions.

C. Sheet Size: Minimum of 22x17.

1.5 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification section number.

D. Identify work of separate stages and other logically grouped activities.

E. Provide tasks and sub-schedules to define critical paths of the entire schedule.

F. Include conferences and meetings in schedule.

G. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

H. Provide separate schedule of submittal dates for shop drawings, product data, and samples, including Owner furnished products, and dates reviewed submittals will be required from Architect/Engineer. Indicate decision dates for selection of finishes.

I. Indicate delivery dates for Owner furnished products

1.6 REVISIONS TO SCHEDULES

A. Indicate progress of each activity to date of submittal, and projected completion date of each activity.

B. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.

C. Provide narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect [including the effect of changes on schedules of separate contractors].

1.7 SUBMITTALS

A. Submit initial schedules within 15 days after date of Owner-Contractor Agreement. After review, resubmit required revised data within ten days.

B. Submit revised Progress Schedules with each Application for Payment.

C. Submit two copies, which will be retained and distributed by Engineer.

1.8 DISTRIBUTION

A. Distribute copies of reviewed schedules to Project site file, Subcontractors, suppliers, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01340

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Submit to the Engineer, shop drawings, product data and samples required by specification sections.

1.2 SUBMITTALS:

A. Shop Drawings:

1. Original drawings, prepared by Contractor, subcontractor, supplier or distributor, which illustrate some portion of the Work; showing fabrication, layout, setting or erection details and includes a schedule of values for all work shown on the shop drawing.

2. Prepared by a qualified detailer or if required by Engineer a NYS Professional Engineer.

3. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

4. Minimum Sheet Size: 8 1/2 in. x 11 in.

B. Product Data:

1. Manufacturer's standard schematic drawings:

   a) Modify drawings to delete information which is not applicable to project.

   b) Supplement standard information to provide additional information applicable to project.

2. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.

   a) Clearly mark each copy to identify pertinent materials, products or models.

   b) Show dimensions and clearances required.

   c) Shop performance characteristics and capacities.

C. Samples:

1. Physical examples to illustrate materials, equipment or workmanship, and to establish standards by which completed work is judged.

2. Office Samples: Of sufficient size and quantity to clearly illustrate:

   a) Functional characteristics of product or material, with integrally related parts and attachment devices.

   b) Full range of color samples (where applicable).

D. Submission Requirements:

1. Schedule submissions at least ten (10) days before dates reviewed submittals will be needed.

2. Number of Submittals: Interim Submissions. Submit five (5) sets of opaque prints of Shop Drawings and Product Data including catalog cuts, design calculations, and schedule of items to Owner. Final Submission. Submit fifteen (15) sets of opaque prints and one set in electronic format (Autocad Rel 13 or later) of Shop Drawings and Product Data including catalog cuts, O&M manuals, design calculations, and schedule of items to Owner.

3. Submit the number of Samples specified in each of specification sections.

4. Accompany submittals with the “shop drawing transmittal” letter containing:

   a) Date.

   b) Project title and number.

   c) Contractor's name and address.

   d) The number of each Shop Drawing, Product Data and Sample submitted.

   e) Notification of deviations from Contract Documents.

   f) Other pertinent data.

5. Submittals shall include:

   a) Date and revision dates.

   b) Project title and number.

   c) The names of:

      (1) Engineer.
      (2) Contractor.
      (3) Subcontractor.
      (4) Supplier.
      (5) Manufacturer.
      (6) Separate detailer when pertinent.

   d) Identification of product or material.

   e) Relation to adjacent structure or materials.

   f) Field dimensions, clearly identified as such.

   g) Specification section number.

   h) Applicable standards, such as ASTM number of Federal Specification.

      (1) Identification of deviations from Contract Documents.

   i) Contracor's stamp, initialed or signed, certifying to review of field measurements and compliance with Contract Documents.

6. Engineer's Review:

a) If a submittal is acceptable, it will be marked "No Exceptions Taken".

b) Shop Drawings or other submittals not bearing "No Exceptions Taken" notation shall not be issued to subcontractor or utilized for construction purposes. No work shall be done or equipment installed without a "No Exception Taken: shop drawing or submittal.

c) Should any submittals be unacceptable, one print or copy will be returned to the Contractor with one of the following notations:

"Revise and Resubmit"
"Make Corrections Noted"
"Rejected"
"Submit Specified Item"

d) Upon return of a submittal marked "Revise and Resubmit", "Rejected" or "Make Corrections Noted", the Contractor shall make the corrections indicated and repeat the initial approval procedure.

e) The "Submit Specified Item" notation is used to indicate materials or equipment that are not acceptable. Upon return of a submittal so marked, the Contractor shall repeat the initial approval procedure utilizing acceptable materials or equipment.

f) It is the Contractor's responsibility to review submittals made by his suppliers and subcontractors before transmitting them to the Engineer to assure proper coordination of the Work and to determine that each submittal is in accordance with his desires and that there is sufficient information about materials and equipment- for the Engineer to determine compliance with the Drawings and specifications. Incomplete or inadequate submittals will be returned for revision without review.

E. Resubmission Requirements:

1. Shop Drawings:

a) Revise initial drawings as required and resubmit as specified for initial submittal.

b) Indicate on drawings any changes which have been made other than those requested by Engineer.

c) Product Data and Samples: Submit new data and samples as required for initial submittal.

END OF SECTION

SECTION 01400

QUALITY CONTROL SERVICES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for quality control services.

B. Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by the Engineer.

C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.

D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.

1. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.

2. Inspections, tests and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.

E. Requirements for the Contractor to provide quality control services required by the Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 RESPONSIBILITIES

A. Contractor Responsibilities: The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity; these services include those specified to be performed by an independent agency and not by the Contractor. Costs for these services shall be included in the Contract Sum.

1. The Contractor shall employ and pay an independent agency, to perform specified quality control services.

2. The Owner will engage and pay for the services of an independent agency to perform inspections and tests specified as the Owner's responsibility.

3. Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.

a. Cost of retesting construction revised or replaced by the Contractor is the Contractor's

responsibility, where required tests were performed on original construction.

B. Coordination: The Contractor engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.4 SUBMITTALS

A. The Contractor shall submit a certified written report of each inspection, test or similar service to the Engineer, in duplicate.

1. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:

a. Date of issue.

b. Project title and number.

c. Dates and locations of samples and tests or inspections.

d. Names of individuals making the inspection or test.

e. Designation of the Work and test method.

f. Identification of product and Specification Section.

g. Complete inspection or test data.

h. Test results and an interpretations of test results.

i. Ambient conditions at the time of sample-taking and testing.

j. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.

k. Name and signature of inspector.

l. Recommendations on retesting.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 REPAIR AND PROTECTION

A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for "Cutting and Patching."

** END OF SECTION **

SECTION 01410

CONTRACTOR FURNISHED TESTING LABORATORY SERVICES

PART 1 GENERAL

1.1 DESCRIPTION

A. Contractor shall provide the services of a soils testing laboratory to determine the following:

1. Laboratory proctor density curves for materials to be used as backfill.

2. Field compaction testing.

1.2 REFERENCES

A. ASTM C802 - Practice for Conducting an Interlaboratory Test Program to Determine the Precision of Test Methods for Construction.

B. ASTM C1077 - Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

C. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

D. ASTM E329 - Practice for Use in the Evaluation of Inspection and Testing Agencies as Used in Construction.

E. ASTM E543 - Practice for Determining the Qualification of Nondestructive Testing Agencies.

F. ASTM E548 - Practice for Preparation of Criteria for Use in the Evaluation of Testing Laboratories and Inspection Bodies.

1.3 SELECTION AND PAYMENT

A. Contractor will employ and pay for services of an independent testing agency or laboratory to perform specified testing.

B. Employment of testing agency or laboratory in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

1.4 QUALITY ASSURANCE

A. Comply with requirements of ASTM C802, ASTM C1077, ASTM D3740, ASTM E329, ASTM E543, and ASTM E548.

B. Agency/Laboratory: Authorized to operate in State of New York.

C. Agency/Laboratory Staff: Maintain a full time specialist on staff to review services.

D. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

1.5 CONTRACTOR SUBMITTALS

A. Prior to start of Work, submit testing laboratory name, address, and telephone number, and names of full time specialist and responsible officer.

1.6 AGENCY/LABORATORY RESPONSIBILITIES

A. Test samples of mixes submitted by Contractor.

B. Provide qualified personnel at site. Cooperate with SMC Representative and Contractor in performance of services.

C. Perform specified sampling and testing of Products in accordance with specified standards.

D. Ascertain compliance of materials and mixes with requirements of Contract Documents.

E. Promptly notify SMC Representative and Contractor of observed irregularities or non-conformance of Work or Products.

F. Perform additional tests required by Engineer.

G. When requested, attend preconstruction meetings and progress meetings.

1.7 AGENCY/LABORATORY REPORTS

A. After each test, promptly submit two copies of report to SMC Representative and to Contractor.

B. Include:

1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and specifications section.
6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

C. When requested by Engineer, provide interpretation of test results.

1.8 LIMITS ON TESTING AUTHORITY

A. Agency / laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.

B. Agency / laboratory may not approve or accept any portion of the Work.

C. Agency / laboratory may not assume any duties of Contractor.

D. Agency / laboratory has no authority to stop the Work.

1.9 CONTRACTOR RESPONSIBILITIES

A. Deliver to agency or laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.

B. Cooperate with laboratory personnel, and provide access to the Work.

C. Provide incidental labor and facilities:

1. To provide access to Work to be tested.

2. To obtain and handle samples at the site or at source of Products to be tested.

3. To facilitate tests.

4. To provide storage and curing of test samples.

D. Notify SMC Representative and laboratory 24 hours prior to expected time for operations requiring testing services.

1.10 SCHEDULE OF TESTS

A. Individual Specification Sections: Tests required and standards for testing.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01420

REMEDIATION OPERATIONS AND MAINTENANCE

PART 1 GENERAL

1.1 SCOPE OF WORK

A. The Contractor shall start up, operate, maintain, monitor, and manage for one year of remediation, on a 24 hour per day, 7 day per week basis, all equipment, processes, systems and appurtenances associated with the site remediation systems, in accordance with these drawings and specifications. The Contractor shall perform this work as specified herein.

B. The Contractor shall be responsible for furnishing all labor, materials and equipment and services required to excavate soil, condition and construct the soil into bio piles; operate and maintain the wastewater treatment facility and all other systems required.

C. The Contractor shall, at a minimum, implement and follow Contractor Quality Assurance Plan.

1.2 SUBMITTALS

A. The items listed below shall be submitted for the approval of the Owner. Submittal requirements shall be in accordance with Section 01300, Submittals.

1. Excavation Plan
2. Operation and Maintenance Manual.
3. Plan of Operation.
4. Staffing Plan.
5. Progress Reports.

1.3 WARRANTIES/GUARANTEES

A. The Contractor shall operate and maintain all equipment, systems, processes and appurtenances in accordance with the manufacturer's recommendations to ensure that the warranties/guarantees are not voided.

B. The Contractor shall be responsible for and correct all deficiency where the Contractor voided a warranty/guarantee due to his/her operation or maintenance practices.

C. The Contractor shall have each respective manufacturer's representative onsite at the time of equipment/system testing and startup to ensure that the installation is correct and that the equipment is checked-out and approved ready for startup and testing by the manufacturer.

END OF SECTION

Deleted: January

SECTION 01450

SPILL CONTROL

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Develop, implement, maintain, supervise, and be responsible for a comprehensive Spill Control Plan. This plan shall provide contingency measures for potential spills and discharges from trucks handling on-site transportation and any other potentially hazardous materials on-site.

B. Provide methods, means, and facilities required to prevent contamination of soil, water, atmosphere, uncontaminated structures, equipment, or material by the discharge of wastes from spills due to Contractor's operations.

C. Provide equipment and personnel to perform emergency measures required to contain any spillages and to remove spilled materials and soils or liquids that become contaminated due to spillage. This collected spill material shall be properly disposed of at the Contractor's expense.

D. Provide equipment and personnel to perform decontamination measures that may be required to remove spillage from previously uncontaminated structures, equipment, or material. Decontamination residues must be properly disposed of at the Contractor's expense.

E. Manage petroleum products in a manner that prevents spills. Provide a written fuel management plan for any liquid petroleum fuels kept on site. Contractor shall install no container with the capacity to store more than 660 gallons of petroleum products, and no combination of containers that can store more than 1,320 gallons without the approval of Owner/Department.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. The Contractor shall provide for any unexpected spills or discharge of hazardous substances. The following minimum equipment is to be kept on site at all times during site work activities:

1. Sand, clean fill, or other noncombustible absorbent.

2. Drums (55 gallon, U.S. DOT 17-E or 17-H)

3. Shovels.

4. Bio-Solvent (e.g. Alconox or other non VOC based solvent) for decontamination of tools and equipment.

5. High-volume water pump.

6. Water transfer hoses.

7. Overpack drums.

PART 3 EXECUTION

3.1 SPILL CONTROL PLAN

A. If a spill occurs, the following actions shall be taken by the Contractor:

1. Notify the Owner, Engineer and Department immediately.

2. Take immediate measures to control and contain the spill within the site boundaries. This shall include the following actions:

   a. Keep unnecessary people away, isolate hazardous areas, and deny entry.

   b. Do not allow anyone to touch spilled material.

   c. Stay upwind; keep out of low areas.

   d. Keep combustibles away from the spilled material.

   e. Use water spray or foam suppressant to reduce vapors and dust, as needed.

   f. Take samples for analysis to determine that cleanup is adequate.

   g. Other actions, as needed.

3. General spill control actions the Contractor will implement are as follows:

   a. Solid Spills: Remove and place contaminated materials into dry containers and cover; label the container as to contents; dispose of the container properly as soon as possible.

   b. Liquid Spills: Absorb with sand, clean fill, or noncombustible absorbent material. Characterize and dispose at appropriate facility the absorbent/spill mixture in the manner specified for "Solid Spills".

B. If a discharge of material stored in tanks or drums occurs, the following actions shall be taken by the Contractor to reduce potential migration to adjacent properties:

1. Notify the Owner and Engineer immediately.

2. Taken immediate measures to control the discharge within the site boundaries or beyond the site boundaries, if necessary. This shall include the following actions:

   a. Contain and eliminate the discharge, if possible.

   b. Remove or retrieve any discharged liquids or sludges, if possible.

   c. Keep unnecessary people away; isolate the hazardous area and deny entry.

   d. Do not allow anyone to touch the discharge materials.

   e. Other actions, as needed.

3. General discharge control actions the Contractor shall implement are as follows:

a. Liquid Discharges to Soil: Immediately identify the point of discharge, and take measures to eliminate further spills. Absorb discharged material with sand, clean fill, or noncombustible absorbent material. Place the absorbent/discharge mixture into dry containers.

C. If the spill or discharge is reportable, and/or humans or the environment are threatened, the Contractor shall immediately implement the Spill Control Plan/Contact NYSDEC Spill hotline as approved by the Owner and Engineer.

D. Decontamination procedures may be required after cleanup to eliminate traces of the substance spilled or reduce it to an acceptable level as determined by the Owner and Engineer. Complete cleanup may require removal of contaminated soils. Personnel decontamination should include showers and cleansing or disposing of clothing and equipment. All contaminated materials including solvents, cloth, soil, and wood that cannot be decontaminated must be properly containerized, labeled, and promptly disposed of off-site as a RCRA manifested hazardous waste.

END OF SECTION

SECTION 01545

PROTECTION OF THE WORK AND PROPERTY

PART 1 GENERAL

1.1 JOB CONDITIONS

A. General:

Contractor shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage as specified in the General Conditions and herein.

1. In order to prevent damage, injury or loss, Contractor's actions shall include, but not be limited to, the following:

    a. Store apparatus, materials, supplies, and equipment in an orderly, safe manner that will not unduly interfere with the progress of the Work or the work of any other contractor or utility service company.

    b. Provide suitable storage facilities for all materials, which are subject to injury by exposure to weather, theft, breakage, or otherwise.

    c. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.

    d. Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the Work shall present a safe, orderly and workmanlike appearance.

    e. Provide barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, elevated walkways and other hazardous areas.

2. Contractor shall not, except after written consent from proper parties, enter or occupy with men, tools, materials or equipment, privately-owned land except on easements provided herein.

3. Contractor shall assume full responsibility for the preservation of all public and private property or facility on or adjacent to the site. If any direct or indirect damage is done by or on account of any act, omission, neglect or misconduct in the execution of the Work by the Contractor, it shall be restored by the Contractor, at his expense, to a condition equal to that existing before the damage was done.

4. Contractor shall not clear, store materials upon, or use any more land than is reasonable and necessary. Other contractors or employees of the Owner, other governing bodies, and utility service companies may for all necessary purposes enter upon the Work and premises used by the Contractor, and the Contractor shall give to other contractors and employees of the Owner, other governing bodies, and utility service companies, all reasonable facilities and assistance for completion of adjoining work.

B. Barricades and Warning Signals:

1. Where Work is performed on or adjacent to the roadway, right-of-way, or public place, Contractor shall furnish and erect barricades, fences, lights, warning signs, and danger signals, shall provide watchmen, and shall take other precautionary measures for the protection of persons or property

and of the work. Barricades shall be painted to be visible at night. From sunset to sunrise, Contractor shall furnish and maintain at least one light at each barricade. Sufficient barricades shall be erected to keep vehicles from being driven on or into Work under construction. Contractor shall furnish watchmen in sufficient numbers to protect the Work. Contractor's responsibility for the maintenance of barricades, signs, lights, and for providing watchmen shall continue until the Project is accepted by Owner.

C. Protection of Existing Structures:

1. Underground Structures:

   a. Underground structures are defined to include, but not be limited to, all sewer, water, gas, and other piping, and manholes, chambers electrical and signal conduits, tunnels and other existing subsurface work located within or adjacent to the limits of the Work.

   b. All underground structures known to Engineer except water, sewer, gas, electric, and telephone service connections are shown on the Drawings. This information is shown for the assistance of Contractor in accordance with the best information available, but is not guaranteed to be correct or complete.

   c. Contractor shall explore ahead of his trenching and excavation work and shall uncover all obstructing underground structures sufficiently to determine their location, to prevent damage to them and to prevent interruption to the services, which such structures provide. If Contractor damages an underground structure, he shall restore it to original condition at his expense.

   d. Necessary changes in the location of the Work may be made by Engineer, to avoid unanticipated underground structures.

   e. If permanent relocation of an underground structure or other subsurface facility is required and is not otherwise provided for in the Contract Documents, Engineer will direct Contractor in writing to perform the Work, which shall be paid for under the provisions of the General Conditions.

2. Surface Structures:

   a. Surface structures are defined as all existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

3. Protection of Underground and Surface Structures:

   a. Contractor shall sustain in their places and protect from direct or indirect injury all underground and surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure and at no additional cost to the Owner. Before proceeding with the work of sustaining and supporting such structure, Contractor shall satisfy the Engineer that the methods and procedures to be used have been approved by the party owning same.

   b. Contractor shall assume all risks attending the presence or proximity of all underground and surface structures within or adjacent to the limits to the Work. Contractor shall be responsible for all damage and expense for direct or indirect injury caused by his Work to any structure. Contractor shall repair immediately all damage caused by his Work, to the satisfaction of the owner of the damaged structure.

4. All other existing surface facilities, including but not limited to, guard rails, posts, guard cables, signs, poles markers, and curbs which are temporarily removed to facilitate installation of the Work shall be replaced and restored to their original condition at Contractor's expense.

5. Where piping passes above or beneath an existing water main or water service line, the following conditions shall apply, unless otherwise specified, shown, or directed by the Engineer.

    a. A vertical clear separation of at least 18 inches between the proposed piping and the existing water main or water service line shall be maintained.

    b. The joints of the proposed piping shall be equidistant and as far as possible from the existing water main or water service line.

    c. The proposed piping and the existing water main or water service line shall be encased in concrete if the clear separation between pipes is less than 12 inches. Encasement shall extend beyond the outside diameter of each pipe a distance of 12 inches.

6. Wherever water, sewer, gas or petroleum mains, electric or telephone lines and poles or cables are encountered and may be in any way interfered with, the Contractor shall keep the Engineer and the utility service company informed in advance. Contractor shall cooperate with the Engineer and utility service company in the protection removal, relocation and replacement of all structures and facilities.

7. Prior to proceeding with any excavations in the area of any water, sewer, gas, or petroleum mains, electric or telephone lines and poles or cables or any other utilities, the Contractor shall contact the appropriate utility service company at least three working days in advance of any construction work.

8. When any survey monument or property marker, whether of stone, concrete, wood or metal, is in the line of any trench or other work and may have to be removed, the Contractor shall notify the Engineer in advance of removal. Under no circumstances shall any monument or marker be removed or disturbed by the Contractor or by any of his subcontractors, employees or agents, without the permission of the Engineer. The Contractor shall furnish the necessary labor and materials required to re-establish any survey monument or property marker under the direction of the Engineer. Should any monuments or markers be destroyed through accident, neglect, or as a result of the work under these Contracts, the responsible Contractor shall, at his own expense, employ a land surveyor licensed in the State of New York to re-establish the monument or marker.

** END OF SECTION **

SECTION 01560

ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.1 QUALITY ASSURANCE

A. General

Provide and maintain methods, equipment, and temporary construction, as necessary to provide controls over environmental conditions at the construction site and adjacent areas. Remove physical evidence of temporary facilities at completion of Work. The Contractor shall comply with all ordinances, laws, permits, etc. pertaining to such controls.

B. Noise Control:

1. Contractor's vehicles and equipment shall be such as to minimize noise to the greatest degree practicable. Noise levels shall conform to the latest EPA, HUD and OSHA standards and state, county and local ordinance requirements, and in no case will noise levels be permitted which interfere with the work of the Owner or others.

C. Dust Control:

1. Contractor shall be responsible for controlling objectionable dust caused by his operation of vehicles and equipment, clearing or for any reason whatever. Contractor shall apply water and or use other methods subject to the Engineer's approval which will keep dust in the air to a minimum. Calcium chloride will not be permitted.

D. Organic Vapor Emission Control:

- Contractor shall be responsible for controlling emissions of organic vapor outside of the established exclusion zone to levels specified in the site Health & Safety Plan. Contractor shall limit excavation operations, apply daily cover, apply foam suppressants or take other means necessary to limit vapor emission to established site parameters. Methods used for limiting vapor emissions shall be subject to the Engineer's approval and shall require NYSDEC and NYSDOH approval if the method(s) are outside of the HASP specified vapor emission control plan.
- Contractor shall be responsible for implementation of the site established vapor emission response plan, under the direction of the owners representative.

E. Water Control:

1. Contractor shall provide methods to control surface water, ground water, water from excavations and structures, and water from dewatering operations to prevent damage to the Work, the site, or adjoining properties.

    a. Control fill, grading and ditching to direct water away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper runoff courses so as to prevent any erosion, damage or nuisance.

2. Provide, operate and maintain equipment and facilities of adequate size to control water.

3. Dispose of water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas and in conformance with all environmental requirements. Contractor shall be responsible for any damage caused by his water disposal operations.

** END OF SECTION **

SECTION 01590

CONTRACTOR'S FIELD OFFICE AND SHEDS

PART 1 GENERAL

1.1 DESCRIPTION

Provide a Contractor's Field Office with minimum facilities specified. Provide all required storage and work sheds.

A. Field Office to include the following furnishings:

1. Size as required by Contractor but with sufficient room for project meetings.
2. Include conference table and chairs sufficient for six persons.
3. Telephone service.
4. Interior lighting of 50 foot candles at desktop.
5. Automatic heating to maintain 65 degrees F. in winter.
6. Automatic cooling to maintain 75 degrees F. in summer.
7. Six (6) protective helmets for visitor's use.
8. Exterior identifying sign.
9. Other furnishings at Contractor's option.

B. Maintain one (1) set of Contract Documents and reference standards in office for ready reference at all times by interested parties.

PART 2 EXECUTION

2.1 INSTALLATION/APPLICATION/PERFORMANCE/ERECTION:

A. Install Contractor's office at location approved by Project Engineer within fourteen (14) days after commencement of Contract Time.

B. Remove office and sheds upon final acceptance unless otherwise approved by Engineer.

** END OF SECTION **

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

B. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals."

C. Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.

1.3 DEFINITIONS

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms such are self-explanatory and have well recognized meanings in the construction industry.

1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

    a. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature, that is current as of the date of the Contract Documents.

2. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

1.4 SUBMITTALS

A. Product List Schedule: Prepare a schedule showing products specified in a tabular form acceptable to the Engineer. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.

1. Coordinate the product list schedule with the Contractor's Construction Schedule and the Schedule of Submittals.

2. Engineer's Action: The Engineer will respond in writing to the Contractor within 2 weeks of receipt of the completed product list schedule. No response within this time period constitutes no objection to listed manufacturers or products, but does not constitute a waiver of the requirement that products comply with Contract Documents, nor does it preclude Engineer's or Contractor's review procedures as required by Section 01300-Submittals. The Engineer's response will include the following:

    a. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.5 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.

1. When specified products are available only from sources that do not or cannot produce a quantity adequate to complete project requirements in a timely manner, consult with the Engineer for a determination of the most important product qualities before proceeding. Qualities may include attributes relating to visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources that produce products that possess these qualities, to the fullest extent possible.

B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.

1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.

3. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels MSDS's (when applicable) and instructions for handling, storing, unpacking, protecting and installing.

4. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.

5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

6. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 PRODUCTS

2.1 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.

B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

   1. Semiproprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.

   2. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

   3. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.

      a. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.

C. Compliance with Standards, Codes and Regulations: Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.

PART 3 EXECUTION

3.1 INSTALLATION OF PRODUCTS

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated.

** END OF SECTION **

SECTION 01620

STORAGE OF MATERIALS

PART 1 GENERAL

1.1 PRODUCT DELIVERY, STORAGE AND HANDLING

A. General:

Store and protect materials in accordance with manufacturer's recommendations and requirements of Specifications.

1. Contractor shall make all arrangements and provisions necessary for the storage of materials and equipment. All excavated materials, construction equipment, and materials and equipment to be incorporated into the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all utility service company installations in the vicinity of the Work. Materials and equipment shall be kept neatly and compactly stored in locations that will cause a minimum of inconvenience to other contractors, public travel, adjoining owners, tenants and occupants. Arrange storage in a manner to provide easy access for inspection.

2. Areas available on the construction site for storage of material and equipment shall be as shown, specified or approved by the Engineer.

3. Contractor shall be fully responsible for loss or damage to stored materials and equipment.

4. Do not open manufacturers containers until time of installation unless recommended by the manufacturer or otherwise specified.

B. Uncovered Storage:

1. Store the above materials on wood blocking so there is no contact with the ground.

** END OF SECTION **

SECTION 01710

FINAL CLEANING

PART 1 GENERAL

1.1 DESCRIPTION

At completion of Work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials.

Remove grease, dust dirt, stains, labels, fingerprints, and other foreign materials from visible interior and exterior finished surfaces so designated to shine finish.

Repair, patch, and touch up marred surfaces to specified finish, to match adjacent surfaces.

Prior to physical completion or Institutions occupancy, conduct an inspection of interior and exterior surfaces, and all work areas, to verify that the entire work is clean.

** END OF SECTION **

SECTION 01720

RECORD DOCUMENTS

PART 1 GENERAL

1.1 DESCRIPTION

A. Maintenance of Documents:

1. The Contractor shall maintain, at the job site, one copy of:

   a. Contract Drawing

   b. Specifications

   c. Addenda

   d. Approved Shop Drawing

   e. Change Orders

   f. Field Test Records

   g. Correspondence File

2. Store documents in approved locations, apart from documents used for construction.

3. Provide files and racks for storage of documents.

4. Maintain documents in clean, dry, legible condition.

5. Do not use record documents for construction purposes.

6. Make documents available at all times for inspection by Engineer and Designated Representative.

7. At close of project, turn over field office file to Designated Representative.

B. Recording

1. Label each document in A (above) "PROJECT RECORD" in 2-inch high printed letter.

2. Keep record documents current.

3. Do not permanently conceal any work until required information has been recorded.

4. Contract Drawings: Legibly mark to record actual construction, including:

   a. Depths of various elements of foundation in relation to the finish floor.

   b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.

c. Location of internal utilities and appurtenance concealed in construction referenced to visible and accessible features of structure.

d. Field changes of dimension and detail.

e. Changes made by Change Order.

f. Clarification drawings not on original contract drawings.

5. Specifications and Addenda: Legibly mark up each Section to record:

a. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

b. Changes made by Change Order.

c. Other matters not originally specified.

6. Shop Drawings: Maintain as record documents. Legible mark-up to show changes made after review.

C. Submittals:

1. At completion of project prior to the final project close-out meeting, deliver marked-up record documents to Engineer.

2. Accompany submittal with transmittal letter, containing:

a. Date.

b. Project title and number.

c. Contractor's name and address.

d. Title and number of each record document.

e. Certification that each document as submitted is complete and accurate.

f. Signature of Contractor, or his authorized representative.

** END OF SECTION **

SECTION 02000

WORK INCLUDED

PART 1GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, material, tools, supervision, and equipment, and services necessary for, and incidental to, the excavation, of AEC's trenching, backfilling, compacting, grading, earth moving, dewatering, protection and disposal, as shown on the Drawings, and as herein specified.

B. The Contractor shall accept the site in the condition in which it exists when awarded the Contract.

C. The Engineer shall determine the suitability of materials that are to be used in the work and should any materials encountered be unsatisfactory for the purpose intended, they shall be removed from the site at the Contractor's expense.

1.2 QUALITY ASSURANCE

A. Reference Standards:

1. The latest edition of the following standards, as referenced herein, shall be applicable.

    a. "Standard Specifications, Construction and Materials, New York State Department of Transportation, Office of Engineering".

    b. "Standard Specifications of Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO)".

B. The Contractor shall comply with the requirements for soil erosion and sedimentation control and other requirements of governmental authorities having jurisdiction, including the State of New York.

C. The Contractor shall provide and pay for all costs in connection with an approved independent testing facility to determine conformance of soils and aggregate with the specifications, in accordance with SECTION 01410 - CONTRACTOR FURNISHED TESTING LABORATORY SERVICES.

1.3 SUBMITTALS

A. The Contractor shall furnish earth materials to the testing laboratory for their analysis and report, as directed by the Engineer, or as outlined in the specifications.

B. The testing laboratory shall submit written reports of all tests, investigations, findings and recommendations to the Contractor and the Engineer.

1.4 PROJECT REQUIREMENTS

A. Notify the Engineer of any unexpected subsurface condition.

B. Protect excavations by shoring, bracing, sheet piling, underpinning or by other methods, as required to ensure the stability of the excavation.

C. Underpin or otherwise support structure adjacent to the excavation which may be damaged by the excavation. This includes service and utility lines.

D. Protection of Existing Utilities:

1. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations. Comply with OSHA requirements.

2. Coordinate interruption and/or termination of utilities with the utility companies and the Owner.

3. Provide a minimum of forty-eight (48) hours notice to the Owner and receive written notice to proceed before interrupting any utility.

4. Demolish and completely remove from the site any existing underground utilities designated to be removed, as shown on the Drawings or as specified in SECTION 02110 - CLEARING AND GRUBBING.

5. Repair any damaged utilities as acceptable to the Engineer, at no additional cost to the Owner.

E. Protection of Persons and Property:

1. Barricade open excavations occurring as part of this work and post with warning lights.

2. Operate warning lights as recommended by authorities having jurisdiction.

3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

4. Perform excavation within drip-line of large trees to remain by hank, and protect the root system from damage or dry out to the greatest extent possible. Maintain moist conditions for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

PART 2 PRODUCTS

2.1 MATERIALS

A. Pipe Zone Bedding: Select mixture of graded crushed stone, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT Section 703-02 and meeting the following gradation requirements (NYSDOT Size 1):

Sieve	Percent Passing
1"	100
1/2"	90-100
1/4"	0-15

B. Pipe Zone Backfill: Sound, durable sand, gravel, stone or blends of these materials, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT Section 304 and meeting the following gradation requirements (NYSDOT Type 4):

Sieve	Percent Passing
2"	100
1/4"	30-65
No. 40	5-40
No. 200	0-10

C. Suitable Material: Sound, durable sand, gravel, stone or blends of these materials, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT 203-2.2C and meeting the following gradation requirements:

Sieve	Percent Passing
4"	100
No. 40	0-70
No. 200	0-15

D. Run-of-trench material, meeting the above criteria, shall be considered suitable material and shall be used for trench backfill only after tested in accordance with SECTION 01410 - CONTRACTOR FURNISHED TESTING LABORATORY SERVICES and approved by the Engineer. The Contractor shall pay for all additional testing required to determine the conformance of run-of-trench material, if at any time during the Work this material appears to be in non-conformance in the opinion of the Engineer.

PART 3 EXECUTION

3.1 PREPARATION

A. Establish required lines, levels, contours and datum.

B. Maintain benchmarks and other elevation control points, re-establish, if disturbed or destroyed, at no additional cost to the Owner.

C. Establish location and extent of utilities prior to commencement of excavation, including isolations and shutoffs.

3.2 EXCAVATION

A. All excavation shall be made to such depth as required and of the width shown on the Drawings to provide suitable room for building the structures and laying the pipe(s) they are to contain and for sheeting, shoring, pumping and draining, and for removing peat, silt, or any other materials which the Engineer may deem unsuitable.

B. Trench excavation for pipes shall be made by open cut to accommodate the pipe or structure at the depths indicated on the Drawings. Excavation shall be made to such a point and to the width indicated on the Plans so as to allow a minimum of eight (8) inches of pipe zone bedding to be placed beneath the bottom of all structures and barrels, bells or couplings of all pipes installed.

C. The bottom of the trench shall be accurately graded to provide a uniform layer of bedding material for each section of pipe. Trim and shape trench bottoms and leave free of irregularities, lumps, and projections.

D. Remove excess or unsuitable excavated material from site.

E. Excavation Below Grade: In, ~~in~~ the opinion of the Engineer, existing material below the trench

grade is unsuitable for properly placing bedding material and laying pipe, the Contractor shall excavate and remove the unsuitable material and replace the same with an approved fill material properly consolidated.

F. Stability of Excavation: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Comply with the requirements of SECTION 02160, SAFE OPERATION SHEET PILING. Maintain sides and slopes of excavation in safe condition until completion of backfilling. The contractor shall have a competent individual inspect all excavations for stability.

G. Removal of materials beyond the indicated subgrade elevations, without authorization by the Engineer, shall be classified as unauthorized excavation and shall be performed at no additional cost to the Owner.

3.3 DEWATERING

A. The Contractor shall remove all water from the excavation promptly and continuously throughout the progress of the work and shall keep the excavation dry at all times until the structures to be built therein are completed. No pipe or concrete is to be laid in water and water is not to be allowed to rise on or flow over any pipe or masonry until such time as approved by the Engineer.

B. All necessary precautions shall be taken to prevent disturbances of and to properly drain the areas upon which concrete is to be placed and upon which pipe is to be laid. If necessary, in the opinion of the Engineer, the well point method shall be used to lower the groundwater level. Well points, if used, shall be shifted frequently to avoid drainage from too long a distance. Provide a suitable point of discharge in a manner satisfactory to the Engineer. Pump wells in proper locations sufficiently removed from the line of the work and at sufficient depth, shall be constructed and maintained as required. Wells are to be securely refilled upon the completion of the work.

C. Precautions shall be taken to protect uncompleted work from flooding during storms or from other causes. All pipe lines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected.

D. Dewatering operations shall be in accordance with SECTION 02140 - DEWATERING.

3.4 BEDDING AND BACKFILLING

A. All pipe trenches (pipe zone backfill and trench backfill) shall be consolidated by tamping or rolling to achieve a minimum dry density of 95 percent of the maximum density of the material used. Any water used for compaction shall be provided by the Contractor at his own expense. The approval of the Engineer of the proposed method of compaction of backfill shall in no way be construed as relieving the Contractor of responsibility of settlement of trenches, etc. and any settlement shall be repaired by him at his own expense.

B. Bedding and backfilling shall be accomplished in three stages. The first stage shall involve placement of "pipe zone bedding" as a layer(s) of selected material required to support, or to stabilize unsound or unsatisfactory foundation conditions. The second stage shall involve placement of "pipe zone backfill" from the top of the bedding material up to one (1) foot above the pipe. The third stage involves the placement of "trench backfill" in the remainder of the trench up to the surface of the ground or the bottom of any special surface treatment subgrade elevation.

C. The bedding material shall be placed in the trench after the same has been excavated a

minimum of eight (8) inches below the bell of the pipe to permit the placing of not less than eight (8) inches of bedding material. Where, in the opinion of the Engineer, more than eight (8) inches of bedding shall be required, the excavation shall be performed and bedding place to the depth ordered by the Engineer.

D. The bedding material shall be placed to the full width of trench. The bedding material shall be placed on either side of the pipe to the elevation shown on the Plans or directed by the Engineer. This bedding material shall then be tamped and compacted to form a firm and even bearing.

E. Pipe zone backfill shall be deposited in layers not-to-exceed six (6) inches in thickness, before compaction. The backfill shall be deposited on both sides of the pipe at the same time and to approximately the same elevation. Any pipe that is damaged or moved out of alignment, regardless of cause, shall be replaced or realigned at the contractor's expense. Each layer shall be thoroughly compacted by hand-tamping or mechanical means being careful not to damage the pipe. When the pipe zone backfill reaches one (1) foot over the top of the pipe, the entire surface shall be compacted by mechanical means.

F. The remainder of the trench above the pipe zone backfill shall be backfilled and compacted with "suitable material" in layers not exceeding six (6) inches.

3.5 BACKFILLING AROUND STRUCTURES

A. The Contractor shall not place backfill against any structure without obtaining the approval of the Engineer. No dumping shall be allowed where materials would flow against or around such structures. Approved backfill material shall be deposited in eight (8) inch horizontal layers thoroughly compacted by hand or pneumatic tampers to the satisfaction of the Engineer.

3.6 SUSPENSION OF WORK

A. Whenever the work is suspended, the excavations are to be protected and the roadways left unobstructed. Within or adjacent to private property, material shall be stored at such locations as not unduly interfere with traffic of any nature and in no case shall materials be stored in locations which will cause damage to existing improvements.

3.7 DISPOSAL OF MATERIAL

A. Excess and unsuitable materials shall be disposed of by the Contractor off the site. Any loam, material of a high clay content, or material containing a high percentage of organic material which the Engineer declares to be unsuitable for backfill shall be replaced at the Contractor's expense.

3.8 FIELD QUALITY CONTROL

A. Notify the Engineer at least one (1) working day in advance of all phases of filling and backfilling operations.

B. Compaction testing shall be performed to ascertain the compacted density of the fill and backfill materials in accordance with SECTION 01410 - CONTRACTOR FURNISHED TESTING LABORATORY SERVICES.

C. Compaction tests shall be provided for every 500 cubic yards of fill and in vertical lifts not exceeding two (2) feet.

D. The Engineer may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions, at the Contraction's expense.

E. Acceptance Criteria: The sole criterion for acceptability of in-place fill shall be in-situ dry density. Minimum dry density for all fill or backfill shall be 95 percent of the maximum dry density. If a test fails to qualify, the fill shall be further compacted and re-tested. Subsequent test failures shall be followed by removal and replacement of the material.

** END OF SECTION **

SECTION 02000

WORK INCLUDED

PART 1GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, material, tools, supervision, and equipment, and services necessary for, and incidental to, the excavation, of AEC's trenching, backfilling, compacting, grading, earth moving, dewatering, protection and disposal, as shown on the Drawings, and as herein specified.

B. The Contractor shall accept the site in the condition in which it exists when awarded the Contract.

C. The Engineer shall determine the suitability of materials that are to be used in the work and should any materials encountered be unsatisfactory for the purpose intended, they shall be removed from the site at the Contractor's expense.

1.2 QUALITY ASSURANCE

A. Reference Standards:

1. The latest edition of the following standards, as referenced herein, shall be applicable.

    a. "Standard Specifications, Construction and Materials, New York State Department of Transportation, Office of Engineering".

    b. "Standard Specifications of Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO)".

B. The Contractor shall comply with the requirements for soil erosion and sedimentation control and other requirements of governmental authorities having jurisdiction, including the State of New York.

C. The Contractor shall provide and pay for all costs in connection with an approved independent testing facility to determine conformance of soils and aggregate with the specifications, in accordance with SECTION 01410 - CONTRACTOR FURNISHED TESTING LABORATORY SERVICES.

1.3 SUBMITTALS

A. The Contractor shall furnish earth materials to the testing laboratory for their analysis and report, as directed by the Engineer, or as outlined in the specifications.

B. The testing laboratory shall submit written reports of all tests, investigations, findings and recommendations to the Contractor and the Engineer.

1.4 PROJECT REQUIREMENTS

A. Notify the Engineer of any unexpected subsurface condition.

B. Protect excavations by shoring, bracing, sheet piling, underpinning or by other methods, as required to ensure the stability of the excavation.

C. Underpin or otherwise support structure adjacent to the excavation which may be damaged by the excavation. This includes service and utility lines.

D. Protection of Existing Utilities:

1. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations. Comply with OSHA requirements.

2. Coordinate interruption and/or termination of utilities with the utility companies and the Owner.

3. Provide a minimum of forty-eight (48) hours notice to the Owner and receive written notice to proceed before interrupting any utility.

4. Demolish and completely remove from the site any existing underground utilities designated to be removed, as shown on the Drawings or as specified in SECTION 02110 - CLEARING AND GRUBBING.

5. Repair any damaged utilities as acceptable to the Engineer, at no additional cost to the Owner.

E. Protection of Persons and Property:

1. Barricade open excavations occurring as part of this work and post with warning lights.

2. Operate warning lights as recommended by authorities having jurisdiction.

3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

4. Perform excavation within drip-line of large trees to remain by hank, and protect the root system from damage or dry out to the greatest extent possible. Maintain moist conditions for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

PART 2 PRODUCTS

2.1 MATERIALS

A. Pipe Zone Bedding: Select mixture of graded crushed stone, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT Section 703-02 and meeting the following gradation requirements (NYSDOT Size 1):

Sieve	Percent Passing
1"	100
1/2"	90-100
1/4"	0-15

B. Pipe Zone Backfill: Sound, durable sand, gravel, stone or blends of these materials, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT Section 304 and meeting the following gradation requirements (NYSDOT Type 4):

Sieve	Percent Passing
2"	100
1/4"	30-65
No. 40	5-40
No. 200	0-10

C. Suitable Material: Sound, durable sand, gravel, stone or blends of these materials, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT 203-2.2C and meeting the following gradation requirements:

Sieve	Percent Passing
4"	100
No. 40	0-70
No. 200	0-15

D. Run-of-trench material, meeting the above criteria, shall be considered suitable material and shall be used for trench backfill only after tested in accordance with SECTION 01410 - CONTRACTOR FURNISHED TESTING LABORATORY SERVICES and approved by the Engineer. The Contractor shall pay for all additional testing required to determine the conformance of run-of-trench material, if at any time during the Work this material appears to be in non-conformance in the opinion of the Engineer.

PART 3 EXECUTION

3.1 PREPARATION

A. Establish required lines, levels, contours and datum.

B. Maintain benchmarks and other elevation control points, re-establish, if disturbed or destroyed, at no additional cost to the Owner.

C. Establish location and extent of utilities prior to commencement of excavation, including isolations and shutoffs.

3.2 EXCAVATION

A. All excavation shall be made to such depth as required and of the width shown on the Drawings to provide suitable room for building the structures and laying the pipe(s) they are to contain and for sheeting, shoring, pumping and draining, and for removing peat, silt, or any other materials which the Engineer may deem unsuitable.

B. Trench excavation for pipes shall be made by open cut to accommodate the pipe or structure at the depths indicated on the Drawings. Excavation shall be made to such a point and to the width indicated on the Plans so as to allow a minimum of eight (8) inches of pipe zone bedding to be placed beneath the bottom of all structures and barrels, bells or couplings of all pipes installed.

C. The bottom of the trench shall be accurately graded to provide a uniform layer of bedding material for each section of pipe. Trim and shape trench bottoms and leave free of irregularities, lumps, and projections.

D. Remove excess or unsuitable excavated material from site.

E. Excavation Below Grade: In, ~~in~~ the opinion of the Engineer, existing material below the trench

grade is unsuitable for properly placing bedding material and laying pipe, the Contractor shall excavate and remove the unsuitable material and replace the same with an approved fill material properly consolidated.

F. Stability of Excavation: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Comply with the requirements of SECTION 02160, SAFE OPERATION SHEET PILING. Maintain sides and slopes of excavation in safe condition until completion of backfilling. The contractor shall have a competent individual inspect all excavations for stability.

G. Removal of materials beyond the indicated subgrade elevations, without authorization by the Engineer, shall be classified as unauthorized excavation and shall be performed at no additional cost to the Owner.

3.3 DEWATERING

A. The Contractor shall remove all water from the excavation promptly and continuously throughout the progress of the work and shall keep the excavation dry at all times until the structures to be built therein are completed. No pipe or concrete is to be laid in water and water is not to be allowed to rise on or flow over any pipe or masonry until such time as approved by the Engineer.

B. All necessary precautions shall be taken to prevent disturbances of and to properly drain the areas upon which concrete is to be placed and upon which pipe is to be laid. If necessary, in the opinion of the Engineer, the well point method shall be used to lower the groundwater level. Well points, if used, shall be shifted frequently to avoid drainage from too long a distance. Provide a suitable point of discharge in a manner satisfactory to the Engineer. Pump wells in proper locations sufficiently removed from the line of the work and at sufficient depth, shall be constructed and maintained as required. Wells are to be securely refilled upon the completion of the work.

C. Precautions shall be taken to protect uncompleted work from flooding during storms or from other causes. All pipe lines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected.

D. Dewatering operations shall be in accordance with SECTION 02140 - DEWATERING.

3.4 BEDDING AND BACKFILLING

A. All pipe trenches (pipe zone backfill and trench backfill) shall be consolidated by tamping or rolling to achieve a minimum dry density of 95 percent of the maximum density of the material used. Any water used for compaction shall be provided by the Contractor at his own expense. The approval of the Engineer of the proposed method of compaction of backfill shall in no way be construed as relieving the Contractor of responsibility of settlement of trenches, etc. and any settlement shall be repaired by him at his own expense.

B. Bedding and backfilling shall be accomplished in three stages. The first stage shall involve placement of "pipe zone bedding" as a layer(s) of selected material required to support, or to stabilize unsound or unsatisfactory foundation conditions. The second stage shall involve placement of "pipe zone backfill" from the top of the bedding material up to one (1) foot above the pipe. The third stage involves the placement of "trench backfill" in the remainder of the trench up to the surface of the ground or the bottom of any special surface treatment subgrade elevation.

C. The bedding material shall be placed in the trench after the same has been excavated a

minimum of eight (8) inches below the bell of the pipe to permit the placing of not less than eight (8) inches of bedding material. Where, in the opinion of the Engineer, more than eight (8) inches of bedding shall be required, the excavation shall be performed and bedding place to the depth ordered by the Engineer.

D. The bedding material shall be placed to the full width of trench. The bedding material shall be placed on either side of the pipe to the elevation shown on the Plans or directed by the Engineer. This bedding material shall then be tamped and compacted to form a firm and even bearing.

E. Pipe zone backfill shall be deposited in layers not-to-exceed six (6) inches in thickness, before compaction. The backfill shall be deposited on both sides of the pipe at the same time and to approximately the same elevation. Any pipe that is damaged or moved out of alignment, regardless of cause, shall be replaced or realigned at the contractor's expense. Each layer shall be thoroughly compacted by hand-tamping or mechanical means being careful not to damage the pipe. When the pipe zone backfill reaches one (1) foot over the top of the pipe, the entire surface shall be compacted by mechanical means.

F. The remainder of the trench above the pipe zone backfill shall be backfilled and compacted with "suitable material" in layers not exceeding six (6) inches.

3.5 BACKFILLING AROUND STRUCTURES

A. The Contractor shall not place backfill against any structure without obtaining the approval of the Engineer. No dumping shall be allowed where materials would flow against or around such structures. Approved backfill material shall be deposited in eight (8) inch horizontal layers thoroughly compacted by hand or pneumatic tampers to the satisfaction of the Engineer.

3.6 SUSPENSION OF WORK

A. Whenever the work is suspended, the excavations are to be protected and the roadways left unobstructed. Within or adjacent to private property, material shall be stored at such locations as not unduly interfere with traffic of any nature and in no case shall materials be stored in locations which will cause damage to existing improvements.

3.7 DISPOSAL OF MATERIAL

A. Excess and unsuitable materials shall be disposed of by the Contractor off the site. Any loam, material of a high clay content, or material containing a high percentage of organic material which the Engineer declares to be unsuitable for backfill shall be replaced at the Contractor's expense.

3.8 FIELD QUALITY CONTROL

A. Notify the Engineer at least one (1) working day in advance of all phases of filling and backfilling operations.

B. Compaction testing shall be performed to ascertain the compacted density of the fill and backfill materials in accordance with SECTION 01410 - CONTRACTOR FURNISHED TESTING LABORATORY SERVICES.

C. Compaction tests shall be provided for every 500 cubic yards of fill and in vertical lifts not exceeding two (2) feet.

D. The Engineer may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions, at the Contraction's expense.

E. Acceptance Criteria: The sole criterion for acceptability of in-place fill shall be in-situ dry density. Minimum dry density for all fill or backfill shall be 95 percent of the maximum dry density. If a test fails to qualify, the fill shall be further compacted and re-tested. Subsequent test failures shall be followed by removal and replacement of the material.

** END OF SECTION **

SECTION 02005

FIELD OFFICE TRAILER

PART 1 GENERAL

1.1 WORK INCLUDED

A. This Section includes the furnishing, installation and maintenance of a separate field office trailer for the exclusive use of the Engineer and his assistants.

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

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

B. Upon the completion and acceptance of the contract the Contractor shall remove the field office trailer and restore the area in accordance with the Section entitled "Restoration of Surfaces.

PART 2 PRODUCTS

2.1 OFFICE FACILITIES

A. The field office trailer shall be not less than 8 feet by 20 feet.

1. Built-In Items

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

b. Drafting table, minimum 36"x72" with double storage below.

c. Forced air heat.

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

e. Storage closet.

2. Movable Items

a. Four office chairs.

b. Two large waste baskets.

c. One drafting stool.

d. One four-drawer, fireproof, legal size, filing cabinet with lock.

e. One eight-place plan rack.

f. Provide Xerox copiers and paper.

g. Portable toilet and water.

h. Refrigerator.

i. Full size microwave.

2.2 TELEPHONE SERVICE

A. Install an individual direct line telephone for the exclusive use of the Engineer.

B. Include the cost of all local and long distance calls necessary to the Work.

C. Provide separate phone line for fax machine.

D. Provide plain paper fax machine, and scanner with paper.

E. Provide answering machine with cordless phone.

2.3 INTRNET SERVICE

A. The contractor shall secure internet service with an e-mail account for the duration of the project.

PART 3 EXECUTION

3.1 INSTALLATION AND MAINTENANCE

A. The trailer shall be located on an approved site convenient to the work.

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

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

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

2. Electric power and lights.

3. Water supply and sewer service.

4. Telephone service.

5. Snow and ice removal in winter.

6. Janitorial services not less than weekly.

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

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

END OF SECTION

SECTION 02006

HEALTH AND SAFETY

PART 1 GENERAL

1.1 SUMMARY

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

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

1.2 REFERENCES

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

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

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

2. Code of Federal Regulations (CFR)

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

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

3. Unites States Environmental Protection Agency (USEPA)

    a. Standard Operating Safety Guides

4. American Conference of Governmental Industrial Hygienists (ACGIH)

    a. ACGIH Threshold Limit Values and Biological Exposure Indices

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

    a. Technical Administrative Guidance Memorandum (TAGM) Hazardous Waste Regulations (HWR) TAGM HWR 89-4031

1.3 SUBMITTALS

A. In addition to those submittals identified in the Special Provisions, the following items shall be submitted:

1. Site Specific Health and Safety Plan including, but not limited to:
    a. Contractor Organizational Chart.
    b. Results of Health and Safety Risk Analysis performed by the Contractor.
    c. Employee and Community Protection Plan.
    d. Employee and Community Air Monitoring Plan.
    e. Vapor Emission Response Plan.
    f. Major Vapor Emission Response Plan.
    g. Employee Training and Experience.
    h. Summary of Medical Surveillance Program.
    i. List of Standard Operating Procedures incorporated into the HASP.
    j. A method to monitor entry and exit from the work site.
    k. Personnel and Equipment Decontamination Procedures.
    l. Spill Containment Program.
    m. Emergency Response Plan and Emergency Reporting Procedures.
    n. Fire Emergency Protection Plan.
    o. Confined Space Entry Procedures.
    p. Lock out - Tag out procedures.
    q. Site map showing utility shutoffs.
2. Certificates of completion of Health and Safety Training as required by 29 CFR 1910.120(e).
3. Resumes of the Contractor's Project Manager, Field Supervisor, and of the health and safety staff expected to work at this site.
4. Evidence of coordination for emergency response with local police, fire, medical, and hazardous materials responders.
5. Air monitoring results.
6. Name and location of proposed permitted off-site disposal facility for used personal protective equipment (PPE).

PART 2 PRODUCTS

2.1 GENERAL

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

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

C. The Contractor's HASP shall be subject to review to the satisfaction of the NYSDEC/NYSDOH prior to acceptance by the Owner. The Contractor is advised that he should allow time for NYSDEC/NYSDOH review and comment on each draft of the HASP submitted for state review. No additional payment or extension of time shall be provided by the owner to the Contractor for delays caused by NYSDEC or the Contractor in the preparation of or in NYSDEC's review of the HASP. Ten copies of the final Certified Industrial Hygienist (CIH) or Board Certified Safety Professional (BCSP) approved Health and Safety Plan as reviewed by NYSDEC/NYSDOH shall be provided to the Owner prior to initiating on-site activities.

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

PART 3 EXECUTION

3.1 ORGANIZATIONAL RESPONSIBILITIES

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

B. Site Health and Safety Officer (HSO). The Contractor must identify and assign a Site Health and Safety Officer (HSO) for the project. That individual must be responsible to the Contractor and have the authority and knowledge necessary to implement the site Health and Safety Plan (HASP) and verify compliance with applicable safety and health requirements.

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

    a. Be present during site operations.

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

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

    d. Initiate evacuation of the site and adjacent residents, if necessary.

2. The HSO shall meet the following minimum qualifications:

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

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

3.2 RISK ANALYSIS

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

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

    1. Overview of the following information:

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

        b. Description of the site operation and tasks to be performed. The specific tasks for the SMC Site activities include, but are not limited to the work described in the Section titled "Summary of Work (Civil Site Development)."

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

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

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

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

    2. An evaluation of the known or suspected contaminants and conditions that may pose inhalation, skin absorption/contact or ingestion hazards.

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

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

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

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

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

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

3.3 MEANS TO CONTROL EMPLOYEE AND COMMUNITY EXPOSURE

A. Employee and Community Protection Plan

1. The Contractor shall specify and implement an Employee and Community Protection Plan (ECPP) in accordance with 29 CFR 1910.120(h) and NYSDEC TAGM HWR 89-4031. The ECPP shall be developed to specify and evaluate the engineering and work practice controls to be implemented to minimize exposure of employees working on the site, residents living in the vicinity of the site, and the environment to contaminants generated or released as a result of work on the site. The ECPP shall be incorporated into the site HASP as a separate section of that document.

B. Employee and Community Air Monitoring Plan

1. The Contractor shall specify and implement an Employee and Community Air Monitoring Plan (ECAMP) to identify times of elevated airborne contaminant concentrations, to determine the level of the concentrations relative to background, and to respond to elevated levels. The Contractor shall provide the personnel, instruments, and materials necessary to perform such air monitoring and to implement the response. The identity of the individual responsible for administering the program shall be included in the site organization chart. In addition to the odor control requirements specified in the Section titled "Special Provisions", the Contractor shall define specific air monitoring methods, sampling media, and sample analyses to be implemented during construction of the remedial action at the Site. The ECAMP shall include proposed responses to levels above the Contractor's action levels. The ECAMP shall be incorporated into the site HASP as a separate section of that document.

2. The level of particulate leaving the downwind side of the site shall be maintained below 150 ug/m3 above the upwind particulate level, as specified in NYSDEC TAGM HWR 89-4031- Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites.

3. The level of volatile organic compounds (VOCs) leaving the site shall be maintained below 5 ppm above background.

4. Daily monitoring of wind direction and velocity for each day that soil handling or excavation activities occur.

   a. Real-time continuous monitoring for VOCs (i.e. air monitoring stations) and for particulates (i.e. real time aerosol monitor) within the work zone, at locations on the perimeter of the work zone (as specified in the approved HASP) and at established site perimeter locations.

   b. Daily verification sampling for, and analysis of, VOCs within the work zone, at the perimeter of the work zone, and at the Site perimeter, using laboratory analytical methods

5. Air monitoring results shall be recorded and available for review by the Owner, Engineer, and NYSDEC.

C. Vapor Emission Response Plan

1. The Contractor shall specify and implement a Vapor Emission Response Plan (VERP) to identify VOC levels that may pose a threat to the health and safety of the surrounding population. The VERP shall be incorporated into the site ECAMP as a separate section of that document and shall, at a minimum, address the following:

    a. VOC levels at the perimeter of the work area that, when exceeded, require that work activities be halted and actions initiated to reduce the VOC emissions from the work area. At that time, air monitoring shall be implemented to measure the vapor emission levels at 200 feet downwind of the work area or at half the distance to the nearest residential or commercial structure.

    b. If efforts to abate the emission source do not lower the VOC levels below an acceptable level, as approved by the NYSDEC, at that location or if elevated levels persist for more than 30 minutes within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone), a Major Vapor Emission Response Plan shall be implemented.

    c. VOC levels at the perimeter of the work area that, when exceeded, require that downwind air monitoring be initiated. Work activities may continue if the level of VOCs at 200 feet downwind of the work area or at half the distance to the nearest residential or commercial structure, whichever is less, remain below the action level specified in Section 3.3 C.l.a. above.

    d. VOC levels at the perimeter of the work area, that allow the downwind monitoring to be discontinued.

D. Major Vapor Emission Response Plan

1. The Contractor shall specify and implement a Major Vapor Emission Response Plan (MVERP) to identify responses to downwind VOC levels above the action levels specified in Section 3.3.C. The MVERP shall be incorporated into the site ECAMP as a separate section of that document and shall, at a minimum, include the following:

    a. Provisions for contacting emergency response personnel, including local police authorities and advising them of the vapor situation.

    b. Provisions for coordinating with local officials to arrange for notification and evacuation, if required, of the surrounding community.

    c. Provisions for conducting air monitoring at 30 minute intervals within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone).

    d. Engineering controls will be implemented including foam suppressants, enclosures, etc.

3.4 TRAINING

A. Training Requirements for On-Site Personnel

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

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

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

B. Personal Protective Equipment and Levels of Protection

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

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

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

3.5 MEDICAL SURVEILLANCE

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

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

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

B. Personnel Certification

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

C. Employee Heat and Cold Stress Prevention

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

3.6 SITE STANDARD OPERATING PROCEDURES

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

3.7 SITE CONTROL

A. Work Zones

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

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

B. Routine and Emergency Communications

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

C. Daily Visitor Log

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

   a. Person visiting the site.

   b. Affiliation.

   c. Date.

   d. Arrival time.

   e. Departure time.

   f. Purpose of visit.

D. Personnel

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

E. Other

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

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

3.8 DECONTAMINATION

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

B. Decontamination shall be conducted in accordance with 29 CFR 1910.120 (k) and shall minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances as well as minimize off-site transport of contamination.

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

3.9 SPILL CONTAINMENT

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

3.10 CONTINGENCY PLANNING

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

    1. The Contractor shall attend public meetings or briefings, as necessary, to discuss and present the HASP and ERP. In addition, the Contractor shall address the following requirements:

        a. Prior to the start of site operations, the Contractor shall attend any and all meetings necessary with local officials and/or those responsible for local emergency management and public safety (to include fire, police, hazardous material response teams, hospitals, and local health officials) for the purpose of coordinating the site-specific ERP with any emergency response efforts that would be performed by such agencies.

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

B. Special Training

    1. The Contractor shall ensure that at least one person holding up-to-date certifications (American Red Cross or equivalent) in basic first aid (8 hr minimum) and CPR is present at the site during all site operations.

C. Accident and Exposure Reports

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

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

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

3.11 FIRE PREVENTION AND PROTECTION

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

3.12 CONFINED SPACE OPERATIONS

A. Standard Operating Procedures

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

3.13 DRUM AND CONTAINER HANDLING OPERATIONS

A. Standard Operating Procedures

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

3.14 OPERATIONS WITHIN AND ADJACENT TO POWER LINES

A. Standard Operating Procedures

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

END OF SECTION

SECTION 02009

PROJECT PHOTOGRAPHS

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes furnishing color digital photographs and video tape of the progress of the project as well as pre- and post-construction videotaping of the project.

B. Significant events and milestones shall be photographically documented for the duration of the Contract at the time and locations as directed by the Engineer.

PART 2 PRODUCTS

2.1 GENERAL

A. The contractor shall maintain on site a digital camera. The camera shall have a high resolution zoom and take 3 1/2" disks. Aerial photographs shall be 8 1/2" x 11" or larger.

1. All photographs shall be consecutively numbered.

2. Each print shall have the photograph number, date taken, project name and number, and photographer's name clearly marked as well as a description of the photograph.

PART 3 EXECUTION

3.1 GENERAL

A. Photographs shall be taken each working day for the duration of the Contract at the time and locations as directed by the Engineer.

B. A minimum of 50 photographs shall be taken of pre-construction and final construction. The final photographs shall be taken from the same locations as the pre-construction photographs. One each of the pre- and final photographs shall be aerial. The altitude shall be such to obtain the maximum coverage of the project. Additionally, each pre- and post-construction route shall be walked and panned with a camcorder. Narrative shall be provided identifying locations, salient features, compass, bearing, etc.

C. The digital camera shall be available for use by the engineer.

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

E. Upon the completion of the videotaping, three standard VHS copies shall be furnished to the Engineer.

END OF SECTION

SECTION 02011

TEST PITS

PART 1 GENERAL

1.1 DESCRIPTION

A. The Contractor shall excavate test pits, in advance of construction, at the locations shown on the Drawings, or where directed by the Engineer. These test pits shall determine the exact location of all pipes, conduits, duct, or other interfering structures in both horizontal and vertical locations. The pit shall be excavated to the depth and width necessary to accurately determine the locations of the utilities of interest.

B. Upon satisfactory execution of the required test pits, the Engineer shall adjust pipe elevations, alignment or design he feels necessary to minimize interferences.

END OF SECTION

SECTION 02110

CLEARING AND GRUBBING

PART I GENERAL

1.1 SUMMARY

A. This Section includes clearing and grubbing by removal or destruction of trees, underbrush, logs, stumps, decayed or growing organic matter above the surface of the ground, and snow and ice which interfere with construction or landscaping, removal of poles designated to be removed by the Contractor as shown on the Contract Drawings, specified or directed, and removal of posts which are within or adjacent to the lines of work.

PART 2 PRODUCTS

2.1 GENERAL

A. Contractor shall protect trees with suitable stakes.

PART 3 EXECUTION

3.1 GENERAL

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

B. Tree protection.

1. The work of this project may necessitate the removal of some trees. Any tree which will not, in the opinion of the Engineer, hinder construction or landscaping shall be protected.

2. Special care shall be exercised to minimize injury to trees that will not be removed. Careful digging will be performed to minimize root damage. Roots may be cut and removed up to 25 percent of the estimated root area. If more than 25 percent is required to be cut, the Engineer shall decide whether the tree shall be removed. Straggling roots shall be pruned. When it becomes absolutely necessary to remove a tree, it shall be completely taken out, including the stump.

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

C. Removal of brush, trees, stumps and spoil.

1. Contractor may chip brush, tree trunks and tree limbs.

2. Contractor may likewise chip tree stumps, provided however, that if the tree was located in a potentially contaminated area, all soil adhering to the stump must first be removed prior to chipping. Soil adhering to the stump shall be handled in accordance with the Section titled "Surface Soil or Debris Relocation" and in a manner accepted by the Engineer.

3. All brush, trees, stumps, and spoil material shall be removed from the area and disposed of off-site by the Contractor in a manner accepted by the Engineer.

END OF SECTION

SECTION 02140

DEWATERING

PART 1 GENERAL

1.1 DESCRIPTION

A. The contractor shall provide all labor, materials, equipment, and services necessary for, and incidental to, dewatering excavations as necessary for the installation of the Work, and as specified herein.

B. Provide dewatering system or systems which will lower and maintain the groundwater level at least 1 foot below required excavation elevations. The contractor shall provide and maintain ample means and equipment such as pumps, well point systems, deep wells, cut-off walls, drains and sumps for dewatering and properly disposing of water entering the trenches, excavation, and other parts of the work.

C. Continuously maintain the groundwater level at or slightly below the required elevations until all Work in the areas requiring dewatering is installed and approved by the SMC Representative, including Work in separate related contracts.

D. Coordinate the Work of this section with related Contractors having Work in these areas. Related Contractors shall be required to progress their work in these areas without undue delay.

E. The Contractor's attention is called to the fact that the crushed stone bedding for piping installed under other contracts may concentrate or act as a drain to carry groundwater to a point of connection under this contract. Compensation for all Work resulting from such a condition shall be considered as having been included in the prices bid for the various items or related work.

1.2 SUBMITTALS

A. Shop Drawings: Submit drawings and diagrams, with all pertinent data to the Engineer, showing the dewatering system proposed for use. Indicate the spacing and location of deep wells, well points, and reading wells, and location of header lines, pumps. valves and discharge line, and cut-off walls, where required.

1.3 JOB CONDITIONS

A. Site soil boring data and samples, soil laboratory testing, and any soil reports shall be made available to prospective bidders for study and review. Bidders must make their own interpretation of subsurface conditions that may affect methods or the cost of construction of the work.

PART 2 PRODUCTS

2.1 DEWATERING SYSTEM

A. Provide a dewatering system of adequate size and capacity to lower and maintain the groundwater at the specified level. The system shall include standby pumps and power source for continuous operation.

   1. Dewatering system shall consist of well points, deep wells, cut-off walls, riser pipes, swing joints, header lines, valves, pumps discharge lines, and all other necessary fittings, accessories, and equipment for a complete operating system. Provide hole punches, sand backfill and clay plugs as required by soil conditions.

2. SMC will receive and treat water at the on-site waste water treatment building. The contractors dewatering system shall deliver the water to the WWTP.

B. Observation Well points: Provide groundwater reading wells or piezometers to monitor the groundwater level, as indicated on the approved Shop Drawings.

C. Sand: Clean concrete sand conforming to ASTM C 33.

PART 3 EXECUTION

3.1 PREPARATION

A. Install the observation well points at locations indicated on approved Shop Drawings. Install observation well points in accordance with manufacturer's printed instructions and in accordance with approved Shop Drawings. Provide sand backfill around well point. Test each observation well point to verify that the installation is performing properly.

B. Protect observation well standpipes from damage by construction operations and maintain accessibility to them. Maintain reading wells until groundwater is allowed to return to its normal level.

3.2 INSTALLATION

A. Install the dewatering system in accordance with approved Shop Drawings and as required by site conditions. Locate elements of the system to allow a continuous dewatering operation without interfering with the installation of any permanent project work. The dewatering system shall be installed as excavation work progresses.

3.3 OPERATION

A. Keep the system in continuous operation from the time excavation is started in the dewatering area (or before if required by site conditions to lower the groundwater to the elevations specified) until the time backfilling is completed at least 2 feet above the normal groundwater level.

1. Do not discontinue dewatering operations without specific approval from the Engineer.

2. Rates of groundwater withdrawal during dewatering operations, shall at all times be below the rate at which soil particles are removed from the existing soils.

B. In the event excavation proceeds subsequent to dewatering as specified above, and the groundwater level is found to be within two feet of the excavation, the dewatering Contractor shall immediately continue to dewater as specified herein, including, but not limited to, additional dewatering and monitoring facilities and modu-tank, at no additional cost to the Owner. The excavation shall not be allowed to proceed below groundwater until groundwater levels are achieved to bedrock..

3.4 FIELD CONTROL

A. Maintain a careful check to detect settlement or subsidance in the existing adjacent work. Notify the SMC Representative of signs of settlement. Establish settlement point bench marks and take periodic readings if directed. The Contractor shall take all such precautions and do any and all work necessary to protect the stability and integrity of adjacent lands, pavements, buildings, and utilities from settlement or other movement that may be caused by his dewatering operations. The Contractor shall be solely responsible for any damage or injury to adjacent lands, pavements, buildings, or utilities caused by his dewatering or other operations or his failure to use corrective or preventive procedures or methods.

B. Take and record measurements of the groundwater in each reading and pumping well periodically and

when directed by the Engineer.

3.5 DISCHARGE

A. Dispose of all water removed from the excavation shall be to SMC's on-site WWTP.

B. Movement and Discharge of water shall be approved by SMC and shall not cause erosion or sedimentation to occur in existing drainage systems. All sedimentation or blocking or existing systems shall be thoroughly cleaned and returned to original condition by the Contractor, at his expense.

3.6 REMOVAL

A. When the dewatering system is no longer required, gradually decrease the pumping rate until the water table resumes its natural position so that the velocity of the returning groundwater will be low enough as not to carry fines with it.

B. When the dewatering system is no longer required and when directed by the SMC Representative, dismantle and remove the system and all appurtenances from the site.

END OF SECTION

SECTION 02141

CONSTRUCTION WATER MANAGEMENT

PART 1 GENERAL

1.1 DESCRIPTION

A. Work Specified

1. Development of an acceptable Construction Water Management Plan detailing the handling of all construction water generated during construction including precipitation of a 25 year event and snowmelt, and residuals generated during treatment of construction water.

2. The Contractor is required to comply with all provisions of the State Pollution Discharge Elimination System (SPDES) Permit for the ground water recovery and treatment system operating at the site. A copy of the SPDES permit is provided in the back of these Contract Documents.

3. Provide all labor, materials, and equipment required for collecting and conveying construction water to SMC's on-site waste water treatment plant.

B. Related Work Specified Elsewhere

1. Excavating, Section 02222

1.2 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. NYSDEC State Pollution Discharge Elimination System (SPDES Fact Sheet Site No. 7-34-010 NY-000-1929 or addenda there to).

1.3 SUBMITTALS

A. Construction Water Management Plan

B. The Contractor shall submit his plan for handling construction water. The plan shall include, but not be limited to the Contractor's proposed method of collecting, conveying and handling of construction water generated during construction.

C. Shop drawings, process schematics; piping, valves and equipment listing and sizes, basis of design information, and control and instrumentation diagrams are required for all on-site construction water treatment systems. A satisfactory means to track the total volume of construction water to be treated or removed shall be provided, as well as the proposed sampling locations, and sampling and laboratory (analytical) means and methods to be utilized to document compliance with applicable regulations, and SPDES Permit for Site No. 7-34-010.

D. Copies of all documentation (letters, facsimiles, hand written, etc.) generated or received to comply with the SPDES Permit, or any other permits, or as a result of any violation or excursion by the Contractor of the permit requirements.

PART 2 EXECUTION

A. It shall be the responsibility of the Contractor to investigate and comply with all applicable Federal, State, and Local laws and regulations governing the handling, storage and disposal of construction water. All construction water shall be disposed of in a manner which meets applicable permit requirements, laws, and regulations.

B. No construction water shall be discharged on-site unless it meets permitted discharge limits.

C. The contractor shall make every effort to minimize the generation of construction water. Appropriate methods to minimize generation of construction and contaminated water include, but are not limited to erection of temporary berms, use of low permeability tarpaulin or suitable means to cover exposed potentially contaminated areas, limiting the amount of exposed potentially contaminated areas, grading to control run-on and run-off, engineering controls on construction activities to minimize contact of personnel and equipment with potentially contaminated areas, thus minimizing the amount of decontamination required, and other appropriate methods.

D. Water shall be handled utilizing equipment sized and compatible with anticipated contaminants which may be present and volumes which occur.

END OF SECTION

SECTION 02144

WELL POINTS

PART 1 GENERAL

1.1 DESCRIPTION

A. The work under this section consists of furnishing all labor, materials and equipment necessary for the installation of a complete well point system capable of dewatering an area for the purpose of construction or installation of piping and structures in the dry.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Well Points - shall be similar or equal to Johnson dewatering well points with self-jetting features. Slot site shall be compatible with the aquifer being dewatered.

B. Header Pipe - shall be of adequate size to properly conduct the water with minimum loss of efficiency.

C. Riser Pipes - shall be sufficient length to properly dewater the excavation within the limits of the pump.

D. Swing Joints - shall be of the flexible or hose-type.

E. Valves - shall be in good condition and capable of being throttled.

F. Pumps - shall be of adequate capacity and proper design to perform the required jetting and pumping.

G. Filter Material.- shall be clean coarse sand of the proper gradation for the aquifer being dewatered.

PART 3 EXECUTION

3.1 INSPECTION

A. Prior to commencing work, inspect each area where work is to be performed and report all unsatisfactory conditions to the Engineer.

B. Do not commence work until all unsatisfactory conditions have been eliminated.

3.2 INSTALLATION

A. Header Layout - Install header level or with slight slope up to the dump. Take care to eliminate any high points in the header which may trap air. All joints shall be air tight.

B. Well Points - Install well points spaced closely enough to properly dewater the excavation as required by the Engineer. Wash the well points in place by jetting. Cut the volume of jetting water down to reduce the return velocity and place filter material into the jetted hole with shovels.

C. Swing Joints - Connect riser pipes to header with swing joints. Provide a valve at each connection to keep the system In balance.

D. Discharge Pipe - Install discharge pipe from pump discharge to outfall point; as approved by the Engineer.

E. Pump - Set pump carefully on firm boil or timber foundation at the lowest practical elevation to minimize suction lift and maximize draw down.

3.3 OPERATION

A. Start pumping with owing joint valves partially open to prevent excessively high entry velocity. Open valves gradually as pumping continues and regulate as necessary to prevent points from running dry and to permit uniform lowering of the water table.

B. Maintain constant surveillance of the operation to observe any possible subsidence or ground movement due to the dewatering operations.

C. When system is no longer required, gradually decrease the pumping rates until the water table resumes its natural position so that the velocity of the returning ground water will be low enough as not to carry fines with it.

** END OF SECTION **

SECTION 02160

SAFE OPERATION SHEET PILING

PART 1 GENERAL

1.1 DESCRIPTION

A. The purpose of this work is to insure the safety of workmen and the public exposed to the hazard of falling or sliding material. It shall be the Contractor's responsibility to provide protection adequate for this purpose. Details of this sheeting must conform with the requirements of Title 29 Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction (OSHA) and the NYS Building Code. SMC shall reserve the right to increase the minimum requirements set forth therein, depending on the hazard.

PART 2 PRODUCTS

2.1 MATERIALS

A. The selection of sheet piling materials shall be the Contractor's option. The Engineer may, at his discretion, disapprove and reject materials which he regards to be unsound or not in conformance with Title 29 Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction (OSHA).

PART 3 EXECUTION

3.1 INSTALLATION

A. In general, this item will be required wherever an excavation exceeds five feet in depth and the side slopes are not laid back to a safe gradient as set forth in Title 29 Code of Federal Requirements, Part 1926, Safety and Health Regulations for Construction (OSHA).

B. Sheet piling shall be installed where shown on the drawings or as required to complete the work.

C. Sheet piling installed under this item shall be tight or continuous, except where skeleton sheet piling is permitted under Title 29 Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction (OSHA). Skeleton sheeting shall be considered as any sheeting other than tight or continuous sheeting.

D. Sheet piling for this item shall be of adequate cross section and adequately braced.

END OF SECTION

SECTION 02220

AEC POST EXCAVATION BACKFILLING MATERIAL

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals necessary to perform all contaminated excavating required for completing the work shown on the Drawings and specified herein.

B. The Contractor shall perform all work required to complete all excavating as shown on the Drawings and specified herein including but not necessarily limited to: dewatering activities; excavation of contaminated soils; and off-site transport of contaminated soil; and all related work.

C. The Contractor shall at a minimum, excavate in the areas and to the depths below grade indicated on the Drawings.

D. Excavation of contaminated soils shall be required below the groundwater table. The Contractor shall submit a proposed dewatering system to the Engineer for approval. The Contractor shall pump water to the onsite wastewater treatment facility. The Contractor shall have the option of using the treated water onsite for dust suppression and other activities.

E. The Contractor shall prepare an Excavation Plan which describes the method of excavation proposed for contaminated soil excavation, debris and boulder removal, dewatering, clean backfilling, and compaction. The Excavation Plan shall include details of the proposed excavation support system to be used and exhibit methods of control required to meet the lines, grades, and tolerances as detailed on the Drawings and specifications. The Contractor should note that adverse conditions (set and/or soft soils) may be encountered during excavation operations and provisions should be made in such event.

F. The Owner shall be performing additional sampling prior to any remediation activities, to further delineate the areas and depths of contamination. This information shall be provided to the Contractor when it becomes available. The Contractor shall use this information to prepare the Excavation Plan.

1.2 SUBMITTALS

A. The Contractor shall submit an Excavation Plan in accordance with the requirements of Section 01300 of these specifications.

B. The Contractor shall submit a description of excavation procedures and a schedule for the excavation and backfill operations prior to commencing the work, identifying the anticipated excavation rate. The Contractor shall update the schedule as necessary during the prosecution of work.

1.3 SITE INFORMATION

A. Existing grades and other site information shown on the applicable Drawings are approximate. the owner does not guarantee that the grades shown will not vary from the actual site conditions. The Contractor must make his own field investigations, to determine all conditions affecting the work to be done and materials needed and make his bid in sole reliance thereon.

B. If the Contractor discovers significant differences in grades or site information which in his/her opinion will materially alter the price of the work as bid, he/she shall notify the Owner and Engineer within 5 days of determination and prior to performing additional work.

1.4 PROTECTION

A. Extreme care shall be exercised to protect existing trees, shrubs, facilities, construction and residential utilities, fences, monitoring wells and private property that are to remain and all necessary precautions shall be taken to preclude damage to these items. Any damage to those items as a result of work performed by the Contractor shall be repaired at the expense of the Contractor.

B. All existing pipes, poles, monitoring wells, wires, fences, and other structures which, in the opinion of the Owner and Engineer must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from injury by the Contractor. In case of injury, the Contractor shall notify the appropriate party so that proper steps may be taken to repair any and all damage done. All damage shall be repaired by the Contractor, or if not promptly done, the Engineer may have the repairs made at the expense of the Contractor. The Contractor shall, at its own expense replace, repair, or restore the affected facilities to their original condition or shall reimburse the Owner for such expenses as the Owner may accrue.

PART 2 PRODUCTS

Not applicable.

PART 3 EXECUTION

3.1 CENERAL

A. The excavation shall be carried out in such a manner as to eliminate any possibility of undermining or disturbing the integrity of any trees or vegetation, or as herein specified.

3.2 SAFETY

A. The Contractor shall provide and maintain barricades, signs, lights, and shelters required for the protection of personnel, materials and property. Barricades and signs shall conform with all codes and regulations, and shall be lighted at night with lanterns and reflectorized paint as directed or required for safety, and shall be removed upon completion of the Contract.

B. All work shall conform to Occupational Safety and Health Administration (OSHA) requirements, and Section 02006, Safety, Health and Emergency Response. All excavation, trenching, and related sheeting, bracing, and other ancillary items, shall comply with the requirements of OSHA Excavation Safety Standards 29 CFR Part 1926.650 Subpart P.

C. Banks may be sloped in accordance with OSHA excavation standards where space permits. The Contractor shall not slope the faces of excavations in lieu of providing excavation support unless all the following conditions are met:

1. There are no adjacent structures, roads, or pavements which the excavation will affect.

2. No equipment, stored materials, or overlying materials will affect the excavations.

3. Vibration from equipment and traffic, will not affect the excavations.

4. Operational considerations do not preclude laying back the slopes of the excavation.

3.3 SHEETING AND BRACING

A. Furnish, put in place and maintain such sheeting and bracing in areas where banking of slopes is not feasible and as may be required by Federal, State and local safety requirements, to support the sides of excavations and to protect adjacent structures from undermining or other damage. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed. Where soil cannot be properly compacted to fill a void, lean concrete shall be used as backfill.

B. When approximately 30% of the contaminated excavation is completed of each campaign, the Contractor shall install sheet piling in the area where excavation is estimated to be completed for that campaign. The Contractor shall discuss the proposed location with the Owner prior to placement of the sheet piling. This sheet piling shall remain in-place until treated soil from the following campaign is backfilled. The sheet piling may then be removed and reused.

C. Sheeting shall be plumb and securely braced in position. Sheeting and bracing shall be adequate to withstand all pressures to which the structure or trench will be subjected. Any movement or bulging which may occur shall be corrected to provide the necessary clearances and dimensions.

D. Leave in place to be embedded in the backfill all sheeting and bracing not shown on the Drawings but which the Owner may direct in writing to leave in place any time during the progress of the work for the purpose of preventing injury to structures, utilities, or property, whether public or private. The Owner may direct that timber used for sheeting and bracing be cut off any specified elevation. All timber sheeting to be left in place within the limits of the structure shall be treated.

E. All sheeting and bracing not left in place shall be carefully removed in such a manner as not to endanger the construction or other structures, utilities, or property. All voids left or caused by withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted to that purpose, or otherwise as may be directed.

F. The right of the Owner to order sheeting and bracing left in place shall not be construed as creating any obligation on the Owner's part to issue such orders and the Owner's failure to exercise this right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise, growing out of a failure on the part of the Contractor to leave in place sufficient sheeting and bracing to prevent any caving or moving of the ground.

3.4 EXCAVATION

A. Excavation will be performed as follows:

1. The Contractor shall excavate in the areas and to depths shown on the drawings.

2. Initial excavation shall be performed within the areas and to the depths required.

3. Trucks shall be loaded with contaminated soil after being staged and characterized for off-site disposal. Trucks loaded with soil shall be weighed on the weigh scale and then proceed off-site to appropriate landfill.

4. Field screening and confirmatory sampling shall then be performed of the base and sidewalls of the excavation.

5. If the confirmatory sampling of soils in the excavation indicates that the remediation goals have been achieved no further excavation is required.

6. If the remediation goals have not been achieved, additional excavation shall be performed in the areas with the elevated levels.

7. The excavation and sampling procedures shall be repeated at 5 cubic yards and as frequently as necessary to achieve the remediation goals.

B. The Contractor shall transport excavated contaminated soil from the excavation location to the soil staging area and from the soil staging area, after proper characterization of waste has been completed, in off-site vehicles appropriate for the present transportation conditions.

C. The Contractor shall take measures to prevent spilling during soil transport.

D. The Contractor shall make excavations in such a manner and to such width as will give suitable room for excavating contaminated soil and backfilling without cross contamination, but complying with the excavation limits shown on the Drawings or as delineated by sampling performed by the Owner prior to remediation activities. The Contractor shall furnish and install any excavation support systems, perform all pumping, excavation dewatering activities, and any other work necessary to render the bottom of the excavation firm and dry and in all respects possible.

E. In the event that the Contractor chooses to slope the sides of the excavation area, the slope shall be kept within the limits of excavation whenever possible, no additional amount will be paid for the additional excavation unless the excavated side slope material is determined to be contaminated. All other costs for additional excavation due to sloping of the sides shall be included in the bid price for treatment of contaminated soils.

F. The side slope material will be determined to be contaminated based on the criteria specified.

G. Before commencing any operations, all required excavation depths shall be staked out by the Owner.

H. The Contractor shall not allow surface water to enter the excavation at any time. Berms shall be constructed around the excavation to preclude any runoff from entering.

I. The Contractor shall protect the bottom of excavation(s) from becoming frozen or unsuitable to receive treated soil and clean backfill, if applicable.

J. The Contractor shall protect temporarily unfinished work such as open excavations and newly graded areas from traffic and erosion and shall keep the area free of trash and debris for the duration of the Contract.

K. The Contractor shall repair and re-establish grades in settled, eroded, and rutted areas to the required elevations, slopes, and tolerances.

L. The Contractor shall not backfill any excavation until the excavation has been determined to be below the remediation goals based on soil sampling.

3.5 BACKFILLING - IMPORTED BACKFILL AND COMMON FILL

A. Approved backfill may be used as trench backfill; fill against exterior walls of structures (except water and retention structures) as indicated on the Drawings; as embankment fill; or in other areas as designated by the Engineer. Material conforming to the requirements of

common fill shall be placed in layers having a maximum thickness of 12-inches measured before compaction.

B. Approved backfill material may be backfilled in the excavations following soil sampling of the excavated soil and the bottom and sidewalls of the excavation confirming the remediation goals have been met.

C. Common Fill and imported backfill material shall be compacted to at least 92 percent of maximum density as determined by ASTM Compaction Tests, Designation D1557, Method D.

D. Materials placed in fill areas shall be deposited to the lines and grades shown on the Drawings making due allowance for settlement of the material and for the placing of loam thereon.

E. The surfaces of filled areas shall be graded to smooth true lines, strictly conforming to grades indicated on the grading plan and no soft spots or uncompacted areas will be allowed in the work.

F. No compacting shall be done when the material is too wet either from rain or from excess application of water. At such times, work shall be suspended until the previously placed and new materials have dried sufficiently to permit proper compaction.

3.6 CARE OF PROPERTY

A. Excavating machinery and cranes shall be operated with care to prevent damage to trees.

B. On paved surfaces, the Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment, the treads or wheels of which are so shaped as to cut or otherwise damage such surfaces. All surfaces that have been damaged by the Contractor's operations shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operation.

3.7 DUST CONTROL AND VAPOR EMISSION

A. During the process of the work, the Contractor shall conduct operations and maintain the area of activities so as to minimize the creation and dispersion of dust and vapor emissions per the approved site HASP. Health and Safety requirements are specified in Section02006.

END OF SECTION

SECTION 02222

EXCAVATING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Excavating for trenching and grading.

B. Excavating for slabs-on-grade, paving, landscaping, and general work.

C. Excavating for site structures.

1.2 RELATED SECTIONS

A. Section 02006 – Health and Safety: Requirements applicable to unit prices for the work of this Section.

B. Section 01400 - Quality Control

C. Section 02110 – Clearing and Grubbing

D. Section 02160 - Safe Operation

E. Section 02011 – Test Pits

F. Section 02140 - Dewatering

G. Section 02144 – Well Points

H. Section 02223 - Backfilling.

I. Section 02227 – Trenching, Backfilling and Compacting: Excavating for utility trenches.

J. Section 02229 - Rock removal: Removal of rock during excavating.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

Not used.

1.4 FIELD MEASUREMENTS

A. Verify that survey benchmark and intended elevations for the Work are as indicated.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. Locate, identify, and protect utilities that remain from damage.

C. Notify utility company of excavations.

D. Protect plant life, lawns, rock outcroppings and other features remaining as a portion of final landscaping.

E. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.2 EXCAVATING

A. Underpin adjacent structures which may be damaged by excavating work.

B. Excavate subsoil to accommodate building foundations, slabs-on-grade paving and site structures, trenching and construction operations.

C. Excavate to working elevations for piling work.

D. Compact disturbed load-bearing soil in direct contact with foundations to original bearing capacity; perform compaction in accordance with these specifications.

E. Slope banks with machine.

F. Grade top perimeter of excavating to prevent surface water from draining into excavation.

G. Hand trim excavation. Remove loose matter.

H. Remove lumped subsoil, boulders, and rock as directed by the engineer.

I. Notify the engineer of any unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

J. Stockpile excavated material in area designated on site as directed by the engineer. Remove excess or unsuitable material from site.

3.3 FIELD QUALITY CONTROL

A. Section 01400 - Quality Assurance: Field inspection and testing.

B. Provide for visual inspection of bearing surfaces.

3.4 PROTECTION

A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

C. Excavations shall be inspected by contractor’s competent person to ensure safety.

END OF SECTION

SECTION 02223

BACKFILLING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Building perimeter and site structure backfilling.

B. Site filling and backfilling.

C. Fill under slabs-on-grade and paving.

D. Fill for over-excavation.

E. Consolidation and compaction as scheduled.

F. Sheet vapor retarder.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Assurance/Quality Control and 01410 - Contractor Furnished Testing Laboratory Services: Compaction testing

B. Section 02220 - Impacted Soil Area Backfilling and Material.

C. Section 02222 - Excavating.

D. Section 02227 – Trenching, Backfilling and Compacting: Backfilling of utility trenches.

E. Section 02271 – Dumped Riprap.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

Not applicable.

1.4 REFERENCES

A. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.

B. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures,

Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

C. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.

D. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

E. ASTM D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

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

G. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. Pipe zone bedding: As specified in Section 02000.

B. Pipe zone backfill: As specified in Section 02000.

C. Suitable Material: As specified in Section 02000.

2.2 ACCESSORIES

A. Geotextile Fabric: Non-biodegradable, woven.

B. Vapor Retarder: 10 mil (0.25 mm) thick, polyethylene.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.

B. Verify underground tanks are anchored to their own foundations to avoid flotation after backfilling.

C. Verify structural ability of unsupported walls to support imposed loads by the fill.

3.2 PREPARATION

A. Compact subgrade to density requirements for subsequent backfill materials.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill and compact to density equal to or greater than requirements for subsequent fill material.

C. Scarify and proof roll subgrade surface to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

3.3 BACKFILLING

A. Backfill areas to contours and elevations with unfrozen materials.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.

C. Place geotextile fabric as shown on the drawings prior to placing next lift of fill.

D. Place and compact materials in equal continuous layers not exceeding 8 inches compacted depth.

E. Employ a placement method that does not disturb or damage other work.

F. Maintain optimum moisture content of backfill materials to attain required compaction density.

G. Do not backfill against unsupported pipes and structures.

H. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.

I. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise.

J. Make gradual grade changes. Blend slope into level areas.

L. Remove surplus backfill materials from site.

M. Leave fill material stockpile areas free of excess fill materials.

3.4 TOLERANCES

A. Top Surface of Backfilling: Plus or minus 1 inch from required elevations.

3.5 FIELD QUALITY CONTROL

A. Section 01400 - Quality Assurance: Field inspection and testing.

B. Compaction testing will be performed in accordance with ASTM and AASHTO.

C. If tests indicate Work does not meet specified requirements, re-compact and retest. If work fails again, remove, re-compact and retest.

D. Frequency of Tests: Every lift.

E. Proof roll compacted fill surfaces.

3.6 PROTECTION OF FINISHED WORK

A. Protect finished Work.

B. Reshape and re-compact fills subjected to vehicular traffic.

END OF SECTION

SECTION 02224

STRUCTURAL EXCAVATION, BACKFILL

PART 1 GENERAL

3.1 WORK INCLUDED

A. Excavation and backfill as required for the construction of structures in accordance with the applicable provisions of the Section entitled "Earthwork" unless modified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Excavating, Section 02222

B. Trenching, Backfilling and Compacting, Section 02227

C. Restoration of Surfaces, Section 02990

D. Topsoil and Seeding, Section 02981

1.3 LIMITS OF EXCAVATION

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

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

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

1.4 SUBSURFACE REINFORCEMENT

A. Where an unstable subgrade is encountered and subject to the approval of the Engineer, select fill may be used for subgrade reinforcement if satisfactory results can be obtained thereby. Such material shall be applied in thin layers, each layer being entirely embedded in the subsoil by thorough tamping.

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

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

1.5 SUBSURFACE

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

1.6 REMOVAL OF WATER

A. The Contractor shall at all times provide and maintain proper and satisfactory means and devices for the removal of all water entering the excavations, and shall remove all such water as fast as it may collect,

in such manner as shall not interfere with the prosecution of the work or the proper placing of pipes, structures, or other work.

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

1.7 BACKFILLING

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

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

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

1.8 COMPACTION

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

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

END OF SECTION

SECTION 02227

TRENCHING, BACKFILLING AND COMPACTING

PART 1 GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, material, and equipment, and services necessary for, and incidental to, the excavation, backfilling, compacting, dewatering, protection and disposal, as shown on the Drawings, and as herein specified.

B. The Contractor shall accept the site in the condition in which it exists when awarded the Contract.

C. The SMC and NYSDEC Representative shall determine the suitability of materials that are to be used in the work and should any materials encountered be unsatisfactory for the purpose intended, they shall be removed from the site at the Contractor's expense.

1.2 QUALITY ASSURANCE

A. Reference Standards:

1. The latest edition of the following standards, as referenced herein, shall be applicable.

   a. "Standard Specifications, Construction and Materials, New York State Department of Transportation, Office of Engineering".

   b. "Standard Specifications of Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO)".

B. The Contractor shall comply with the requirements for soil erosion and sedimentation control and other requirements of governmental authorities having jurisdiction, including the State of New York.

C. The Contractor shall provide and pay for all costs in connection with an approved independent testing facility to determine conformance of soils and aggregate with the specifications, in accordance with SECTION 01410 - CONTRACTOR FURNISHED TESTING LABORATORY SERVICES.

1.3 SUBMITTALS

A. The Contractor shall furnish earth materials to the testing laboratory for their analysis and report, as directed by the Engineer, or as outlined in the specifications.

B. The testing laboratory shall submit written reports of all tests, investigations, findings and recommendations to the Contractor and the Engineer.

1.4 PROJECT REQUIREMENTS

A. Notify the Engineer of any unexpected subsurface condition.

B. Protect excavations by shoring, bracing, sheet piling, underpinning or by other methods, as required to ensure the stability of the excavation.

C. Underpin or otherwise support structure adjacent to the excavation which may be damaged by the excavation. This includes service lines and existing wells.

D. Protection of Existing Utilities:

1. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations. Comply with OSHA requirements.

2. Coordinate interruption and/or termination of utilities with the utility companies and the Owner.

3. Provide a minimum of forty-eight (48) hours notice to the Owner and receive written notice to proceed before interrupting any utility.

4. Demolish and completely remove from the site any existing underground utilities designated to be removed, as shown on the Drawings or as specified in SECTION 02110 – CLEARING AND GRUBBING.

5. Repair any damaged utilities as acceptable to the SMC Representative, at no additional cost to the Owner.

E. Protection of Persons and Property:

1. Barricade open excavations occurring as part of this work and post with warning lights.

2. Operate warning lights as recommended by authorities having jurisdiction.

3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

4. Perform excavation within drip-line of large trees to remain by hand, and protect the root system from damage or dryout to the greatest extent possible. Maintain moist conditions for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

PART 2 PRODUCTS

2.1 MATERIALS

A. Pipe Zone Bedding / Drainage Layer: Select mixture of graded crushed stone, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT Section 703-02 and meeting the following gradation requirements (NYSDOT Size 1):

Sieve	Percent Passing
1"	100
2"	90-100
1/4"	0-15

B. Gravel Roadway Replacement: Sound, durable sand, gravel, stone or blends of these materials, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT Section 304 and meeting the following gradation requirements (NYSDOT Type 4):

Sieve	Percent Passing
2"	100

1/4"	30-65
No. 40	5-40
No. 200	0-10

Or Alternately Roadway Material may be stone dust. SMC Representative to select roadway material.

C. Suitable Run Of Trench Material: Sound, durable soil, free from organic, frozen or other deleterious materials. Run-of-trench material, meeting this criteria, shall be considered suitable material and shall be used for trench backfill only after tested in accordance with SECTION 01410 - CONTRACTOR FURNISHED LABORATORY TESTING and approved by the SMC Representative. The Contractor shall pay for all additional testing required to determine the conformance of run-of-trench material, if at any time during the Work this material appears to be in non-conformance in the opinion of the SMC Representative.

D. Select Granular Fill

Sieve	**Percent Passing**
4"	100
No. 40	0-70
No. 200	0-15

PART 3 EXECUTION

3.1 PREPARATION

A. Establish required lines, levels, contours and datum.

B. Maintain benchmarks and other elevation control points, re-establish, if disturbed or destroyed, at no additional cost to the Owner.

C. Establish location and extent of utilities prior to commencement of excavation.

3.2 EXCAVATION

A. All excavation shall be made to such a depth as required and of the width shown on the Drawings to provide suitable room for the building the structures and laying the pipe(s). Suitable accommodations shall also be made for the installation of sheeting, shoring, pumps and drainage, and for the removing of peat, silt, or any other materials, which the SMC Representative may deem unsuitable.

B. Trench excavation for pipes shall be made by open cut to accommodate the pipe or structure at the depths indicated on the Drawings. Excavation shall be made to such a point and to the width indicated on the Plans so as to allow a minimum of six (6) inches of pipe zone bedding to be placed beneath the bottom of all structures and barrels, bells or couplings of all pipes installed.

C. The bottom of the trench shall be accurately graded to provide a uniform layer of bedding material for each section of pipe. Trim and shape trench bottoms and leave free of irregularities, lumps, and projections.

D. Stockpile and stage excavated subsoil for off-site disposal where directed. Remove excess or unsuitable excavated material from site.

E. Excavation Below Grade: If, in the opinion of the SMC Representative, existing material below the trench grade is unsuitable for properly placing bedding material and laying pipe, the Contractor shall excavate and remove the unsuitable material and replace the same with an approved fill

material properly compacted.

F. Stability of Excavation: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Comply with the requirements of SECTION 02160, SAFE OPERATION SHEET PILING. Maintain sides and slopes of excavation in safe condition until completion of backfilling.

G. Removal of materials beyond the indicated subgrade elevations, without authorization by the SMC Representative, shall be classified as unauthorized excavation and shall be performed at no additional cost to the Owner.

3.3 DEWATERING

A. The Contractor shall remove all water from the excavation promptly and continuously throughout the progress of the work and shall keep the excavation dry at all times until the structures to be built therein are completed. No pipe or masonry is to be laid in water and water is not to be allowed to rise on or flow over any pipe or masonry until such time as approved by the SMC Representative.

B. All necessary precautions shall be taken to prevent disturbances of and to properly drain the areas upon which pre-cast concrete is to be placed and upon which pipe is to be laid. If the well point method is used to lower the groundwater level. Well points, shall be shifted frequently to avoid drainage from too long a distance. Provide a suitable point of discharge in a manner satisfactory to the SMC Representative. Pump wells in proper locations sufficiently removed from the line of the work and at sufficient depth, shall be constructed and maintained as required. Wells are to be securely refilled upon the completion of the work.

C. Precautions shall be taken to protect uncompleted work from flooding during storms or from other causes. All pipe lines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected.

D. Dewatering operations shall be in accordance with SECTION 02140 - DEWATERING.

3.4 BEDDING AND BACKFILLING

A. All pipe trenches (pipe zone backfill and trench backfill) shall be consolidated by tamping or rolling to achieve a Standard Proctor Density of 90 percent of the maximum density of the material used. Any water used for compaction shall be provided by the Contractor at his own expense. The approval of the SMC Representative of the proposed method of compaction of backfill shall in no way be construed as relieving the Contractor of responsibility of settlement of trenches, etc. and any settlement shall be repaired by him at his own expense.

B. The drainage layer material shall be placed in the trench after the same has been excavated a minimum of six (6) inches below the bell of the pipe to permit the placing of not less than six (6) inches of crushed stone material.

C. The trench backfill material shall be placed to the full width of trench. The trench backfill material shall be placed on either side of the pipe to the elevation shown on the Plans or directed by the SMC Representative. This trench backfill material shall then be tamped and compacted to form a firm and even bearing.

D. The remainder of the trench above the trench backfill material shall be backfilled and compacted with "suitable run-of trench material" as shown on the plans in layers not exceeding twelve (12) inches.

3.5 BACKFILLING AROUND STRUCTURES

A. The Contractor shall not place backfill against any structure without obtaining the approval of the SMC Representative. No dumping shall be allowed where materials would flow against or around such structures. Approved backfill material shall be deposited in twelve (12) inch horizontal layers thoroughly compacted by hand or pneumatic tampers to the satisfaction of the SMC Representative.

3.6 SUSPENSION OF WORK

A. Whenever the work is suspended, the excavations are to be protected and the required access ways left unobstructed. Within or adjacent to private property, material shall be stored at such locations as not unduly interfere with traffic of any nature and in no case shall materials be stored in locations which will cause damage to existing improvements.

3.7 DISPOSAL OF MATERIAL

A. Excess and unsuitable materials shall be staged, characterized and disposed off-site by the Contractor at a permitted disposal facility location specified by SMC. Any frozen material or material containing a high percentage of organic matter which the SMC Representative declares to be unsuitable for backfill shall be replaced at the Contractor's expense.

3.8 FIELD QUALITY CONTROL

A. Notify the SMC Representative at least one (1) working day in advance of all phases of filling and backfilling operations.

B. Compaction testing shall be performed to ascertain the compacted density of the fill and backfill materials in accordance with SECTION 01410 - CONTRACTOR FURNISHED LABORATORY TESTING.

C. Compaction tests shall be provided for every 100 feet of trench and in vertical lifts not exceeding ten (10) feet.

D. The SMC Representative may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions, at the Contraction's expense.

E. Acceptance Criteria: The sole criterion for acceptability of in-place fill shall be in-situ density. Minimum density for all fill or backfill shall be 90 percent of the Standard Proctor maximum dry density. If a test fails to qualify, the fill shall be further compacted and re-tested. Subsequent test failures shall be followed by removal and replacement of the material.

3.9 AIR AND SOIL MONITORING

A. The Contractor shall periodically monitor the soil and air both in the trench and within the designated exclusion areas for contaminates.

** END OF SECTION **

SECTION 02232

IMPACTED SOIL OR DEBRIS EXCAVATION AND STAGING

PART I GENERAL

1.1 SUMMARY

A. This Section includes excavation and backfilling including the loosening, removing and filling of all materials classified as surface soil or debris to be removed off-site, including the completion of all work under the Contract.

B. Excavation to the widths and depths shown on the Contract Drawings, specified, or directed.

1.2 REFERENCES

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

1. American Society for Testing and Materials (ASTM)

   a. ASTM D698 Test Method for Laboratory Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3) (600 kN-m/m3)

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

   c. ASTM D3017 Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

1.3 SUBMITTALS

A. In addition to those submittals identified in the Special Provisions, the following items shall be submitted:

1. Compaction Curves for Surface Soil.

2. Proposed Testing Laboratory.

3. Test results.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 SURFACE SOIL OR DEBRIS EXCAVATION

A. No disposal at an off-site permitted disposal facility will be allowed without the written approval of the Owner.

B. The Contractor shall not expose surface soil or debris deposits in excess of the quantity that can be excavated and staged and characterized for disposal off-site in one working day.

C. Where existing soil cover is in place over the surface soil or debris to be excavated, the existing soil cover shall be excavated with the surface soil or debris, and handled in accordance with this Section.

D. The Contractor shall excavate surface soil or debris by means of appropriate procedures and equipment.

E. The Contractor shall avoid excessive disturbance of the excavated surface soil or debris, to control the release of dust and vapor emissions.

3.2 COMPACTION

A. The Contractor shall place and compact backfill material as necessary to achieve required subgrades within the limits of the trench. Prior to any surface soil or debris excavation activities, the Contractor shall submit his proposed method of backfill compaction to the Engineer for review.

B. Material, which could potentially damage the pipe, pavement or manholes including, but not limited to, other materials as determined by the Engineer, shall be placed a minimum of one foot below the proposed final grade of the pavement outside of the pipe zone backfill. This material shall be covered with approved backfill acceptable to the Engineer.

C. Compaction of backfill as accepted by the Engineer, may be accomplished by the following methods, subject to acceptance by the Engineer upon completion of on-site field tests by the Contractor.

1. Pneumatic - Tired Compactors:

A lift thickness of no more than 12 inches shall be used, the minimum pneumatic compactor class shall consist of Class F with a tire size of 13.00 X 24, number plys is 18, inflation pressure (psi) of 100* and the range of ballasted wheel loads (lbs. per wheel) allowed on that lift thickness shall be 8,000 - 10,000. The minimum effort for all pneumatic compactors shall be 6 passes, at speeds up to 12 feet per second (fps) on no more than the first 2 passes, and all subsequent passes at speeds of 6 fps or less. (*Inflation pressure for not less than the last two passes on each lift. May be reduced during earlier passes and gradually increased to this level.)

2. Vibratory Drum Compactors:

This type of compactor is defined as a machine which primarily develops its compactive effort from the vibrations created and is classified for use according to the developed compactive force rating per linear inch of drum width(PLI). A loose thickness of no more than 12 inches shall be used. The minimum effective compactive force, PLI, used shall be 740 and the minimum effort on such a lift shall be 6 passes at 4.5 fps.

3. Sheepsfoot Rollers:

A loose lift thickness of no more than 12 inches shall be used. The minimum stress level shall consist of a tire psi of 40. The minimum effort for all sheepsfoot rollers shall be 6 passes, operating at speeds not exceeding 6 feet per second when towed and 15 feet per second when self-propelled. Compaction shall continue until the sheepsfoot roller can "walk out" of the compacted material.

4. Other Type of Compactor:

Compactor types other than those classified above may be employed by the Contractor, subject to acceptance by the Engineer of the proposed minimum applied effort (minimum number of passes and travel speed) and maximum lift thickness. Such acceptance by the Engineer will be based upon the results of appropriate on-site field tests.

D. The Engineer shall be availed the opportunity to witness that the Contractor has achieved adequate compaction of a given area defined by location on a daily basis. If the Engineer is not provided this opportunity by the Contractor, areas compacted on that day are subject to rejection.

E. In areas where the material to be backfilled consists solely of soil, as accepted by the Engineer, the soil shall be compacted to minimum 90% standard density and tested in accordance with the following:

Test	Standard	Minimum Frequencv	Criteria
Compaction Characteristics	ASTM D698	Once per 100 cubic yards of surface soil relocated or a minimum of one, whichever is greater	Develop compaction characteristics
In-Place Moisture Content	ASTM D3017	Once per 1,000 square feet per lift of surface soil relocated or a minimum of one, whichever is greater	Monitor compaction
In-Place Density	ASTM D2922	Once per 1,000 square feet per lift of surface soil relocated or a minimum of one, whichever is greater	Minimum 90% of maximum density in accordance with ASTM D698

F. The Contractor shall make all reasonable efforts to grade cut areas in a manner to achieve the required subgrade following compaction of the said cut areas.

G. Any areas of backfilled soils not meeting the criteria shall be reworked by the Contractor to meet the criteria at no additional cost to the Owner.

H. Additional testing may be required at the request of the Engineer.

3.3 BACKFILLING

A. No backfilling of AEC's shall be performed without acceptance of the Engineer.

END OF SECTION

SECTION 02265

SOIL-BENTOINITE GROUND WATER CUTOFF WALL

PART I GENERAL

1.1 SUMMARY

A. This Section includes construction of a soil-bentonite ground water cutoff wall by excavating a trench in existing overburden soils by the slurry method of excavation, open trench or other approved method and backfilling with a soil-bentonite backfill to the established lines, grades, and elevations as shown on the Contract Drawings, as specified herein, or as directed by the Engineer.

B. The soil-bentonite ground water cutoff wall shall have essentially vertical walls and a minimum width of 3 feet. The installed soil-bentonite backfill shall have a maximum hydraulic conductivity of 1 x 10-7 centimeters per second (cm/sec), as determined by laboratory tests performed on shelby-tube samples of the soil-bentonite backfill using site ground water. All efforts shall be made to provide a continuous, homogeneous soil- bentonite cutoff wall within the trench. The occurrence of "windows" of material having a permeability greater than 1 x 10^{-7} cm/sec shall not be allowed.

C. The work consists of furnishing all plant, labor, equipment, and materials required to construct the soil-bentonite ground water cutoff wall.

1.2 REFERENCES

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

1. American Society for Testing and Materials (ASTM)

   a. ASTM C 117- Test Method for Material Finer than *75.u* (micron)- (No. 200) Sieve in Mineral Aggregates by Washing

   b. ASTM C136 -Method for Sieve Analysis of Fine and Coarse Aggregates

   c. ASTM C138 -Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete

   d. ASTM C143 -Test Method for Slump of Hydraulic Cement Concrete

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

   f. ASTM D 1587 -Standard Practice of Thin Walled Tube Sampling of Soils

   g. ASTM D2166 -Test Method for Unconfined Compressive Strength of Cohesive Soil

   h. ASTM D2216 -Method for Laboratory Determination of Water Moisture Content of Soil, Rock, and Soil-Aggregate Mixtures

   i. ASTM D4318 -Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

   j. ASTM D5084 -Test Method for Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

2. American Petroleum Institute (API)

    a. API SPEC 13A -Specification for Drilling-Fluid Materials

    b. API RP 13B-1- Recommended Practice-Standard Procedure for Field Testing Water-Based Drilling Fluids

3. Center Hill/United States Protection Agency (USEPA), Solid and Hazardous Waste Research Facility

    a. Free Swell Test -Center Hill In-House Method Modified Swell Test - Center Hill In-House Method

    b. Filter Cake Hydraulic Conductivity -Center Hill In-House Method ;

1.3 SUBMITTALS

A. In addition to those submittals identified in the Special Provisions, the following items shall be submitted:

1. The Contractor shall submit a Construction Quality Assurance/Construction Quality Control (CQA/CQC) Program detailing field quality control procedures for construction of the cutoff wall, prior to initiating construction activities. The Field CQA/CQC Program shall provide sufficient data to demonstrate that the cutoff wall is constructed in a manner which satisfies the design requirements set forth in this specification. For the cutoff wall, the program shall include, but not be limited to, checks on the excavation and backfilling procedures, cutoff wall depths and alignment, cutoff wall continuity, and testing of slurry and backfill for conformance with the proposed mix. Proposed forms for documenting CQC testing shall also be submitted.
2. Name of proposed testing laboratory and/or independent organization certifying the laboratory test results. If the Contractor proposes to perform laboratory testing utilizing the Contractor's own facilities and equipment, the test results shall be certified by an independent organization.
3. Proposed method of construction of the cutoff wall including types and sources of materials to be used to construct the cutoff wall, construction procedures, and procedures for handling and disposing of contaminated materials (bentonite slurry, backfill, ground water and/or soils) removed during excavation of the slurry trench.
4. After award of the Contract and prior to cutoff wall installation, the successful Contractor shall submit all laboratory test results to the Engineer for acceptance. The Contractor shall also submit an independent certification that the laboratory tests were conducted in accordance with the specified laboratory testing program.
5. If at any time during the Contract the Engineer requests further testing to insure that the characteristics of the construction materials are as specified in this Section, the Contractor shall perform these tests at no cost to the Owner.
6. The Contractor shall submit evidence of experience and competence to construct soil-bentonite cutoff walls using the slurry trench method with his Bid, The Contractor shall have a minimum of five years of continuous and successful experience in constructing soil-benionite cutoff walls. The Contractor shall submit a detailed list of applicable projects performed by the firm, including project name, client's name, contact person with telephone number, description of the project, construction cost of the project, date the work was performed, key personnel involved, and size of the project in square feet of the wall, and any difficulties which may have occurred. Partners, specialty contractors, or consultants which may have participated with the Contractor shall be identified (if applicable).
7. The Contractor shall list key personnel proposed for the project, including their soil-bentonite cutoff wall experience With his Bid. Experience which was obtained with another Contractor or

firm shall be clearly identified. The Contractor shall have sufficient experienced personnel on-site to carry out the operations specified, In particular, a slurry trench specialist (as approved by the Engineer) shall supervise the construction, slurry preparation, and quality control. The Contractor's slurry trench specialist shall have a minimum of five years of continuous, and relevant experience in constructing soil-bentonite cutoff walls and have been responsible for the installation of at least 500,000 square feet of soil bentonite cutoff walls.

8. Source of soils to be used in backfill for cutoff wall.
9. Proposed bentonite manufacturer and manufacturer's certificate of compliance.
10. Proposed additive manufacturer, type, and trade name, if used.
11. Location of proposed source or sources of potable water.
12. Proposed locations of equipment and operations.
13. Contingency plan addressing, at a minimum, loss of slurry, maintenance of slurry density, and premature gelation of slurry.
14. Results of unconfined compression strength testing for slurry disposal.
15. Reports and records in accordance with Section 3.6.
16. Affidavit form owner(s) of source(s) and results of hazardous waste testing in accordance with the Special Provisions

1.4 DEFINITIONS

A. Soil-Bentonite Cutoff Wall-A soil-bentonite cutoff wall (cutoff wall) is a subsurface, low permeability, ground water flow barrier, constructed by excavating a trench in existing overburden by the slurry method of excavation and backfilled with an appropriate soil-bentonite backfill.

B. Slurry Method of Excavation-The slurry method of excavation is the excavation of a vertical-sided trench while simultaneously pumping slurry into the trench.

C. Bentonite-A naturally occurring clay containing the clay mineral montmorillonite and meeting the requirements of this Section.

D. Soil Backfill-Soil backfill is defined as soil used in preparation of the soil-bentonite backfill. Backfill soils may consist of imported soils or soils removed from the cutoff wall trench excavation, as accepted by the Engineer.

E. Bentonite Slurry-Bentonite slurry is defined as the mixture of bentonite and water used to provide stability of the excavated trench and for preparation of the soil-bentonite backfill mixture.

F. Slurry Trench-Slurry trench is defined as an excavated trench filled with slurry to provide trench stability.

G. Soil-Bentonite Backfill-Soil-bentonite backfill is defined as soils mixed with bentonite, water, and other additives as necessary for the construction of a continuous, low permeability, hydraulic barrier in the slurry trench.

H. Ground Water Level-Ground water level is defined as the elevation at which ground water is encountered. The elevation shall be determined based on the distance (in feet) below the top of existing grade.

I. Key Stratum-The key stratum is defined as the bedrock stratum into which the bottom of the cutoff wall shall penetrate. The cutoff wall shall be extended into bedrock to a maximum depth that can be achieved using conventional construction excavation equipment such as backhoes or tracked excavators, or as directed by the Engineer. The approximate location of the top of bedrock is shown on the Contract Drawings with the actual location to be confirmed during performance of the work.

J. Overburden-Overburden is defined as all material overlying the key stratum which the cutoff wall will be keyed into and which must be excavated to construct the cutoff wall. This includes refuse and all native soil materials such as silts, clays, sands, gravel, cobbles, and boulders that can be excavated without blasting.

K. Slurry Trench Specialist

The slurry trench specialist shall be a person on the Contractor's staff or a subcontractor, assigned on a full-time basis, to supervise the construction of the cutoff wall and other associated work. The slurry trench specialist shall have a minimum of five years of continuous successful experience in constructing soil-bentonite cutoff walls, have successfully completed five (5) projects of a similar nature, and be knowledgeable in all facets of the cutoff wall construction including, but not limited to:

1. Use, testing, and control of bentonite as a slurry

2. Proper mixing methods to mix slurry and backfill material

3. Trench excavation and backfill operations

4. Construction equipment and testing requirements needed for cutoff wall construction

5. Stabilization of residual bentonite slurry at the end of excavation

P ART 2 PRODUCTS

2.1 BENTONITE

A. The bentonite used in the slurry shall be a premium-grade, sodium cation montmorillonite in accordance with API 13A and as accepted by the Engineer. Certificate of Compliance of the bentonite material with the specification shall be obtained from the manufacturer and submitted to the Engineer. Any changes in manufacturers or manufacturer's brands during the project must be approved by the Engineer in advance of their use.

2.2 WATER

A. Contractor shall be responsible for providing all water required for construction of the cutoff wall and associated activities. A potable source of water will be available to the contractror from an on site source.

B. Water used for preparation of the slurry shall be from a potable water source.

C. The Contractor shall submit to the Engineer for acceptance the location of the proposed source or sources of water. It is the responsibility of the Contractor that the water utilized always meet the requirements of this Section and the requirements of the bentonite manufacturer.

D. The water shall have a pH in the range of 7.0 to 8.5 and shall be as required by the bentonite manufacturer to properly hydrate the bentonite.

2.3 SOIL BACKFILL

A. Soils to be used as soil backfill for the cutoff wall shall be suitable soils obtained from the excavated trench or from off -site borrow sources, as accepted by the Engineer.

B. Silts and clays excavated from the trench may be added as fines to the proposed backfill. The proposed addition of these materials shall be identified by the Contractor with

submission of his Bid and shall be subject to the acceptance of the Engineer. Excavated soils to be added to the backfill during construction shall be subject to the acceptance of the Engineer. The soils shall be friable and free from roots, organic matter, or other deleterious materials. The soils shall be thoroughly mixed and well graded. Following excavation of soils, as accepted by the Engineer, the Contractor shall collect four soil samples as directed by the Engineer. The soil samples shall be tested for particle size analysis (ASTM D422), liquid limit, plastic limit and plasticity index (ASTM D4318), and moisture content (ASTM D2216). Test results shall be submitted to the Engineer upon receipt of data. Additional testing may be required at the request of the Engineer. Excavated soils from tile trench not utilized as soil backfill shall be handled in accordance with the Section titled “Impacted Soil or Debris Relocation” and in a manner accepted by the Engineer. C

C. The Contractor shall submit to the Engineer for acceptance the location of any borrow source(s) for the soils to be used as backfill. The soils shall be friable and free from roots, organic matter, or other deleterious materials. The soils shall be thoroughly mixed and well graded. The soils of each borrow source shall be tested at four different locations for particle size analysis (ASTM D422), liquid limit, plastic limit and plasticity index (ASTM D4318), and moisture content (ASTM D2216), and in accordance with the special provisions. Test results shall be submitted to the Engineer upon receipt of data. Additional testing may be required at the request of the Engineer. If the character of the soils changes during excavation the Contractor shall submit additional test results of the new material.

2.4 BENTONITE SLURRY

A. Bentonite Slurry after Hydration -The bentonite slurry shall consist of a stable colloidal suspension of premium grade sodium bentonite in water. The bentonite slurry shall be allowed to hydrate completely before its use in the trench. The density of the slurry after hydration (minimum 8 hours, unless it can be otherwise demonstrated by the Contractor to the satisfaction of the Engineer that the hydrated slurry meets the requirements of this Section in less than 8 hours) shall be a minimum of 64 pounds per cubic foot, with a corresponding Marsh Funnel viscosity of 40 to 45 seconds. The bentonite slurry shall have a filtrate loss of not more than 20 cubic centimeters in 30 minutes at 100 PSI as measured by a standard filter press. The pH of the slurry shall be maintained in the range of 7-10.

B. Bentonite Slurry in the Trench – The bentonite slurry in the trench shall have a minimum density of 64 pounds per cubic foot and shall be at least 15 pounds per cubic foot lighter than the soil-bentonite backfill. The viscosity of the bentonite slurry shall be in the range of 40 to 60 seconds as measured by a Marsh Funnel. The bentonite slurry in the trench shall have a filtrate loss of not more than 35 cubic centimeters in 30 minutes at 100 PSI as measured by a standard filter press. The pH of the slurry shall be maintained in the range of 7-10. The 'Contractor shall maintain the properties of the slurry in the trench. The use of additives, recirculation, or replacement must be approved.

C. Bentonite Slurry in Backfill -Slurry mixed with backfill materials shall be either slurry taken from the trench or slurry meeting the requirements of slurry introduced into the trench.

D. Bentonite slurry shall not be allowed to freeze.

E. Biodegradable slurry shall not be used during construction of the cutoff wall.

2.5 ADDITIVES AND BULKING AGENTS

A. If additives or bulking agents are to be used, the type, trade name, manufacturer, function and quantity shall be submitted to the Engineer

B. No additives or bulking agents shall be used without written acceptance of the Engineer

2.6 EQUIPMENT

A. Trench Excavation

Excavation of the slurry trench shall be performed by equipment capable of producing a continuous trench to the final depth and minimum 3-foot width specified herein. Special chopping, chiseling, or other equipment may be used as necessary to achieve the required excavation. No blasting will be allowed at any time. The width of the excavation shall be equal to or greater than the specified width of the cutoff wall. Additional equipment such as air lift pumps and slurry desanders shall be used as necessary to clean the trench bottom and/or slurry in accordance with this specification.

B. Slurry Batching Plant

The slurry batching plant shall include all necessary equipment, including a mixer capable of producing a colloidal suspension of bentonite in water, pumps, valves, hoses, supply lines, and all other equipment required to supply slurry to the trench. The location of the slurry batching plant shall be approved by the Engineer. Storage ponds and/or tanks shall be provided to store the mixed slurry during hydration and to serve as a reserve in cases where substantial slurry loss from the trench may occur. The slurry shall be agitated or recirculated in the storage ponds as required to maintain a homogeneous mix. No slurry is to be made in the trench. The slurry batching plant shall also be capable of incorporating any additives, weighing agents, or bulking agents as specified in 2.5.

C. Backfill Mixing and Placing

Equipment for mixing and placing backfill shall consist of blenders, such as a pug mill, and/or grading equipment, such as bulldozers, that are capable of thoroughly mixing the backfill materials into a homogeneous paste.

2.7 BENTONITE AND SOIL-BENTONITE BACKFILL LABORATORY TESTING PROCEDURES

A. All cutoff wall field and laboratory testing services required prior to and during installation of the cutoff wall shall be provided to the Engineer by the Contractor.

B. The Contractor shall perform laboratory testing of the Contractor's proposed materials of construction prior to and during construction. The purpose of this testing is to provide an evaluation of the hydraulic conductivity and chemical compatibility of the proposed cutoff wall materials with site ground water and soils, and to demonstrate to the Engineer that the proposed cutoff wall meets the requirements of this Section.

C. The Contractor shall have the testing performed using the actual types and mixtures of materials of construction to be used during installation of the cutoff wall including:

1. Representative soils from the proposed borrow pit(s) or excavated trench soils

2. Contractor's proposed bentonite

3. Contractor's proposed backfill

4. Contractor's proposed water source

5. Site ground water from up to three monitoring wells selected by the Engineer.

D. The Contractor's laboratory testing program shall include testing the proposed bentonite by preparing and testing bentonite slurries with the Contractor's proposed water source and site ground water. The Contractor shall perform the following tests on the proposed bentonite:

Test	Standard
Marsh Funnel	API RP13B-1
Free Swell Test	Center Hill/USEPA In-House Method
Modified Swell Test	Center Hill/USEPA In-House Method
Filtrate Loss	API RP13B-1

E. The laboratory testing program required by the Engineer for the soil-bentonite backfill shall include the use of triaxial apparatus with back pressure as indicated in ASTM D5084 and a filter press as indicated in API 13 B-I following the requirements specified herein. Triaxial testing may be conducted concurrently with construction. The Contractor is not limited to performing this testing procedure only, and shall complete any additional testing he determines necessary to fulfill the performance criteria established in this Section.

F. The permeability testing performed using the triaxial equipment shall be run on samples of material prepared in a similar manner to which the Contractor intends to implement during construction of the cutoff wall. The following specific requirements shall be incorporated into the testing program:

1. The consolidation pressure applied to the sample during testing shall simulate the effective stress anticipated at mid-depth of the cutoff wall.

2. A minimum of three (3) pore volumes of fluid shall be passed through the sample during the testing program. The first pore volume shall be water to insure saturation of the sample and the second two (2) pore volumes shall be site ground water. The water used in saturation of the sample shall be de-aired by the testing laboratory prior to use in this testing program. Site ground water shall not be de- aired prior to use.

3. All testing shall be done at a constant temperature approximating temperatures expected under field conditions. The permeability testing using triaxial apparatus shall be run continuously, once started, until the pore volume of water saturates the sample and likewise, once the test has been started on the sample using site ground water, the test shall be run continuously, without interruption, until completion

4. Readings from the triaxial apparatus shall be taken and recorded a minimum of once every twelve (12) hours for permeability.

G. The permeability testing performed using the filter press (API RP13B-I) shall be run on samples of material prepared in a similar manner to which the Contractor intends to implement during construction of the cutoff wall. The following specific requirements shall be incorporated into the testing program:

1. All testing shall be done at a constant temperature approximating temperatures expected under field conditions.

2. A sufficient number of tests (five minimum) shall be performed for site ground water to establish a relationship between results of testing performed using the triaxial and filter press methods. The range of filter press permeability tests performed for each

permeant shall be in the range of 10 to 15 times greater than corresponding results from permeability tests performed using triaxial equipment or as accepted by the Engineer.

H. The Contractor shall submit to the Engineer in a written report the results of all laboratory testing including soil backfill testing, permeability tests using triaxial equipment, filter press permeability tests, and all corresponding calculations. The testing results presented shall be certified by an independent testing laboratory or organization approved by the Engineer. With the exception of permeability testing using filter press and/or triaxial equipment conducted concurrent with construction, test results shall be accepted by the Engineer in writing prior to installation of the cutoff wall. The results of permeability testing performed with filter press and/or triaxial equipment conducted during construction shall be submitted to the Engineer as they become available.

I. The Contractor shall notify the Engineer prior to initiating the laboratory testing program, of the date, time and location at which the testing program will be conducted and make the laboratory testing facilities accessible to the Engineer and for inspection.

J. The Contractor shall notify the Engineer a minimum of two weeks prior to initiating the laboratory testing program to coordinate collection of the ground water to be used in the laboratory testing program. The Contractor shall collect samples of the site ground water as approved by the Engineer.

PART 3 EXECUTION

3.1 TRENCH EXCAVATION

A. Excavation shall be performed to a minimum width of 3 feet, to the final depth at the point where the excavation is started, and along the line of the trench. Excavation shall proceed in a continuous manner from start to finish. Bentonite slurry shall be added to the trench at the same time trenching is begun and shall be maintained in the trench during excavation and until backfilled with the soil-bentonite backfill.

B. The trench for the cutoff wall shall be excavated vertically through the subsurface soil and keyed to the top of bedrock, or as otherwise directed by the Engineer.

C. The Contractor shall maintain the stability of the excavated trench at all times for its full depth and prevent slurry dilution due to ground water, surface water, and other sources. The level of the bentonite slurry shall always be maintained at least three (3) feet above ground water level and shall not be permitted to drop more than three (3) feet below the surface of the existing grade. The Contractor shall be responsible for documenting in daily reports, to the satisfaction of the Engineer, that the slurry trench is continuous to the required depth over its entire length. The Contractor shall have personnel, equipment, and materials available in the event of loss of slurry and to raise the slurry level at any time, including work stoppages, weekends and/or holidays.

D. The slurry trench shall be extended into bedrock to a maximum depth that can be achieved using conventional construction excavation equipment, such as backhoes or tracked excavators, or as directed by the Engineer. The approximate location of the top of bedrock is shown on the Contract Drawings with the actual location to be confirmed during performance of the work. The Contractor shall be responsible for demonstrating, to the satisfaction of the Engineer, that the trench is continuous and has been excavated into bedrock. When the maximum depth of excavation has been reached, the trench bottom shall be probed for boulders, gravel, or excessive sediment. Boulders, gravel, or sediment shall be removed to the satisfaction of the Engineer.

E. The side of the trench excavation where depth measurements are taken shall be maintained in a smooth manner to ensure accurate depth measurements and elevation determinations to within ± 0.5 feet.

F. The Contractor shall always maintain adequate means to expeditiously remedy unstable conditions. These may include additional stabilization measures such as additional slurry and bulking agents, shoring, bracing, etc. if unstable soil conditions are encountered. The stockpiling and/or use of stabilization measures shall not impact trench stability.

G. Upon completion of excavation, loose material and cuttings shall be removed from the bottom of the trench with the excavation tools or other equipment, such as an air lift pump. When the unit weight of the slurry in the trench exceeds the specified limits, or becomes unworkable, the heavy slurry shall be removed from the trench or the excess solids shall be removed from the slurry by screening or use of a centrifugal-type desander.

H. Materials excavated from the trench and which are not used in preparation of the soil-bentonite backfill shall be disposed of in accordance with the requirements of the Section titled "Impacted Soil or Debris Relocation".

3.2 SOIL-BENTONITE BACKFILL MIXING

A. Soil and bentonite materials for soil-bentonite backfill shall be mixed and blended in mechanical blenders or by windrowing, disk harrowing, bulldozing, blading, or by other approved methods. Soil-bentonite backfill mixing areas shall be accepted by the Engineer. Mixing and blending shall be performed in such a manner as to produce the required gradation of backfill. The soil-bentonite backfill material shall be thoroughly mixed into a homogeneous mass, free from large lumps or pockets of fines, sand, or gravel. Just prior to placing, the backfill material shall have a slump of 4 to 6 inches. The materials may be sluiced with slurry during blending operations. Sluicing with water will not be permitted.

B. When mixing the backfill, equipment such as a dozer shall not operate in a back and forth fashion paralleling the open slurry trench within 15 feet of the edge of the trench.

C. Where mixing occurs adjacent to the trench, the Contractor shall construct a small dike (two to three feet high) paralleling the cutoff wall trench in order to keep the backfill from flowing into the trench as a result of wave actions created by mixing the backfill. Intermittent holes in the dike will be allowed so that excess slurry may flow back into the trench.

D. No slurry or backfill will be allowed to flow away from the trench or remote mixing pad onto the surrounding property.

E. The Contractor shall not mix excessive amounts of backfill.

F. The soil-bentonite backfill shall not be allowed to dry, become excessively wet, or freeze prior to placement m the trench.

3.3 SOIL-BENTONITE BACKFILL PLACEMENT

A. Placement of backfill shall not be made until the trench has been inspected, and accepted by the Engineer.

B. Initial backfill shall be placed by a tremie process or lead in trench in the slurry stabilized cutoff trench. The initial process shall be continued until sufficient material has been placed in the excavation to expose the backfill material at the top of the trench.

C. After exposure of tile backfill material at the top of the trench, the remainder of the backfill shall be placed in such a manner that the backfill enters the trench by sliding down the

forward face of the previously placed backfill. Sufficient backfill shall be stockpiled on the edge of the existing backfill to cause a slump and sliding action on the face of the in-place backfill. The backfill shall not be dropped or deposited in any manner that will cause segregation or inclusion of soil or slurry pockets.

D. The backfill shall be placed continuously from the beginning of the trench, in the direction of the excavation, to the end of the trench. The toe of the slope of the trench excavation shall precede the toe of the backfill slope by no more than 50 feet or less than 25 feet or as required to permit proper cleaning of the trench bottom and to permit inspection and measurement. Trench excavation activities shall not disturb the installed soil-bentonite backfill slope. Placing operations shall proceed in such a fashion that the surface of the backfill below the slurry wall follows a smooth grade and shall not have hollows which may trap pockets of' slurry during subsequent backfilling. Free dropping of backfill material through the slurry will not be permitted.

E. At the start of each working day, the toe of the backfill in the trench shall be cleaned a minimum of 30 feet up slope as accepted by the Engineer.

F. If work is suspended greater than two days, the Contractor shall clean the entire backfill slope face until clean soil-bentonite backfill is observed at ten foot station intervals along the backfill slope as accepted by the Engineer.

G. Dilution of slurry by surface waters shall be prevented. The Contractor shall become familiar with the surface drainage characteristics at the site and the sediment and erosion control plans, and shall take all necessary precautions to protect the trench during inclement weather. The Contractor shall insure that runoff from rain or other sources shall not be allowed to flow into the trench at any time.

H. All soil or debris shall be kept out of the slurry before, during, and after placement of the trench. The removal of such soil or debris shall be at the direction of the Engineer.

I. The Contractor shall be responsible for containing on-site any bentonite contaminated runoff. Any required cleanup activities shall be at the Contractor's expense.

J. The Contractor shall prepare and implement a Contingency Plan for, at a minimum, slurry loss, maintenance of slurry density, premature gelation of slurry, and slurry or backfill flow onto the surrounding property and Skaneateles Creek. The Contingency Plan shall be submitted to and accepted by the Engineer prior to any excavation activities.

K. The Contractor shall be solely responsible for maintaining the stability and integrity of the trench excavation, cutoff wall and surrounding areas at all times and locations during construction, including road crossings.

L. A minimum of seven days shall elapse between the installation of the.soil-bentonite ground water cutoff wall and the placement of geomembrane. The Contractor shall not place geomembrane over the cutoff wall until the Contractor can demonstrate to the satisfaction of the Engineer that placement of the geomembrane will not affect the integrity of the cutoff wall.

3.4 CLEANUP

A. Bentonite slurry shaill be stabilized with cement prior to disposal. The stabilized slurry shall have a minimum unconfined compression strength of 20 psi as determined by testing performed in accordance with ASTM D 2166.

B. The stabilized slurry shall be disposed of in accordance with the Section titled "Impacted Soil or Debris Relocation."

C. Following completion of the soil-bentonite cutoff wall, all remaining backfill and bentonite slurry shall be relocated or removed to within the limits of the cutoff wall, or as otherwise directed by the Engineer. Bentonite slurry hydration ponds shall be pumped dry and backfilled with fill material as accepted by the Engineer.

3.5 QUALITY CONTROL AND TESTING

A. General

1. The Contractor shall maintain his own quality control for the cutoff wall construction subject to the approval of the Engineer. Minimum testing requirements are specified herein.

2. The Contractor shall provide and maintain, as a minimum, the following equipment in the Contractor's on-site laboratory.

a. 1 - Marsh funnel set
b. 1 - Direct Indicating Viscometer (hand crank)
c. 1 - Standard Filter Press for low temperature test (carbon dioxide cartridge pressurization system);
d. 1 - Mud Balance (direct reading of density and specific gravity)
e. 1 - sand content set
f. 1 - slurry sampler suitable for sampling to depths up to 40 feet, in accordance with API RP 13B-l.

3. If at any time during the Contract the Engineer requests further testing to insure that the characteristics of the construction materials are as specified in this Section, the Contractor shall perform these tests at no additional cost to the Owner.

B. Bentonite

1. The bentonite material shall be a premium grade sodium cation montmorillonite. A manufacturer's Certificate of Compliance of the bentonite material with the specification shall be obtained from the material manufacturer and submitted to the Engineer for each truckload.

C. Water

1. The water to be used in the bentonite slurry shall be tested for pH. The pH of the water shall be in the range of 7 to 8.5. The results of all laboratory tests will be submitted to the Engineer prior to its use. The water shall be as required by the bentonite manufacturer to properly hydrate the bentonite.

D. Additives and Bulking Agents

1. No additives shall be used without the written acceptance of the Engineer.

2. If additives or bulking agents are to be used, the type, trade name, manufacturer, function and quantity shall be submitted to the Engineer for each truckload.

E. Trench Excavation

1. The Contractor shall be responsible for demonstrating that the trench is continuous. Trench continuity shall be accepted when digging tools can be passed vertically from top to bottom of the trench and moved horizontally along the axis of the trench without encountering unexcavated material.

2. Tests for deviation from the planned horizontal alignment shall be performed at 20-foot intervals.

3. The trench shall be tested at 10-foot intervals along the horizontal alignment for depth and at 20-foot intervals for width.

4. The Contractor shall be responsible for demonstrating that the trench is continuous and extends into bedrock to a maximum depth that can be achieved using conventional construction excavation equipment such as backhoes or tracked excavators, or as directed by the Engineer. Penetration of the bottom of the trench into bedrock shall be demonstrated by observing the cuttings removed from the trench. Tests for penetration into bedrock shall be performed at 20-foot intervals.

5. The Contractor shall perform soundings of the trench excavation with a device accepted by the Engineer. The soundings shall be performed at 20-foot intervals along the horizontal alignment and shall record the elevation into bedrock, bottom of the excavation, and the bottom of the excavation prior to backfilling.

F. Bentonite Slurry After Hydration

1. Prior to placing the bentonite slurry in the trench, the Contractor shall perform the following tests on the bentonite slurry.

Parameter	Minimum Frequency	Standard	Limit
pH	2/day	pH (API RP 13B-I)	7- 10
Viscosity	2/day	Marsh Funnel (API RP 13B-I)	40 -45 seconds
Density	2/day	Mud Weight (API RP 13B-I)	Minimum 64 pcf
Filtrate Loss	2/day	Filtration (API RP 13B-I)	20 cm3 in 30 minutes at 100 psi

If multiple slurry ponds are used, each pond shall be tested in accordance with the above frequency.

G. Bentonite Slurry in the Trench

1. Samples of bentonite slurry to be used for pH, viscosity, density and filtrate loss analyses shall be collected from the bottom of the trench with the excavation bucket.

2. The Contractor shall perform the following tests on the bentonite slurry:

Parameter	Minimum Frequency	Standard	Limit
pH	2/day	pH (API RP 13B-I)	7- 10
Viscosity	2/day	Marsh Funnel (API RP 13B-I)	40 -60 seconds
Density	2/day	Mud Weight (API RP 13B-I)	Minimum 64 pcf maximum 85 pcf and 20 pcf less than soil-bentonite backfill
Filtrate Loss	2/day	Filtration (API RP 13B-I)	35 cm3 in 30 minutes at 100 psi

H. Soil Backfill

1. Prior to construction of the cutoff wall, the Contractor shall collect samples of backfill soils at four different locations of each borrow source or the excavated trench soils. The soil samples shall be analyzed for particle size (ASTM D422), Liquid Limit, Plastic Limit and Plasticity Index (ASTM D4318) and moisture content (ASTM D2216). Results of the analyses shall be submitted to the Engineer for acceptance.

2. The Contractor shall perform the following tests on the soil backfill during construction of the cutoff wall:

Parameter	Frequency	Standard	Limit
Particle Size	Once per 500 cubic yards excavated or delivered and/or source or material change	D422	Monitor soil Backfill Characteristics
Liquid Limit Plastic Limit Plasticity Index	Once per 500 cubic yards excavated or delivered and/or source or material change	D4318	Monitoring Soil Backfill Characteristics
Moisture Content	Once per 500 cubic yards excavated or delivered and/or source or material change	D2216	Monitoring Soil Backfill Characteristics

3. Sampling of the backfill soils shall be performed by the Contractor at the locations and times specified by the Engineer.

I. Soil-Bentonite Backfill

1. The Contractor shall perform the following tests on the soil-bentonite backfill:

Parameter	Minimum Frequency	Standard	Limit
Slump	2/day	ASTM C143	4 - 6 inches
Density	2/day	ASTM C138	Minimum 20 pcf above slurry density
Passing No.200 Sieve	1/500 cy and for each new batch	ASTM C117 ASTM C136	Monitoring soil back-fill characteristics
Filter Press	1/batch	API RP 13B-1	Use as indicator of quality of backfill
Flexible Wall Permeameter Permeability	1/100 linear feet	ASTM D5084 ASTM D1587	Maximum $1x10^{-7}$ cm/sec

2. Sampling of the soil-bentonite backfill shall be performed by the Contractor at the locations and times specified by the Engineer.

3. All sampling equipment and procedures shall be subject to the acceptance of the Engineer.

4. All test results shall be provided to the Engineer within 24 hours after the tests are conducted.

5. Samples for analysis of slump, density, particle-size and filter press permeability shall be collected from the soil bentonite backfill as accepted by the Engineer.

6. The Contractor shall perform soundings of the backfill slope profile with a device accepted by the Engineer. The soundings shall be performed at 20-foot intervals along the horizontal alignment of the wall and at the beginning and end of each shift.

7. Within one day after placement of a section of backfill in the trench, an undisturbed Shelby tube sample or other sampling equipment approved by the Engineer shall be collected in accordance with ASTM D1587 from the upper two feet of the backfill at a maximum interval of 100 linear feet along the center line of the trench. Any resulting void shall be refilled with the cutoff wall backfill.

8. Permeability testing shall be performed on the Shelby tube samples or other sampling equipment approved by the Engineer in accordance with ASTM D5084. This testing procedure will be used to determine the acceptability of the soil-bentonite backfill material.

9. In the event a test result exceeds 1×10^{-7} cm/sec, two more backfill samples from the same section as the failed sample shall be taken at maximum 50-foot intervals from the area where the failed sample was collected. If both of the samples meet the permeability requirements, the backfill shall be accepted. If one or both of the samples fail, the soil-bentonite backfill shall be excavated and replaced to sections of the cutoff wall previously installed and meeting permeability requirements and as directed by the Engineer.

3.6 REPORTS AND RECORDS

A. The Contractor shall prepare and submit the following records and reports:

1. A profile of the trench bottom and backfill slopes including a description of the material encountered in the bottom (including retention of all trench bottom samples, properly identified and labeled) and extent of excavation at the end of each workday.

2. Results of all tests performed in accordance with this Section shall be recorded on forms acceptable to the Engineer and signed by the Contractor. Copies of all forms shall be submitted daily to the Engineer for his reference.

3. A record of all admixtures utilized, their proportions, and placement locations.

4. Slurry mix adjustments and placement location.

5. A construction log of daily activities including delays encountered during slurry placement, including the cause, location, and extent of delay. The Contractor shall also record the time elapsed between slurry and soil-bentonite batching and placement in the wall, rate of slurry delivery, and the location in the wall where batches are placed.

6. A record of unusual conditions of materials and construction problems encountered and dispositions made.

7. A copy of these reports and records as well as corrective action taken shall be furnished to the Engineer daily unless directed otherwise in writing by the Engineer.

* * END OF SECTION * *

SECTION 02273

GEOTEXTILES

PART 1 GENERAL

1.1 WORK INCLUDED

A. Furnishing of all plant, labor, material, and equipment and performing all operations required for furnishing, hauling, and placing geotextile, utilized as shown on the drawings or specified by the Engineer.

1.2 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

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

A. American Society of Testing and Materials (ASTM).

B. ASTM D 3776-85 Test Methods for Mass Per Unit Area (Weight) of Woven Fabric

C. ASTM D 3786-87 Test Methods for Hydraulic Bursting Strength of Knitted Goods and on woven Fabric-Diaphragm Bursting Strength Tester Method

D. ASTM D 3787-89 Test Methods for Bursting Strength of Knitted Goods-Constant-Rate-of-Traverse (CRT) Ball Burst Test

E. ASTM D 4355-84 Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Are Type Apparatus)

F. ASTM D 4439-87 Terminology for Geotextiles

G. ASTM D 4491-89 Test Methods for Water Permeability of Geotextile by the Permittivity Method

H. ASTM D 4533-85 Test Methods for Trapezoid Tearing Strength of Geotextiles

I. ASTM D 4595-86 Tensile Properties of Geotextiles by the Wide Width Strip Method

J. ASTM D 4632-86 Test Methods for Breaking Load and Elongation of Geotextiles (Grab Method)

K. ASTM D 4751-87 Test Method for Determining Apparent Opening Size of a Geotextile

L. ASTM D 4833-88 Puncture

1.3 SUBMITTALS

A. Manufacturer's certification of the geotextile indicating that the geotextile meets the chemical, physical, and manufacturing requirements stated in this Section.

PART 2 PRODUCTS

2.1 GEOTEXTILE FILTER FABRIC

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

B. The geotextile shall be a non-woven, needle-punched geotextile with a minimum mass per unit area of 12 oz/yd as determined by ASTM D 3776-85,

C. The geotextile shall conform to the following physical requirements:

Property	Standard	Criteria
Geotextile Permittivity	ASTM D 4491-85	Minimum permittivity of 0.8 sec
Mass per Unit	ASTM O 3776-85	Minimum 12 ozlyd2
Grab Tensile Strength	ASTM D 4632-86	390 lbs.
Grab Tensile Elongation	ASTM D 4632-86	65%
Trapezoid Tear	ASTM D 4533-85	130 lbs.
Puncture Resistance	ASTM D 4833	155 lbs.
Mullen Burst Strength	ASTM D 3786	640 psi
Apparent Opening Size	ASTM 04751	Maximum 0.150mm (U.S. Standard Sieve Number 100)

D. Acceptable Manufacturers:

1. Hoechst Celanese - Trevira 1145
2. Phillips SUPAC 12NP
3. Equal

2.2 TESTING

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

PART 3 EXECUTION

3.1 GEOTEXTILE FILTER FABRIC

A. During all periods of shipment and storage, the geotextile shall be protected from di rect sunlight, ultraviolet light, temperatures greater than 140°F, mud, dirt, dust, and debris. To the greatest extent possible, the geotextile shall be maintained wrapped in a heavy duty protective covering.

B. Prior to installation of the geotextile filter fabric, the material on which the filter fabric is to be installed will be free of organic matter, irregularities, protrusions, and any abrupt changes in

grade that could damage the filter fabric. The Supporting layer will be maintained in a smooth, uniform, and compacted condition during installation of the filter fabric.

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

D. The geotextile used in the ground water interceptor trench shall be placed normal to the line of the trench and shall be laid smooth and free of tension, stress, folds, wrinkles, or creases. The geotextile shall be overlapped a minimum of 24 inches along all edges. Geotextile shall also be placed normal to the ends of the trench on both ground water collection trench terminations.

E. The geotextile shall be protected at all times during construction from contamination by surface runoff and any geotextile so contaminated shall be removed and replaced with uncontaminated geotextile. Any damage to the geotextile during its installation or during placement of soil layers shall be replaced by the Contractor at the Contractor's expense.

F. The work shall be scheduled so that the covering of the geotextile with a layer of the specified material is accomplished within 5 days after placement of the geotextile.

G. The geotextile shall be protected from damage due to the placement of materials by limiting the height of drop of the material to less than 1 foot.

END OF SECTION

SECTION 02274

GEOTEXTILE STABILIZATION FABRIC

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes geotextile stabilization fabric, utilized above the soil-bentonite ground water cutoff wall and elsewhere as specified herein and as shown on the drawings or directed by the Engineer.

1.2 REFERENCES

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

1. American Society for Testing and Materials (ASTM)

   a. ASTM D 3786 Test Methods for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabric-Diaphragm Bursting Strength Tester Method

   b. ASTM D 4355 Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Are Type Apparatus)

   c. ASTM D 4533 Test Methods for Trapezoid Tearing Strength of Geotextiles

   d. ASTM D 4595 Test Method for Tensile Properties of Geotextiles by the Wide Width Strip Method

   e. ASTM D 4632 Test Methods for Breaking Load and Elongation of Geotextiles

   f. ASTMD4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

1.3 SUBMITTALS

A. In addition to those submittals identified in the Special Provisions, the following items shall be submitted:

1. Manufacturer's certification of the geotextile stabilization fabric indicating that the geotextile meets the chemical, physical, and manufacturing requirements stated in this Section.

PART 2 PRODUCTS

2.1 MANUFACTURERS

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

1. Mirafi 600x

2. Or approved equivalent.

2.2 GEOTEXTILE STABILIZATION FABRIC

A. The geotextile stabilization fabric shall consist of a long-chain geosynthetic polymer composed of at least 85 percent by weight of propylenes and shall contain stabilizers and/or inhibitors added to the base plastic to make the fibers resistant to deterioration due to ultraviolet light and heat exposure. The fibers shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including salvages. The geotextile shall also be mildew and rot resistant, and inert to chemicals and hydrocarbons.

B. The geotextile stabilization fabric shall be a woven geotextile.

C. The geotextile stabilization fabric shall conform to the following minimum average roll values:

Property	Standard	Criteria
Puncture Strength	ASTM D 4833	Minimum 120 lbs.
Mullen Burst Strength	ASTM D 3786	Minimum 600 psi
Trapezoid Tear Strength	ASTM D 4533	Minimum 120 lbs.
Grab Tensile Strength	ASTM D 4632	Minimum 300 lbs. MD and XD
Grab Tensile Elongation	ASTM D 4632	Minimum 15%
Wide Width Tensile Strength @ 10% Strain	ASTM D4595	Minimum 80 lbs MD and XD
UV Resistance	ASTM D4355	70% strength retained (after 150 hours)

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

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

2.3 TEMPORARY PINS

A. No securing pins shall be used.

PART 3 EXECUTION

3.1 INSTALLATION

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

B. The geotextile stabilization fabric shall be placed in manner and at the locations shown on the drawings. At the time of the installation, the geotextile shall be rejected if it has defects,

rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.

C. The geotextile shall be placed with the long dimension parallel to the line of the soil-bentonite ground water cutoff wall and shall be laid smooth and free of tension, stress, folds, wrinkles, or creases. The strips shall be placed to provide minimum overlaps of 3 feet. Overlap shall be increased if during fill placement excessive wandering of the unrolled geotextile is observed.

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

E. The work shall be scheduled so that covering of the geotextile with a layer of the specified material is accomplished within 5 days after placement of the geotextile. Failure to comply shall require replacement of geotextile. The geotextile stabilization fabric shall be protected from damage due to the placement of materials by limiting the height of drop of the material to less than 1 foot.

F. Cover material shall be placed on the geotextile in such a manner that a minimum of 6 inches of material will be between the vehicle or equipment tires, or tracks, and the geotextile at all times.

G. Compaction of the first lift above the geotextile shall be limited to routing of placement and spreading equipment only. No vibratory compaction will be allowed on the first lift.

END OF SECTION

SECTION 02280

DRUM REMOVAL AND DISPOSAL

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes disposing of drums encountered during excavation at the site. Drums encountered during construction shall be disposed of only as directed by the Engineer and after the Contractor notifies the Engineer such a drum may have been encountered.

B. Backfilling and compacting excavations resulting from drum removal.

1.2 REFERENCES

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

1. Occupational Safety and Health Administration (OSHA)

   a. 29CFR Part 1910 Occupational Safety and Health Standards for General Industry

   b. 29CFR Part 1926 Occupational Safety and Health Standards for Construction

2. U.S. Department of Transportation (DOT)

   a. 49CFR Part 173 DOT General Requirements for Shipments and Packaging

   b. 49CFR Part 173.3 DOT Regulations for Packaging and Exceptions

1.3 SUBMITTALS

A. In addition to those submittals identified in the Special Provisions, the following items shall be submitted:

1. Sampling and Waste Characterization (SAWC) Plan prior to initiating work at the site.

2. Name and location of CLP Analytical laboratory.

3. Design of Staging Area (Prior to Construction).

4. Completed Drum Inventory Log Sheets.

5. Results of all compatibility chemical testing.

6. Name and location of proposed off-site disposal facility.

PART 2 PRODUCTS

2.1 SAMPLING AND WASTE CHARACTERIZATION (SAWC) PLAN

The SAWC Plan shall detail all procedures to be undertaken by the Contractor to handle, sample, and characterize drum waste. All procedures to be conducted under the SAWC Plan shall be in strict

accordance with the HASP. As a minimum, the SAWC Plan shall include the following provisions for drums:

A. Staging, Inventory, Sampling

1. Personnel

a. The Contractor shall provide adequate manpower to stage, inventory, and sample all breached drums containing liquids and intact drums in accordance with the approved Sampling and Waste Characterization (SAWC) Plan.

b. Personnel involved in handling and transporting drum waste shall work in teams containing no fewer than two people. Visual contact shall be maintained between members of the working team at all times.

c. Personnel shall at all times be equipped at the level of protection as specified by the Health and Safety Plan. As a minimum this shall include the use of grounding straps.

2. Equipment/Materials

a. The Contractor shall provide adequate and proper equipment to stage, inventory, open, and sample all breached drums containing liquid waste and intact drums which may potentially contain free liquids in accordance with the approved Sampling and Waste Characterization (SAWC) Plan.

b. Drums shall be handled with a grappler equipped backhoe, front end loader, forklift, or other approved equipment. Drums shall be grounded while being handled. Alternate methods of segregating or lifting drums may be used subject to prior acceptance from the Engineer.

c. All handling equipment shall be equipped with full frontal and side splash and explosion shields. Class ABC fire extinguishers shall be fitted to the body of each piece of equipment.

d. Any equipment used for handling, opening, and sampling drums must be of the non-sparking type.

3. Handling and Evidence Documentation

a. If during excavation activities, an object which is suspected of being a drum is encountered, the Contractor shall notify the Engineer so that an appraisal of the object and its condition may be made. If the Engineer determines that the object is not a drum, that it is empty, or that it does not contain liquids, the Contractor will be directed to crush the drum and handle the drum in accordance with the Section "Surface Soil or Debris Disposal". See Figure 2, Drum Removal/Management Plan. If the drum potentially contains free liquids, the Contractor will be directed to handle the drum in accordance with drum handling procedures in the Site Approved Drum Handling Plan. If the drum is handled as soil, solids or debris, no additional payment will be made for drum removal.

b. Drums shall be staged and inventoried in a final staging and drum storage area, to be constructed by the Contractor or, at the Contractor's option, in an initial staging area, in accordance with paragraph 2.2 of this Section.

c. Before handling, the condition of each drum shall be determined and categorized as open, leaking, bulging, empty, or a combination.

d. Drums that exhibit leakage of free liquid, or apparent deterioration such that movement may cause rupture and potential leakage of free liquid, shall immediately have the contents transferred to a secure container.

e. Inventory

After securing and opening a drum, if no free liquids or soils/solids are present, with the approval of the NYSDEC, the Contractor shall crush the drum. The drum shall then be handled in accordance with the Section titled "Surface Soil or Debris Disposal", with no additional payment made for drum removal. After securing and opening a drum, if free liquids are noted, the Contractor shall test and characterize liquids for the off-site disposal Per Figure 2, record the following information onto a drum inspection log or data sheet that indicates:

(1) Drum number, with an individual number being permanently marked on each drum.

(2) Physical state of materials: i.e., liquid, semi-solid, sludge or powder and percentages thereof, including whether there are multiple layers of materials and approximate percentages thereof.

(3) Color of materials.

(4) PH

(5) Percent each drum is filled with materials, usually specified as 1/4,1/2, 3/4, or completely full.

(6) Condition of drum (intact, leaking, bulging, rusting, etc.)

(7) Size, type, and labeling of drum.

(8) Size and type of overpack necessary (if any).

(9) Inspection/sampling time and date.

(10) Weather at time of inspection.

(11) RCRA characterization results

Note: Odor description is not a recommended observation due to the potentially toxic nature of organic and inorganic substances.

4. Sampling

a. Drum sampling procedures for drums from which the bung can be removed, and for drums in which the bung is badly rusted or cannot be opened, and for drums that do not have bungs, shall be outlined in the SAWC plan. All openings shall be plugged except during sampling. Unanalyzed samples shall not be fixed with any preservative or preserved with ice or dry ice.

b. Empty drums (containing less than 1 in. solid residue waste). The drums shall be crushed and handled in accordance with the Figure 4 of the Drum Handling and Removal Plan.

c. Drums identified by the Engineer as containing water will not be tested. Water contained in the drum shall be handled in accordance with the Section titled "Construction Water Management" as described in Part 3.2. The drums shall then be crushed and handled in accordance with the Section "Surface Soil or Debris Disposal."

d. After completing drum staging and inventory, the Contractor will proceed with the compatibility testing and RCRA characterization at the Contractor's laboratory.

e. The Owner and NYSDEC shall be given the opportunity to have split samples prepared by the Contractor for any and all samples obtained under this Contract.

B. Sample Shipment

1. Unanalyzed samples shall be transported, in accordance with all applicable regulatory requirements. If a material specifically identified in the Department of Transportation (DOT) Hazardous Material Table (49 CFR 172.101) is known to be contained in a sample at or above the reportable quantity (RQ), that sample shall be transported as prescribed therein.

C. Compatibility Testing

1. The testing and analytical procedures to be used on wastes contained in the drums will be conducted in conformance with the Code of Federal Regulations, Methods for Chemical Analysis of Water and Waste, American Society for Testing and Materials, and Test Methods for Evaluating Solid Waste.

2. Compatibility and RCRA characterization testing of wastes shall include, at a minimum, the tests listed below:

a. pH

b. Acid Reactivity

c. Ignitability

d. Corrosivity

D. Disposal

1. After the Contractor completes the compatibility and RCRA characterization testing, samples of compatible wastes may be bulked (composited) for waste characterization analyses for disposal.

2. Contractor shall provide for storage of the drums on-site in the final drum staging area until disposed at an off-site facility approved by the Owner. The Contractor shall be responsible for any additional sampling and analyses required by the off-site disposal facility.

2.2 STAGING AREAS

A. The Contractor shall provide drawings showing the location and design of the proposed drum staging area(s). As a minimum, the staging and drum storage areas shall include the following provisions.

1. The initial drum staging area, asphalt or other approved material, shall be established within the limits of the proposed areas to receive flexible membrane cover which have been brought to the required subgrade. The initial staging area shall be shaped to prevent run on and shall be surrounded by a containment berm with a minimum height of 1 foot.

2. The final drum staging area shall be constructed in a location accepted by the Engineer and NYSDEC. The final staging and drum storage area shall be contained by constructing berms to a minimum height of 1 foot. The base and sides of the final staging and drum storage area shall be covered with a minimum of three inches of uniform, medium sand. A high-density polyethylene (HDPE) liner with a minimum nominal thickness of 60 mils shall be placed over the sand bedding layer in accordance with manufacturers recommendations. Drums shall not be stacked. Alternative, environmentally sound final drum staging areas will be considered, subject to prior review of the Engineer.

2.3 FILL MATERIAL

A. All excavations made for the purpose of removing drums shall be backfilled with off-site embankment material as directed by the Engineer. Compaction shall be in accordance with the Section "Earthwork" as directed by the Engineer.

2.4 OVERPACK DRUMS

A. Overpack drums shall conform to DOT 49 CFR 173.3 and shall be constructed of the same material as the drums to be overpacked.

PART 3 EXECUTION

3.1 GENERAL

A. The Contractor shall perform all excavations to the lines, grades, and elevations specified. Due to the unknown nature of the area substrata and waste material, the Health and Safety Officer or his designee shall be present during all drum removal activities and shall approve the rate and manner of drum removal to insure safety of all on-site personnel.

3.2 PROCEDURES

A. Excavation of Subsurface Drums

1. Subsurface drums encountered during excavation and other construction operations will be removed if directed by the Engineer. Should the Engineer determine that the drum will be handled under this specification, the Contractor shall take all necessary steps to remove the drums intact to preserve any evidence of ownership. Following inspection and testing of contents, drums will be overpacked and/or staged at suitable locations on site and then transferred to the drum staging area. The Contractor will then arrange for their sampling and removal and off-site disposal under the applicable payment item for this work. All work shall be done in accordance with the approved SAWC Plan.

B. Dewatering

1. Dewater as required shall be performed in accordance with the Section "Earthwork"

2. The Contractor shall collect surface and ground water entering excavations resulting from the removal of drums in accordance with the Section "Construction Water Management".

C. Initial Staging

1. The Contractor shall establish an initial staging and drum storage area in accordance with the requirements of paragraph 2.2 of this Section.

2. The Contractor shall utilize a front-end loader or other approved equipment to transport inventoried drums to the drum processing portion of the staging area.

3. Prior to transport to the staging area, the Contractor shall either transfer the contents of unsound drums to DOT approved containers or overpack unsound drums.

4. Drummed liquids shall be transferred using hand-operated, non-sparking drum pumps. Any small containers (e.g. 5 gal. or less) shall be transferred by gently pouring the contents into drums using wide rim funnels.

5. If transferring the contents of unsound drums employing these methods is not feasible, a portable containment structure shall be placed immediately adjacent to the unsound drum. The unsound drum shall be placed in the containment structure where it will be maneuvered to a position where the contents can be transferred or the drum overpacked. Overpack drums shall be immediately available during the handling of any unsound containers. In the event of a drum rupture, the ruptured drum shall be overpacked immediately in an effort to minimize any release of contaminants.

D. Compatibility and RCRA Characterization Testing

1. Unless otherwise directed in the field by the Engineer, the Contractor shall perform a series of compatibility and RCRA characterization tests during the initial staging activities to determine the compatibility of contaminated materials for off-site disposal purposes. All compatibility and RCRA characterization testing shall be performed in accordance with the approved Site Drum Handling Plan.

E. Final Staging

1. Following the receipt of characterization and compatibility test results, the Owner will have the Contractor move drums to the final staging area, for transport and disposal at an off-site facility approved by the Owner. Material, which is improperly contained, shall be transferred into appropriate containers prior to movement.

F. Decontamination liquids shall be handled in accordance with the Section "Construction Water Management".

G. For off-site disposal or treatment, the Contractor shall transport and dispose of drums at a facility approved by the Owner in accordance with all applicable federal, state, and local regulations and requirements.

H. The Contractor shall provide for on-site storage of drums as long as necessary for drum disposal to occur. Storage will be terminated prior to substantial completion.

3.3 TESTING

A. All required state and federal testing required for drum removal and disposal shall be supplied by the Contractor.

END OF SECTION

SECTION 02281

EXCAVATION AND STAGING OF POTENTIALLY CONTAMINATED MATERIAL

PART 1 GENERAL

1.1 WORK SPECIFIED

A. Work to be performed under this section shall consist of all labor, materials, supplies, and equipment necessary for the excavation and staging of contaminated materials to the limits shown on the contract drawings or as directed by the Engineer.

B. Codes, Regulations, and Statutes

1. The Contractor shall comply with all applicable codes, ordinances, regulations, statutes, and standards including, but not limited to, 40 CFR 268.

2. New York State Department of Transportation Regulations.

3. New York State Solid and Hazardous Waste Management Regulations.

4. State Department of Transportation regulations and state solid waste and hazardous waste management regulations applicable to transportation, handling and disposal of materials within the state of concern if transportation and/or disposal out of New York State is to occur.

C. Definition

1. Contaminated Material

a. Any solid material including, but not limited to, asphalt, soil, debris, concrete, and rock which is identified as potentially contaminated by the Engineer.

D. Submittals

1. Prior to commencing operations, the Contractor shall submit proposed methods for handling, stockpiling, transporting, and disposing of contaminated materials. In addition, the Contractor shall submit the Tagging Plan, Site Specific Health and Safety Plan, Erosion and Sediment Control Plan or Storm Water Pollution Prevention Plan, as required by the Special Conditions.

2. The Contractor shall submit copies of all manifests, bills of laden, off-site weight tickets, and other applicable tracking documents and a written certification of proper transport and final disposal of materials disposed of off-site.

3. The Contractor shall submit copies of all materials characterization upon receipt of analytical results.

4. Information relative to the truck scales to be used shall be submitted for review in accordance with the General Provisions.

E. Characterization

1. All materials scheduled for off-site disposal shall be characterized by the Contractor as required by federal and state regulation and the off-site disposal facilities. Per Figure 3, Contractor will be responsible for determining through appropriate laboratory analyses whether or not materials staged for off-site disposal are within acceptance criteria for hazardous or non-hazardous landfilling. Results of all analytical testing shall be submitted to the Engineer and NYSDEC upon receipt.

PART 2 EXECUTION

2.1 STOCKPILING

A. Contaminated material that is not immediately treated or disposed of shall be stockpiled in such a manner as to prevent erosion and contamination of surrounding areas as directed by the Engineer.

B. At a minimum, all potentially contaminated material shall be placed on polyethylene sheeting or staged in a similar, environmentally sound manner, particularly if staging is done in an area not suspected of having contamination.

C. All potentially contaminated stockpile areas will be covered with adequately ballasted polyethylene sheeting or similarly protected to minimize run-on onto, and potentially contaminated run-off from, stockpiles during rainfall.

END OF SECTION

SECTION 02283

OFF-SITE DISPOSAL OF MATERIALS

PART 1 GENERAL

1.1 DESCRIPTION

A. Work Specified

1. Loading, transportation and off-site disposal of all excavated materials that are deemed by the Engineer as:

   a. General debris from clearing and site preparation activities.

   b. Special Waste – Contains elevated levels of volatile organic compounds. (VOCs), semi-volatile organic compounds (SVOCs).

   c. Drummed waste liquids and solids.

B. Related Work Specified Elsewhere

1. Excavating, Section 02222

2. Trenching, Backfilling and Compacting, Section 02227

3. Excavation and Staging of Potentially Contaminated Material, Section 02281

1.2 QUALITY ASSURANCE

A. Applicable codes, standards and specifications:

1. New York State Department of Environmental Conservation (NYSDEC) and Federal regulations.

2. New York State Department of Transportation (NYSDOT) regulations

1.3 SUBMITTALS

A. Permits and certifications of waste transporters and permitted disposal facilities prior to commencement of work.

B. Written certification/documentation of proper transport and disposal within thirty (30) days of final disposition at landfill. This includes, but is not limited to: manifests, bill of lading receipts, weight tickets and certification of acceptance from the landfill facility.

C. Written description of proposed off-site disposal locations for general debris and material non-suitable for backfill prior to commencement of work.

PART 2 EXECUTION

A. The Contractor shall segregate separately and stage on and cover with polyethylene sheeting, all excavated materials considered by the Engineer as: general debris, contaminated soil, and special waste.

B. The three separate stockpile locations shall be as specified in the Contract Drawings unless alternate locations are mutually acceptable to the Owner, Engineer and Contractor.

C. All segregated materials must be stockpiled in an environmentally sound manner.

D. It is the Contractor's responsibility to submit to the Owner locations/facilities for the disposal of general debris and non-suitable non-contaminated spoil. Disposal facilities must be submitted to the Owner for review and approval prior to the commencement of work.

E. Transportation of the material shall be by a permitted waste hauler in the State of New York and any state in which the material is transported.

F. All necessary authorization permits and manifests required for the proper transportation and disposal of excavated material shall be the responsibility of the Contractor. The Contractor shall submit all disposal documentation to the Engineer.

G. The Contractor shall provide all equipment, materials, and labor necessary to load, transport and make suitable for disposal of the materials to be disposed in an environmentally sound manner. This includes but is not limited to, material processing requirements (ie. removal of free liquids) and the transportation of the material in accordance with appropriate regulatory requirements.

H. Copies of all permits, manifests and applications associated with disposal and transportation of the materials shall be submitted to the Engineer.

END OF SECTION

SECTION 02369

STEEL SHEET PILING

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and install the steel sheet piles as indicated on the Drawings and specified herein. The sheet piles shall be installed after approximately 30 percent of the contaminated soil for each campaign has been excavated. The sheet piling shall define the barrier for each campaign.

1.2 SPECIAL REQUIREMENTS

A. Steel sheet piling shall be stored and handled carefully to prevent physical damage. The sheet piling shall be free of excessive kinks, camber or twist that would prevent the interlocking pile from siding freely to grade.

1.3 SUBMITTALS

A. Submit to the Engineer in accordance with Section 01300, shop drawings showing details of fabrication and installation of the steel sheet piles stamped by a Professional Engineer, registered in the State of New York. Mill certificates shall be submitted which shall state the chemical composition and yield point of the steel sheeting.

1.4 QUALITY ASSURANCE

A. Engage a Professional Engineer, registered in the State of New York to design the sheeting and required bracing. The sheeting and bracing installed shall be in conformity with the design and certification of this shall be provided by the professional Engineer. Submit P.E. Certification form contained in Section 01300 to show compliance with this requirement.

B. The geotechanical design criteria shall be obtained from a geotechanical engineer.

PART 2 PRODUCTS

2.1 MATERIALS

A. Steel Sheet Piling

1. Steel sheet piling shall conform to the requirements specified in the ASTM A328 structural material in fabricated connections and accessories used with steel sheet piling and shall conform to the requirements specified in ASTM A588. Miscellaneous structural shapes shall conform with ASTM A36

2. Steel sheet piling shall be Type PZ32 interlocking type, weighing not less than thirty-two (32) pounds per square foot of wall as manufactured by U.S. Steel or comparable types by Bethlehem, or equal.

3. Steel sheet piling and miscellaneous structural shapes shall be in accordance with ASTM A123. Coating weight shall average not less than 2.3 ounce per square foot. The bolts and hardware shall be in accordance with ASTM A153.

PART 3 EXECUTION

3.1 STORAGE AND HANDLING

A. Steel sheet piles shall be stored on level ground where possible, or the lower series of blocking should be laid so that the piling will be level. Blocking should be positioned so that there will not be excessive sag in sheeting. Overhang at the end of the piles not to exceed two (2) feet. When lifting piles, slings shall be positioned so that the weight will not be concentrated at any one point.

B. The sheet piles shall be driven to the lines and grades determined in the field. The sheet piles shall be driven with the bell end as the leading edge to prevent the socket end from clogging with gravel during the driving process. The sheet piles shall be driven in such a manner to assure that they are interlocked for 100 percent of the length.

C. During driving operation, the location and alignment of the sheet piles shall be maintained. The sheet piles shall be reasonably plumb and in line. Sheet piles out of line or damaged during driving operation shall be removed and a new pile driven in its place.

D. Sheet piling shall be removed after each side has been backfilled with remediated soil. Sheet piling may be reused for each campaign.

END OF SECTION

SECTION 02511

ASPHALT PAVING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Hot-mix asphalt paving.
2. Hot-mix asphalt patching.
3. Hot-mix asphalt overlays.
4. Asphalt surface treatments:
    a. Fog seals.
    b. Slurries.
5. Pavement-marking paint.
6. Hot-mix asphalt curbs.
7. Wheel stops.

1.3 SYSTEM DESCRIPTION

A. Provide hot-mix asphalt pavement according to the materials, workmanship, and other applicable requirements of the standard specifications of the state or of authorities having jurisdiction.

1. Standard Specification: As indicated.
2. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.4 SUBMITTALS

A. Product Data: For each product specified. Include technical data and tested physical and performance properties.

B. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.

C. Job-Mix Designs: For each job mix proposed for the Work.

D. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate dedicated handicapped spaces with international graphics symbol.

E. Samples: 12 by 12 inches minimum, of paving fabric.

F. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
G. Material Test Reports: Indicate and interpret test results for compliance of materials with requirements indicated.
H. Material Certificates: Certificates signed by manufacturers certifying that each material complies with requirements.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed hot-mix asphalt paving similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Manufacturer Qualifications: Engage a firm experienced in manufacturing hot-mix asphalt similar to that indicated for this Project and with a record of successful in-service performance.

1. Firm shall be a registered and approved paving mix manufacturer with authorities having jurisdiction or with the DOT of the state in which Project is located.

C. Testing Agency Qualifications: Demonstrate to Architect's satisfaction, based on Architect's evaluation of criteria conforming to ASTM D 3666, that the independent testing agency has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.

D. Regulatory Requirements: Conform to applicable standards of authorities having jurisdiction for asphalt paving work on public property.

E. Asphalt-Paving Publication: Comply with AI's "The Asphalt Handbook," except where more stringent requirements are indicated.
F. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings" Review methods and procedures related to asphalt paving including, but not limited to, the following:
1. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.

2. Review condition of substrate and preparatory work performed by other trades.

3. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

4. Review and finalize construction schedule for paving and related work. Verify availability of materials, paving Installer's personnel, and equipment required to execute the Work without delays.
5. Review inspection and testing requirements, governing regulations, and proposed installation procedures.

6. Review forecasted weather conditions and procedures for coping with unfavorable conditions.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location and within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if substrate is wet or excessively damp or if the following conditions are not met:

1. Prime and Tack Coats: Minimum surface temperature of 60 deg F.

2. Slurry Coat: Comply with weather limitations of ASTM D 3910.
3. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.

4. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 50 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: Sound; angular crushed stone; crushed gravel; or properly cured, crushed blast-furnace slag; complying with ASTM D 692.

C. Fine Aggregate: Sharp-edged natural sand or sand prepared from stone; gravel, properly cured blast-furnace slag, or combinations thereof; complying with ASTM D 1073.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

D. Mineral Filler: Rock or slag dust, hydraulic cement, or other inert material complying with ASTM D 242.

2.2 ASPHALT MATERIALS

A. Asphalt Cement: ASTM D 3381 for viscosity-graded material; ASTM D 946 for penetration-graded material.
B. Asphalt Cement: ASTM D 3381 for viscosity-graded material.
C. Undersealing Asphalt: ASTM D 3141, pumping consistency.

D. Prime Coat: ASTM D 2027; medium-curing cutback asphalt; MC-30, MC-70, or MC-250.

E. Prime Coat: Asphalt emulsion prime conforming to state DOT requirements.

F. Prime Coat: ASTM D 977, emulsified asphalt or ASTM D 2397, cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.

G. Tack Coat: ASTM D 977, emulsified asphalt or ASTM D 2397, cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.

H. Fog Seal: ASTM D 977, emulsified asphalt or ASTM D 2397, cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.

I. Water: Potable.

2.3 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by Environmental Protection Agency (EPA). Provide granular, liquid, or wettable powder form.

B. Sand: ASTM D 1073, Grade Nos. 2 or 3.

C. Paving Geotextile: Nonwoven polypropylene, specifically designed for paving applications, resistant to chemical attack, rot, and mildew.

D. Pavement-Marking Paint: Alkyd-resin type, ready-mixed, complying with FS TT-P-115, Type I, or AASHTO M-248, Type N.

E. Pavement-Marking Paint: Latex, water-base emulsion, ready-mixed, complying with FS TT-P-1952.
   1. Color: As indicated.

   2. Color: White.

   3. Color: Yellow.

F. Glass Beads: AASHTO M-247.

G. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, approximately 6 inches high, 9 inches wide, and 84 inches long. Provide chamfered corners and drainage slots on underside, and provide holes for anchoring to substrate.

   1. Dowels: Galvanized steel, 3/4 inch diameter, minimum length 10 inches.

2.4 MIXES

A. Hot-Mix Asphalt: Provide dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction; designed according to procedures in AI's "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types"; and complying with the following requirements:

   1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
   2. Base Course: As indicated.

   3. Surface Course: As indicated.

B. Hot-Mix Asphalt: Provide dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction and designed according to procedures in AI's "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types."

   1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.

   2. Provide mixes complying with the composition, grading, and tolerance requirements of ASTM D 3515 for the following nominal, maximum aggregate sizes:
      a. Base Course: 1 inch.

      b. Surface Course: 1/2 inch.

C. Emulsified-Asphalt Slurry: ASTM D 3910, consisting of emulsified asphalt, fine aggregates, and mineral fillers and as follows:
   1. Composition: Type 1.

   2. Composition: Type 2.

   3. Composition: Type 3.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.

B. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.

C. Notify Architect in writing of any unsatisfactory conditions. Do not begin paving installation until these conditions have been satisfactorily corrected.

3.2 COLD MILLING

A. Clean existing paving surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement, including hot-mix asphalt and, as necessary, unbound-aggregate base course, by cold milling to grades and cross sections indicated.

1. Repair or replace curbs, manholes, and other construction damaged during cold milling.

3.3 PATCHING AND REPAIRS

A. Patching: Saw cut perimeter of patch and excavate existing pavement section to sound base. Recompact new subgrade. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically.
   1. Tack coat faces of excavation and allow to cure before paving.
   2. Fill excavation with dense-graded, hot-mix asphalt base mix and, while still hot, compact flush with adjacent surface.
   3. Partially fill excavation with dense-graded, hot-mix asphalt base mix and compact while still hot. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.

1. Pump hot undersealing asphalt under rocking slabs until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.

2. Remove disintegrated or badly broken pavement. Prepare and patch with hot-mix asphalt.

C. Leveling Course: Install and compact leveling course consisting of dense-graded, hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.

1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

D. Crack and Joint Filling: Remove existing filler material from cracks or joints to a depth of 1/4 inch. Refill with asphalt joint-filling material to restore watertight condition. Remove excess filler that has accumulated near cracks or joints.

E. Tack Coat: Apply uniformly to existing surfaces of previously constructed asphalt or portland cement concrete paving and to surfaces abutting or projecting into new, hot-mix asphalt pavement. Apply at a uniform rate of 0.05 to 0.15 gal./sq. yd. of surface.

1. Allow tack coat to cure undisturbed before paving.

2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.4 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
   1. Mix herbicide with prime coat when formulated by manufacturer for that purpose.

C. Prime Coat: Apply uniformly over surface of compacted-aggregate base at a rate of 0.15 to 0.50 gal./sq. yd. Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure for a minimum of 72 hours.

   1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use just enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.

   2. Protect primed substrate from damage until ready to receive paving.

3.5 GEOTEXTILE INSTALLATION

A. Apply bond coat, consisting of asphalt cement, uniformly to existing surfaces at a rate of 0.20 to 0.30 gal./sq. yd.

B. Place paving geotextile promptly according to manufacturer's written instructions. Broom or roll geotextile smooth and free of wrinkles and folds. Overlap longitudinal joints 4 inches and transverse joints 6 inches.

   1. Protect paving geotextile from traffic and other damage and place overlay paving the same day.

3.6 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt mix on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness, when compacted.
   1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.

   2. Place hot-mix asphalt surface course in single lift.

   3. Spread mix at minimum temperature of 250°F.

   4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.

   5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide, except where infill edge strips of a lesser width are required.

   1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete asphalt base course for a section before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.7 JOINTS

A. Construct joints to ensure continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat.

2. Offset longitudinal joints in successive courses a minimum of 6 inches.

3. Offset transverse joints in successive courses a minimum of 24 inches.

4. Construct transverse joints by bulkhead method or sawed vertical face method as described in AI's "The Asphalt Handbook."

5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.

6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.8 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Accomplish breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Repair surfaces by loosening displaced material, filling with hot-mix asphalt, and rerolling to required elevations.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling, while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
1. Average Density: 96 percent of reference laboratory density according to ASTM D 1559, but not less than 94 percent nor greater than 100 percent.

2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while still hot, with back of rake or smooth iron. Compact thoroughly using tamper or other satisfactory method.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials. Remove paving course over area affected and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.9 INSTALLATION TOLERANCES

A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:
1. Base Course: Plus or minus 1/2 inch.

2. Surface Course: Plus 1/4 inch, no minus.

B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch.

2. Surface Course: 1/8 inch.

3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.10 ASPHALT CURBS

A. Construct hot-mix asphalt curbs over compacted pavement surfaces. Apply a light tack coat, unless pavement surface is still tacky and free from dust. Spread mix at minimum temperature of 250°F.

1. Asphalt Mix: Same as pavement surface-course mix.

B. Place hot-mix asphalt to curb cross section indicated or, if not indicated, to local standard shapes, by machine or by hand in wood or metal forms. Tamp hand-placed materials and screed to smooth finish. Remove forms after hot-mix asphalt has cooled.

3.11 SURFACE TREATMENTS

A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.15 gal./sq. yd. to existing asphalt pavement and allow to cure. Lightly dust areas receiving excess fog seal with a fine sand.

B. Slurry Seals: Apply slurry coat in a uniform thickness according to ASTM D 3910 and allow to cure.
1. Roll slurry seal to smooth ridges and provide a uniform, smooth surface.

3.12 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow paving to cure for 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

1. Broadcast glass spheres uniformly into wet pavement markings at a rate of 6 lb/gal.

3.13 WHEEL STOPS

A. Securely attach wheel stops into pavement with not less than 2 galvanized steel dowels embedded in precast concrete at one-third points. Firmly bond each dowel to wheel stop and to pavement.

1. Extend upper portion of dowel 5 inches into wheel stop and lower portion a minimum of 5 inches into pavement.

3.14 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing agency to perform field inspections, tests and to prepare test reports.

1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.

B. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.

C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

E. In-Place Density: Samples of uncompacted paving mixtures and compacted pavement will be secured by testing agency according to ASTM D 979.

1. Reference laboratory density will be determined by averaging results from 4 samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 1559, and compacted according to job-mix specifications.
2. Reference maximum theoretical density will be determined by averaging results from 4 samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.

3. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

    a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, but in no case will fewer than 3 cores be taken.
    b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

END OF SECTION

SECTION 02562

HIGH DENSITY POLYETHYLENE PIPE

PART 1 GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, materials, equipment and services necessary for, and incidental to, the installation of polyethylene piping systems as shown on the Drawings and as specified herein.

B. All piping, fittings, and appurtenances shall be new, clean and in accordance with material specifications. In no instance shall second hand or damaged materials be used.

1.2 QUALITY ASSURANCE

A. Reference Standards:

1. The latest edition of the following standards, as referenced herein, shall be applicable.

a. *Standard Specifications, Construction and Materials* - New York State Department of Transportation. Office of Engineering.

b. *Standard Specifications for Highway Materials and Methods of Sampling and Testing* - American Association of State Highway and Transportation Officials (AASHTO)."

c. American Society of Testing and Materials (ASTM).

1.3 SUBMITTALS

A. Product Data:

1. Submit manufacturer's catalog cuts. specifications and installation instructions, for both pipe and coupling system.

2. Submit five (5) copies of manufacturer's certification that product was manufactured. tested, and supplied in accordance with the standards specified herein.

B. Samples:

1. Submit two 3 feet long lengths of same diameter pipe, complete with coupling system.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage:

1. Pipe, fittings, specials, appurtenances and accessories shall be delivered to and stored within the Contractor's work limits as shown on the Drawings.

2. Special care shall be exercised during delivery and storage to avoid damage to the products.

3. Products shall be stored so as to avoid unnecessary handling and in locations where they will not interfere with the Owner's operations or public travel.

B. Handling:

1. Pipe, fittings, specials, appurtenances and accessories shall be handled carefully, with approved handling devices in strict conformance with the manufacturer=s recommendations.

2. Products shall not be dropped nor shall products be otherwise dragged, rolled or skidded.

C. Products cracked, gouged. chipped, dented or otherwise damaged will not be approved and shall be removed and replaced at the Contractor's expense, unless the product can be repaired in a manner acceptable to the manufacturer and theSMC Representative. All repairs shall be at the Contractor's expense.

PART 2 PRODUCTS

2.1 MATERIALS

A. Pipe

1. Pipe shall be ADS N-12 high-density polyethylene pipe (HDPE) as manufactured by Advanced drainage or equivalent, and shall conform to the requirements of AASHTO M-294.

2. HDPE pipe will be perforated where indicated.

3. Pipe and fittings shall be made of polyethylene compounds which conform to the physical requirements of Type III, Category 3, 4, or 5, P23, P33, or P34, Class C per ASTM D-1248 with the applicable requirements defined in ASTM D-1248. Clean reworked material may be used.

4. Pipe shall be of the diameters shown on the Drawings.

B. Couplings

1. Field joints shall be made with HDPE band couplers.

2. Couplers and pipe shall be from the same manufacturer.

3. Couplers shall be corrugated to match the pipe corrugations and the width shall not be less than one-half the nominal diameter of the pipe. Split couplers shall be manufactured to engage an equal number of corrugations on each side of the pipe joint.

4. One half inch diameter galvanized steel bolts and nuts or nylon ties as supplied by manufacturer shall be used on coupling bands.

C. Flared End Section

1. Flared end sections shall be 1210 NP or 1810 NP HDPE end sections as manufactured by ADS, or equivalent.

2. End sections shall be fastened to the last corrugation of the pipe length using a high strength nylon cable tie supplied by the manufacturer through pre-drilled holes at the top or the end section collar.

PART 3 EXECUTION

3.1 INSPECTION

A. Inspect all pipe and fittings prior to laying in the trench. Remove defective pipe and fittings from the site.

B. Do not backfill until inspection by the engineer, unless otherwise approved by the Engineer.

3.2 INSTALLATION

A. Trenching, backfilling and compaction shall conform to SECTION 02227- TRENCHING, BACKFILLING AND COMPACTION.

B. Pipe installation shall be performed as indicated on the Drawings.

3.3 TESTING

A. Perform a hydro test as directed by the engineer.

** END OF SECTION **

SECTION 02765

RACEWAY PIPELINE ABANDONMENT AND DIVERSION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes abandonment and diversion of the pipeline in the raceway as shown on the Contract Drawings, specified, or directed.

1.2 REFERENCES

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

1. American Society for Testing and Materials (ASTM)

   a. ASTM C618 - Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineial Admixture in Concrete.

2. American Concrete Institute (ACI)

1.3 SUBMITTALS

A. In addition to those submittals identified in the Special Provisions, the following shall be submitted:

1. Proposed mix design for controlled low-strength material (CLSM).

1.4 DEFINITIONS

A. Controlled Low-Strength Material (CLSM)

1. Controlled low-strength material (CLSM) shall mean a self-compacted, low-strength backfill material used to fill sections of pipeline in the raceway to be abandoned as shown on the Contract Drawings.

PART 2 PRODUCTS

2.1 GENERAL

A. Contractor shall provide adequate and proper equipment to produce and handle all materials necessary to completely fill sections of pipeline in the raceway to be abandoned with controlled low-strength material (CLSM).

2.2 CONTROLLED LOW-STRENGTH MATERIAL (CLSM)

A. The materials used for the controlled low-strength material (CLSM) shall be Portland cement (Type 1 or 2), potable water, fine aggregate, and fly ash mixed in the following proportions: 9

Material	Quantity
Cement	80 lbs/yd
Fly Ash	1245 lbs/yd
Fine Aggregate	1540 lbs/yd
Water	65 gal/yd

B. The CLSM shall have a 28-day compressive strength of between 40 and 200 psi.

C. The CLSM shall have a slump in the range 8 - 10 inches.

D. Aggregate used shall have 100% passing a 3/4-inch square opening.

E. Fly ash used shall conform to the chemical and physical requirements for mineral admixture, Class F listed in ASTM C618 including Table 2 (except footnote A). The loss on ignition shall be waived.

PART 3 EXECUTION

3.1 VERIFICATION OF RACEWAY PIPELINE SIZE, LOCATION, AND INVERT

A. For the purpose of verifying the size, location, and invert of the raceway pipeline where it exits the eastern face of the Main Plant Building, the Contractor shall excavate test pits in advance of the work. Test pits shall be excavated in accordance with the Sections titled "Earthwork" and "Trenching, Backfilling and Compacting". The size, location, and invert of the raceway pipeline where it exists the eastern face of the Main Plant Building shall be submitted to the Engineer for review prior to initiation of raceway pipeline abandonment and diversion activities.

3.2 ABANDONMENT OF RACEWAY PIPELINE

A. Contractor shall abandon pipeline in existing raceway by filling the pipe with CLSM. Water stops consisting of CLSM shall be placed at the ends of the pipeline as approved by the Engineer.

B. Contractor shall leave existing concrete within the limits of the raceway in-place unless otherwise ordered by the Engineer. Concrete which is ordered to be removed by the Engineer shall be disposed of below the low-permeability cover to be placed on the area north of the Main Plant Building in accordance with the Section titled "Impacted Soil or Debris Disposal".

C. The raceway shall be backfilled as required to achieve proposed or existing grades, as directed by the Engineer.

D. Contractor shall provide documentation regarding the actual volume of CLSM used to fill the interior of the pipeline and to construct the water stop at the end of the pipe.

3.3 DIVERSION OF RACEWAY PIPELINE

A. The diverted raceway pipeline shall be constructed to the lines, grades, and elevations as shown on the Contract Drawings, specified, or directed.

END OF SECTION

SECTION 02831

CHAIN LINK FENCE AND GATES

PART 1 GENERAL

1.0 DESCRIPTION

A. The Contractor shall provide all labor, materials, equipment and services necessary for and incidental to the installation of chain link fence and gates as shown on the Drawings and as specified herein.

1.1 QUALITY ASSURANCE

A. Comply with standards of the Chain Link Fence Manufacturer's Institute.

B. Provide steel fence and related gates as a complete system produced by a single manufacturer, including necessary erection accessories, fittings and fastenings.

C. Comply with ASTM A-120 for requirements of Schedule 40 piping.

D. Height of fence shall be measured from the top of concrete footing to the top of post.

1.3 SUBMITTALS

A. Shop Drawings: Show application to project include gates.

B. Product Data: Manufacturers catalog cuts with printed specifications and installation instructions.

C. Samples: One square foot minimum of fence fabric and two of each size post tops and extension arms.

PART 2 PRODUCTS

2.1 STEEL FRAME WORK

A. End Posts, Corner Posts, Pull Posts and Line Posts:

1. Class B Steel Tubing: 2.875 inches OD, 4.64 lb. per linear ft; SS-40 Fence Pipe as manufactured by Allied Tube and Conduit Corp., Harvey IL. or equivalent.

2.2 STEEL FABRIC

A. One-piece widths for fence heights up to 12'-0".

B. Chain link No. 9 gauge 2 inch mesh.

C. Selvages: Top side twisted and barbed; bottom side knuckled.

2.3 SWING GATE POSTS

A. Pipe: 4 Inches OD, 9.11 lb. per linear foot (Schedule 40).

2.4 SWING GATE FRAMES

A. Class B Steel Tubing: 1.90 inches OD, 2.28 lb. per linear foot; SS-40 Fence pipe as manufactured by Allied Tube and Conduit Corp. Harvey, IL. or equivalent.

B. Assemble gate frames by welding or with special steel fittings and rivets for rigid connections as shown on the Drawings or on Shop Drawings reviewed by the Engineer.

2.5 GATE HARDWARE

A. Hinges: Non-lift-off type offset to permit 180 degree swing and of suitable size and weight to support gate. Provide 1 2 pair of hinges for each leaf over 6 feet high.

B. Provide plunger bar type complete with flush plate set in concrete for all double gates and single gates over 10 feet. Padlock eye shall be an integral part of latch construction.

C. Keeper for Vehicle Gates: Provide keeper which automatically engages the gate leaf and holds it in the open position until manually released.

2.6 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Rails and Post Braces

1. Class B Steel Tubing: 1.660 inches OD, 1.84 lb. per linear foot; SS-40 Fence Pipe as manufactured by Allied Tube and Conduit Corp. Harvey IL or equivalent.

B. Post Tops: Steel, wrought iron or malleable iron.

C. Stretcher Bars: One piece equal to full height of fabric, minimum cross-section 3/16 inch x 3/4 inch.

D. Metal Bands (for stretcher bars): Steel, wrought iron or malleable iron, to secure stretcher bars to end, corner, pull and gate posts.

E. Wire ties:

1. For tying fabric to line posts, rails and braces: 9 gauge steel wire.

2. For tying fabric to tension wire: 11 gauge steel hog rings.

F. Truss Rods: 3/8 inch diameter.

G. Tension Wire: 7 gauge coiled spring steel wire.

H. Angle Beams, I Beams and Steel Shapes: ASTM A-36.

I. Bolts and Nuts: ASTM A-307, Grade A.

2.8 BARBED WIRE

A. Two strand 12 2 gauge steel wire with 14 gauge 4-point steel barbs spaced 5 inches oc.

B. Extension Arms: Pressed steel, wrought iron, or malleable iron, complete with provision for anchorage to posts and attaching 3 rows of barbed wire to each arm. Provide the following type:

1. Single vertical arm; one for each post.

2.9 FINISHES

A. Steel Framework

1. Pipe: Galvanized in accordance with ASTM A-120, 2.0 oz. zinc per sq. ft.

2. Class "B" Steel Tubing: Exterior; 1.0 oz zinc per sq. ft. plus a coating of chromate and polyurethane. Interior; zinc rich organic coating.

B. Fabric

1. Aluminized Finish: ASTM A-491 aluminum coated with 0.40 oz per sq. ft.

C. Fence and Gate Hardware, Miscellaneous Materials, Accessories

1. Wire Ties: Galvanized Finish, ASTM A-90 2.0 oz. zinc per sq. ft.

2. Hardware and Other Miscellaneous Items: Galvanized finish, ASTM A-153 (Table 1).

3. Angle Beams, I Beams, and Steel Shapes: Galvanized in accordance with ASTM A-123, 2.0 oz zinc per sq. ft.

D. Barbed Wire and Tension Wire:

1. Aluminized Finish: ASTM A-585 Class 2, 0.30 oz. per sq. ft.

PART 3 EXECUTION

3.1 PREPARATION

A. Coordinate fence and gate installation with completion of finished grading including top soiling and paving.

3.2 INSTALLATION

A. Space posts equidistant in the fence line with a maximum of 10 feet on center.

B. Earth: Excavate holes as indicated for fence and gate posts. Set posts in center of hole and fill hole with concrete. Plumb and align posts. Vibrate or tamp concrete for consolidation. Finish concrete in a dome shape above ground to shed water. Do not attach fabric to posts until concrete has cured a minimum of 7 days.

C. Locate corner posts at corners and at changes in direction. Use pull posts at all abrupt changes in grade and at intervals no greater than 500 feet. On runs over 500 feet, space pull posts evenly between corner or end posts. On long curves, space pull posts so that the strain of the fence will not bend the line posts.

D. Install top rail continuously through post caps or extension arms, bending to radius for curved runs. Install expansion couplings as recommended by fencing manufacturer.

E. Install intermediate rails in one piece between posts and flush with post on fabric side using special offset flttings where necessary.

F. Diagonally brace corner posts, pull posts, and terminal posts to adjacent line posts with truss rods and turnbuckles.

G. Attach fabric to security side of fence. Maintain a 2 inch clearance above finished grade except when indicated otherwise. Thread stretcher bars through fabric using one bar for each gate and end post

and two for each corner and pull post. Pull fabric tight so that the maximum deflection of fabric is 2 inches when a 30 pound pull is exerted perpendicular to the center of a panel. Maintain tension by securing stretcher bars to posts with metal bands spaced 15 inches oc. Fasten fabric to steel framework with wire ties spaced 12 inches oc. for line posts and 24 inches oc. for rails and braces. Bend back wire ends to prevent injury. Tighten stretcher bar bands, wire ties, and other fasteners securely.

H. Position bolts for securing metal bands and hardware so nuts are located opposite the fabric side of fence. Tighten nuts and score excess threads.

1. Secure post tops, extension arms, and caps with one-way cadmium plated steel screws.

I. Install gates plumb and level and adjust for full opening without interference. Install ground-set items in concrete for anchorage, as recommended by fence manufacturer. Adjust hardware for smooth operation and lubricate where necessary.

J. Tension Wire: Support bottom edge of fabric with coil spring tension wire. Weave tension wire through fabric or fasten with hog rings spaced 24 inches oc. Tie tension wire to posts with 9 gauge wire ties.

** END OF SECTION **

SECTION 02950

TREES AND GROUND COVERS

PART 1 GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, materials, equipment, and services necessary for, and incidental to, the planting and maintenance of trees and ground covers as shown on the Drawings, or as specified herein.

1.2 QUALITY ASSURANCE

A. All landscaping work shall be performed by one (1) Contractor, with proven experience in this field.

B. Reference Standards:

1. The latest edition of the following standards, as referenced herein, shall be applicable.

a. "Standardized Plant Names", American Joint Committee of Horticultural Nomenclature.

b. “American Standard for Nursery Stock”, American Association of Nurserymen, Inc,

c. American National Standards Institute (ANSI)

1.3 SUBMITTALS

A. Before plant material it shipped to the project site, submit a complete itemized list of all plants including the source of supply.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Preparation for Delivery:

1. Balled and burlapped (B&B) trees shall be dug and prepared for shipment in a manner that will not damage roots, branches, shape and future development after replanting. The trees shall be balled with firm, natural balls of soil and wrapped with burlap and tied in accordance with ANSI 760.1.

2. Potted ground covers shall be potted in a minimum 2 1/2 inch pot.

B. Furnish the following with each planting material delivery:

1. An invoice indicating sizes and variety of plant material.

2. All certificates of inspection required by State and Federal agencies.

3. Labels for each plant or bundles of plants indicating name and size.

C. Protect plants against climate and mechanical injuries and remove unacceptable plants immediately from the job site.

D. Deliver fertilizer In manufacturer's standard sized bags showing weight, analysis, and manufacturer's name. Store under a waterproof cover or in a dry place as approved by the Engineer.

1.5 PROJECT REQUIREMENTS

A. Plant trees and ground covers before lawns are seeded.

B. Plant trees and ground covers only when weather and soil are suitable in accordance with locally accepted practice.

PART 2 PRODUCTS

2.1 MATERIALS

A. Plants:

1. Well formed and shaped, true to type, and free from disease such as knots, sun-scald, windburn, injuries, abrasions or disfigurement.

2. Comply with the “PLANTING SCHEDULE" as shown on the Drawings.

B. Planting Soil:

1. Mix three (3) parts acceptable topsoil with one (1) part peat moss.

C. Topsoil:

1. Comply with the requirements of Section 02981 – TOPSOIL AND SEEDING.

D. Fertilizer:

1. Bonemeal - Commercial, steamed finely ground material with a minimum of 1.0 percent nitrogen and a minimum of 11 percent phosphoric acid.

2. Commercial Fertilizer (10-6-4) - Containing not less than 10 percent nitrogen, 6 percent available phosphoric acid and 4 percent water soluble potash.

E. Top Mulch:

1. 3" garden bark.

F. Wrapping Material:

1. Waterproof 30-30-30 Krinklecraft in 4-inch wide strips.

2. Lightly tarred medium or course sisal yarn.

G. Guying and Staking Material:

1. Stakes - construction grade cedar, 2-inch square or 1 1/2 inch diameter by 8 feet long and pointed at one end.

2. Guying Wire - annealed, galvanized iron or steel 10 gauge wire.

3. Hose - New 2-ply reinforced rubber, 3/4 inch diameter.

H. Water:

1. Clean, Potable.

PART 3 EXECUTION

3.1 INSPECTION

A. Verify final grades have been established prior to beginning planting operations.

B. Inspect trees and ground covers for injury, insect infestation or improper pruning. Do not begin planting until deficiencies have been corrected, or plants replaced.

3.2 PREPARATION

A. Stake out all tree locations and planting areas.

B. Do not begin excavation until stakeout is approved by the Engineer.

C. Excavate pits for trees to the dimensions as detailed on the Drawings and for ground covers at required. Dispose of excavated material off site unless otherwise approved by the Engineer.

3.3 PLANTING

A. Center the plant in the pit and face for best effect. Set the plant plumb and hold in position until planting soil has been tamped firmly around ball or roots. Complete backfilling with planting soil and settle continuously with water. Form saucers during the growing season and remove before winter.

B. Balled Plants - Set plants in position and backfill 1/3 depth of ball. Remove burlap from to and just to eliminate air pockets. Complete backfilling while settling with water.

C. Bare Root Plants - Set plants in position and place planting soil around roots while settling with water. Use care to avoid breaking roots when firming soil.

3.4 MULCHING

A. Mulch to thicknesses as shown on the Drawings for trees, or to 2 inches for ground covers. Water thoroughly after mulching.

3.5 WRAPPING

A. Wrap all deciduous trees within four (4) days after planting,

B. Wrap from the ground line to the height of the second branches, overlapping 1 1/2 inches, and tie the wrapping securely in place.

3.6 STAKING

A. Set tree stakes into solid ground below the bottom of the plant before backfilling. Place stakes at the outer edge of the roots or ball, in line with the prevailing winds at a 10 degree angle to the tree trunk.

3.7 MAINTENANCE

A. Begin maintenance immediately after each item is planted and continue throughout the Contract.

B. Maintenance shall consist of keeping plants in a healthy growing condition by watering, weeding, cultivating, pruning, spraying, tightening of guys, weeding, remulching and by any other necessary operations.

C. Water all plants at least once per week between April 1 and October 31 with approximately 5 gallons per square yard (1 inch layer of water) per watering unless otherwise specified. Provide additional watering during dry periods as required or directed by the Engineer.

D. Keep planting saucers and beds free of weeds, grass and other undesired vegetation.

E. Apply fertilizers and herbicides with good horticultural methods to promote growth and control insects, disease or rodents.

END OF SECTON

SECTION 02981

TOPSOIL AND SEEDING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes topsoil, fertilizer, seed, mulch, anchorage, and associated work and maintenance required until acceptance.

1.2 REFERENCES

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

1. American Society of Testing and Materials (ASTM)

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

   b. ASTM D2974 Test Method for Moisture, Ash, and Organic Matter of Feat and Other Organic Materials

   c. ASTM D4972 Standard Test Method for pH of Soils

   d. ASTMD5268 Specification for Topsoil used for Landscaping Purposes

1.3 SUBMITTALS

A. In addition to those submittals identified in the Special Provisions, the following items shall be submitted:

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

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

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

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

5. Affidavit from owner of source and hazardous waste testing results in accordance with the Special Provisions.

PART 2 PRODUCTS

2.1 TOPSOIL

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

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

Minimum

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

2.2 GRASS SEED

A. Seed mixtures shall be of commercial stock of the current season's crop and shall be delivered in unopened containers bearing the guaranteed analysis of the mix.

B. Seed Mixture: Pounds Per Acre

Common Name	% By Weight	% Purity	% Germination
Timothy	30	90	90
Clover	20	90	90
Perennial Ryegrass	40	90	90
Annual Ryegrass	10	90	90

2.3 FERTILIZER

A. Fertilizer shall be a standard quality commercial carrier of available plant food elements. A complete prepared and packaged material containing a minimum of 10 percent nitrogen, 10 percent phosphoric acid and 10 percent potash.

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

2.4 MULCH

A. Mulch shall be un-rotted stalks of oats, wheat, rye or other approved crops which are free from noxious weeds, salt, mold, or other objectionable material.

B. Other sources of mulch may be utilized if approved by the Engineer.

PART 3 EXECUTION

3.1 INSTALLATION

A. All areas to be topsoiled outside of the limits of the areas to receive flexible membrane cover shall receive a minimum of 4-inches of topsoil. The areas to receive topsoil shall be graded to a depth of not less than 4 inches or as specified below the proposed finished surface. If the

depth of topsoil existing prior to construction was greater than 4 inches, the topsoil shall be replaced not less than the greater depth.

1. All debris and inorganic material shall be removed and the surface loosened for a depth of 2 inches prior to the placing of topsoil.

B. All areas to be topsoiled within the limits of the areas to receive flexible membrane cover shall receive a minimum of 6-inches of topsoil.

C. The topsoil shall not be placed until the subgrade is in suitable condition and shall be free of frost and excessive moisture.

D. Topsoiled surfaces shall be seeded in accordance with this Section. All surfaces shall then be mulched and fertilized in accordance with this section.

3.2 APPLICATION PROCEDURES

A. The finished surface shall conform to the lines and grades of the area before disturbed or as shown on the Contract Drawings. Any irregularities shall be corrected before the placement of fertilizer and seed.

B. The Contractor shall proceed with the complete landscape work as rapidly as portions of the site become available, working within seasonal limitations of each type of work required.

C. The fertilizer shall be applied uniformly at the rate of 20 pounds per 1000 square feet.

1. Following the application of the fertilizer and prior to application of the seed, the topsoil shall be scarified to a depth of at least 2 inches with a disc or other suitable method traveling across the slope if possible.

D. When the topsoil surface has been fine graded, the seed mixture shall be uniformly applied upon the prepared surface with a mechanical spreader at a rate of not less than 8 pounds per 1000 square feet.

1. The seed shall be raked lightly into the surface and rolled.

2. Seeding shall be suspended when wind velocities exceed 5 miles per hour or as directed by the Engineer.

E. Mulch shall be hand or machine spread to form a continuous blanket over the seed bed, approximately 2 inches uniform thickness at loose measurement. Excessive amounts of bunching of mulch will not be permitted.

1. Mulch shall be anchored by an acceptable method.

2. Unless otherwise specified, mulch shall be left in place and allowed to disintegrate.

3. Any anchorage or mulch that has not disintegrated at time of first mowing shall be removed. Anchors may be removed or driven flush with ground surface.

F. Seed bed shall be moistened following application of mulch. A muddy soil condition will not be acceptable.

G. Hydroseeding may be accepted as an alternative method of applying fertilizer, seed and mulch. The Contractor must submit all data regarding materials and application rates to the Engineer for review.

H. Seeded areas shall be watered as often as required to obtain germination and to obtain and maintain a satisfactory sod growth. Watering shall be in such a manner as to prevent washing out of seed.

I. The stand of grass resulting from the seeding shall not be considered satisfactory until accepted by the Engineer. An acceptable lawn shall have a minimum of 90% of the area covered with plants of the specified seed mix and no areas greater than one foot square of bare surface. If areas are determined to be unacceptable, the remaining mulch will be removed and all areas shall be reseeded, refertilized and remulched as per the above application procedures at the Contractor's expense.

3.3 MAINTENANCE

A. The Contractor shall begin maintenance period immediately after planting of landscape materials.

B. The Contractor shall maintain grass areas, for the periods required to establish an acceptable growth, but not less than 60 days after date of substantial completion. If seeded in the fall and not given a full 60 days of maintenance, or if not considered acceptable by the Engineer at that time, continue maintenance during following spring until acceptable, grass stand is established.

C. Seeded areas shall be watered as often as required to obtain germination and to obtain and maintain a satisfactory sod growth. Watering shall be in such a manner as to prevent washing out of seed.

END OF SECTION

SECTION 02990

SURFACE RESTORATION AND REPAIR

PART 1 GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, materials, equipment, and services necessary for, and incidental to, the restoration and repair of all disturbed surfaces, as shown on the Drawings, and as specified herein.

1. In general, the Contractor shal1 be responsible for leaving the Work site in an equal or better condition than it exists prior to construction. This work shall include, but is not necessarily be limited to, restoration and repair of the following items:

   a. Sidewalks

   b. Curbs

   c. Driveways

   d. Lawns

   e. Trees and Planting

   f. Retaining Walls

   g. Monuments

   h. Any others encountered and disturbed by construction.

PART 2 PRODUCTS

2.1 MATERIALS

A. Driveways:

1. Asphalt driveways shall be replaced to their existing thickness, but not less than 2 inches, with NYSDOT Section 401, type 6F, in accordance with [SECTION 02511 – ASPHALT PAVING].

2. Crushed stone and gravel driveways shall be replaced to their existing thickness, but not less than 2 inches, with NYSDOT Section 703, Size 1.

B. Lawns:

1. Lawns shall be restored In conformance with SECTION 02981 - TOPSOIL AND SEEDING.

2. Trees and Planting:

   a. Trees and planting shall be replaced or replanted only at the locations shown on the Drawings, in conformance with [SECTION 02220 - IMPACTED SOIL AREA BACKFILLING AND MATERIAL].

C. Miscellaneous Items:

1. Monuments, flagpoles, retaining walls, etc., shall be removed in such a manner as to prevent damage, and be reset or reconstructed in their original locations unless otherwise directed by the Engineer. Damages incurred shall be corrected, or the item replaced, at the discretion of the Engineer.

PART 3 EXECUTION

3.1 INSTALLATION

A. All items designated to be reset or reused shall be removed during construction in a manner to prevent damage. Damaged items shall be replaced with an equal material as approved by the Engineer at the Contractor's expense.

B. All methods and materials are subject to the approval of the Engineer.

C. Restore or repair to their original condition, or as otherwise specified herein, all surfaces damaged or removed in the Work.

END OF SECTION