TABLE OF CONTENTS

CONTRACT SPECIFICATIONS
for
INTERIM REMEDIAL MEASURE #4

Former Sperry Remington Site – North Portion
Elmira, New York

TABLE OF CONTENTS
(continued)

SECTION 00 31 00

USE OF ELECTRONIC FILES

PART 1 GENERAL

1.01 AUTOCAD FILES

A. AutoCAD® files may be provided as a convenience to CONTRACTOR, subject to approval by ENGINEER.

B. Should AutoCAD® files be provided, CONTRACTOR assumes all risk, responsibility, and liability associated with use of the electronic files, including if there is an error or incomplete information contained on the files.

C. Only the signed and sealed printed copies of the Contract Drawings supplied with the Project Manual may be relied upon for contract purposes.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

*** END OF SECTION ***

SECTION 01 10 00

SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY OF WORK

A. All work shall be completed, and materials imported in accordance with the approved Interim Remedial Measure work plans. Proposed modifications to the work plans must be approved by NYSDEC.

B. CONTRACTOR shall perform the Work during the construction period and shall coordinate the construction schedule and operations with OWNER and other contractors performing Work listed under this Section. CONTRACTOR is responsible for scheduling the activities listed below in a manner such that all activities are completed by the scheduled project completion date. Note that the following list is included to identify the main elements of the Work to assist CONTRACTOR in understanding the general requirements of the project and is not intended to describe all of the work required under this Project Manual.

1. Interim Remedial Measure #4
    a. Mobilize to the site.
    b. Provide submittals required in the Specifications and revising the submittals as required until they meet the requirements of the Specifications to the satisfaction of ENGINEER.
    c. Implement temporary erosion and sediment control measures and maintain erosion and sediment control measures throughout the Project.
    d. Clear the construction area within limits of disturbance. Remove existing chain-linked as indicated on the Drawings. In areas with existing pavement, saw cut and remove concrete pavement within the limits of disturbance.
    e. Construct and maintain temporary haul and access roads as well as decontamination pads for construction equipment.
    f. Construct stockpile areas as indicated on the Drawings.
    g. Demolish the EHS grandstands, press box and restrooms.
    h. Relocate the EHS visitor bleachers to the EHS basketball court parking lot as temporary rally point.
    i. Demolish designated utilities, structures, and equipment, providing temporary relocation of utilities so that they remain in-service during construction.
    j. Install required support of excavation (SOE) as indicated on the Drawings.

k. Excavate soils within limits of disturbance to depths indicated on the Drawings.
l. Dispose of soils at approved off-site facilities in accordance with the Interim Remedial Measures Work Plan.
m. Place and compact backfill using stockpiled soils that based on laboratory testing results are acceptable for use as backfill.
n. Install demarcation layer netting prior to backfilling
o. Furnish, place, and compact approved off-site soils to complete backfilling.
p. Furnish replacement utilities as indicated on the Drawings.
q. Furnish approved fill and topsoil for placement in excavation to elevations indicated on the Drawings.
r. Topsoil and seed or provide sod to establish vegetation in construction area designated for vegetation.
s. Demobilize from the Site.
t. Perform all other Work that is not specifically defined in this Part 1.01.C of this Section but shown on the Drawings and described in these Technical Specifications.

2. Interim Remedial Measure #5
   a. Mobilize to the site.
   b. Provide submittals required in the Specifications and revising the submittals as required until they meet the requirements of the Specifications to the satisfaction of ENGINEER.
   c. Implement temporary erosion and sediment control measures and maintain erosion and sediment control measures throughout the Project.
   d. Clear the construction area within limits of disturbance. Remove existing chain-linked as indicated on the Drawings. In areas with existing pavement, saw cut and remove concrete pavement within the limits of disturbance.
   e. Construct and maintain temporary haul and access roads as well as decontamination pads for construction equipment.
   f. Construct stockpile areas as indicated on the Drawings.
   g. Demolish designated utilities, structures, and equipment, providing temporary relocation of utilities so that they remain in-service during construction.
   h. Install required support of excavation (SOE) as indicated on the Drawings.
   i. Remove sections of the former industrial sewer as indicated on the Drawings.
   j. Excavate soils within limits of disturbance to depths indicated on the Drawings.
   k. Dispose of soils at approved off-site facilities in accordance with the Interim Remedial Measures Work Plan.

l. Place and compact backfill using stockpiled soils that based on laboratory testing results are acceptable for use as backfill.
m. Install demarcation layer netting prior to backfilling
n. Furnish, place, and compact approved off-site soils to complete backfilling.
o. Furnish replacement utilities as indicated on the Drawings.
p. Furnish approved fill and topsoil for placement in excavation to elevations indicated on the Drawings.
q. Topsoil and seed or provide sod to establish vegetation in construction area designated for vegetation.
r. Demobilize from the Site.
s. Perform all other Work that is not specifically defined in this Part 1.01.C of this Section but shown on the Drawings and described in these Technical Specifications.

C. CONTRACTOR is responsible to provide all materials, labor, equipment, supervision, testing, and coordination required for execution of the Work.

1.02 CONTRACTOR USE OF SITE AND PREMISES

A. CONTRACTOR's access to OWNER's property is limited to the project work area as identified in the Contract Documents to include:
1. the limits of disturbance for construction;
2. the equipment lay down area(s);
3. the soil stockpile area(s); and
4. designated access roads.

1.03 SITE OCCUPANCY

A. The Site has been developed as Elmira High School. During execution of the Work, Elmira School District employees and other Contractors may be performing work in the immediate vicinity of the limits of work shown on the Drawings. CONTRACTOR shall cooperate with all parties to minimize conflict and allow access to the Site.

B. CONTRACTOR shall document all aspects of work affected by or schedule changes requested by other contractors working on Site and include the same in project review meetings.

1.04 COMPLETION DATES AND SUBSTANTIAL COMPLETION

A. The date for substantial completion of the Work items identified in Part 1.01.A of this Section shall be as specified in the Agreement. The date of substantial

completion is defined herein as the date when OWNER gives its approval of substantial completion of the Work in accordance with Section 01 77 00. ENGINEER shall review the Work to establish the following conditions are met.

1. Soils designated for disposal have been properly managed at permitted off-site facilities.
2. Excavation limits have been backfilled with approved soils to satisfaction of OWNER.
3. Temporarily disconnected utilities have been restored and are fully functioning.
4. Record Drawings have been submitted for review.

B. Specific project milestone and target dates are provided in the Project Management and Coordination Section.

1.05 WORK PLAN SUBMITTALS

A. In addition to information regarding materials, equipment, and shop drawings, CONTRACTOR is required to provide a number of Work Plan submittals associated with the project. These submittals include, but are not limited to:
1. Health and Safety Plan (Section 01 35 29.13);
2. Construction baseline progress schedules (Section 01 31 00);
3. Construction Quality Control Plan (Section 01 45 00);
4. Temporary Facilities and Controls Plan (Section 01 50 00);
5. Excavation Work Plan (Section 02 61 13);
6. Dewatering Plan (Section 31 23 19);
7. Support of Excavation Design and Work Plan (Section 31 15 00);
8. Sewer Removal Work Plan (Section 02 41 13.23); and
9. Vibration Monitoring Plan (Section 02 22 13).

B. The purpose of the Work Plan submittals is for CONTRACTOR to:
1. describe the means and methods proposed for the activity addressed;
2. demonstrate CONTRACTOR’s understanding of the scope of work;
3. demonstrate CONTRACTOR’S understanding of the schedule dependence of other components of the Work on the completion of the activity addressed; and
4. define CONTRACTOR’s contingency actions in the event that schedule delays occur.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIALS

A. CONTRACTOR shall furnish new materials, utilities, equipment and supplies when completing the Work.

B. Approval from ENGINEER is required prior to use of substitution or "or equal" equipment or materials when completing the Work. Approval shall be at the sole discretion of ENGINEER.

PART 3 EXECUTION

3.01 GENERAL

A. CONTRACTOR shall execute all Work in accordance with the requirements of the Project Manual.

3.02 FAMILIARIZATION

A. Prior to implementing any Work described in the Project Manual, CONTRACTOR shall become thoroughly familiar with the site, the existing site conditions, and all portions of the Work falling within the appropriate section of the Technical Specifications.

B. Prior to implementing any Work, CONTRACTOR shall carefully inspect the previously installed Work to verify that the previous Work is complete to the point where the installation of succeeding Work may properly commence without adverse impact.

C. If CONTRACTOR has any concerns regarding the previously installed Work, then CONTRACTOR should immediately notify OWNER and ENGINEER verbally and in writing (within 48 hours of the site visit). Failure to notify OWNER and ENGINEER or continuance with Work will be construed as CONTRACTOR's acceptance of the previous Work.

3.03 PROTECTION OF WORK

A. CONTRACTOR shall use all means necessary to protect all prior Work, including all materials and completed Work of other Sections.

B. In the event of damage to Work performed by CONTRACTOR prior to OWNER's acceptance of the Work, CONTRACTOR shall immediately make all repairs and replacements necessary, to the approval of ENGINEER and at no additional cost to OWNER.

*** END OF SECTION ***

SECTION 01 14 00

WORKING ON SCHOOL PROPERTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals

B. Regulatory Requirements

C. Project/Site Conditions

1.02 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

B. Submit provisions for site security and plans for controlling ingress and egress in the CONTRACTOR'S Work Plan, in accordance with Section 01 50 00.

C. Submit the following week's work activities and schedule by Friday noon of the following week.

1.03 REGULATORY REQUIREMENTS

A. Compliance with Regulations of the Commissioner of Education Section 155.5 Uniform Safety Standards for School Construction and Maintenance Project.

1.04 COORDINATION REQUIREMENTS

A. Rights for the use of the work and storage areas have been obtained, and the general limits of the areas are shown on the Drawings.

B. The CONTRACTOR shall schedule weekly meetings (to include a pre-construction meeting prior to construction) with the school administration to present the following week's work activities and schedule as it pertains to the school's operations and schedule and to discuss any concerns the schools may have.

C. Any concerns or complaints raised by the School District or the community when on school property should be conveyed to the ENGINEER immediately.

1.05 PROJECT/SITE CONDITIONS

A. Location and Verification

1. It shall be the CONTRACTOR'S responsibility to accurately locate the limits of all lands utilized under the contract in accordance with Section 01 78 29. The approved work areas for which rights have been obtained shall be temporarily fenced off using minimum 8 ft high chain link fence with privacy screen in the areas as shown on the Drawings and per Section 01 50 00 TEMPORARY FACILITIES.

PART 2 PRODUCTS - Not Applicable

PART 3 EXECUTION

3.01 SITE ACCESS LIMITATIONS

A. The CONTRACTOR shall honor all requests by the Elmira City School District to halt work that is disrupting both pedestrian and vehicle traffic related to school arrival and dismissal as well as afterhours events. It is up to the CONTRACTOR to obtain the school district schedules and plan work accordingly. The CONTRACTOR shall account for schedule delays anticipated to be caused by site access limitations by the schools.

B. Although CONTRACTOR shall comply with all requests by the Elmira City School District for access, the time periods where it will be required when school is in session are

1. prior to the start of school between 7:40 a.m. and 08:40 a.m.

2. following dismissal of school at 3:10 p.m. and 4:10 p.m.

3.02 SAFETY AND SECURITY

A. All construction, reconstruction and Renovation work shall be performed in a manner to protect the workers and public from injury. Adjoining property and structures shall be protected from damage at all times by the Contractor(s).

B. Site security will be performed in accordance with Section 01 50 00

C. Fences around construction activities, supplies, and debris shall be maintained.

D. Gates shall always be locked unless a worker is in attendance to prevent unauthorized entry.

E. Workers who will be entering the EHS building, including SUBCONTRACTORS, shall be required to wear photo identification badges at all times for identification and security purposes. In addition to current photo, badge shall include at a minimum the following information (valid time frames should match individuals anticipated duration on the project):

Former Sperry Remington Site - North Portion
Interim Remedial Measure
<COMPANY NAME>
<PERSONNEL'S FULL NAME>
VALID FROM <DATE OF NTP> THROUGH <DATE OF FINAL COMPLETION>

F. All construction materials shall be stored in a safe and secure manner.

G. No smoking is allowed on public school property.

H. The CONTRACTOR shall be responsible for the control of chemical fumes, gases, and other contaminants produced by welding, gasoline or diesel engines, roofing, paving, painting, equipment, construction, etc. to ensure they do not enter occupied portions of the nearby school building or air intakes.

3.03 NOISE AND VIBRATION MONITORING ON SCHOOL PROPERTY

A. CONTRACTOR'S vehicles and equipment shall be configured in a manner that minimizes noise to the greatest degree practicable.

B. Noise levels shall conform to the latest OSHA standards and in no case shall noise levels be permitted to interfere with the Work of OWNER or others.

C. Vibration monitoring will be carried out in accordance with Section 022213.

3.04 CONTRACTOR CODE OF CONDUCT

A. The work zones for this project are on, or adjacent to Elmira High School. The Department has zero tolerance for inappropriate behavior, compromising of student safety, or other situations which may give rise to complaints from the school district related to CONTRACTOR conduct.

B. Workers need to be cognizant of protecting students from the construction process

and from themselves. Workers should not initiate conversations with students or allow them to gather near construction barriers. As onlookers at any construction site can attest, construction equipment and activities can be fascinating to children. Truck traffic may be heavy, areas may be covered or blocked. These can be attractive hazards that are difficult for children to resist; the CONTRACTOR will need to plan and act accordingly.

C. During the construction process, construction workers will have access to parking areas that contain personal property of students and faculty. Experienced workers are accustomed to having access to otherwise secure areas and almost always can be trusted; there are, however, many others who may be on the site temporarily and have little accountability. The CONTRACTOR will need to keep things as secure and well protected as possible.

D. The following information shall be posted in all on-site job trailers and reviewed during daily tailgate meetings:

CODE OF CONDUCT FOR CONTRACTORS

1. Sign in and out when entering/exiting a school building.
2. Work safely and responsibly and be aware of responsibility for own actions and behavior. It is the responsibility of all adults to safeguard and promote the welfare of children and young people.
3. Avoid contact with children. Never give your personal contact details to children or young people.
4. Never be in contact with children without school supervision.
5. Stay within the agreed work area and access routes, obtain permission if you need to go outside these areas.
6. When in school buildings, keep school staff informed of where you are going and what you are doing.
7. Do not use profane or inappropriate language.
8. Dress appropriately.
9. Remember your actions, no matter how well intentioned, could be misinterpreted. Be mindful of the need to avoid placing yourself in vulnerable situations.

3.05 HAZARD CONTROL

A. The Contractor shall take every precaution to eliminate the potential of construction fumes entering the occupied building. The Contractor shall take care to assure fresh air intakes do not draw construction related fumes into the building.

1. Each Contractor shall provide for "off-gassing" of volatile organic compounds introduced during construction before occupancy. Specific attention is warranted for activities including glues, paint, furniture, carpeting, wall coverings, and drapery. Manufacturers shall be contacted to obtain information regarding appropriate temperatures and times needed to cure or ventilate the product during use and before safe occupancy of a space can be assured.

2. Building materials or furnishings which "off-gas" chemical fumes, gases, or other contaminants shall be aired out in a well-ventilated heated warehouse before it is brought to the project for installation or the manufacturer's recommended "off-gassing" periods must be scheduled between installation and use of the space. If the work will generate toxic gases that cannot be contained in an isolated area, the work must be done when school classes and programs are not in session. The work areas must be properly ventilated, and the material must be given proper time to cure or "off gas" before re-occupancy.

3. Each Contractor shall maintain the Manufacturer's Material Safety Data Sheets (MSDS) at the site for all products used in the project. MSDS sheets shall be provided to the School District when requested. MSDS indicate chemicals used in the product, product toxicity, and typical side effects of exposure to the product and safe procedures for use of the product.

B. Asbestos abatement protocols.

1. All asbestos abatement projects shall comply with all applicable Federal and State laws including but not limited to the New York State Department of Labor industrial code rule 56(12 NYCRR 56), and the federal Asbestos Hazard Emergency Response Act (AHERA), 40 CFR Part 763 (Code of Federal Regulations, 1998 Edition, Superintendent of Public Documents, U.S. Government Printing Office, Washington, DC 20402; 1998; downloading and reading at the Department of Housing and Urban Renewal, 451 7th Street SW, Washington, DC 20410, (202) 401-0388, web site; www.hud.gov/search.html, scroll web page to Reading Room, click on Bookshelf 10: Lead Paint).

2. Large and small asbestos projects as defined by 12 NYCRR 56 shall not be performed while the building is occupied. Minor asbestos projects defined by 12 NYCRR 56 as an asbestos project involving the removal, disturbance, repair, encapsulation, enclosure or handling of 10 square feet or less of asbestos or asbestos material, or 25 linear feet or less of asbestos or asbestos material may be performed in unoccupied areas of an occupied building in accordance with the above referenced regulations.

C. Lead Based paint:

1. Lead based paint has been identified as being applied to some building components that are to be selectively demolished. Lead based paint testing has been performed and a report is on file and available for review and use. It is the Contractor's responsibility to become familiar with areas containing lead-based paint and to communicate the presence of lead-based paint to all employees.

2. Effective April 22, 2010 all contractors are required to conform to the Environmental Protection Agency's (EPA) Lead Renovation, Repair and Painting (RRP) program. This regulation has been developed to prevent lead contamination when performing renovation, repair and painting projects which disturbs lead based paint in homes, childcare facilities and schools built before 1978 if these buildings are visited regularly by any child under 6 years of age.

3. Any abatement work required shall be performed by a certified firm employing workers trained and certified for lead based paint activities. All work is to be performed in accordance with all applicable regulations including: 40 CFR 745 (USEPA), 29 CFR 1926 (OSHA), (HUD) Federal Housing and Urban Development Regulations and New York State Education Department requirements.

4. All contractors involved with lead-based paint activities shall be certified in lead-safe practices as detailed in the Code of Federal Regulation 40 CFR, Part 745.

5. Contractors must document compliance with this requirement. EPA's <http://www.epa.gov/lead/pubs/renovaterightbrochuresp.pdf>may be used for this purpose.

6. For more information regarding this regulation visit the EPA website at www.epa.gov/lead/pubs/renovation.htm for requirements.

7. Should paint suspected of containing lead, but not identified within the report be encountered, do not disturb the suspect material, and immediately notify the Engineer.

D. Polychlorinated Biphenyls (PCBs):

1. Where present, PCB contaminated window and door sealants shall be removed and disposed of in accordance with U.S. E.P.A. Toxic Substances Control Act 40 CFR 761. Disposal of contaminated material shall also conform to the NYSDEC solid waste regulations (6NYCRR Part 360) if concentrations are less than 50 ppm and in accordance with (6NYCRR370-373 if concentrations are 50 ppm or greater. It is the CONTRACTOR'S responsibility to become familiar with areas contaminated with PCB and to communicate the presence of contaminated materials to all employees. Should a material suspected of being contaminated by PCB, but not identified within the report be encountered, do not disturb the suspect material, and immediately notify the Engineer.

3.06 POST CONSTRUCTION INSPECTION

A. Each Contractor is advised that the School District shall be provided the opportunity for a walk-through inspection by the School District's health and safety committee members to confirm building safety during construction and that the area is ready to be reopened for occupancy.

*** END OF SECTION ***

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 ORGANIZATION

A. A Project Organization Chart is presented as Figure 013100-1.

1.02 PRECONSTRUCTION MEETING

A. OWNER shall schedule a Preconstruction Meeting at the Site or other convenient location prior to commencement of construction activities.

B. OWNER, ENGINEER, and CONTRACTOR and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the meeting by persons familiar with, and authorized to, conclude matters relating to the Work.

C. OWNER shall prepare the agenda for the meeting, which shall include items of significance that could affect progress including such topics as:
   1. Health and Safety.
   2. Tentative construction schedule.
   3. Critical work sequencing.
   4. Designation of responsible personnel.
   5. Construction quality control requirements.
   6. Construction quality assurance procedures and protocols.
   7. Procedures for processing field decisions and change orders.
   8. Procedures for processing applications for payment.
   9. Distribution of Contract Documents.
   10. Submittal of shop drawings, product data, and samples.
   11. Preparation of record documents.
   12. Use of the premises.
   13. Office, work, and storage areas.
   14. Equipment deliveries and priorities.
   15. Security.
   16. Housekeeping.
   17. Temporary facilities and controls.
   18. Working days and hours.

D. Prior to the Preconstruction Meeting, CONTRACTOR shall provide, in a manner satisfactory to OWNER and ENGINEER the following preconstruction submittals:
   1. Health and Safety Plan;
   2. Construction progress schedule;
   3. Preliminary schedule of construction submittals (i.e., Shop Drawings, Manufacturer's Certifications, Manufacturer's Warranties, CQC test data, etc.);
   4. Schedule of Values with completed quantities and unit pricing for use in CONTRACTOR Applications for Payment;
   5. Evidence of insurance required by the Contract; and
   6. Performance and payment bonds as required by the Contract.

1.03 PROGRESS MEETINGS

A. At a minimum, weekly construction progress meeting will be facilitated by OWNER or ENGINEER at the Site or other convenient location. OWNER will notify CONTRACTOR and ENGINEER of scheduled meeting dates. More frequent meetings shall be held at OWNER's discretion. CONTRACTOR shall provide updated Construction Progress Schedule for each progress meeting and be prepared to discuss the progress of the project.

B. In addition to OWNER, ENGINEER, and CONTRACTOR, each subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.

C. No later than seven (7) days after each progress meeting date, OWNER or ENGINEER will distribute copies of the meeting minutes to each party present and to other parties who should have been present. The minutes will include a brief summary, in narrative form, of progress since the previous meeting. Anyone who disagrees with the accuracy or completeness of such minutes shall notify ENGINEER within ten (10) days of receipt of minutes or otherwise be deemed to agree with the minutes as prepared.

1.04 PROPLEM OR WORK DEFICIENCY MEETING

A. A special meeting shall be held when and if a problem or deficiency is present or likely to occur. At a minimum, OWNER, ENGINEER, and CONTRACTOR shall attend the meeting, along with any affected subcontractors. The purpose of the meeting is to define and resolve the problem or work deficiency.

B. OWNER or ENGINEER shall document the meeting and shall transmit minutes to the meeting attendees and others as appropriate.

1.05 PROGRESS SCHEDULES

A. The progress schedule shall be furnished within fourteen (14) days prior to the Preconstruction Meeting and shall be updated and submitted to ENGINEER no less than two (2) days before each bi-weekly progress meeting throughout the duration of the Contract. Throughout the Project, CONTRACTOR shall furnish in duplicate, graphic type construction progress schedules, listing trade divisions and all parts of Work, and showing the planned starting date and completion time for each part of the Work.

1.06 ADMINISTRATION OF CONTRACT

A. CONTRACTOR shall follow the Drawings strictly and execute all Work in accordance therewith, and with the kind and quality of materials set forth in the Specifications, using the figured dimensions marked on the Drawings and not scaled measurements, unless approved by ENGINEER.

B. The Specifications and Drawings shall be coordinated, so that any Work shown on the Drawings and not mentioned in the Specifications, and vice-versa, shall be executed in the same manner as though mentioned in the Specifications and shown on the Drawings.

C. CONTRACTOR shall furnish and install such Work and material as may be proper and suitable preparation, basis, support, or finish for the Work which is shown or specified, whether or not the same is specifically mentioned in the Specifications or shown on the Drawings. CONTRACTOR shall be required to make plural and complete Work that is shown single or partially indicated to avoid needless repetition, for the sake of brevity, and for reasons of clarity. In all cases, the intent and meaning of the Drawings and Specifications, as defined herein, shall be followed.

1.07 REGULATORY MEETINGS AND APPROVALS

A. At a minimum, weekly regulatory meetings between OWNER and ELMIRA CITY SCHOOL DISTRICT will be facilitated by NYSDEC at the Site or other convenient location to discuss construction progress, technical issues and proposed changes to the IRM Work Plan and other issues. NYSDEC will notify OWNER, ENGINEER and

CONTRACTOR of scheduled meeting dates. More frequent meetings shall be held at the request of NYSDEC, OWNER or ELMIRA CITY SCHOOL DISTRICT.

B. NYSDEC approval shall be required for

1. modifications to the IRM Work Plan;
2. step-out or step-down of the excavation
3. import or reuse of fill material; and
4. backfilling.

PART 2 PRODUCTS

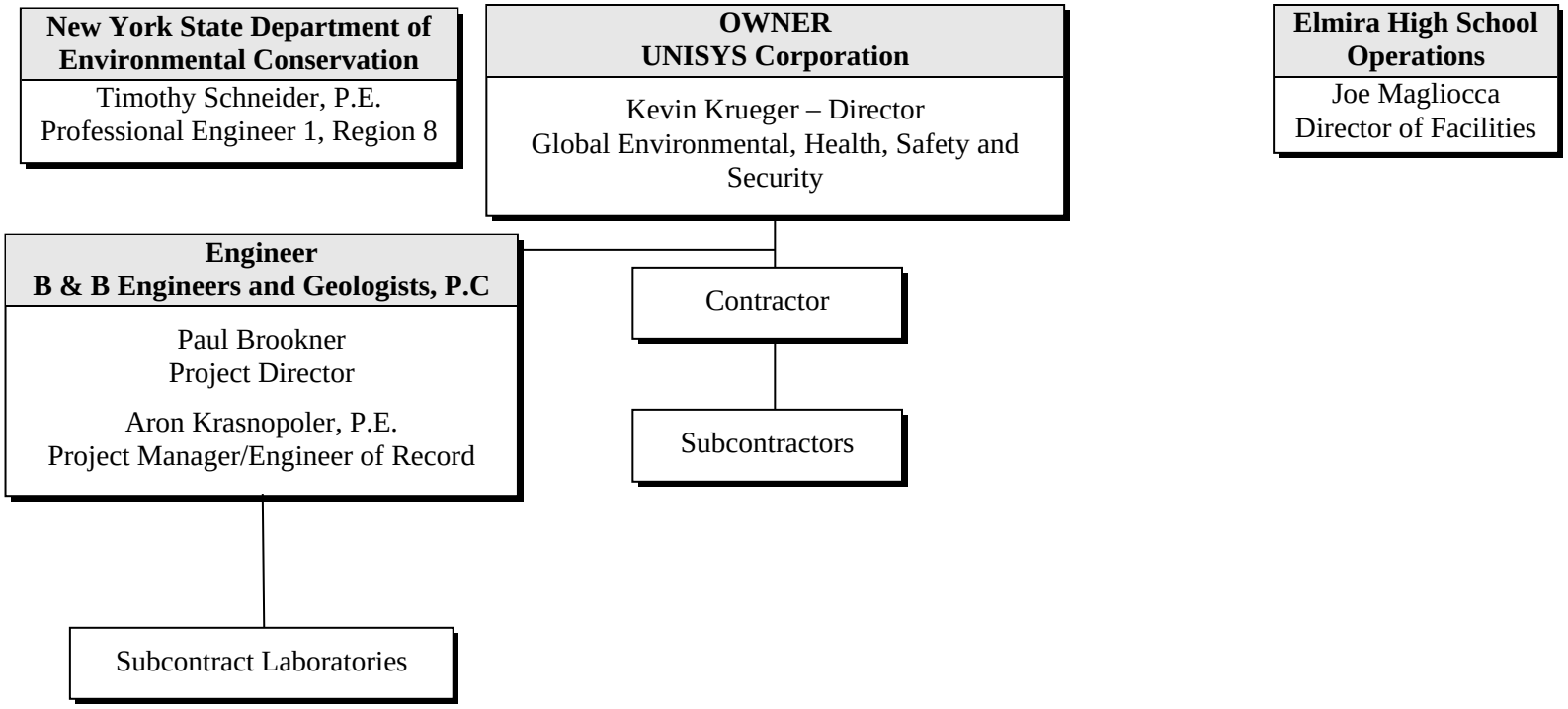
Not used.

PART 3 EXECUTION

Not used.

FIGURE 013100-1

ORGANIZATION CHART



*** END OF SECTION ***

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. CONTRACTOR shall submit Shop Drawings, Record Documents, Working Drawings, supplier's certificates of compliance, manufacturer's warranties, and manufacturer's operations and maintenance information, in accordance with the relevant Specification.

B. OWNER shall furnish to CONTRACTOR, OWNER's standard title block and border. CONTRACTOR shall be responsible for incorporating these items into the Record Drawings.

1.02 DEFINITIONS

A. Shop Drawings are all drawings, diagrams, illustrations, brochures, schedules, and other data prepared by CONTRACTOR, a subcontractor, manufacturer, fabricator, supplier, or distributor, that illustrates how specific portions of the Work shall be fabricated or installed.

B. Record Documents include drawings, diagrams, or illustrations that are prepared by CONTRACTOR during construction to illustrate the final work product to ENGINEER and OWNER. Record Documents include, but are not limited to: (i) As-built Surveys, which are drawings prepared by a Professional Land Surveyor licensed in the State of New York; and (ii) Working Drawings, which shall be used to communicate work progress or status while work is underway, but not yet complete.

C. Supplier's certifications of compliance are information provided by the material supplier to CONTRACTOR to document the material or equipment supplied meets the required physical properties and quality control.

D. Manufacturer's warranties are material and/or performance guarantees covering specific materials and/or assembled equipment provided by manufacturer to CONTRACTOR for a specified period.

E. Manufacturer's operations and maintenance information are drawings, diagrams, illustrations, schedules, and other data provided by manufacturer to CONTRACTOR

describing the proper assembly, use, shut-down, disassembly, and maintenance required for equipment provided by the manufacturer.

1.03 IDENTIFICATION

A. The Shop and Working Drawings shall have the following identification data contained thereon: (i) Project name; (ii) Contract Number; and (iii) description of the item.

B. The Shop and Working Drawings shall reference the particular Specification Section or Drawing sheet number. Each revised submission shall be numbered sequentially in order of the original submission. Resubmittals shall include the original submittal number and be lettered sequentially (i.e., A, B, …).

1.04 SUBMITTALS

A. At least fourteen (14) days prior to Preconstruction Meeting, CONTRACTOR shall submit to ENGINEER a list of all project submittals that will be made and the tentative dates that they will be submitted for review. ENGINEER and CONTRACTOR will use the submittal list throughout the Project to communicate submittal requirements and responsibilities.

B. CONTRACTOR shall maintain the submittal log in current and correct condition. CONTRACTOR shall provide ENGINEER with an updated submittal log with each submittal submission.

C. For required submittals, CONTRACTOR shall prepare submittals in electronic format and forward them electronically to ENGNEER for review and acceptance. If requested by ENGINEER or OWNER, CONTRACTOR shall provide printed submittals.

D. For required Record Drawings, CONTRACTOR shall submit six original documents and an electronic copy of the documents to ENGINEER.

E. For the convenience of CONTRACTOR, the following listing enumerates submittal requirements stipulated herein and specified within other Sections of the Specifications. The listing may not include certain submittal requirements found elsewhere in these Specifications. All such submittal requirements stipulated elsewhere in the Documents of this Solicitation must be complied with. Items to be submitted include, but are not necessarily limited to, the following:

Administrative

1. Health and Safety Plan (Section 01 35 29.13)
2. Baseline construction schedule (Section 01 31 00)
3. Performance and payment bonds (if required)
4. Certificates of insurance
5. Submittal log (Section 01 33 00)
6. Schedule of values (Section 01 29 73)
7. CQC Plan (Section 01 45 00)
8. Surveyor qualifications (Section 01 78 29)
9. Demolition Plan (Section 02 41 16)
10. Excavation Plan (Section 02 61 13)

Supplier's Certificates of Compliance

1. Seed and fertilizer mixtures (Section 31 25 00)
2. Paved surface inlet protection (Section 31 25 00)
3. Silt fence (Section 31 25 00)
4. Imported soils (Section 31 23 23)

1.05 SHOP DRAWINGS

A. Shop Drawings shall be submitted for all materials, equipment, accessories, and appurtenances as specified or shown on the Drawings prior to the fabrication, installation, or incorporation of the specified materials, equipment, accessories, and appurtenances in the Work.

B. All Shop Drawings shall be prepared to scale, shall be accurate and distinct, and shall give all dimensions required for the fabrication, installation, and incorporation of the specified items in the Work. Wherever the location of any of the materials, equipment, accessories, and appurtenances is not shown on the Drawings, CONTRACTOR shall furnish prints of Shop Drawings for the purpose of giving the exact location in plan and in elevation of the said materials, equipment, accessories, and appurtenances.

C. At the time of submission, CONTRACTOR shall call to OWNER's and ENGINEER's attention, in writing, any deviations that the Shop Drawings may have from the requirements of the Drawings and the Specifications.

1.06 FINAL RECORD DRAWINGS

A. The Final Record Drawings shall be prepared by CONTRACTOR and submitted to ENGINEER as required by the relevant Specification Sections. Each individual Record

Drawing shall be signed and sealed by a Professional Land Surveyor licensed in the State of New York.

B. Final Record Drawings shall conform to the standards and tolerances presented herein.

C. Final Record Drawings shall be provided in both paper and digital format. Paper copies shall be plotted on paper no larger than D-size drawing paper (i.e., 24 in. by 36 in.). The digital files shall be in the latest version of AutoCAD®. Digital files shall be furnished on a clearly labeled compact disk.

D. Final Record Drawings shall be prepared using OWNER's title block and border.

1.07 SUBMITTAL REVIEW

A. CONTRACTOR shall make diligent effort to provide complete, accurate, and responsive submittals requiring minimal or no revision. Contract Times shall not be extended as a result of late or rejected submittals or for time required by ENGINEER to review CONTRACTOR submittals.

B. ENGINEER shall review submittals within fourteen (14) days of receipt, with the exception of substitution and "or-equal" submittals, which shall have a twenty-one (21) day review time. Submittals returned to CONTRACTOR for resubmittal or rejection shall restart the submittal review period.

C. After review, ENGINEER shall mark submittals as either: (i) No Exceptions Taken; (ii) Approved as Noted; (iii) Resubmit; (iv) Rejected; or (v) Not Reviewed – For Information Only.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

*** END OF SECTION ***

SECTION 01 35 29.13

HEALTH AND SAFETY CRITERIA

PART 1 GENERAL

1.01 SUMMARY

A. Safety on the project site is of the utmost priority.

B. CONTRACTOR shall designate one person as the full-time Health and Safety Manager for the duration of the Project.

C. The Health and Safety Manager shall be responsible for: (i) maintaining health and safety records for the Project; (ii) coordinating periodic on-site health and safety meetings; and (iii) communicating safe work practices and control measures during work operations.

D. CONTRACTOR shall be responsible for general safety and security at the Site. The CONTRACTOR's responsibilities include, but are not limited to the safety of; (i) CONTRACTOR's employees, and subcontractors; (ii) visitors to the Site; and (iii) vehicular traffic within the Site, as well as traffic entering and exiting the Site.

1.02 SUBMITTALS

A. All persons assigned to the Project shall be properly trained in their specific work tasks. CONTRACTOR shall submit documentation verifying that the following training has been completed for all personnel associated with the Work:

1. 40 hours initial OSHA Hazardous Waste Site Worker training per 29 CFR 1910.120;
2. 8-hour annual refresher courses per 29 CFR 1910.120;
3. DOT hazardous materials regulation training and applicable job-specific DOT regulation training per 49 CFR 172, Subpart H with re-training every 3 years; and
4. Job-specific waste management training to eliminate RCRA violations per 40 CFR 165.16 with annual refreshers.

B. Completion of the Work includes a number of potential hazards, including, but not limited to, i) exposure to third-party truck and heavy equipment traversing the site; (ii) fall hazards; (iii) exposure to electrical hazards; (iv) exposure to biological hazards; (v) work within trenches; (vi) exposure to hazardous substances; and (vii) confined

space entry. CONTRACTOR shall prepare a site-specific Health and Safety Plan (HASP) for either the Project as a whole or will prepare multiple site-specific HASPs for each major component of the Work. The HASP shall be submitted to ENGINEER at least 14 days prior to the initiation of the Work addressed by the HASP. ENGINEER's review of CONTRACTOR's HASP shall be limited to verification that the various components of the Project are adequately addressed. The HASP shall conform to the requirements of 29 CFR 1910.20 and all applicable state, federal, local, and other health and safety requirements and safe construction practices not specifically identified in these requirements.

C. CONTRACTOR shall submit to ENGINEER, HASPs for all subcontractors or submit written documentation that said subcontractors shall follow CONTRACTOR's HASP. In any case, the HASP or the written documentation shall be submitted at least 14 days prior to the subcontractor's mobilization to the site.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01 GENERAL

A. CONTRACTOR shall hold daily health and safety meetings prior to each shift's work.

B. CONTRACTOR shall provide personnel with the proper training for each work assignment.

C. CONTRACTOR shall provide personnel with the proper personal protective equipment (PPE) for the duration of the project.

D. CONTRACTOR shall conduct inspections of the work areas to ensure operations are conducted in a safe manner.

3.02 DOCUMENTATION

A. CONTRACTOR shall maintain a health and safety log that shall be available and open for review to OWNER and ENGINEER.

B. CONTRACTOR shall document all reportable and non-reportable incidents to OWNER. Documentation shall include methods to prevent a reoccurrence of such an incident.

3.03 PREVENTION/MITIGATION

A. CONTRACTOR shall employ all means and methods necessary to ensure a safe work place for all personnel.

B. Health and safety audits by OWNER shall be performed periodically and without warning.

C. Mitigation of unsafe work conditions shall be enforced prior to continuing work.

D. OWNER and/or ENGINEER reserve the right to immediately stop work if unsafe work conditions are observed. CONTRACTOR shall not be reimbursed for costs related to work stoppage for reasons of unsafe work conditions.

E. Should a reportable accident or serious near-miss incident occur, OWNER reserves the right to require CONTRACTOR to suspend Work and perform additional safety training of field personnel. The length of the work suspension shall be no more than one day per incident.

*** END OF SECTION ***

SECTION 01 43 00

CONSTRUCTION QUALITY ASSURANCE

PART 1 GENERAL

1.01 SUMMARY

A. OWNER will retain ENGINEER to be responsible for construction quality assurance (CQA) testing and construction oversight for the Project. ENGINEER shall perform the quality assurance testing and construction oversight in accordance with the CQA Plan and the Specifications.

B. CQA testing procedures and frequencies for individual products, materials, and procedures are described in the Specifications.

C. All Work shall be monitored or tested in accordance with the requirements of the Specifications which are a part of the Documents of this Solicitation. CONTRACTOR shall be familiar with the contents of the Specifications.

D. When requested by CQA Consultant, CONTRACTOR shall provide equipment and labor required to access CQA testing locations and obtain samples.

E. CONTRACTOR shall take the quality assurance testing frequencies and procedures into account when planning the construction schedule. CONTRACTOR shall not claim delay of the Work as a result of quality assurance testing.

1.02 DEFINITIONS

A. Construction Quality Assurance (CQA) is a planned and systematic pattern of the means and actions designed to provide adequate confidence that items or services meet contractual and regulatory requirements, and will perform satisfactorily in service.

B. For this Project, CQA refers to means and actions employed by ENGINEER or CQA Consultant and testing laboratories to assure that the components of the design are produced and installed to conform to the requirements of the Drawings and Specifications.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

*** END OF SECTION ***

SECTION 01 45 00

CONSTRUCTION QUALITY CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. CONTRACTOR shall assign one person as the Quality Control Manager for the Project. The Quality Control Manager shall be responsible for preparing and submitting quality control certifications and test results to the ENGINEER, as applicable.

B. CONTRACTOR shall maintain an appropriate frequency of contact with ENGINEER to ensure that work quality is being maintained.

C. CONTRACTOR shall perform Construction Quality Control (CQC) field and laboratory testing as required by the Drawings and Specifications and as necessary to demonstrate compliance with the Specifications. If CONTRACTOR is unable to self-perform these tasks, CONTRACTOR shall retain a CQC Consultant to complete the required CQC field and laboratory testing.

1.02 DEFINITIONS

A. Construction Quality Control (CQC) are those actions that provide a means to measure and regulate the characteristics of an item or service to contractual and regulatory requirements.

B. CQC refers to those actions taken by the manufacturers, fabricators, installers, or CONTRACTOR to ensure that the materials and the workmanship meet the requirements of the Drawings and the Specifications.

1.03 SUBMITTALS

A. At least fourteen (14) day prior to the Preconstruction Meeting, CONTRACTOR shall prepare a CQC Plan for the Project. The Plan shall: (i) identify the Quality Control Manager; (ii) identify CONTRACTOR's CQC Consultant and/or testing laboratories, if required; and (iii) describe the proposed means and method for quality control to be implemented by CONTRACTOR. The CQC Consultant and/or laboratories shall be acceptable to both OWNER and ENGINEER.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01 GENERAL

A. CONTRACTOR shall be responsible for obtaining quality control documentation, or performing quality control tests as described in the Specifications.

B. Quality control testing procedures and frequencies for individual products and material are described in the Specifications.

3.02 SAMPLING AND TESTING

A. CONTRACTOR shall perform CQC soils testing during construction and shall promptly provide all test results to ENGINEER as required.

B. OWNER and ENGINEER have the right to perform CQA testing and to observe the work at any time. CONTRACTOR shall be responsible for cooperating with OWNER and ENGINEER during all CQC and CQA testing activities and in resolving all problems identified during testing. CONTRACTOR shall provide all equipment and labor required to access CQC and CQA testing locations. CONTRACTOR shall repair any damage to finished Work caused by CQC or CQA sampling or testing activities.

C. Material sampling and testing for soils, pipe, etc., is the responsibility of CONTRACTOR and shall be performed by the appropriate supplier or manufacturer. CONTRACTOR and its subcontractor(s) shall be responsible for cooperating with the CQA Consultant during all testing activities. CONTRACTOR and its subcontractor(s) shall provide equipment and labor required to access CQA testing locations. CONTRACTOR and its subcontractor(s) shall repair any damage to finished Work caused by sampling or testing activities.

D. CONTRACTOR shall be responsible for geometric control of the Work. Any surveying that may be performed by OWNER or ENGINEER does not relieve CONTRACTOR of its responsibility to layout, control, and document its Work. Any additional surveying that is required, if the initial CQC survey shows that the Work

has not yet been completed to the lines and grades shown on the Drawings, shall be performed at the expense of CONTRACTOR.

E. CONTRACTOR shall abide by all qualification requirements identified in these Specifications (for subcontractors, supplies, manufacturers, etc.).

F. The work shall, at all times, be subject to the observation of OWNER and/or ENGINEER. Observation or non-observation by OWNER and/or ENGINEER shall not relieve CONTRACTOR from his contractual obligation to furnish work and material as required, and properly complete the work in accordance with these Contract Documents. If OWNER or ENGINEER considers that the work is not being properly accomplished, he may condemn or reject all or any part or the work and any materials or equipment incorporated into it. If any material, equipment, or work is condemned or rejected by OWNER or ENGINEER, the CONTRACTOR shall bear all expenses for removal and proper replacement of such material, equipment, or work required to be provided by Contract Documents. The expense of replacing any work performed by Others that is adversely affected by removal and proper replacement of improper work performed by CONTRACTOR shall be borne by CONTRACTOR.

G. ENGINEER's presence does not include supervision or direction of the actual work by CONTRACTOR, his employees, or agents. Neither the presence of the ENGINEER nor any observations and testing performed by either party shall excuse CONTRACTOR from defects discovered in his work.

3.03 PROTECTION OF WORK

A. CONTRACTOR shall use all means necessary to protect all prior Work, including all materials and completed Work of other Sections.

B. In the event of damage to Work performed by CONTRACTOR prior to OWNER's acceptance of the Work, CONTRACTOR shall immediately make all repairs and replacements necessary, to the approval of ENGINEER and at no additional cost to OWNER.

3.04 SUBSTANDARD WORK OR MATERIALS

A. Any defective or substandard work or materials furnished by CONTRACTOR that is discovered before the final acceptance of the work, as established by the ENGINEER's Certificate of Substantial Completion, or during the subsequent guarantee period, shall be removed immediately by CONTRACTOR even if it had

been initially overlooked by the ENGINEER and recommended for payment. Satisfactory work or materials shall be substituted by CONTRACTOR for that rejected.

B. The ENGINEER may order tests on substandard or damaged work, equipment, or materials to determine the required functional capability for possible acceptance, if there is no other reason for rejection. The cost of such tests shall be borne by CONTRACTOR, and the nature, extent, and supervision of the tests will be as determined by the ENGINEER. If the results of the tests indicate that the required functional capability of the work, equipment, or material is impaired, consistent with the final general appearance of same, the work, equipment, or materials may be deemed substandard and shall be replaced by CONTRACTOR. The CONTRACTOR may elect to replace the substandard work or material in lieu of performing the tests.

*** END OF SECTION ***

SECTION 015000

TEMPORARY FACILITIES

PART 1 GENERAL

1.01 SCOPE

A. The CONTRACTOR shall furnish labor, tools, supervision, transportation, equipment and incidentals necessary for establishing temporary construction facilities.

B. The Work shall include, but not limited to, provision, maintenance, and removal of temporary on-site facilities necessary to perform the Work. The CONTRACTOR shall provide temporary construction necessary for the Work. Temporary facilities may include, but are not limited to, the following:

1. temporary field office;
2. temporary potable water service;
3. temporary sanitary and first aid facilities;
4. roads, access and parking areas;
5. protection of personnel, Work, and property;
6. temporary signs;
7. temporary pumping;
8. relocation or removals;
9. CONTRACTOR's use of premises
10. security; and
11. cleanup during construction.

1.02 SUBMITTALS

A. The CONTRACTOR shall submit plans and descriptions of the proposed facilities and proposed locations for the facilities to the OWNER and ENGINEER for approval at least 14 calendar days prior to scheduled installation.

1.03 HEALTH AND SAFETY REQUIREMENTS

A. The CONTRACTOR shall comply with environmental health and safety/training requirements in accordance with the approved Health and Safety Plan and Section 01 35 29.13

PART 2 PRODUCTS

2.01 FIELD OFFICE AND TELEPHONES

A. CONTRACTOR shall provide and maintain upon the premises, where shown on the Drawings, one field offices, one for its own use and for use by ENGINEER.

B. CONTRACTOR shall provide all offices with adequate heating, air conditioning, and lighting for the full duration of the Project. The offices shall have continuous power not subject to voltage fluctuations capable of damaging electrical equipment. CONTRACTOR shall maintain the offices in a clean condition.

C. CONTRACTOR's field office shall be equipped with an automatic feed copy machine. CONTRACTOR shall provide ENGINEER access to the facsimile and copy machines and shall pay the cost for the use of these machines. The copy machine shall be kept in operation for the full duration of the Project

D. CONTRACTOR shall provide sufficient office space for the CONTRACTOR's onsite management personnel, and ENGINEER. Office space provided for ENGINEER may include secure storage (i.e., lockable closet) for a nuclear moisture/density gauge as defined by the Nuclear Regulatory Commission and State of New York.

E. CONTRACTOR shall provide sufficient space for meetings to be conducted onsite.

2.02 TEMPORARY POTABLE WATER SERVICE

A. CONTRACTOR shall make arrangements for supply of potable water to the field office and shall pay for this service.

2.03 TEMPORARY SANITARY AND FIRST AID FACILITIES

A. CONTRACTOR shall provide temporary toilet accommodations and first aid supplies for workers on the Project, including all workers employed by SUBCONTRACTORS. Toilets shall be located in an area approved by OWNER and shall be maintained in a sanitary condition. Sanitary and first aid requirements include:

1. Provide at least one unit for every 20 persons, or fraction thereof.
2. Where water and sewer connections are not available, provide approved chemical or electric toilets.
3. Provide first aid stations at Work areas and in CONTRACTOR's field office.

4. Post telephone numbers of emergency services and hospitals at conspicuous locations at the Site.
5. Provide facilities and fixtures in compliance with OSHA regulations and all other applicable federal, state, and local laws and regulations.
6. Enforce proper use of sanitary facilities, including preventing the committing of nuisances in buildings on the site. Employees who violate this rule shall be discharged. Dispose of all wastes in conformance with applicable regulations.

2.04 TEMPORARY DECONTAMINATION PAD

A. The CONTRACTOR shall provide temporary decontamination pads in accordance with Section 02 51 00.

B. The temporary decontamination pads shall be such that they can be decontaminated and removed from the Site at the conclusion of the project.

C. The temporary decontamination pads shall be capable of containing wastewater from the decontamination of equipment until the water is transferred to the wastewater holding tanks or combined with other contact water.

PART 3 EXECUTION

3.01 ROADS, ACCESS AND PARKING AREAS

A. Use of existing site access roads will be permitted to CONTRACTOR's personnel who lawfully frequent the Project Site. CONTRACTOR's vehicles shall in all cases yield to waste hauling or other trucks or equipment when operating on Site access roads.

B. Existing roads shall be kept open by CONTRACTOR for the passage of vehicular traffic and pedestrians during the construction period unless otherwise approved by OWNER.

C. CONTRACTOR shall provide signs, signals, barricades, lights, and personnel to regulate all traffic and to warn vehicles and personnel of hazards. Routes of ingress and egress to the location of the Work shall be clearly marked by CONTRACTOR and approved by OWNER.

E. CONTRACTOR's personnel shall only use those parking areas designated for the Work. Storage of materials or parking of vehicles or equipment in areas not approved by OWNER is prohibited.

F. CONTRACTOR shall maintain storage and Work areas free of debris and obstructions.

3.02 PROTECTION OF PERSONNEL, WORK, AND PROPERTY

A. CONTRACTOR shall follow the requirements of its Health and Safety Plan, developed as required by Section 01 35 29.13.

B. CONTRACTOR shall protect all existing structures and utilities not marked for removal and shall make all necessary repairs at its own expense to same, where CONTRACTOR is required to disturb existing structures or utilities, or existing structures or utilities become damaged from activities associated with the new construction work.

C. CONTRACTOR shall provide equipment with proper safety devices as required by local, State, or Federal regulation.

D. CONTRACTOR shall provide all scaffolding, staging, platforms, temporary flooring, railing, stairs, shoring, bracing, sheet, and fall protection, etc. for safe and proper execution of the Work as required by local, State, or Federal laws and regulations for the protection of personnel and the public. Temporary safety measures shall be removed when the Work is completed.

E. CONTRACTOR shall provide all temporary barriers, covers, stabilization, etc. for protection of completed Work from accidental damage or degradation due to exposure to cold, heat, sunlight, wind, or precipitation. Temporary protective measures shall be removed when the Work is completed.

F. Any Work damaged by failure to provide the protection required shall be repaired or removed and replaced with new Work at CONTRACTOR's expense.

G. The location of any construction fencing, and areas for on-site storage of equipment and other facilities required by CONTRACTOR shall be subject to approval by OWNER and ENGINEER.

3.03 TEMPORARY PUMPING

A. Pursuant to Section 02 61 13, CONTRACTOR shall install and maintain all necessary temporary drainage structures and shall perform temporary pumping as necessary to keep excavations and other areas within the limits of disturbance free from standing water, regardless of the source of the water.

B. Temporary stormwater management or dewatering activities proposed by CONTRACTOR that are not described in the Drawings and Specifications shall be subject to ENGINEER's approval.

3.04 RELOCATION OR REMOVALS

A. Should a change in location of a temporary facility be necessary in order to continue progress of the Work, CONTRACTOR shall remove and relocate such items as directed without additional cost to OWNER.

B. CONTRACTOR shall remove temporary facilities when they are no longer required. Restore permanent facilities to their original or better condition.

3.05 CONTRACTOR'S USE OF PREMISES

A. The limits of the area allocated for use by CONTRACTOR for storage and execution of the Work is indicated on the Drawings. CONTRACTOR must obtain prior approval by OWNER for use of any other areas of the Site.

B. CONTRACTOR shall:

1. not unreasonably encumber the Site with materials or equipment;
2. not load or surcharge existing structures or other facilities with equipment or supplies having a weight that will endanger the integrity of the structures;
3. assume full responsibility for protection and safekeeping of CONTRACTOR's equipment, products or materials stored on the premises;
4. move any stored products or equipment that interferes with operations of OWNER or other CONTRACTORS;
5. coordinate and cooperate with other CONTRACTORS on Site;
6. not restrict access to the Site by others;
7. stockpile materials removed from excavations within the Work area as directed by OWNER.

3.06 SECURITY

A. CONTRACTOR shall protect completed Work, existing premises, and OWNER's operations against theft, vandalism, and unauthorized entry.

B. CONTRACTOR shall coordinate Project Site security with OWNER's existing security system.

C. CONTRACTOR shall restrict entrance of persons and vehicles into Project Site to only those working on the Project.

D. CONTRACTOR shall allow entrance only to authorized persons with proper identification.

3.07 CLEANUP DURING CONSTRUCTION

A. CONTRACTOR shall collect and dispose of garbage and other municipal solid waste associated with the field offices at a solid waste disposal facility approved by the OWNER and pay disposal costs.

B. Cleanup shall be performed daily to prevent accidents to personnel, protect all Work in place, and to effect completion of the Work in an orderly manner. Trash containers or roll-off boxes shall be emptied promptly after becoming full. All construction debris must be placed on trash barrels or roll-off containers at the end of the working day.

C. Construction cleanup shall consist of the removal of all mud, oil, grease, sand, gravel, dirt, trash, scrap, debris, and excess materials, from any floor space, ground, or walking surface, that may cause the tripping or sliding of Workers, ladders, or equipment. Particular attention shall be given to the removal of water from areas where electrical power tools are to be used.

D. Burning of waste material is prohibited.

3.08 REMOVAL

A. The CONTRACTOR's field office and temporary decontamination pad shall remain the property of the CONTRACTOR.

B. The CONTRACTOR's field office and temporary decontamination pad shall be removed from the Site within thirty (30) calendar days after receipt of written notice to remove from the OWNER.

C. The CONTRACTOR shall decontaminate the temporary decontamination pad in accordance with the manufacturer's recommendations, if applicable, and the requirements for equipment decontamination set forth in Section 02 51 00 prior to removing it from the Site.

*** END OF SECTION ***

SECTION 01 55 00

VEHICULAR ACCESS AND PARKING

PART 1 GENERAL

1.01 SUMMARY

A. This section includes descriptions for vehicular access and parking associated with the Work.

B. Vehicular access and parking items addressed in this section include:
   1. site entrance requirements;
   2. traffic patterns; and
   3. parking for construction equipment, site personnel, and visitors.

1.02 LOCATIONS

A. The locations for vehicular access and parking are shown on the Drawings.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01 GENERAL

A. CONTRACTOR shall be aware of the normal traffic volume and traffic patterns associated with the regular business activities of the school and immediately surrounding properties.

B. CONTRACTOR shall not interfere with any school activities or ongoing construction in the vicinity of the Work.

3.02 SITE ENTRANCE

A. CONTRACTOR shall construct and use the designated construction Site entrance for all vehicular ingress and egress to the Site.

3.03 TRAFFIC PATTERNS

A. CONTRACTOR shall follow the traffic patterns shown on the Drawings and shall adhere to one or two-way traffic flow as directed by OWNER.

C. CONTRACTOR shall provide personnel as necessary to control traffic flow on the portion of existing roadways that are shared with traffic associated with regular landfill operations.

D. CONTRACTOR shall provide signage and/or personnel to direct construction-related vehicles (e.g. deliveries) to the appropriate location at the Site.

3.04 PARKING

A. CONTRACTOR shall establish and maintain a parking area at the location shown on the Drawings.

B. CONTRACTOR shall provide ample parking for construction personnel and visitors.

*** END OF SECTION ***

SECTION 01 57 00

NUISANCE CONTROLS

PART 1 GENERAL

1.01 SCOPE

A. The CONTRACTOR shall furnish labor, tools, supervision, transportation, equipment and incidentals necessary for establishing proper nuisance controls.

B. The Work shall include, but not limited to, provision, maintenance, and removal of nuisance control. The CONTRACTOR shall provide nuisance control necessary for the Work. This may include, but is not limited to, the following:

1. noise control;
2. dust control;
3. fire prevention control;
4. pollution control; and
5. traffic control.

1.02 PERFORMANCE REQUIREMENTS

A. The intent of this Section is to document and formalize the CONTRACTOR's plan for managing, controlling nuisance issues and associated corrective measures during construction per the Contract Documents.

B. The CONTRACTOR shall provide advance notification to the community of any work activities that will generate nuisances in accordance with this specification. The minimum notification period is 48 hours before noisy work is scheduled. Longer notification periods of a week or more may apply to work likely to exceed the Local regulation noise or other levels or at the start of a project.

C. The point of compliance for fugitive dust, At the point of compliance, no visible dust is allowed. Complaints from the community will result in work stoppage until corrective measures are implemented to the satisfaction of the ENGINEER.

1.03 REFERENCES

A. 42 US Code, Chapter 65 Noise Control

B. Code of Ordinances of the City of Elmira, New York, Part II, Chapter 14, Article V – Noise Control Ordinance

C. Odor - TITLE 6. DEPARTMENT OF ENVIRONMENTAL CONSERVATION CHAPTER III. AIR RESOURCES SUBCHAPTER A. PREVENTION AND CONTROL OF AIR CONTAMINATION AND AIR POLLUTION - Air pollution is the presence of an air contaminant, including odor, "which unreasonably interferes with the comfortable enjoyment of life and property."

D. Fugitive Dust - Clean Air Act - Particulate Matter (PM) Air Quality Standards.

E. Vibration – New York State Department of Transportation Engineering Instruction 05-045.

1.04 SUBMITTALS

A. The CONTRACTOR shall submit plans and descriptions of the proposed nuisance control measures to the OWNER and ENGINEER for approval at least 14 calendar days prior to scheduled installation.

B. The CONTRACTOR shall develop a one-page summary of general practices for nuisance management and clearly display on site. Operating hours, delivery times, truck routes, and extra considerations for works during sensitive times could also be included in the summary.

C. Monitoring Reports

1.05 HEALTH AND SAFETY REQUIREMENTS

A. The CONTRACTOR shall comply with environmental health and safety/training requirements in accordance with the approved Health and Safety Plan and Section 013529.13.

PART 2 PRODUCTS – Not Used

PART 3 EXECUTION

3.01 COMMUNITY CONSULTATION

A. Community consultation is an essential part of managing nuisances associated with the construction project. All communications shall be coordinated with the ENGINEER and the DEPARTMENT.

B. CONTRACTOR shall:

1. establish good working relationships with community stakeholders such as nearby residents, the school district, and businesses;

2. give and receive feedback on construction activity and performance during a project; and

3. discuss the community's concerns and be proactive in complaint resolution.

3.02 COMPLAINT RESOLUTION

A. The CONTRACTOR shall immediately notify NYSDEC and the ENGINEER and respond respectfully to a complaint and implement all feasible and reasonable measures to address the issue.

B. It is particularly important to respond when the complaint refers to disturbed sleep and/or noise that is tonal (beeping, metal-on-metal), impulsive (hammering, pile driving) or low frequency (truck engine, heavy machinery).

C. The CONTRACTOR shall have a readily accessible contact point (mobile phone number of Community Liaison Person) for managing complaints. The CONTRACTOR shall call back as soon as possible, and then maintain communication about how the issue is to be resolved.

D. The complaint management process shall be well documented, with details about the following:

- the nuisance in question
- the time of the complaint and the person making it.
- the person dealing with the complaint and planned corrective action.
- how resolution of the complaint is to be communicated to the person who made the complaint, the community and the ENGINEER
- who shall be contacted if the complaint cannot be resolved, and
- the time taken for responses.

3.03 NOISE CONTROL

A. CONTRACTOR's vehicles and equipment shall be configured in a manner that minimizes noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards and in no case shall noise levels be permitted to interfere with the Work of OWNER or others.

B. CONTRACTROR shall not operate or permit the operation of any tools or equipment used in construction, drilling, or demolition work between the hours of 9:00 p.m. and 7:00 a.m. the following day on any day of the week.

3.04 DUST CONTROL

A. CONTRACTOR shall be responsible for controlling objectionable dust caused by operation of vehicles and equipment, by clearing or grubbing, or any other activities within the Work area in accordance with the Soil/Dust Control and Monitoring Plan. CONTRACTOR shall keep dust in the air to a minimum. CONTRACTOR shall control dust by spraying water as described on Page 2.25 of the *New York Standards and Specifications for Erosion and Sediment Control, dated November 2016.*

3.05 FIRE PREVENTION CONTROL

A. CONTRACTOR shall take all precautions necessary to prevent fires and explosions. CONTRACTOR is advised that flammable and explosive gases are naturally generated at landfills and may be present in and adjacent to the Work area.

B. Fuel for cutting and heating torches shall be contained in containers approved by the Underwriter's Laboratory.

C. CONTRACTOR shall at a minimum furnish and maintain a 20-pound maximum capacity dry chemical type fire extinguisher in the immediate vicinity of the Work when welding tools or torches of any type are in use.

3.06 POLLUTION CONTROL

A. CONTRACTOR shall provide methods, means and facilities required to prevent contamination of soil, water, or atmosphere by discharges from construction operations.

B. CONTRACTOR shall provide the methods, means and facilities required to prevent contamination of soil, water, or atmosphere from discharges of waste, leachate resulting from damage to existing structures and/or equipment by CONTRACTOR.

C. CONTRACTOR's equipment used during construction shall conform to current federal, state, and local laws and regulations regarding pollution control.

3.07 TRAFFIC CONTROL

A. All trucks bringing to or removing earth, loose materials, or debris from the Project Site shall be loaded in a manner to prevent dropping of materials on streets and shall be covered by a tarp.

B. CONTRACTOR shall maintain a crew at all points where trucks leave the Project Site and enter adjacent paved streets, to prevent any mud from being carried onto such adjacent paved streets.

C. Earth, loose materials, or debris deposited on the streets due to trucking activities shall be removed daily, regardless of the source of the debris.

*** END OF SECTION ***

SECTION 01 65 00

PRODUCT DELIVERY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Delivery of products whether OWNER or CONTRACTOR supplied, shall be clearly labeled for this Project.

B. Product deliveries shall be scheduled with ENGINEER.

C. Products shall be stored in designated areas only.

D. CONTRACTOR shall provide signage and/or personnel to direct product deliveries to the appropriate location at the Site.

E. CONTRACTOR is responsible for proper unloading and storage of materials.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

*** END OF SECTION ***

SECTION 01 77 00

PROJECT CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 CLOSEOUT PROCEDURES

A. Project closeout shall consist of the CONTRACTOR reaching Substantial Completion, followed by Final Completion as defined in Parts 1.02 and 1.03 of this Section.

B. When CONTRACTOR believes Substantial Completion has been reached, CONTRACTOR shall submit written notice that Contract Documents have been reviewed, Work has been inspected, and that Work is complete, in accordance with Contract Documents, and ready for ENGINEER's and OWNER's final inspection.

C. Upon receipt of CONTRACTOR's notice of Substantial Completion, ENGINEER shall inspect the Work. Within 14 days, ENGINEER shall notify OWNER that either (i) ENGINEER concurs that Substantial Completion has been reached; or (ii) the status of the Work does not qualify as Substantially Complete based on deficiencies noted.

D. If ENGINEER agrees that Substantial Completion has been reached, a "punch list" identifying outstanding minor work items shall be provided to CONTRACTOR. CONTRACTOR shall address the items on the punch list to the satisfaction of ENGINEER and OWNER. Thereafter, ENGINEER shall issue notice of Final Completion to CONTRACTOR.

E. ENGINEER's opinion regarding the status of the Work with regard to Substantial Completion and Final Completion shall be final.

1.02 SUBSTANTIAL COMPLETION

A. The Work will be considered Substantially Complete based on the requirements of Part 1.04A. of Specification Section 01 10 00.

1.03 FINAL COMPLETION

A. Following Substantial Completion, CONTRACTOR shall remove its equipment, signs, facilities, construction materials, and trash, and shall perform any other reasonable clean-up activities requested by OWNER and ENGINEER. All disturbed

areas shall be revegetated or otherwise put into a condition satisfactory to OWNER and ENGINEER.

B. CONTRACTOR shall provide signed and sealed Final Record Documents, all submittals required by these Specifications, and any other submittals required by governing or other authorities to ENGINEER and OWNER.

C. Final Completion shall be reached when: (1) all required Final Record Drawings for the Project have been submitted, and ENGINEER has confirmed that the Final Record Drawings submitted are acceptable and comply with project requirements; (2) all CQC testing required for the Project has been completed and acceptable results have been obtained; and (3) ENGINEER has completed final inspection of the Work and CONTRACTOR has completed all noted deficiencies to the satisfaction of OWNER and ENGINEER.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

*** END OF SECTION ***

SECTION 01 78 29

SURVEY REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. CONTRACTOR shall employ a licensed Surveyor to provide field survey control for and prepare as-built Record Drawings of CONTRACTOR's construction activities.

B. CONTRACTOR's Surveyor shall work with ENGINEER to ensure that the Work is completed as required on the Drawings and in these Specifications.

C. CONTRACTOR shall comply with the requirements of this Section regarding field surveying.

1.02 QUALIFICATIONS OF SURVEYOR

A. CONTRACTOR's Surveyor shall meet the following minimum qualifications:
   1. is a registered professional surveyor in the State of New York;
   2. have an established office in the state of New York which provides land surveying services; and
   3. is acceptable to ENGINEER and OWNER.

1.03 SUBMITTALS

A. At least fourteen (14) days prior to the Preconstruction Meeting, CONTRACTOR shall submit to ENGINEER the name, contact information, and qualifications of the Surveyor.

B. Upon request, submit to ENGINEER the project staffing, scheduling, and the type of equipment the Surveyor intends to use in the field and in the office (i.e., computer software) to complete the Project.

C. On request, submit to ENGINEER, documentation verifying accuracy of survey work.

1.04 PROJECT RECORD DRAWINGS

A. CONTRACTOR or CONTRACTOR's Surveyor shall maintain a complete and accurate log of control and survey work as work progresses.

B. CONTRACTOR shall keep and update as-built drawings of all Work consistent with the requirements of Part 3.07.F of this Section. CONTRACTOR shall allow ENGINEER to routinely inspect the interim record drawings. At the end of the Project, CONTRACTOR shall submit a complete set of Record Drawings and the surveyor's log of control and survey work to ENGINEER for its use in preparing the final report of construction activities.

1.05 EXAMINATION

A. CONTRACTOR or CONTRACTOR's Surveyor shall verify locations of survey control points prior to starting Work.

B. CONTRACTOR shall promptly notify OWNER of any discrepancies discovered.

1.06 SURVEY REFERENCE POINTS

A. CONTRACTOR shall protect preexisting survey control and reference points.

B. The control datum for survey is that indicated on Drawings.

C. CONTRACTOR shall protect survey control monuments during construction.

D. CONTRACTOR shall promptly report to OWNER the loss or disturbance of any monument or relocation required because of changes in grades or other reasons.

E. CONTRACTOR's Surveyor shall replace disturbed monuments based on original survey control. Changes shall not be made without prior written notice to OWNER and ENGINEER.

PART 2 PRODUCTS

2.01 MATERIALS AND SURVEY EQUIPMENT

A. Provide materials and survey equipment as necessary to properly perform the surveys, including, but not limited to, instruments, tapes, rods, measures, mounts, and tripods, stakes and hubs, nails, ribbons, reference markers.

B. The survey instruments used for this work shall be precise and accurate to meet the needs of the work described. All survey instruments should be capable of reading to a precision of 0.001 ft and with a setting accuracy of ± 0.8 seconds.

PART 3 EXECUTION

3.01 GENERAL

C. Measurement and payment surveys for elevation and for horizontal distances shall be to the nearest 0.1 ft ± 0.05 ft.

D. CONTRACTOR shall be responsible for coordination of all as-built surveying. Should as-built surveying data not meet the requirements of this Specification, CONTRACTOR shall be solely responsible for all project delays and costs associated with uncovering completed Work in order to obtain necessary as-built data.

E. Perform construction layout surveys in advance of scheduled construction activities. At completion of a survey, provide a copy of the field notes, drawings, or sketches to the DESIGN ENGINEER for review. The CONTRACTOR shall allow the CQA CONSULTANT and/or DESIGN ENGINEER three business days for review. The CONTRACTOR is responsible for rework and/or construction delays caused by survey or staking errors.

F. Set grade stakes required for construction activities as the work progresses. Grade stakes shall be set regardless of whether GPS equipped grading equipment is used. The grade stakes are required to allow ENGINEER to readily field verify elevations and grades.

3.02 SPECIFIC FIELD SURVEY REQUIREMENTS

A. CONTRACTOR or CONTRACTOR's Surveyor shall provide field survey services to perform CONTRACTOR's work using accepted engineering survey practices.

B. CONTRACTOR's Surveyor shall provide all materials required to establish and maintain benchmarks, control points, grade stakes, and other necessary items.

C. All topographic surveying shall have a horizontal scale of 1 in. = 50 ft. with 1-ft. contour intervals. Elevations shall be taken at a maximum 50-ft grid to confirm as-built grades.

D. To prepare Record Drawings, CONTRACTOR's Surveyor shall establish the as-built elevations, lines and levels for the features of the construction project including, but not limited to:

1. Original ground surface topography of construction and stockpile areas before demolition, earth work or alterations to utilities. Topographic survey of the Work area shall extend at least 10 ft. in all directions beyond the limits of grading. This survey shall serve as the baseline for excavation and structural fill volume computations.

2. Ground surface topography after excavations have been completed and prior to backfilling. Topographic survey of the Work area shall extend at least 10 ft. in all directions beyond the limits of grading.

3. Location, type, and dimensions of existing underground utilities prior to demolition. Gravity sewer piping shall also indicate slope prior to demolition.

4. Location and elevation of sidewall and bottom confirmation and documentation samples.

5. Location, type and dimensions of subsurface structures encountered during excavation other than underground utilities.

6. Limits of pavement removed during construction.

7. Location and type of demarcation layers placed in the excavation prior to backfill.

8. Location, type, and dimension of restored underground utilities. Gravity sewer piping shall provide slope based on elevations taken no more than 25 feet on center along the pipe.

9. Location, type and dimension of support of excavation left in place with the agreement of the OWNER.

10. Ground surface topography of construction areas, stockpile areas and temporary haul roads after such temporary facilities have been removed and those areas restored to existing grades with fill and topsoil. Topographic survey of the Work area shall extend at least 10 ft. in all directions beyond the limits of grading.

F. CONTRACTOR shall be responsible for coordination of all as-built surveying. Should as-built surveying data not meet the requirements of this Specification, CONTRACTOR shall be solely responsible for all project delays and costs associated with uncovering completed Work in order to obtain necessary as-built data.

3.03 SURVEY FOR QUANTITY ESTIMATES

A. CONTRACTOR is responsible to obtain and submit all survey documentation required for verification of quantities. ENGINEER shall verify measurements and quantities.

B. Should ENGINEER determine that insufficient survey data has been submitted to accurately verify quantities, ENGINEER shall notify CONTRACTOR of deficiencies. CONTRACTOR shall address identified deficiencies prior to further review of quantities.

C. In the event that survey data provided by CONTRACTOR is not sufficient to determine actual completed quantity and the status of Work prevents additional data from being obtained, ENGINEER shall attempt to reasonably estimate the completed quantity based on available information, ENGINEER's estimate shall be final.

D. OWNER shall have the right to retain a third-party Surveyor licensed in the State of New York to review field survey data and/or resurvey portions of the Work to check as-built quantity estimates. In the case of conflict between the two surveys, ENGINEER shall review the two surveys and determine the final pay quantity.

3.04 TOLERANCES

A. All constructed grades and elevations shall meet the following survey tolerances:

1. Length, thickness, or distance: ±0.1 ft
2. Length, thickness, or distance with a specified minimum: 0 to +0.2 ft
3. Vertical elevation: ±0.1 ft
4. Slope angles: ± 5 percent of specified slope (e.g. 3H:1V = 33.3 percent ±1.7 percent)
5. Slope angles with a specified minimum: 0 to + 10 percent of specified slope
6. Horizontal coordinates: ±0.1 ft

*** END OF SECTION ***

SECTION 02 22 13

VIBRATION MONITORING (NON-BLASTING)

PART 1 GENERAL

1.01 WORK INCLUDED

A. This work shall consist of: (i) performing vibration monitoring of background and construction activities when construction activities adjacent to existing buildings make monitoring prudent; (ii) and preparing daily and summary reports of vibration readings. Vibration monitoring shall be performed for the entire duration of the temporary excavation support installation.

1.02 REFERENCES

Siskind, D. E. et al., (1990). "Structure Response and Damage Produced by Ground Vibration from Surface Mine Blasting." United States Department of the Interior, Bureau of Mines.

1.03 SUBMITTALS

A. At least 14 days prior to performing work adjacent to the Elmira High School, CONTRACTOR shall submit a Vibration Monitoring Plan to ENGINEER for approval.

B. The Vibration Monitoring Plan shall include all necessary information to outline the recording collection. The Vibration Monitoring Plan shall include, but not be limited to, the following:

1. Name of vibration monitoring specialist including documentation of prior experience of at least two projects in the past five years where the vibration monitoring was performed recording maximum peak particle velocities (PPVs) as required in this Section. Experience shall include the name and location of the project as well as contact information for the Owner or Engineer on the project.

2. Information on the required three-component seismograph, capable of measuring particle velocity data in three mutually perpendicular directions, including: the manufacturer's name, model number, and documentation of factory calibration

performed within the last 12 months.

3. Scheduled start date and length of construction operations which require vibration monitoring.

4. Limits of vibration monitoring work.

5. The location of adjacent structures to be monitored and maximum allowable PPVs as indicated in the contract documents.

6. The location of seismographs placement and appropriate details for anchoring the geophones.

7. The procedure for tracking PPV throughout pile driving operations (e.g., pile tip vs. vibrations may be correlated through time of day). A record of the time of day at each depth interval, included on the pile driving records, will be required to correlate to a time-based readout of PPV.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 EQUIPMENT

A. CONTRACTOR shall provide the following equipment for vibration monitoring:

1. Three-component seismograph, capable of measuring particle velocity data in three mutually perpendicular directions. Factory calibration is required throughout the duration of the vibration monitoring.

3.02 VIBRATION MONITORING

A. Perform continuous vibration monitoring during construction operations when construction activities adjacent to existing buildings require monitoring. CONTRACTOR shall perform the work in a manner that will limit construction vibration at the specified locations to within the limits set by the United States Bureau of Mines (USBM) Vibration Criteria as shown on Figure 022213-1. The vibration criteria shall be limited by the “threshold damage” limit from Figure 022213-1 defined

as cosmetic damage (i.e., cracking) within the structure, categorized by both frequency ranges and particle velocity.

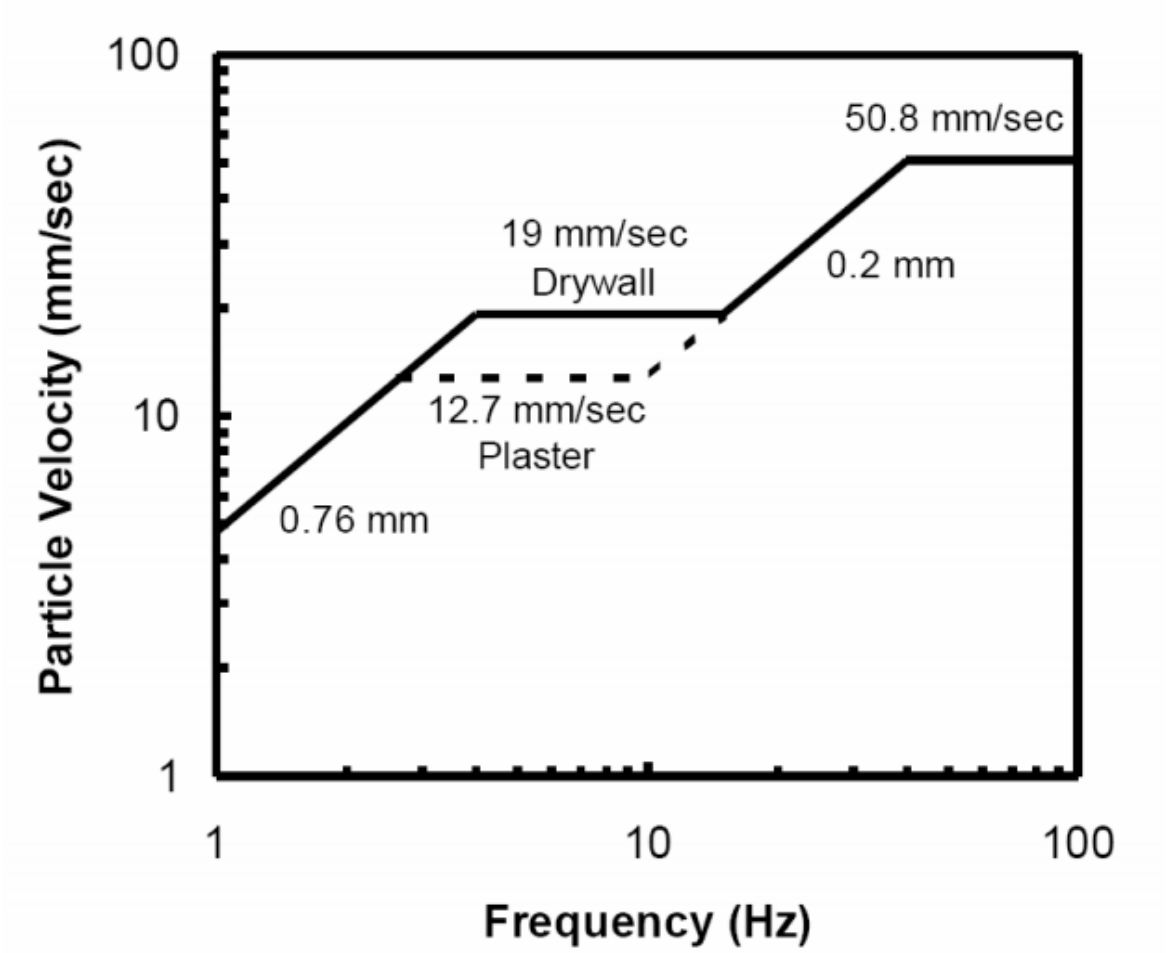


Figure 022213-1. Threshold Limit Particle Velocity Associated with Cosmetic Damage, USBM Vibration Criteria (after Siskind et al., 1980)

B. CONTRACTOR shall inform ENGINEER immediately each time measured particle velocities exceed 85% of the allowable PPV. CONTRACTOR shall make equipment or procedural modifications as required to avoid exceeding the allowable vibration intensity.

C. If the measured velocities exceed the maximum allowable PPVs, CONTRACTOR shall stop operations immediately and revise equipment and procedures to reduce

vibrations to allowable levels.

D. Should seismograph operation be interrupted for any reason, CONTRACTOR shall stop operations immediately. If the seismographs show any indication of damage or vandalism, the seismographs shall be immediately recalibrated and/or replaced.

E. CONTRACTOR shall be in communication with the vibration monitoring specialist to verify the data recorded during the entire vibration monitoring and at all locations.

F. CONTRACTOR shall provide ENGINEER with the results of daily vibration monitoring within one work day after readings are taken. Upon completion of the construction operations for those locations requiring vibration monitoring, the daily submittals shall be compiled into a final report.

*** END OF SECTION ***

SECTION 022500

BUILDING CONDITION SURVEY

PART 1 GENERAL

1.01 WORK INCLUDED

A. This work shall consist of performing a building condition survey for the "A" Wing of the Elmira High School prior to the commencement of work, after completion of work, and at locations and times during construction as directed by the ENGINEER.

1.02 SUBMITTALS

A. CONTRACTOR shall submit documentation for each building condition survey to ENGINEER within two weeks of the completion of each survey.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 EQUIPMENT

A. The CONTRACTOR shall provide a digital camera capable of taking clear and accurate photographs in outdoor and indoor conditions. The camera shall be capable of superimposing the date and time on all images.

B. Should field conditions warrant, videotape of conditions shall be performed.

3.02 BUILDING CONDITION SURVEY

A. The CONTRACTOR shall provide the following, at a minimum, for each building condition survey:

1. Photographic documentation of the interior and exterior condition of the "A" Wing of Elmira High School.

2. Extent and location of signs of building distress in the "A" Wing of Elmira High School, such as cracks, spalling, signs of settlement, flooding, leaking, etc.

B. ENGINEER may accompany CONTRACTOR on each building condition survey for verification of the recorded data.

C. A building condition survey shall be performed before and after construction, and during constructed as requested by the ENGINEER.

*** END OF SECTION ***

SECTION 02 41 16

DEMOLITION OF STRUCTURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Demolition and removal of Elmira High School (EHS) Football Field Complex (FFC) home grandstands for salvage and recycling where possible.

2. Demolition and removal of EHS FFC bathrooms and press box for disposal and salvage and recycling where possible.

1.02 DEFINITIONS

A. Recycle: the process of collecting, sorting, sizing, cleansing, treating, and reconstituting materials that would otherwise become solid waste, and returning them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.

B. Reuse: further or repeated use of demolition debris.

C. Salvage: Controlled removal of disassembled building materials for the purpose of reuse or recycling.

1.03 SUBMITTALS

A. Submit Work Plan prior to start of work. The Work Plan shall detail locations of proposed dust- and noise-control. Also discuss means of protection for items in path of material removal.

B. Schedule of Demolition Activities, include the following:

1. Detailed sequence of demolition and removal work, with starting and ending dates for each activity.

2. Anticipated transportation and disposal requirements.

C. Inventory: After demolition is complete, submit a list of items that have been salvaged, recycled, and disposed of documentation (receipts/scale tickets/waybills) showing the quantities.

D. Demolition Photographic Documentation: Document general condition of materials to be removed prior to removal.

E. Daily Progress Reports: During demolition activities reports shall be submitted daily, at the end of each work day, to the Construction Manager. The report shall include a summary of onsite personnel, equipment utilized, equipment and facilities maintenance (including fueling and PM services when required), materials and supplies, completed daily activities, estimated volumes of stockpiles and containers, stockpile and container identification, sampling/monitoring data, and photographs of each day's progress.

1.04 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Contractor and subcontractors must be experienced and specialize in performing the Work of this Section with documented experience in similar types of demolition work.

B. Regulatory Requirements: Comply with demolition and material storage regulations of authorities having jurisdiction.

1. Comply with noise and dust regulations of authorities having jurisdiction.

A. Pre-Construction Meeting: Before the Work of this Section is scheduled to commence, a meeting will be held by the Construction Manager at the Site. The Contractor personnel, including the Project Manager, Field Supervisor, health and safety officers, and personnel expected to complete the work, and subcontractors, if applicable, shall attend.

The meeting will be held at the Elmira City School District Maintenance office located at 733 Benjamin Street, Elmira, New York followed by a site walk at the property.

The meeting will be held for the purpose of reviewing methods and procedures related to demolition including, but not limited to, the following:

1. Health and safety.
2. Site background and constituents of concern (including site characterization data).
3. Inspect and discuss condition of buildings to be demolished.

4. Review and finalize demolition schedule and verify availability of materials, personnel, equipment, and facilities needed to make progress and avoid delays. Discuss critical work sequencing.
5. Discuss recycling goals and transportation and disposal needs and coordination.
6. Review use of project site, staging and storage areas, security, and housekeeping.
7. Stormwater protection and site monitoring requirements.

1.05 PROJECT CONDITIONS

A. Hazardous Materials: The primary constituents of concern in Site soils include polychlorinated biphenyls (PCBs) and metals. A hazardous materials survey of the structures to be demolished will be completed by the CONTRACTOR prior to demolition.

1.06 WORK PLAN

A. Material Identification: Indicate anticipated types and quantities of materials to be salvaged, recycled, and disposed of. Indicate quantities by weight or volume but use same units of measure throughout. Quantities provided in Project Documents are estimates for reference only and not to be used for bidding purposes. Until the results from the aforementioned Hazardous Materials survey are provided, CONTRACTOR shall assume that hazardous material are not present.

B. Procedure: Describe demolition methodology, sequencing, and materials handling, and removal procedures.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 UTILITY SERVICES

A. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services. Utility services include, but may not be limited to, electric and water utilities, and sanitary sewers.

B. Capping requirements:

1. Sanitary sewer: A non-shrink concrete grout mixture would be injected into the two 4-inch laterals coming from the bathroom structures into the manhole located east of the women's bathroom. Approximately 2 feet of concrete grout will be injected from the manhole into each line. The concrete material will be held in place with a retaining plug to ensure the concrete sets in place. The manhole will not be plugged or altered and the line running to the north will remain intact and unplugged for future discharges to the sewer.

3.02 PREPARATION

A. Site Access and Temporary Controls: Conduct demolition operations to ensure minimum interference with parking areas, roads, streets, walks, walkways, and other adjacent occupied and used facilities. If hazardous materials are determined to be present, preparation activities will include proper access restrictions and controls prior to their removal.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to workers and damage to salvageable materials.

1. If hazardous materials are determined to be present, preparation activities will include proper access restrictions and controls prior to their removal.

2. Provide protection to ensure safe passage of workers around demolition area.

3. Provide weather protection for all salvage materials before, during, and after demolition.

3.03 DEMOLITION

A. General: Demolish and remove existing materials identified in the Demolition Plan. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with demolition systematically, from higher to lower level. Complete demolition operations above each floor or tier before disturbing supporting members on the next lower level.

2. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of

hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices and fire-watch personnel during flame-cutting operations.

3. Maintain adequate ventilation when using cutting torches.

4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of offsite in accordance with all federal, state, and local regulations.

5. Remove structural framing members in such a way as to maintain their highest value.

6. Locate demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

7. Notify Construction Manager when demolished items and materials are ready for disposal to ensure prompt removal of materials from the Site.

B. Salvaged Items:

1. Sort and organize salvaged materials as they are removed from the structure.

2. Size, pack, crate, or band materials to keep them contained and organized.

3. Store items in a secure and weather protected area until removed from the Site.

4. Coordinate with the Construction Manager to transport items offsite in a timely manner.

3.04 DISPOSAL OF DEMOLISHED MATERIALS

A. General: CONTRACTOR is responsible for disposal of materials.

1. If hazardous materials are determined to be present, disposal of demolished materials will reflect such conditions.

2. Do not allow demolished materials to accumulate on site. Coordinate with the Construction Manager in a timely manner to remove and transport debris from the Site.

3. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

3.05 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before demolition operations began.

***** END OF SECTION *****

SECTION 02 51 00

EQUIPMENT DECONTAMINATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Decontamination of equipment and vehicles that have or are suspected to have contacted impacted soils shall be performed. Decontamination equipment shall include but not be limited to the following: tanks, pumps, compressors, heaters, hose nozzles, reels, piping and other components and appurtenances required to provide and operate a high pressure hot and cold wash. Temporary decontamination pads shall be constructed as shown on the Drawings. All equipment and vehicles entering or leaving site will be decontaminated prior to leaving the site.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Pressure Washer. A pressure washer capable of hot water washing shall be provided along with ancillary hoses, fittings, and other necessary items.

B. Temporary Equipment Decontamination Pad. A temporary decontamination pad shall be provided to handle the decontamination of equipment as shown on the Drawings. This temporary decontamination pad shall have sufficient strength and size to accommodate any piece of equipment that might contact impacted soils at the Site, a sump or other means of containing and collecting the generated wastewater, and provisions to minimize overspray and prevent additional impacts at the Site.

PART 3 EXECUTION

3.01 CONTRACTOR'S RESPONSIBILITY

A. The CONTRACTOR shall be responsible for installing decontamination equipment and for maintaining the equipment in safe and working condition.

3.02 DECONTAMINATION

A. The CONTRACTOR shall perform decontamination of any trucks or equipment contacting or suspected of contacting impacted soils prior to traversing areas not

specifically designated as impacted areas, prior to handling clean soils, and prior to departure from the Site.

B. Trucks and equipment transporting impacted soils shall be loaded in a manner that prevents contact with impacted soils outside of the secured bed of the truck. This includes the use of plastic sheeting or equivalent materials to prevent spilled soils from contacting the sides of the truck and the use of a clean physical barrier (plastic sheeting, etc.) to prevent truck tires from traveling directly on impacted soils. Trucks and equipment that comes into contact with impacted soils outside of the secured bed shall be decontaminated prior to leaving the site in accordance with this Section.

C. All equipment used within the limits of the impacted soils excavation by the CONTRACTOR shall be decontaminated prior to demobilizing from the Site.

D. Decontamination shall, at a minimum, consist of:

1. Pressure washing the equipment to removal all visible soils;

2. Allowing the equipment to air dry, as practical; and

3. Storing the equipment following decontamination in a manner such that the equipment does not get re-contaminated.

3.03 CLEAN UP

A. Following the completion of decontamination activities, CONTRACTOR shall remove and dispose all materials used to construct the decontamination pad.

*** END OF SECTION ***

SECTION 02 61 13

EXCAVATION, REMOVAL, AND HANDLING OF PCB-IMPACTED SOILS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Soil contaminants encountered during excavation will consist primarily of polychlorinated biphenyls (PCBs) but may also include metals and semi-volatile organic compounds (SVOCs).

B. This Section includes general procedures that shall be followed for excavating, handling, and placing PCB-impacted soils. The CONTRACTOR shall provide all labor, materials, equipment, and supplies required for:

1. excavation of PCB-impacted soils;
2. drying or dewatering of wet PCB-impacted soils to achieve desired moisture content for transportation;
3. temporary stockpiling PCB-impacted soils;
4. transportation and disposal of PCB-impacted soils;
5. preparation of the excavation for backfilling; and
6. placement and compaction of PCB-impacted soils that can be returned to the excavation.

C. The horizontal and vertical limits of materials requiring excavation and off-site disposal are shown on the Drawings dated January 2020 and subsequent revisions. Excavated material not requiring off-site disposal shall be temporarily stockpiled and later backfilled within the excavation area in accordance with Specification 31 23 23. Material to be excavated and disposal off-site shall be segregated and disposed of as outlined in this Specification.

D. Laboratory sampling results shall be used to divide materials proposed for disposal into disposal categories. The categories shall depend on whether the soil is hazardous or non-hazardous in terms of TSCA and RCRA regulations, and the requirements of the receiving disposal facility. Materials with total PCBs $\geq$ 50 milligrams per kilogram (mg/kg) are considered hazardous by NYSDEC. Materials with total PCBs > 3.2 mg/kg and < 50 mg/kg from near the water table (i.e. below 14 feet below ground surface) are to be considered PCB remediation waste in terms of TSCA regulations.

E. The CONTRACTOR is responsible for minimizing the potential for surface water to come into contact with disturbed PCB-impacted soils, and for minimizing surface water accumulation, controlling run on, and preventing runoff.

1.02 ENVIRONMENTAL SAFEGUARDS

A. The CONTRACTOR shall control dust in accordance with Section 015000 and the Excavation Work Plan.

B. The CONTRACTOR shall perform grading and provide erosion and sediment controls sufficient to control runoff from and runon to excavated areas.

C. Trucks and equipment transporting PCB-impacted soils shall be loaded in a manner that prevents contact with PCB-impacted soils outside of the secured bed of the truck. This includes the use of plastic sheeting or equivalent materials to prevent spilled soils from contacting the sides of the truck and the use of a clean physical barrier (plastic sheeting, etc.) to prevent truck tires from traveling directly on PCB-impacted soils. Trucks and equipment that come into contact with PCB-impacted soils outside of the secured bed shall be decontaminated prior to leaving the site in accordance with the requirements in Section 02 51 00 and before demobilization.

D. Trucks transporting PCB-impacted soils for off-site disposal as hazardous waste shall include a plastic bed liner. Trucks hauling materials to and from stockpile areas may omit the plastic bed liner so long as the truck gate is secured with no risk of spillage.

1.03 SUBMITTALS

A. The CONTRACTOR shall prepare an Excavation Work Plan that describes in detail the equipment, facilities, procedures, and sequence of events associated with the excavation, dewatering, transportation, and handling of PCB-impacted soils, staging areas and methods, surface water control mechanisms, and placement and compaction of PCB-impacted soils within the staging and stockpile areas. Proposed location for the temporary decontamination facility, described in Section 02 51 00, shall be included in the Excavation Work Plan. The Excavation Work Plan shall be in conformance with the NYSDEC approved Interim Remedial Measure Work Plan and amendments. The CONTRACTOR shall not proceed with excavation of PCB-impacted soils until the Excavation Work Plan has been reviewed and approved.

B. The Contractor shall submit the qualifications of the designated “competent person” to be on-site during excavations per 29 CFR 1926 Subpart P – Excavations. The qualifications of the designated “competent person” will be provided to NYSDEC prior to IRM construction.

C. Proposed off-site disposal facilities shall be submitted to OWNER for approval. All shipments shall be appropriately manifested, labeled, and placarded in accordance with local, state and federal regulations.

D. Completed manifests, bills of lading and certificates of disposal shall be submitted to OWNER and ENGINEER. CONTRACTOR shall provide any and all information requested by OWNER, including, but not limited to, compliance and safety audit, certificates of insurance, indemnifications, permit information, regulatory compliance history, and transportation safety plan.

PART 2 PRODUCTS

2.01 DEMARCATION LAYER NETTING

A. Demarcation layer netting shall consist of one hundred percent (100%) continuous monofilament polypropylene spun bond fabric with UV inhibitors, such as OD5340 or OD7525 oriented netting by Industrial Netting, Pocket Net Fence by 3T Products, or approved equal. Color shall be orange.

PART 3 EXECUTION

3.01 GENERAL

A. CONTRACTOR shall provide a separate bucket for the excavation equipment that is dedicated to excavation of PCB-impacted soils >= 50 mg/kg in order to prevent cross-contamination with soils that have PCB levels <50 mg/kg.

B. PCB-impacted soils shall remain within the boundaries of the excavation except for direct transport to accumulation areas, temporary stockpile areas or off-site disposal.

C. As excavation proceeds, CONTRACTOR shall use global positioning satellite (GPS) or similar technology to identify the limits of PCB-impacted soils with differing levels of contamination (i.e. < 10 mg/kg; ≥ 3.2 and < 50 mg/kg; ≥ 10 and < 50 mg/kg; and >= 50 mg/kg in as shown on the Drawings order to maintain segregation of these materials during the excavation. Limits shall be marked clearly to prevent cross-contamination between areas. CONTRACTOR shall construct temporary transit roads to move dedicated equipment between areas of PCB levels >= 50/mg/kg and between areas of PCB levels <50 mg/kg.

D. In the event that source material other than PCB-impacted soils is identified based on visual or olfactory observations or field screening during excavation, the ENGINEER may

direct the CONTRACTOR to stockpile that material within the work area or the temporary stockpile area for further testing in order to determine final disposition.

E. All shipments for off-site disposal shall be appropriately manifested, labeled, and placarded in accordance with local, state and federal regulations. Each vehicle shall be inspected by ENGINEER prior to shipment. Each vehicle shall be lined and covered, and the tailgate secured. The wheels, sides and underbody shall be decontaminated as described in Section 02 61 23 Part 3.01 prior to departure from the Site.

F. All shipments between excavation areas and the temporary stockpile location shown on the Drawings will be logged, noting truck identification, time, volume, load wetted/covered/tailgate secured, and truck decontamination. Each vehicle shall be covered, and the tailgate secured. The wheels, sides and underbody shall be decontaminated as described in Section 02 61 23 Part 3.01 prior to departure from the excavation area or temporary stockpile location. Shipment logs will be made available to the ENGINEER for inspection.

3.02 LOADING AND DISPOSAL OF HAZARDOUS WASTE

A. For areas with hazardous waste or PCB remediation waste as shown on the Drawings, CONTRACTOR shall accumulate soil in TSCA Accumulation Area(s) prior to loading in TSCA Loading Area(s) for off-site disposal as shown on the Drawing. Trucks will be loaded in the TSCA Loading Area for transport of hazardous waste a for off-Site disposal at an appropriate treatment storage and/or disposal facility. Temporary stockpiling of these soils outside the limits of excavation is not permitted. Contractor shall take efforts to minimize movement of these soils within the limits of excavation.

B. ENGINEER shall be responsible for any additional characterization sampling required for obtaining disposal facility approval for acceptance.

C. CONTRACTOR shall be responsible for all handling and disposal fees, taxes and/or surcharges for disposal. CONTRACTOR shall be responsible for additional charges associated with overweight or rejected loads.

3.03 TEMPORARY STOCKPILING OF NON-HAZARDOUS PCB-IMPACTED SOILS

A. For excavation areas with total PCB concentrations < 50 mg/kg as shown on the Drawings, CONTRACTOR shall prepare the temporary stockpile location where shown on the Drawings. Alternative locations require prior approval by ENGINEER and NYSDEC.

B. Prior to stockpiling soils, CONTRACTOR shall prepare stockpile pads as shown on the Drawings.

C. Soils with total PCB concentrations < 10 mg/kg and uncharacterized soils shall be stockpiled separately from soils with total PCB concentrations ≥ 10 and < 50 mg/kg.

D. Soils with total PCB concentrations < 10 mg/kg that overlay areas with total PCB concentrations ≥ 50 mg/kg as shown on the Drawings shall be stockpiled separately on temporary tarps within the limits of disturbance on EHS property.

E. At the end of each work day, CONTRACTOR shall completely cover stockpiled soils with a secured tarp. CONTRACTOR shall be responsible for ensuring PCB-impacted soils do not migrate from staging and stockpile locations.

3.04 CHEMICAL TESTING OF STOCKPILED PCB-IMPACTED SOILS

A. ENGINEER shall sample and test PCB-impacted soils that have been temporarily stockpiled for potential re-use for the methods and at the frequencies shown in Table 026113-1 for up to 100 cubic yards. Acceptable results for the final disposition shall be received prior to re-use. NYSDEC will be notified a minimum of two days prior to sampling. NYSDEC review and approval of test results is required for soils designated for re-use as backfill.

B. ENGINEER shall sample and test PCB-impacted soils that have been temporarily stockpiled for disposal for the methods and at the frequencies shown in Table 026113-2. Acceptable results for the final disposition shall be received prior to or disposal.

C. ENGINEER shall be responsible for any additional characterization sampling required for obtaining disposal facility approval for acceptance.

D. CONTRACTOR shall be responsible for all handling and disposal fees, taxes and/or surcharges for disposal. CONTRACTOR shall be responsible for additional charges associated with overweight or rejected loads.

3.05 LOADING AND DISPOSAL OF PCB REMEDIATION WASTE

A. For areas with total PCB concentrations ≥ 3.2 mg/kg at and near the water table as shown on the Drawings, CONTRACTOR shall accumulate soil in TSCA Accumulation Area(s) prior to loading in TSCA Loading Area(s) for off-site disposal as shown on the Drawing. Trucks will be loaded in the TSCA Loading Area for transport of PCB remediation waste for off-Site disposal at an appropriate treatment storage and/or disposal facility. Temporary stockpiling of these soils outside the limits of excavation is not permitted.

Contractor shall take efforts to minimize movement of these soils within the limits of excavation.

B. ENGINEER shall be responsible for any additional characterization sampling required for obtaining disposal facility approval for acceptance.

C. CONTRACTOR shall be responsible for all handling and disposal fees, taxes and/or surcharges for disposal. CONTRACTOR shall be responsible for additional charges associated with overweight or rejected loads.

3.06 REVIEW AND PREPARATION OF EXCAVATION PRIOR TO BACKFILLING

A. PCB-impacted soils shall be removed within horizontal and vertical limits of materials requiring excavation.

B. Each excavation shall be surveyed in accordance with Section 01 78 29 upon completion of excavation activities. ENGINEER shall verify completion of excavation activities at each location.

C. ENGINEER shall perform confirmation and documentation sampling of the base and sidewalls of the excavation in accordance with DER-10 Section 5.4 (b). CONTRACTOR shall provide ENGINEER access to excavations to collect samples under safe conditions as determined by CONTRACTOR'S "competent person" for on-site excavation.

1. Confirmation samples will be submitted to the fixed laboratory for expedited analyses (1-day turnaround time) for PCBs and target analyte list (TAL) metals.

2. Upon receipt of unvalidated results, ENGINEER shall verify achievement of cleanup goals or determine the need to step out or step down the excavation in in consultation with NYSDEC:

    a. Step out a maximum of thirty (30) feet and re-sample sidewall and bottom areas

    b. Step down a maximum of two (2) feet and re-sample sidewall and bottom areas.

    c. Step down below the water table will evaluated for feasibility based on lithology, transmissivity and impact on schedule.

3. CONTRACTOR shall not backfill excavation until ENGINEER and NYSDEC provide approval.

4. Documentation samples will be submitted to the fixed laboratory for standard analyses for PCBs and TAL metals for excavation sidewalls where cleanup will be completed at a future date.

D. As excavation progresses, CONTRACTOR shall ensure that methods used for ongoing excavation to not result in migration of PCB-impacted soils onto cleaned areas. PCB-impacted soils migrating onto clean areas shall be re-cleaned by the CONTRACTOR at no additional expense to the OWNER.

E. A continuous layer of demarcation netting shall be placed prior to backfilling the installation. Abutting panels of netting shall be overlapped a minimum of two inches. CONTRACTOR shall provide anchorage as required to prevent shifting during backfilling.

F. In the event that PCB-impacted soils shall remain in place after excavation, geotextile fabric shall be placed in those areas of the excavation beneath the demarcation netting in order to separate PCB-impacted soil remaining and backfill.

G. Each demarcation layer shall be surveyed in accordance with Section 01 78 29 upon prior to placement of fill.

3.07 WATER MANAGEMENT

A. The percolation of water into the excavation shall be avoided to the extent practical. Stormwater contacting PCB-impacted soils shall be removed for proper handling and off-site disposal.

B. Grading shall be performed as necessary to divert surface water runoff from entering excavation areas. Diversion control berms and temporary drainage channels shall be constructed as needed and maintained.

C. The CONTRACTOR shall ensure segregation of stormwater contacting PCB-impacted soils (contact water) from stormwater entering areas cleaned of PCB-impacted soils (non-contact water). Contact and non-contact water shall remain separated at all times.

3.08 BACKFILLING OF EXCAVATIONS

A. Excavations shall not be backfilled prior to approval by ENGINEER as described in Part 3.06 of this Section.

B. Pursuant to Section 31 23 23, off-site borrow sources used for backfilling will require chemical testing results indicating conformance with DER-10 Section 5.4 (e) and Appendix 5 for Restricted Residential uses.

C. Stockpiled PCB-impacted soils (i.e. with total PCB concentrations < 10 mg/kg) may be used for backfilling below asphalt or soil cover system and a minimum of one (1) foot above the seasonal high water table with NYSDEC approval of request for reuse.

C. Backfilling shall conform to placement and compaction requirements in Section 31 23 23.

3.08 CLEANUP

A. Upon completion of construction activities subject to the requirements in this Section, equipment used for excavation of PCB-impacted soils shall be decontaminated in accordance with the Section 02 51 00.

B. Rubbish and debris shall be removed from the Site in accordance with Section 015000. Disposal or removal of materials from the Site shall be coordinated through the OWNER. All construction equipment and implements of service shall be removed and the entire area involved shall be left in a neat, clean and acceptable condition.

B. Access roads traversed during transportation of PCB-impacted soils from the originating construction area to the stockpile area shall be cleaned by sweeping. Sweepings shall be removed off-site for disposal

TABLE 026113-1

MINIMUM TESTING FREQUENCIES FOR CHEMICAL SOIL EVALUATION(1)

	VOCs	SVOCs, Inorganics & PCBs	
Imported Soil Quantity (yd3)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0 to 50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50 to 100	2	1	
100 to 200	3	1	
200 to 300	4	1	
300 to 400	4	2	
400 to 500	5	2	
500 to 800	6	2	
800 to 1,000	7	2	
>1,000	2 VOC and 1 composite for each additional 1,000 yd3		

Notes:

1. Tests to be performed on representative composite samples collected by ENGINEER from proposed imported soils. Chemical testing results shall indicate conformance with DER-10 Section 5.4 (e) and Appendix 5 for Restricted Residential uses.

TABLE 026113-2

MINIMUM TESTING FREQUENCIES FOR PCB-IMPACTED SOILS LABORATORY SOIL EVALUATION(1)

TEST	USEPA TEST METHOD	MINIMUM FREQUENCY OF TESTING
PCBs (total)	SW846, 8082A	1 per 100 yd^3
TCLP	SW846, 1311	1 per 100 yd^3

Notes:

1. Tests to be performed on representative composite samples collected by ENGINEER from soil stockpiles.

*** END OF SECTION ***

SECTION 02 61 23

TRANSPORTATION AND OFF-SITE DISPOSAL

PART 1 GENERAL

1.01 SUMMARY OF WORK

A. CONTRACTOR shall provide all labor, materials, equipment and transportation necessary for the safe transportation, off-site disposal and tracking of hazardous and non-hazardous wastes as required by the Contract Documents. This shall include, but not be limited to:
   1. Notification of local officials;
   2. Transportation of hazardous and non-hazardous wastes for off-site disposal;
   3. Manifesting, labeling and placarding;
   4. Recordkeeping and reporting; and
   5. Emergency notification and response.

B. The Specifications shall be considered minimum standards to be met by CONTRACTOR and their suppliers and subcontractors.

1.02 REGULATORY REQUIREMENTS

A. 40 CFR 260 Hazardous Waste Management System: General

B. 40 CFR 261 Identification of Hazardous Waste

C. 40 CFR 262 Standards Applicable to Generators of Hazardous Waste

C. 40 CFR 263 Standards Applicable to Transporters of Hazardous Waste

D. 40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

E. 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities

F. 49 CFR 171 General Information, Regulations and Definitions

G. 49 CFR 172 Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

H. 49 CFR 173 Shippers – general requirements for shipments and packaging

I. 49 CFR 177 Carriage by public highway

J. 6 NYCRR Part 364 Waste Transporter Permits

1.03 DEFINITIONS

A. MSDS – Material Safety Data Sheet

B. RCRA – Resource Conservation and Recovery Act (40 CFR)

C. TSA – Transportation and Safety Act (49 CFR)

1.04 SUBMITTALS

A. CONTRACTOR shall submit a Work Plan for approval describing methods and equipment proposed for transportation and disposal operations. The Work Plan shall at a minimum include the following:

1. proposed equipment;
2. personnel and their training;
3. travel routes;
4. disposal facilities;
5. procedures for inspection, manifesting, and recordkeeping.

C. CONTRACTOR shall document the following training has been completed for all personnel associated with waste disposal:

1. 40 hours of initial OSHA Hazardous Waste Site Worker training per 29 CFR 1910.120;
2. 8-hour annual refresher courses per 29 CFR 1910.120;
3. DOT hazardous materials regulation training and applicable job-specific DOT regulation training per 49 CFR 172, Subpart H with re-training every 3 years; and
4. Job-specific waste management training to eliminate RCRA violations per 40 CFR 165.16 with annual refreshers.

1.05 QUALITY ASSURANCE

A. ENGINEER shall observe the work for conformance with the Interim Remedial Measures Plan.

B. CONTRACTOR shall be aware of the observation and testing activities by ENGINEER and shall take into account this activity in its schedule. CONTRACTOR shall assist ENGINEER with testing activities when requested.

C. CONTRACTOR shall review the licenses, permits, previous performance, DOT violation history and availability of vehicles and containers for each subcontracted transporter. A copy of all licenses and permits for transporter shall be retained at the Site by CONTRACTOR, with copies provided to ENGINEER and/or OWNER upon request.

PART 2 PRODUCTS

2.01 TRANSPORT VEHICLES AND CONTAINERS

A. All vehicles and containers used for transport of hazardous and non-hazardous wastes shall be DOT-compliant, clean, free of holes, leaks, and excessive rust.

B. All vehicles hauling impacted soils on the public roadway will have a valid NYS Part 364 Waste Transporter Permit.

C. All vehicles and containers used for transport of hazardous for off-Site disposal shall be lined with a minimum 6-mil polyethylene and covered.

D. End dump tractor-trailers shall have a minimum capacity of 40 cubic yards.

E. Triaxle dump trucks shall have a minimum capacity of 20 cubic yards.

F. Roll-off containers shall have a minimum capacity of 20 cubic yards.

PART 3 EXECUTION

3.01 GENERAL

A. CONTRACTOR shall coordinate the delivery of empty vehicles with the selected transporter(s), and the loading, staging and shipment of all wastes to the facilities selected by OWNER.

B. CONTRACTOR is responsible for coordination and communication with transporters or disposal facilities, and shall be responsible for delays in receipt of empty vehicles or shipment of loaded vehicles and the impact on work activities.

C. Emergency response shall be conducted in accordance with CONTRACTOR'S Site Specific Health and Safety Plan.

D. CONTRACTOR is responsible for conducting all work activities in accordance with applicable local, state and federal regulations.

E. Vehicles entering the Exclusion Zone or Stockpile area shall be loaded and unloaded in a manner that prevents contact with PCB impacted soils outside of the secured bed of the truck. This includes the use of plastic sheeting or equivalent materials to prevent spilled soils from contacting the sides of the truck and the use of a clean physical barrier (plastic sheeting, etc.) to prevent truck tires from traveling directly on PCB impacted soils. Should vehicles come into contact with PCB impacted soils outside of the secured bed, they shall be decontaminated prior to leaving the site. Decontamination of vehicles shall be wet decontamination of wheels, tires, sides, underbody and any other portions of the vehicle which may have residual soil.

3.02 MATERIALS REQUIRING OFF-SITE DISPOSAL

A. Excavated soils
   1. Soils with total PCBs ≥ 50 milligrams per kilogram (mg/kg) are TSCA PCB remediation waste and New York State hazardous waste and shall be stockpiled at designated locations prior to transport off-site for disposal.
   2. Soils with total PCBs ≥ 10 and < 50 mg/kg shall be stockpiled at designated locations and tested prior to transport off-site for disposal as non-hazardous waste.

B. Miscellaneous Waste
   1. wastes generated during work activities but not from the contaminant source areas.
   2. spent PPE (Tyvek, gloves, rubber boots, respirator cartridges)
   3. building construction debris (wood, siding, insulation, plastic sheeting)
   4. ordinary trash

3.03 TRANSPORTATION VEHICLES

A. All waste transporters shall be licensed and permitted in all states and Canadian provinces through which they travel, including New York licenses and decals appropriate to the waste.

B. Progress of shipments according to the transporter and disposal facility shall be checked weekly by CONTRACTOR, at a minimum. A weekly progress report shall be submitted to ENGINEER. The progress report shall identify traveling vehicles, vehicles that have arrived at the disposal facility, loads which have been disposed and

procedures to correct vehicles which are behind schedule. Vehicles shall be cross-referenced to their unique manifest or bill of lading number.

C. Temporary storage while in-transit shall not be permitted, except when necessary for transportation safety.

3.04 HAZARDOUS AND NON-HAZARDOUS DISPOSAL FACILITIES

A. CONTRACTOR shall identify proposed disposal facilities for hazardous and non-hazardous waste.

B. All disposal facilities shall be on an OWNER approved facility list, or shall be satisfactory to OWNER following an audit.

3.05 VEHICLE INSPECTION PRIOR TO SHIPMENT

A. All loads of waste shall be reviewed and approved in writing by CONTRACTOR prior to shipment for off-site disposal.

B. All previous labels shall be removed completely. Vehicles with deficiencies shall be corrected prior to loading.

C. Vehicles transporting soils for off-site disposal shall include a plastic bed liner. Trucks hauling materials to and from stockpile areas may omit the plastic bed liner so long as the truck gate is secured with no risk of spillage. Vehicle liners shall be placed in the bed of the vehicle by the driver. The driver shall have appropriate PPE for the waste handled. The excess liner shall be wrapped over the top of the waste material by CONTRACTOR.

D. Each vehicle shall be fitted with a tarp to cover the entire load and prevent infiltration by rain and release of dust. Prior to tarping, CONTRACTOR shall inspect the loaded vehicle to ensure that waste has not spilled onto the sides of the vehicle. Waste spillage will be cleaned and removed by CONTRACTOR prior to the shipment leaving the loading area. CONTRACTOR shall observe decontamination procedures in accordance with Part 3.01E of this Section.

E. CONTRACTOR shall inspect the loaded vehicle to ensure that it has been loaded, tarped, and placarded properly and that it is ready for inspection by the ENGINEER.

3.06 VEHICLE WEIGHT

A. Each load shall be weighed at certified scales at the appropriate disposal facility to determine actual net load weight. CONTRACTOR shall compare actual net load weights in order to maximize the net weight of material in each shipment without

exceeding the 80,000 lb maximum gross vehicle weight requirement. Should a pattern of excessively light loads occur (as defined by less than 90 percent of legal gross vehicle weight), OWNER has the right to negotiate a discount for excessive transportation cost.

3.07 MANIFESTING

A. All hazardous wastes shall be documented by a hazardous waste manifest per 40 CFR Section 262 and 6 NYCRR Part 372. All non-hazardous wastes shall be documented by a non-hazardous bill of lading per 49 CFR Sections 171 and 172.

B. The Unisys EPA ID Number is NYD987035482. The Site Shipping Origin Address is 777 S Main St, Elmira, New York 14904.

C. Manifests and bills of lading shall be completed by CONTRACTOR.

D. A copy of the manifest or bill of lading shall accompany the appropriate load. The transporter shall ensure that the manifest or shipping paper is readily available and recognizable by the authorities in the case of an accident or inspection. The transporter shall present the manifest to the disposal facility's representative upon arrival at the disposal facility.

E. Copies of completed manifests and bills of lading shall be maintained on file at the Site by CONTRACTOR along with the associated inspection form and checklists. Copies will be provided to the QA Official and Unisys upon completion of transportation and disposal activities, or at any time upon request.

3.08 LABELING AND PLACARDING

A. Each container shall be labeled per 49 CFR 172 Subpart E.

B. Each container shall be marked per 49 CFR Part 172.304, including Unisys's name and address and Manifest Document Number.

C. Each vehicle or container shall be placarded per 49 CFR Part 172, Subpart F.

D. CONTRACTOR shall be responsible for determining the appropriate DOT hazard class based upon waste identification and classification during field activities and subsequent placarding.

3.09 RECORDKEEPING

A. Recordkeeping for shipping and waste tracking logs shall be conducted by CONTRACTOR in accordance with 40 CFR Part 262, Subpart D.

B. All test results, waste analyses, and copies of inspection logs, checklists, manifests, and bills of lading shall also be retained by CONTRACTOR for the duration of the project. At the completion of work, CONTRACTOR shall release all electronic and paper records to Unisys.

C. All records shall be neat and orderly. All electronic files shall be printed to generate a hard-copy backup. Electronic files shall be developed using Excel or Access. CONTRACTOR shall maintain a file index with his records for easy location of documents. The file index shall be updated weekly at a minimum.

D. CONTRACTOR shall provide OWNER with the information necessary to prepare and submit biennial reports.

E. CONTRACTOR shall notify OWNER and ENGINEER if a properly signed copy of a manifest is not received from the disposal facility within 35 days of the date the waste was accepted for transport. CONTRACTOR shall assist OWNER and ENGINEER in contacting the disposal facility to resolve the status of the hazardous waste and associated manifest.

F. CONTRACTOR shall assist OWNER in completion of an Exception Report (40 CFR 262.42) if completed manifests are not received within 45 days.

G. CONTRACTOR shall maintain a log of all hazardous and non-hazardous shipments at the Site. The log shall contain the following information at a minimum:
1. Shipment date
2. Truck number/license plate number
3. Weight (gross and tare)
4. Manifest/bill of lading number
5. Disposal facility
6. Corresponding sample identification and results
7. Corresponding excavation and depth interval
8. Waste classification
9. Waste profile
10. Date received at the facility
11. Date of treatment/disposal.

3.10 TRANSPORT ROUTES

A. Proposed traffic routing from the Site to all disposal facilities shall be submitted by CONTRACTOR for OWNER's approval.

B. Transport vehicles shall not congest or back-up off-site roadways at entry or exit.

*** END OF SECTION ***

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork

B. Concrete reinforcement

C. Joint devices associated with concrete work

D. Concrete finishing

E. Concrete curing

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Products and installation for sealants for saw cut joints and isolation joints in slabs.

B. Section 32 13 13 - Concrete Paving: Sidewalks, curbs and gutters.

1.03 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010.

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).

C. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).

D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000.

E. ACI 305R - Hot Weather Concreting; 2010.

F. ACI 306R - Cold Weather Concreting; 2010.

G. ACI 308R - Guide to Curing Concrete; 2001 (Reapproved 2008).

H. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2011.

I. ACI 347R - Guide to Formwork for Concrete; 2014.

J. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.

K. ASTM C 31/C 31M -Standard Practice for Making and Curing Concrete Test Specimens in the Field, 2009.

L. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.

M. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2015a.

N. ASTM C 42/C 42M - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete, 2010.

O. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.

P. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2013.

Q. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2012.

R. ASTM C150/C150M - Standard Specification for Portland Cement; 2015.

S. ASTM C 172 -Standard Practice for Sampling Freshly Mixed Concrete, 2008.

T. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2014.

U. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.

V. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2013.

W. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2015.

X. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2014.

Y. ASTM C 1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete, 2008.

Z. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2010.

AA. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).

BB. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting; 2015.

1.04 SUBMITTALS

A. Product Data: Submit manufacturers' data on manufactured products such as joint devises and admixtures, showing compliance with specified requirements.

1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.

B. Mix Design: Submit proposed concrete mix design.

1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.

C. Design Data:

1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:

a. Hot and cold weather concrete work.

b. Air entrained concrete work.

2. Identify mix ingredients and proportions, including admixtures.

3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.

D. Manufacturer's Installation Instructions: For concrete accessories, indicate

installation procedures and interface required with adjacent construction.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Follow recommendations of ACI 306R when concreting during cold weather.

1.06 COORDINATION

A. Section 01 30 00: Coordination and project conditions.

B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 PRODUCTS

2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

1. Form Facing for Exposed Finish Concrete: Steel.

2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces. Natural rock formations that maintain a stable vertical edge may be used as side forms.

3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.

4. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.02 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).

1. Type: Deformed billet-steel bars.

2. Finish: Unfinished, unless otherwise indicated.

B. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.

2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

3. Provide stainless steel, galvanized, plastic, or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.

1. Acquire all cement for entire project from same source.

2. Coarse Aggregate Maximum Size: In accordance with ACI 318

B. Fine and Coarse Aggregates: ASTM C 33.

1. Acquire all aggregates for entire project from same source.

2. Coarse Aggregate Maximum Size: In accordance with ACI 318

C. Fly Ash: ASTM C 618, Class F. Loss on ignition requirement waived if used in flowable fill concrete mix.

D. Water: ACI 318; Clean and not detrimental to concrete.

2.04 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.

C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.

D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.

E. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.

F. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.

G. Accelerating Admixture: ASTM C494/C494M Type C.

H. Retarding Admixture: ASTM C494/C494M Type B.

I. Water Reducing Admixture: ASTM C494/C494M Type A.

2.05 ACCESSORY MATERIALS

A. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

1. Minimum Compressive Strength at 48 Hours, ASTM C109/C109M: 2,000 pounds per square inch.

2. Minimum Compressive Strength at 28 Days, ASTM C109/C109M: 10,000 pounds per square inch.

B. Non-Shrink Epoxy Grout: Moisture-insensitive, two-part; consisting of epoxy resin, non-metallic aggregate, and activator.

1. Minimum Compressive Strength at 7 days, ASTM D695: 12,000 pounds per square inch.

2.06 BONDING AND JOINTING PRODUCTS

A. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.

1. Material: ASTM D1751, Nonextruding, resilient asphalt impregnated fiberboard or felt.

2.07 CURING MATERIALS

A. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.

B. Curing and Sealing Compound, Low Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.

C. Moisture-Retaining Sheet: ASTM C171.

a. Polyethylene film, clear, minimum nominal thickness of 0.0040 inch.

b. Non-staining cotton fabric, weighing not less than 8 oz/per square yd, bonded to prevent separation during handling and placing.

D. Polyethylene Film: ASTM D2103, 4 mil thick, clear.

E. Water: Potable, not detrimental to concrete.

2.08 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.

1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

2.09 MIXING

A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.

1. Fiber Reinforcement: Batch and mix as recommended by manufacturer for specific project conditions.

B. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

B. Verify requirements for concrete cover over reinforcement.

C. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with

placing concrete.

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Remove debris and ice from formwork, reinforcement, and concrete substrates.

C. Remove water from areas receiving concrete before concrete is placed.

D. Verify that forms are clean and free of rust before applying release agent.

E. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

F. Wet sticking anchor rods shall not be permitted.

G. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions. Remove laitance, coatings & unsound materials.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

B. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Notify testing laboratory and Architect/Engineer not less than 24 hours prior to commencement of placement operations.

C. Ensure reinforcement, embedded parts, and anchor rods will not be disturbed during concrete placement.

3.05 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:

1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.

2. Parge coating is not acceptable.

3.06 CURING

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

1. Normal concrete: Not less than 7 days.

3.07 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed by Owner's testing laboratory in accordance with ACI 318 and applicable code.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

D. Concrete Inspections:

1. Continuous Placement Inspection: Inspect for proper installation procedures.

2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures

E. Strength Test Samples:

1. Sampling Procedures: ASTM C172

2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, field cured.

3. Sample concrete and make one set of four cylinders for every 50 cu yds or less of each class of concrete placed each day and for every 5,000 sf of surface area for slabs and walls.

4. When volume of concrete for any class of concrete would provide less than 5 sets of cylinders, take samples from five randomly selected batches, or from every batch when less than 5 batches are used.

5. Make one additional cylinder during cold weather concreting, and field cure.

F. Field Testing:

1. Slump Test Method: ASTM C143/C143M.

2. Air Content Test Method: ASTM C173/C173M.

3. Temperature Test Method: ASTM C1064/C1064M.

4. Measure slump and temperature for each compressive strength concrete sample.

5. Measure air content in air entrained concrete for each compressive strength concrete sample.

G. Cylinder Compressive Strength Testing:

1. Test Method: ASTM C39.

2. Test Acceptance: In accordance with ACI 318 and applicable code.

3. Test one cylinder at 7 days.

4. Test two cylinders at 28 days.

5. Retain one cylinder for 56 days for testing when requested by Architect/Engineer.

6. Dispose remaining cylinders when testing is not required.

H. Core Compressive Strength Testing:

1. Sampling and Testing Procedures: ASTM C42/C42M.

2. Test Acceptance: In accordance with ACI 318 and applicable code.

I. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

3.08 PATCHING

A. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.

B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect/Engineer upon discovery.

C. Patch imperfections as directed by Architect/Engineer in accordance with ACI 318.

3.09 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Architect/ Engineer. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect/ Engineer for each individual area.

3.10 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

*** END OF SECTION ***

SECTION 07 90 05

JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sealants

B. Joint backing

1.02 RELATED REQUIREMENTS

A. Section 07 25 00 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders:

1.03 REFERENCE STANDARDS

A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

B. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

C. ASTM D1056 - Standard Specification for Flexible Cellular Materials--Sponge or Expanded Rubber; 2014.

D. ASTM D1667 - Standard Specification for Flexible Cellular Materials--Poly(Vinyl Chloride) Foam (Closed-Cell); 2005 (Reapproved 2011).

E. ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements; 1991 (Reapproved 2011).

1.04 SUBMITTALS

A. Product Data: Provide data indicating sealant chemical characteristics.

B. Samples: Submit two samples illustrating sealant colors for selection.

C. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the

Products specified in this section with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.06 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five-year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Gunnable and Pourable Sealants:

1. BASF Construction Chemicals-Building Systems (Sonneborn): www.buildingsystems.basf.com.

2. Dow Corning Corporation: www.dowcorning.com.

3. Tremco Global Sealants: www.tremcosealants.com.

2.02 SEALANTS

A. Type A - General Purpose Exterior (Non-Traffic) Sealant: Polyurethane; ASTM C 920, Grade NS, Class 25, Uses M, G, and A; single component.

1. Color: Match adjacent finished surfaces. Submit colors to Architect for approval.

2. Compatible with elastomeric waterproofing for use at new and existing precast concrete copings to be waterproofed.

3. Product: NP2 manufactured by Sonneborn.

4. Applications: Use for:

   a. Joints between concrete and other materials.

   b. Joints between metal frames and other materials.

   c. Other exterior non-traffic joints for which no other sealant is indicated.

B. Type B - Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.

1. Product: multi-purpose sealent manufactured by Tremco.

2. Applications: Use for:

   a. Concealed sealant bead in sheet metal work.

   b. Concealed sealant bead in siding overlaps.

C. Type C - Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C920, Class 25, Uses T, I, M and A; single component.

1. Color: Color as selected.

2. Product: SL2 manufactured by Sonneborn.

3. Applications: Use for:

   a. Joints in sidewalks and vehicular paving.

   b. Furnish slope grade sealant at all sloped paving.

2.03 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker where joint backing is not used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Tool joints concave.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

3.05 PROTECTION

A. Protect sealants until cured.

*** END OF SECTION ***

SECTION 31 12 00

CLEARING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, installation equipment, and incidentals necessary to complete the Work specified herein and shown on the Drawings. The Work shall include, but not be limited to clearing the work area of trees, brush, and incidental debris; and

B. CONTRACTOR shall remove and dispose of all cleared and vegetation, debris, other organic and deleterious material, and other materials that exist within the limit of disturbance or as determined by OWNER or ENGINEER.

1.02 SUBMITTALS

A. Off-site disposal facilities for cleared vegetation shall be submitted by CONTRACTOR for approval by OWNER.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01 CLEARING

A. Clearing shall only be performed in areas identified within the limits of disturbance on the Drawings and approved by OWNER or ENGINEER. Appropriate erosion and sedimentation controls shall be in place in all areas to be cleared.

B. Clearing shall consist of removing trees, timber, shrubs, brush, undergrowth, deadwood, and miscellaneous debris and rubbish from the work area shown on the Drawings.

C. Grubbing (typically the removal and disposal of stumps, roots, and vegetation from below the ground surface) and topsoil removal shall shall conform to Section 02 61 13 when performed in areas with PCB-impacted soil.

D. CONTRACTOR shall, to the satisfaction of OWNER, remove timber, brush, deadwood, and other refuse designated for removal from the clearing operations. Material shall be kept as free of inorganic material as possible. Material shall be disposed of off-site at a permitted facility approved by OWNER.

*** END OF SECTION ***

SECTION 31 23 19
DEWATERING

PART 1 GENERAL

1.01 WORK INCLUDED

A. CONTRACTOR shall furnish all materials, implements, machinery equipment, tools, supplies, transportation, labor and supervision required to perform and maintain all dewatering as required throughout the duration of the Work.

1.02 SUBMITTALS

A. At least seven days prior to any dewatering activities at the site, CONTRACTOR shall submit to ENGINEER a Dewatering Plan with proposed dewatering methods to be implemented when groundwater is encountered during excavation.

1.03 GENERAL REQUIREMENTS

A. Excavation is likely to occur at or near the static groundwater table. Excavation below the water table may be required by the Engineer and NYSDEC to achieve cleanup goals. Therefore, CONTRACTOR shall provide and maintain at all times, before and during construction, ample means and devices, including all necessary equipment, power and labor to pump, bail or otherwise promptly remove and properly dispose of all water entering, or found in the excavations, trenches or other parts of work. Excavation and structures must be kept dry until all work to be built therein is completed.

B. CONTRACTOR shall maintain throughout the duration of the Work, ample provisions to prevent flotation of utilities, pipes, or structures and shall be responsible for any damage caused by water.

C. It shall be the CONTRACTOR's responsibility to assure that dewatering operations are conducted so as not to affect adjacent structures. CONTRACTOR shall be responsible for any damage to adjacent structures.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01 GENERAL

A. Water from construction dewatering shall be discharged to adjacent frac tanks as shown

on the Drawings. Approximately 20,000 gallons of capacity is reserved for excavation dewatering activities. CONTRACTOR shall have a contingency plan for additional capacity to be provided within one day based on actual conditions encountered if this capacity will be exceeded.

B. CONTRACTOR shall supply all piping, or hose to transport water to the frac tanks.

C. Dewatering shall conform to the latest version of "*New York State Standards and Specifications for Erosion and Sediment Control (Blue Book), dated November, 2016*" and must be approved by ENGINEER before proceeding.

D. CONTRACTOR shall provide continuous pumping if required in order to prevent damage to the Work or adjacent structures or utilities.

E. CONTRACTOR shall notify ENGINEER when frac tanks are near capacity.

F. ENGINEER shall be responsible for characterization sampling required for obtaining disposal facility approval for acceptance.

G. CONTRACTOR shall be responsible for all handling and disposal fees, taxes and/or surcharges for disposal. CONTRACTOR shall be responsible for additional charges associated with overweight or rejected loads.

END OF SECTION

SECTION 31 23 23

SOILS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary to place and compact soil as specified in this Section and as shown on the Drawings.

B. Soil described in this Section shall be used for construction as follows.
   1. Structural fill shall be used for soil cover system, excavation backfill, and general grading purposes.
   2. Topsoil shall be used to support permanent vegetation.

C. CONTRACTOR shall be prepared to place and compact soil in conjunction with the construction of other components of the Work.

D. The Work of this Section shall include, but not necessarily be limited to:
   1. furnishing, placing, and compacting soil;
   2. sampling and testing (laboratory and field) soil; and
   3. disposal and stockpiling of surplus soil.

E. Soil placed and compacted shall conform to the dimensions, lines, grades, and sections indicated on the Drawings.

F. CONTRACTOR shall be responsible to ensure that the soil meets the requirements of this Section. Any soil that does not conform to this Section will be rejected by ENGINEER and shall be replaced by CONTRACTOR with soil that conforms to this Section at no cost to OWNER

G. CONTRACTOR shall perform the required field and laboratory CQC tests described in this Section.

H. All Work and imported materials shall conform to the approved Interim Remedial Measure work plan.

1.02 SUBMITTALS

A. At least 30 days prior to the delivery of soil to the Site, CONTRACTOR shall provide the following information to ENGINEER:
   1. the proposed off-site material source or sources.

B. At least 14 days prior to starting soil placement and compaction, CONTRACTOR shall provide ENGINEER the following:
   1. The date and time that soil delivery operations will start; and
   2. The date and time that soil placement and compaction operations will start

C. As soon as the information is available, CONTRACTOR shall provide ENGINEER the results of field and laboratory tests performed on soil.

D. If Work is interrupted for reasons other than inclement weather, then CONTRACTOR shall notify ENGINEER a minimum of 24 hours prior to the resumption of Work.

1.03 CONSTRUCTION QUALITY ASSURANCE

A. Construction and testing of soil shall be monitored by ENGINEER as outlined in this Section

B. CONTRACTOR shall be aware of the CQA activities outlined in this Section and shall account for these activities in the construction schedule. This specifically includes the time required for off-site shipment and testing of soils.

PART 2 PRODUCTS

2.01 GENERAL

A. CONTRACTOR shall employ an independent geotechnical testing laboratory acceptable to OWNER and ENGINEER to perform pre-qualification tests (at a frequency of 1 set of tests per source) on each off-site borrow source that is proposed for use and shall provide the test results to ENGINEER. Geotechnical and/or agricultural testing laboratory requirements are provided in Table 312323-1.

C. The final approval of a source for the soil will be at the sole discretion of ENGINEER.

2.02 STRUCTURAL FILL

A. Structural fill material shall be free of debris, foreign objects, large rock fragments, organic matter, and other deleterious materials. Structural fill material shall be a well graded soil with maximum particle size of 4 inches and no more than 10 percent passing the #200 sieve.

2.03 TOPSOIL

A. Topsoil shall be defined as the upper natural surface soil, typically having high organic content, presenting the characteristics of representative soils on the site that promote growth of grass or other vegetation. For topsoil salvaged from on-site borrow sources, topsoil shall typically extend to a depth of approximately 6 to 12 inches.

B. Topsoil shall consist of relatively homogenous soil that is free of debris, foreign objects, and excess roots.

C. Topsoil shall conform to the following requirements:
   1. pH between 6.0 and 7.5;
   2. soluble salts less than 500 parts per million;
   3. Reasonably free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds, and foreign matter.
   4. less than 15 percent larger than the 3/8-inch sieve and less than 40 percent passing the #200 sieve when tested for a Particle-Size Analysis, with hydrometer - ASTM D 422; and
   5. contains between 3 and 8 percent organic matter by weight when tested in accordance with ASTM D 2974, Method C.

D. If topsoil does not meet the material requirements specified herein, CONTRACTOR may propose to amend the topsoil to bring it into conformance with project requirements. CONTRACTOR shall submit to ENGINEER for approval a soil amendment plan describing the materials, application rates, and equipment proposed for topsoil amendment. Approval of the topsoil amendment plan shall be at the sole discretion of ENGINEER.

E. Any amendments applied shall be incorporated throughout the entire thickness of the topsoil layer using a disc harrow or other suitable equipment which will result in a uniform distribution of amendments within the topsoil.

2.04 EQUIPMENT

A. CONTRACTOR shall furnish, operate, and maintain grading equipment as is necessary to produce uniform layers, sections, and smoothness of grade for compaction and drainage.

B. CONTRACTOR shall furnish, operate and maintain compaction equipment as is necessary to produce the required in-place soil density and moisture content.

C. CONTRACTOR shall furnish, operate equipment designed to apply water uniformly and in controlled quantities to variable surface widths, if moisture conditioning of soil is required to achieve the specified in-place density and moisture content.

D. CONTRACTOR shall furnish, operate, and maintain miscellaneous equipment such excavators, scrapers, compactors, loaders, dozers, earth hauling equipment and all other equipment, as required for earthwork construction.

PART 3 EXECUTION

3.01 GENERAL

A. Prior to import of soils from an off-site source identified by CONTRACTOR, ENGINEER shall perform pre-qualification tests (at a frequency shown on Table 312323-2) on each off-site borrow source that is proposed for use. Chemical testing results shall indicate conformance with DER-10 Section 5.4 (e) and Appendix 5 including requirements for emerging contaminants. ENGINEER shall submit Request to Import to NYSDEC with validated chemical testing results for approval.

B. Prior to placing and compacting soils, CONTRACTOR shall become thoroughly familiar with the Site, the site conditions, and all patrons of the Work falling under this Section and other relevant Sections related to specific uses of soil.

C. Prior to placing and compacting soil, CONTRACTOR shall carefully inspect the installed Work of all other sections and verify that all Work is complete to the point where Work of this Section may properly commence without adverse impact.

D. Soil shall be placed and compacted to the lines and grades shown on the Drawings.

E. No frozen or thawing soils shall be placed or compacted. Soil shall be placed only on dry, unfrozen subgrade surfaces.

3.02 STRUCTURAL FILL

A. Structural fill shall be placed and compacted within excavations and in other non-specified areas to match existing grades and allow positive drainage of runoff.

B. Structural fill shall be placed in loose lifts that result in a compacted lift thickness of 12 in. or less. Compaction shall be performed using a bulldozer, smooth-drum roller, or padded-foot compactor. Hand compaction of material shall be used in locations where larger compaction is inappropriate due to limited area.

C. Unless otherwise specified, each soil lift shall be compacted to at least 95 percent of the maximum dry density and at a moisture content between -4 to +2 percent of the optimum moisture content as determined by ASTM D 698. At CONTRACTOR's request, ENGINEER may consider revising the range of acceptable moisture contents based on the field and laboratory test results submitted by CONTRACTOR.

D. Field testing of each lift of structural fill shall be tested by ENGINEER as required by Table 312323-3. Should field testing indicate the moisture or density of any portion of a lift of structural fill outside of acceptable values, CONTRACTOR shall scarify, moisture condition, and recompact the lift as necessary to bring it into conformance with acceptable moisture and density values

E. CONTRACTOR shall finish each day's work with a smooth-drum roller to create a smooth surface, free from ruts or indentations, which will minimize moisture penetration. The area shall be left in a manner to promote runoff at the end of each day.

F. Prior to continuing construction from the previous day's work, CONTRACTOR shall scarify the surface to provide a bond between the layers.

3.03 TOPSOIL

A. Topsoil shall be placed in a single lift to a minimum 4-inch thickness where shown on the Drawings.

B. CONTRACTOR shall place soil in a manner that minimizes compaction. Low ground pressure equipment shall be used during placement. Multiple passes by spreading equipment should be avoided when placing soils.

C. CONTRACTOR shall apply fertilizer and permanently stabilize as described in Section 31 25 00 and on the Drawings.

D. The surface of the completed topsoil shall be tracked immediately after placement and addition of soil amendments. Tracking is to be performed by low-ground pressure bulldozers operating in the direction of runoff flow. The tracks of the bulldozer shall have grousers of sufficient height to leave visible indentations in the completed cover surface. The indentations shall be perpendicular to the direction of runoff flow to reduce erosion potential.

3.04 FIELD QUALITY ASSURANCE

A. ENGINEER will monitor the placement and compaction of soils in accordance with the CQA Plan.

B. ENGINEER shall perform field CQA testing of soil during placement and compaction, as described below.
   1. The minimum testing frequencies for material evaluation and construction quality evaluation are presented in Tables 312323-1 and 312323-3.
   2. Sampling locations will be selected by ENGINEER.
   3. The frequency of testing may be increased at the discretion of ENGINEER when visual observations of construction performance indicate a potential problem.

C. Defective Areas:
   1. If a defective area is discovered in the compacted soil, then ENGINEER will notify CONTRACTOR who shall proceed to determine the extent and nature of the defect. If the defect is indicated by an unsatisfactory test result, then CONTRACTOR will determine the extent of the defective area by additional tests, observations, a review of records, or other means that CONTRACTOR deems appropriate. If the defect is related to adverse site conditions, such as overly wet soils or surface desiccation, then CONTRACTOR will define the limits and nature of the defect.
   2. After the extent and nature of a defect has been determined, CONTRACTOR shall correct the deficiency to the satisfaction of ENGINEER. The cost of corrective actions shall be borne by CONTRACTOR.
   3. Additional testing will be performed by CONTRACTOR to verify that the defect has been corrected. This additional testing will be performed and submitted to the ENGINEER before any additional work is allowed in the area of deficiency.

3.05 TOLERANCE

A. The soils shall be constructed to within ± 0.1 ft. of the thickness indicated on the Drawings.

TABLE 312323-1

MINIMUM TESTING FREQUENCIES FOR GEOTECHNICAL SOIL EVALUATION(1)

TEST	SOIL TYPE REQUIRING TEST (2)	METHOD	MINIMUM FREQUENCY OF TESTING
Grain Size Analysis (Sieve and Hydrometer)	TS, SF	ASTM D 422	1 per 1,000 yd^3 (minimum 1 test per material type and source)
Standard Proctor	SF	ASTM D 698	1 per 1,000 yd^3 (minimum 1 test per material type and source)
Organic Content	TS	ASTM D 2974	1 per 1,000 yd^3 (minimum 1 test per material type and source)
Agricultural Analyses	TS	---	1 per 1,000 yd^3 (minimum 1 test per material type and source)

Notes:

1. Tests to be performed by ENGINEER on samples of bulk soil samples collected from soil to be placed. These tests will be performed in addition to the pre-qualification tests performed by CONTRACTOR as required in this Specification.
2. Abbreviations: TS = Topsoil; SF = Structural Fill

TABLE 312323-2

MINIMUM TESTING FREQUENCIES FOR CHEMICAL SOIL EVALUATION(1)

	VOCs	SVOCs, Inorganics & PCBs/Pesticides	
Imported Soil Quantity (yd^3)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0 to 50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50 to 100	2	1	
100 to 200	3	1	
200 to 300	4	1	
300 to 400	4	2	
400 to 500	5	2	
500 to 800	6	2	
800 to 1,000	7	2	
>1,000	2 VOC and 1 composite for each additional 1,000 yd^3		

Notes:

1. Tests to be performed by ENGINEER on proposed imported soils.
2. Chemical testing results shall indicate conformance with DER-10 Section 5.4 (e) and Appendix 5 for:
    a. Unrestricted Use for the soil cover system (0 to 2 ft bgs); or
    b. Restricted Residential uses below the soil cover system (> 2 ft bgs).
3. Chemical testing results shall indicate conformance with DER-10 Section 5.4 (e) requirements for emerging contaminants.

TABLE 312323-3

MINIMUM FIELD DENSITY TESTING FREQUENCIES(1)

TEST	METHOD	MINIMUM FREQUENCY OF TESTING
Moisture Content (Nuclear Gauge)	ASTM D 6938	minimum of five per lift
In-Place Dry Density (Nuclear Gauge)	ASTM D 6938	minimum of five per lift
Moisture Content (Field Oven Test)	ASTM D 2216	two per material type and source
In-Place Dry Density (Drive Cylinder Method or Sand Cone)	ASTM D 2937 or D 1556	as needed by ENGINEER to verify nuclear density gauge

Note:

1. Field tests are to be performed by ENGINEER on in-place, compacted fill.

*** END OF SECTION ***

SECTION 312333

TRENCHING AND BACKFILLING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section describes the requirements and standards for trenching and backfilling and bedding of environmental piping and conduit outside of excavations (Section 026113).

1.02 REFERENCED SECTIONS

A. Section 312323 Soils

B. Section 026113: Excavation, Removal, and Handling of PCB Impacted Soils

1.03 CITED STANDARDS

A. All trenching and backfilling shall conform to the requirements of the following standard specifications, of the latest revisions, as applicable:

1. ASTM C136 Sieve Analysis of Fine and Coarse Aggregates
2. ASTM D423 Liquid Limit of Soils
3. ASTM D424 Plastic Limit and Plasticity Index of Soils
4. ASTM D1556 Density and Unit Weight of Soil in Place by the Sand-Cone Method
5. ASTM D2419 Sand Equivalent Value of Soils and Fine Aggregate
6. ASTM D2844 Resistant R-Value and Expansion Pressure of Compacted Soils
7. ASTM D2922 Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

1.04 NOTED RESTRICTIONS

A. The total length of excavated trench open at any one time should not be greater than the total length of pipeline/utility line that can be placed in the trench and

backfilled in one working day. The CONTRACTOR shall use underground Service Alert (USA) notifications and shall utilize an underground utility locating service prior to performing work.

B. The total length of excavated trench open at any one time should not be greater than the total length of pipeline/utility line that can be placed in the trench and backfilled in one working day. The CONTRACTOR has the option of using trench plates instead, and if this is the case, trench plates may be used but shall not exceed an area that is greater than 400 ft in length.

C. Location of excavated material from pipe/conduit run in front of blast wall shall be coordinated with the OWNER or OWNER'S REPRESENTATIVE. This material cannot be stockpiled and must be direct loaded and staged at the Building 10 pad north of Cover Street.

1.05 QUALITY CONTROL

A. The CONTRACTOR shall verify all soil conditions prior to the start of work and all trenches shall be dug in accordance with the design drawings. The CONTRACTOR shall have all trenches dug and inspected prior to the arrival of the pipe installation crew.

B. During excavation, stockpile excavated material in designated areas only.

C. Caution shall be exercised in operating heavy equipment over pipelines. Leaks or breaks caused by the CONTRACTOR's operations shall immediately be repaired at no additional expense to the OWNER and in a manner acceptable to the OWNER's REPRESENTATIVE.

D. The banks of excavated areas shall be controlled as is necessary to prevent movement of soil in areas supporting existing foundations, slabs, pole lines, underground power or telephone cables, trees, pipelines or other structures.

E. If, as a result of the excavation or through fault or neglect of the CONTRACTOR, the earth or ground under or around such foundations, slabs, pole lines, underground power or telephone cables, trees, pipelines or other structures, slips or is otherwise disturbed, corrective measures shall be taken as directed at no additional expense to the OWNER.

F. The bottom of the trench shall be excavated to the lines and grades shown with proper allowance for pipe thickness, and for foundation stabilization and special bedding when required. Material containing rocks or cobbles larger than 2 inches in maximum dimension shall not be permitted within 6 inches of the pipe. Material of this type shall be removed from the bottom of the trench and replaced with backfill material. Parts of the trench excavated below grade shall be corrected with backfill as specified. The depth of trenches shall be as indicated on the Drawings.

G. Measurements for cover requirements shall be taken from the existing grade. (It is the responsibility of the CONTRACTOR to maintain these cover requirements with any future grade changes that may occur.)

H. The pipe shall have a minimum vertical clearance of 18” from other underground utilities unless denoted otherwise on the Drawings. The CONTRACTOR shall verify this requirement with the City of Long Beach and City of Lakewood standard engineering drawings if installed work must supersede this requirement.

I. Pipe Base

1. The pipe base shall be defined as a layer of material immediately below the bottom of the pipe or conduit and extending over the full trench width in which the pipe is bedded. Thickness of pipe base shall be 6 inches or as otherwise shown on the Drawings or otherwise described in the specifications for the particular type of pipe installed.

J. Safety

1. Barriers shall be placed at each end of all excavations and at such places as may be necessary along excavations to warn all pedestrians and vehicular traffic of such excavations. Lights shall also be placed along excavations from sunset each day to sunrise of the next day until such excavation is entirely refilled.

2. Flagmen shall be used at all times to insure safety of work performed in accordance with OSHA requirements.

1.06 SUBMITTALS

A. Submit two (2) copies of a report from a testing laboratory verifying that imported material conforms to the specifications.

PART 2 PRODUCTS

1.01 BACKFILL AND BEDDING

A. Backfill materials shall be imported Class II aggregate base for the top 6 to 12" of all excavations in improved surfaces. Bedding material shall be sand.

B. Sand used for bedding and backfilling pipe and utilities shall have the following gradation:

Gradation for Backfill and Bedding Pipe/Utilities	
Sieve Size	**% Passing Sieve (by Weight)**
2 in.	100
No. 4	70 - 100
No. 16	35 - 75
No. 50	10 - 40
No. 200	0 - 10

Minimum sand equivalent shall be 30 per ASTM D-2419.

C. All imported fill material must meet the requirements of 6 NYCRR Part 375 including requirements to address emerging contaminants. See Section 312323 Soils.

1.02 CONCRETE FOR PIPE ENCASEMENT

A. Concrete for pipe encasement shall be 520C-2500 per the SSPWC, unless otherwise shown on the Drawings.

1.03 WATER FOR COMPACTION

A. Water used in compaction shall have a maximum chloride concentration of 500 mg/l, a maximum sulfate concentration of 500 mg/l, and shall have a pH of 7.0 to 9.0. Water shall be free of acid, alkali, or organic materials injurious to the pipe

coatings.

PART 3 EXECUTION

1.04 PREPARATION

A. The CONTRACTOR shall prepare the trench width one foot wider than the width of the pipe to be buried unless specified otherwise in the design Drawings. Where more than one pipe is specified for a given trench, the trench shall be at least one foot wider than the width of the combined piping.

B. Trench width at the top of the trench will not be limited except where the width of the excavation would undercut adjacent structures, footings or slopes. In such cases, trench width shall be such that there is at least 18 inches between the top of edge of the trench and the structure, footing or slope.

C. Excavate the trench to the lines and grades shown on the Drawings with allowance for pipe thickness and for pipe base or special bedding. If the trench is inadvertently excavated below the required grade, refill any part of the trench excavated below the grade at no additional cost to the OWNER with sand slurry. Place the refilling material over the full width of trench in compacted layers not exceeding 6 inches deep to the established grade with allowance for the pipe base or special bedding.

D. Dewatering shall be performed as needed per the requirements in Section 312319.

E. The CONTRACTOR shall have the trench inspected by the OWNER or the OWNER's REPRESENTATIVE.

F. Location of Excavated Material

1. During trench excavation, place the excavated material only within the working area. Do not obstruct any roadways or streets. Conform to federal, state, and local codes governing the safe loading of trenches with excavated material.

2. Location of excavated material from pipe/conduit run in front of blast wall shall be coordinated with the OWNER or OWNER’S REPRESENTATIVE. This material cannot be stockpiled.

G. Foundation Stabilization

1. After the required excavation has been completed, the OWNER's REPRESENTATIVE will inspect the exposed pipe zone and trench subgrade to determine the need for any additional excavation. It is the intent that additional excavation be conducted in all areas within the influence of the pipeline where unacceptable materials exist at the exposed subgrade.

2. Over excavation shall include the removal of all such unacceptable material that exists directly beneath the pipeline or within the pipe zone to the width shown on the Drawings and to the depth required. This may require excavating a wider trench.

3. Backfill the trench to subgrade of pipe base with refill material for foundation stabilization. Place the foundation stabilization in layers not exceeding 6 inches deep to the required grade.

H. Refill material used by the CONTRACTOR for his convenience will not receive any additional payment.

1.05 INSTALLATION

A. Pipe Bedding

1. Bedding of the pipe shall be done in accordance with the trench detail on the Drawings. Care shall be taken to prevent any damage or shifting of the pipe. The pipe bedding material shall be compacted into place to the same density as specified for backfill above the pipe bedding material with materials as specified.

2. Thickness of pipe base shall be 6 inches or as otherwise shown on the Drawings or otherwise described in the specifications for the particular type of pipe installed.

3. Excavate coupling or bell holes at each joint to permit proper assembly and inspection of the entire joint.

B. After pipe has been bedded, place bedding material simultaneously on both sides of the pipe, keeping the level of bedding the same on each side. Carefully place the material around the pipe so that the pipe barrel is completely supported and that no voids or uncompacted areas are left beneath the pipe. Use particular care in placing material on the underside of the pipe to prevent lateral movement during subsequent backfilling.

C. The CONTRACTOR shall install a second layer of approved backfill material to a depth of approximately 12 inches unless specified otherwise in the Drawings. Place the backfill material carefully onto the bedding material previously placed. Do not permit free fall of the material until at least 2 feet of cover is provided over the top of the pipe. Do not drop sharp, heavy pieces of material directly onto the pipe. This second layer of backfill material shall be graded to provide an even bed and compacted as per the compaction requirements in Section 312323**.**

D. The pipe installation crew will install the warning tape in the trench not more than one foot below finish grade. The CONTRACTOR will provide the warning tape.

E. Tracer wire shall be installed on HDPE piping in accordance with Division 40 specifications and as shown in the Detail Drawings.

F. Continue backfill to grade in accordance with compaction requirements in Section 312323.

G. Throughout the installation process, the CONTRACTOR shall not allow newly installed piping to be left uncovered overnight without prior approval from the OWNER or the OWNER's REPRESENTATIVE.

*** END OF SECTION ***

SECTION 31 25 00

EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, installation equipment, and incidentals required to install the erosion and sediment control features shown on the drawings, including: (i) silt fence; (ii) temporary stabilization; and (iii) permanent stabilization, as specified herein and as shown on the Drawings.

B. CONTRACTOR shall furnish all labor, material, tools, supervision, transportation, installation equipment, and incidentals required to install erosion and sediment controls not shown on the Drawings, but required to prevent sedimentation or pollution to waters of the State or Federal waterways.

C. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, installation equipment, and incidentals required to maintain all soil erosion and sediment control features and structures throughout the duration of the Project and removal of temporary measures and structures, where and when necessary, as directed by OWNER or ENGINEER.

D. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, installation equipment, and incidentals required to construct and maintain soil stockpiles on site.

1.02 SUBMITTALS

A. At least ten days prior to the Preconstruction Meeting, CONTRACTOR shall provide ENGINEER the proposed product material data sheets, and manufacturer recommended method of installation for silt fence and paved surface inlet protection.

B. At least seven days prior to applying any temporary or permanent stabilization, CONTRACTOR shall provide ENGINEER information of:

1. seed mixture, quantity, and application rate;
2. mulch type and application rate;
3. fertilizer type and application rate; and

4. seed bed preparation.

C. At least seven days prior to installing a sediment control feature not addressed in this Section, CONTRACTOR shall provide ENGINEER Shop Drawings and/ or product information on the proposed feature, along with calculations necessary to verify the proper functioning of the feature for the intended purpose.

1.03 CONSTRUCTION QUALITY ASSURANCE

A. The installation, use, and maintenance of the erosion and sediment control features shall be monitored by ENGINEER.

B. At the discretion of OWNER or ENGINEER, the Work of this Section may be subjected to CQA monitoring.

PART 2 PRODUCTS

2.01 SILT FENCE

A. Silt fence fabric shall be inert to chemicals commonly found in soils and to hydrocarbons.

B. Silt fence fabric shall be resistant to mildew, rot, insects, and rodent attack.

C. Silt fence fabric and posts shall meet the Criteria for Silt Fence Materials provided on pages 5.54 and 5.55 of the New York State *Standards and Specifications for Erosion and Sediment Control – November 2016 (SSESC)* and as shown on the Drawings.

2.02 PAVED SURFACE INLET PROTECTION

A. Paved surface inlet protection shall be installed after pavement construction has been conducted and while final grading and soil stabilization is occurring.

B. Paved surface inlet protection shall meet the requirements for Storm Drain Inlet Protection as described on pages 5.57 through 5.59 of the New York State *Standards and Specifications for Erosion and Sediment Control – November 2016 (SSESC)* and as shown on the Drawings.

2.02 TEMPORARY STABILIZATION

A. Temporary stabilization shall consist of placing seed, mulch, and/or soil amendments as needed, for the area to be stabilized.

B. Seed, mulch, and soil amendments shall meet the requirements for Soil Stabilization requirements described in Section 4 of the New York State *Standards and Specifications for Erosion and Sediment Control – November 2016 (SSESC)* and as shown on the Drawings.

2.03 PERMANENT STABILIZATION

A. Permanent stabilization shall consist of placing seed, mulch, fertilizer, and/or soil amendments as needed, for the area to be permanently stabilized.

B. Seed, lime, fertilizer, mulch, and soil amendments shall meet the requirements Soil Stabilization requirements described in Section 4 of the New York State *Standards and Specifications for Erosion and Sediment Control – November 2016 (SSESC)* and as shown on the Drawings.

C. Liquid mulch binders shall not be used.

D. Permanent seed mix shall be Summer Green Supreme (Preferred Seed Company) or equivalent approved by ENGINEER.

Summer Green Supreme

%	Variety
20%	Cochise IV Tall Fescue
20%	Rebounder Tall Fescue
20%	4th Millennium Tall Fescue
15%	Essential Tall Fescue
10%	Green Supreme Perennial Ryegrass
10%	Palmetto Turf Type Annual Ryegrass
5%	SR 2100 Kentucky Bluegrass

Total = 100%

Rate = 8 lbs. / 1,000 SF

2.04 OTHER EROSION AND SEDIMENT CONTROL FEATURES

A. CONTRACTOR shall select appropriate erosion and sediment control features from New York State *Standards and Specifications for Erosion and Sediment Control – November 2016 (SSESC)* and as shown on the Drawings.

B. CONTRACTOR may use erosion and sediment control features presented in other published erosion and sediment control guidance documents or manufacturers recommendations as approved by ENGINEER.

PART 3 EXECUTION

3.01 SILT FENCE

A. CONTRACTOR shall install silt fence in accordance with the Design Criteria provided on pages 5.54 through 5.56 of the New York State *Standards and Specifications for Erosion and Sediment Control – November 2016 (SSESC)* and as shown on the Drawings. Silt fences shall be placed as close to the disturbed area as possible, but at least 10 feet from the toe of a slope steeper than 3H:1V.

B. Sediment accumulated against the silt fence shall be removed when it reaches one half of the above ground height of the fence.

C. The selection of silt fence material shall be agreed to between CONTRACTOR and ENGINEER based on slope steepness, slope length, anticipated runoff and ponding depth, soil conditions, and anticipated time area will be left undisturbed.

D. Silt fence shall not be used for more than one year to intercept sediment laden runoff.

3.02 TEMPORARY STABILIZATION

A. CONTRACTOR shall install temporary stabilization over disturbed areas, as needed, to minimize the potential for erosion in accordance with the Soil Stabilization and Landgrading requirements described in Section 4 of the New York State *Standards and Specifications for Erosion and Sediment Control – November 2016 (SSESC)* and as shown on the Drawings.

B. The selection of temporary stabilization shall be agreed to between CONTRACTOR and ENGINEER based on season, ground and weather conditions, and anticipated time area will be left undisturbed.

3.03 PERMANENT STABILIZATION

A. CONTRACTOR shall install permanent stabilization over areas that will not be disturbed in accordance with the Soil Stabilization and Landgrading requirements described in Section 4 of the New York State *Standards and Specifications for Erosion and Sediment Control – November 2016 (SSESC)* and as shown on the Drawings.

3.04 OTHER EROSION AND SEDIMENT CONTROL FEATURES

A. CONTRACTOR shall install, operate, and maintain erosion and sediment control features in accordance with published literature and/or manufacturers recommendations throughout the duration of the Contract and direction by OWNER and ENGINEER.

3.05 STOCKPILING

A. CONTRACTOR shall install temporary tarps over all stockpiled soils to minimize the potential for erosion in accordance with the requirements of Standards and Specifications for Landgrading as described on pages 4.24 through of 4.28 the New York State *Standards and Specifications for Erosion and Sediment Control – November 2016 (SSESC)* and as shown on the Drawings.

*** END OF SECTION ***

SECTION 31 15 00

EXCAVATION SUPPORT AND PROTECTION OF EXISTING STRUCTURES

PART 1 GENERAL

1.01 WORK INCLUDED

A. This work includes but is not limited to: (i) designing, furnishing, installing and maintaining temporary Support of Excavation (SOE) system as required and necessary; (ii) withdrawing and removing the SOE system unless such system is allowed to be left-in-place by ENGINEER; and (iii) all appurtenant equipment, labor and supervision necessary to furnish, install and maintain the SOE system in a safe manner.

B. Excavations more than four (4) feet deep shall be supported with an SOE system or properly sloped where employees may be exposed to moving ground or cave-ins. Excavations less than four (4) feet in depth shall also be effectively protected when examination of the excavation indicates hazardous ground movement may be expected.

1.02 GENERAL REQUIREMENTS

A. All work must be completed in a controlled, safe manner complying with the requirements of state and federal occupational health and safety (OSHA) regulations for trenching, excavation, and related SOE work. All permits, if required, shall be secured by CONTRACTOR.
B. All personnel on site have to be HAZWOPER Trained to be allowed to work in the site.

1.03 QUALIFICATIONS

A. If not self-qualified, CONTRACTOR shall subcontract a qualified firm for design of temporary Soldier Pile and Lagging shoring. Soldier Pile and Lagging design shall be performed under the responsible charge of a Professional Engineer licensed in the State of New York.

B. The SOE designer is required to provide documentation of prior experience of at least three previous projects of similar scope. Experience shall include the name and location of the project as well as contact information for the Owner or Engineer on the

project.

1.04 REFERENCES

A. American Institute of Steel Construction (AISC) Steel Construction Manual Code.

B. ASTM A36 – Standard Specification for Carbon Structural Steel.

C. ASTM A572 – Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.

D. ASTM A6 General requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Pilling and Bars for Structural Use.

E. ASTM C33 Specifications for Concrete Aggregates.

F. ASTM C39 Test Method for Compressive Strength of Cylindrical Concrete Specimens.

G. ASTM C150 Specifications for Portland Cement.

H. American Welding Society (AWS) D1.1 – Structural Welding Code – Steel.

I. Post Tensioning Institute (PTI DC35.1-14) Manual.

1.05 SUBMITTALS

A. Provide all required submittals at least fourteen (14) days prior to the start of Work.

B. Geotechnical data to be used by CONTRACTOR for SOE System design is provided in SOE design report. Additional reference information is provided as part of the Project Manual.

C. CONTRACTOR shall submit a SOE system design to the ENGINEER that at a minimum includes the following:

1. Design calculations based on site-specific project conditions that demonstrates the SOE system is capable of maintaining stability under temporary conditions.
2. Design calculations that demonstrate that overall stability of the soil mass is acceptable at all stages of the work.
3. Design calculations indicating the size and shape of apparent lateral earth pressure diagrams from earth, water and surcharge loads from vehicular traffic, construction

equipment, material storage, adjacent structures, etc.

4. Design calculations shall account the effects of construction dewatering, as required.
5. The design of the steel component of the SOE system shall follow AISC Steel Construction Manual Code, 13th edition or later.
6. Design calculations shall include free body diagrams with boundary conditions, load, shear, bending moment, and deflection diagrams for all SOE System for each change in cross section. Designs performed by computer program shall be submitted with complete program documentation and all input and output.
7. Design shall show structural calculations for bracing, plates and welds, anchoring system including selection of load for each support.
9. Information from any additional soil borings, test pits, and other investigations that may be required to properly develop the work shall be included with the design submittal.
10. All calculations shall be prepared and signed by a certified Professional Engineer licensed in the State of New York.

C. Drawings:

1. Include plan, elevation, section views of the wall, and construction control data, with details to illustrate the work.
2. Include the size and embedment of all piles on a scaled plan.
3. Include the size of bracing, plates, welds, wales, and anchors.
4. Drawings shall be reviewed and signed by a certified Professional Engineer licensed in the State of New York.

D. Work Plans:

1. SOE system installation plan shall include, at a minimum:
   a. Materials, methods, and equipment to be used for installation of the SOE system.
   b. Materials, methods, and equipment to be used for the pile removal, anchor destressing if needed.
   c. Tools, material, and methods to remove or go through obstructions in case they are encountered.
   d. Excavation and bracing plan.

e. Quality assurance plan that includes record keeping and surveying, including monitoring of movement of the SOE system wall.

f. Detailed construction schedule for the wall, including sequence of pile installation, temporary dewatering, wales and struts installation, grouting, anchor installation and prestressing, etc. The sequence of construction should be consistent and synchronized with the dewatering operations.

h. Welding procedures for the internal bracing and walers and welder's certifications.

2. Prior to construction, CONTRACTOR shall submit material certifications and mill certificates for all materials used in the construction of the temporary wall including, but not limited to, those included herein.

E. CONTRACTOR shall submit a Vibration Monitoring Plan in accordance with Section 02 22 13.

F. Review by ENGINEER of the SOE system proposed by CONTRACTOR will only be with respect to the basic principles of the methods the Contractor intends to employ. Review by ENGINEER does not relieve CONTRACTOR of the full responsibility for the adequate performance of the SOE system and for conforming with local, state, and federal regulations.

PART 2 PRODUCTS

A. All steel piling shall be new and un-spliced material conforming to ASTM A572.

B. Steel piles, struts, wales, laggings, and special fabricated shapes shall be of a design that ensures continuous wall throughout the entire length when in place.

D. All steel plates and miscellaneous shapes shall be new, hot-rolled, conforming to ASTM A36 and ASTM A572, as required by application.

E. All Anchor design and installation should follow the Post Tensioning Institute (PTI DC35.1-14) Manual recommendations.

F. Timber Lagging: Any species, rough-cut, mixed hardwood.
   a. Size: Min. 3-inch nominal thickness, unless design indicates larger section requirement

PART 3 EXECUTION

3.01 GENERAL

A. Confirm the existing site conditions prior to starting work.

B. Diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Water shall not be allowed to accumulate in an excavation.

C. No person shall be permitted under loads handled by loaders, excavators, derricks, or hoists.

D. In excavations more than four feet deep, adequate means of exit, such as a ladder or steps, shall be provided in accordance with OSHA requirements.

E. Where employees are required or permitted to cross over excavations, walkways or bridges with standard guardrails shall be provided as necessary or required.

F. Climbing on or supporting construction loads from the SOE wall is prohibited.

G. Excessive deflections of the SOE wall members will not be permitted.

H. Excavations shall be properly barricaded and protected at all times.

I. Any design changes or field adjustments needed during construction shall be submitted to ENGINEER for review prior to executing the work.

J. Shoring shall be in place prior to initiation of excavation.

3.02 SOE SYSTEM INSTALLATION

A. Prior to beginning work, CONTRACTOR shall become familiar with the site, including contacting the New York one-call system as required by law. Underground utilities at the site shall be marked prior to pile installation.

B. The SOE wall alignment shall be staked by CONTRACTOR per the SOE wall Drawings.

C. The Soldier Pile and Lagging Wall shall consist of a series of evenly spaced piles drilled connected with wooden lagging, reinforced with anchors and/or Struts as needed. the

system needs to be installed by skilled workers with in depth experience in Soldier pile lagging, struts, and anchor installation and anchor stressing.

D. The selected SOE installation method and equipment shall be consistent with the expected ground conditions at the site. The piles shall be drilled to the minimum tip elevations without damaging the surrounding structures.

E. All drill cuttings shall be treated as hazardous material and shall be handled in accordance to the specification Section 026113– Excavation, Removal, and Handling of PCB Impacted Soils.

F. Pile location and verticality should be kept to minimum. The pile location shall be surveyed and staked before drilling. The verticality of the pile shall be within one (1) percent of total length. Misalignment or out of plumb piles greater than the specified tolerances shall be reported to ENGINEER for review and recommendation for remedial action. The cost of such remedial action is solely the responsibility of CONTRACTOR.

G. External loadings, such as heavy equipment, trucks, or other heavy objects on a level above or near the edge of the excavation shall not be permitted. Should examination indicate deflection or potential movement of SOE Wall, CONTRACTOR shall modify excavation methods to remove loads above or near the edge of the excavation if existing.

H. All existing instrumentation and survey monitoring systems shall be maintained by CONTRACTOR. CONTRACTOR shall inform OWNER of any conflicts between existing instrumentation, monitoring points, and the SOE wall. CONTRACTOR shall replace any instrumentation damaged during the course of the work at no additional cost to OWNER.

I. BRACING; Provide sound material for wales and bracing. Place wales and bracing in compliance with design submittal drawing.

1. Exercise care when setting wales and braces to set them accurately, so as to avoid shifting of braces.
2. Provide an efficient means to properly transfer external forces from shoring to internal bracing. Abutting ends of bracing shall provide full bearing across entire section of member.
3. Install fillers and wedge, at each level of bracing, between piles and wales at time of installation, so bracing system will be properly stressed at all times.

4. Post and tie internal bracing so as to prevent spreading and distortion of braces frames.

5. Correct settlement and other damage caused by failure of shoring and other methods used to protect banks and sides of excavations, buildings, structures, utilities, and other facilities at no additional expense to Owner.

J. TIEBACKS;

1. Tieback Capacity:

   a. The contractor shall be responsible for installation tie-backs that will develop the tie-back design load indicated on the working drawings in accordance with the testing subsection herein.

2. Tieback Tendons:

   a. Tendons shall be handled and stored in such a manner as to avoid damage or corrosion. Damage to the tie-back tendon as a result of abrasions, cuts, nicks, welds, and weld splatter will be cause for rejection by the Engineer.

   b. Steel shall be protected from dirt, rust, and deleterious substances. A light coating of rust on the steel is acceptable on tendons which are to be grouted. If heavy corrosion or pitting is noted, the Engineer will reject the affected tendons. If there is a question about the extent of the corrosion, the Contractor may select an independent testing laboratory subject to the approval of the Engineer and test samples of the tendon to determine if the prestressing steel meets the minimum mechanical properties of the appropriate ASTM specification. If the steel fails to meet the ASTM specification requirements, the Contractor shall replace the damaged tendons. The Contractor shall pay all costs associated with the tests.

   c. Centralizers shall be securely attached to the tendon in the anchor length only and their center spacing shall not exceed 10 feet. In addition, the lower centralizer shall be located a maximum of 5 feet from the bottom of the anchor length.

   d. The unbonded length of the tendon shall be sheathed with a plastic tube conforming to the requirements herein. The sheath is used to provide corrosion protection and shall have a minimum wall thickness of: 60 mils Polyethylene/Polypropylene or 30 mils PVC. The annular space between the tendon and sheath shall be completely filled with a corrosion inhibitor conforming to the requirements herein. The ends of pulled-on sheaths shall be sealed with ultra-high molecular weight PE tape or heat-shrinkable tubing. The

ends of extruded sheaths do not require a separate sealing means. The sheath can also function as the bond breaker.

e. The trumpet shall have an inside diameter equal to or larger than the hole in the bearing plate furnished by the tendon supplier. The trumpet shall be long enough to accommodate movements of the structure during testing and stressing.

f. For strand tendons, the Contractor shall consult the tendon supplier to determine the minimum length trumpet required making a transition from the diameter of the tendon in the unbonded length to the diameter of the tendon at the anchor head. A watertight seal shall be provided between the trumpet and the unbonded length corrosion protection. If grout is used to fill the trumpet, then the seal is temporary, and it acts as a grout form. If corrosion inhibitor is used to fill the trumpet, then the seal is permanent, and it shall be fabricated from Buna-N synthetic rubber or functionally approved equal.

3. Installation of Tieback:

a. The Contractor shall select the drilling method and the grouting procedure used for the installation of the tie-back. The minimum drill hole diameter shall be 1 inch larger than the diameter of the anchor, or 4 inches, whichever is greater. Core drilling, rotary drilling, percussion drilling, auger drilling, or driven casing may be used. The tie-back angle shall be within plus or minus 3 degrees of that shown on the plans.

b. If water is used in the drilling operation, the Contractor shall control and dispose of the water in a manner that adheres to any Jurisdictional regulations and is not harmful to the site or adjacent property.

c. The Contractor shall use care in handling and storing the tendons at the site. Prior to inserting a tendon in the drill hole, the Contractor shall examine the tendon for damage. If the sheathing has been damaged, it can be repaired with ultra-high molecular weight PE tape. The tape shall be spirally wound around the tendon so as to completely seal the damaged area. The pitch of the spiral shall ensure a double thickness at all points.

d. Anchor grout shall have a water/cement ratio between 0.35 and 0.50. Admixtures, except expansive additives, will be permitted and shall be mixed in accordance with the manufacturer's recommendations. The grouting equipment shall include a mixer capable of producing a grout free of lumps and non-dispersed cement. A positive displacement grout pump shall be used.

The pump shall be equipped with a pressure gage to monitor grout pressures at the pump. The pressure gage shall be capable of measuring pressures of at least 150 psi or twice that of actual grout pressures used by the Contractor. The grouting equipment shall be sized to enable the tie-back to be grouted in one continuous operation. Mixing and storage times shall not cause excessive temperature build in the grout. The mixer shall be capable of continuously agitating the grout.

e. Anchor grout shall be injected from the lowest point of the tie-back. The grout may be placed using grout tubes, casing, or drill rods. The grout may be placed before or after insertion of the tendon. The quantity of the grout and the grout pressures shall be recorded. The grout pressures and grout takes shall be controlled to prevent excessive heave in cohesive soils or fractured rock.

f. The Contractor shall prevent the grout column from contacting the wall or the trumpet. After stressing the tie-back, the void at the top of the unbonded length shall be filled with grout or grease. The tie-back shall remain undisturbed for at least 72 hours.

4. Tieback Testing and Stressing:

a. Each tie-back shall be proof tested, except those that are subjected to the more rigorous performance test or extended creep test. The maximum test load shall not exceed 80 percent of the guaranteed ultimate tensile strength of the tendon. The test load shall be simultaneously applied to the entire tendon. Testing shall not be performed until the grout has cured for at least 72 hours. The tie-back testing equipment shall consist of:

1) A dial gage accurate to 0.001 inch to measure the tie-back movement with sufficient stroke length to complete the test without interrupting the dial gauge. interrupting the dial gauge.

2) A hydraulic jack and pump to apply the test load. The jack and pressure gage shall be calibrated as a unit. The pressure gage shall be graduated to a minimum of 10 psi increments or 5% of the design tieback design load, whichever is less. The hydraulic pump shall be capable of raising the load from one load increment to another in less than 60 seconds.

b. A minimum of 1 tieback per wall, shall be performance tested. The performance test shall be made by incrementally loading and unloading the tie-back in accordance with the schedule presented below. The movement of

the tendon shall be measured and recorded to the nearest 0.001 inch with respect to an independent fixed referenced point at the alignment load and each increment of load. The test load shall be monitored with a pressure gage.

c. At the conclusion of below-grade construction (when determined shoring system is no longer required, i.e. below-grade walls can withstand lateral earth pressures), de-stress tiebacks on public and private property as necessary to comply with permit application and contract requirements.

5. Tieback Performance Test Schedule:

Step	Loading	Applied Load	Record and Plot Total Movement (δ_{ti})	Record and Plot Residual Movement (δ_{ri})	Calculate Elastic Movement (δ_{ei})
1	Apply alignment load (AL)				
2	Cycle 1	0.25DL	δ_{t1}		
		AL		δ_{r1}	$\delta_{t1}- \delta_{r1}= \delta_{e1}$
3	Cycle 2	0.25DL	δ_{2}		
		0.50DL	δ_{t2}		
		AL		δ_{r2}	$\delta_{t2}- \delta_{r2}= \delta_{e2}$
4	Cycle 3	0.25DL	δ_{3}		
		0.50DL	δ_{3}		
		0.75DL	δ_{t3}		
		AL		δ_{r3}	$\delta_{t3}- \delta_{r3}= \delta_{e3}$
5	Cycle 4	0.25DL	δ_{4}		
		0.50DL	δ_{4}		
		0.75DL	δ_{4}		
		1.00DL	δ_{t4}		
		AL		δ_{r4}	$\delta_{t4}- \delta_{r4}= \delta_{e4}$
6	Cycle 5	0.25DL	δ_{5}		
		0.50DL	δ_{5}		
		0.75DL	δ_{5}		
		1.00DL	δ_{5}		
		1.2DL	δ_{t5}		
		AL		δ_{r5}	$\delta_{t5}- \delta_{r5}= \delta_{e5}$
7	Cycle 6	0.25DL	δ_{6}		
		0.50DL	δ_{6}		
		0.75DL	δ_{6}		
		1.00DL	δ_{6}		
		1.2DL	δ_{6}		
		1.33DL	δ_{t6}, zero reading for creep test		

8	Hold load for 10 minutes while recording movement at specified times. If the total movement measured during the load hold exceeds the specified maximum value then the load hold should be extended to a total of 60 minutes.				
9	Cycle 6 cont'd.	AL		δ_{r6}	Cycle 6: δ_{tn}- δ_{r6}= δ_{e6}
10	Adjust to lock-off load if test results satisfy acceptance criteria, otherwise see section 7.4.5.4				
Notes: AL = Alignment Load, DL = Design Load, δ_i = total movement at a load other than maximum for cycle, i = number identifying a specific load cycle.					

6. Tieback Proof Test Schedule:

The proof test shall be performed by incrementally loading the tie-back in accordance with the following schedule. The movement of the tendon shall be measured and recorded to the nearest 0.005 inch with respect to an independent fixed reference point at the alignment load and each increment of load. The test load shall be monitored with a pressure gage

Step	Load
1	AL
2	0.25DL
3	0.50DL
4	0.75DL
5	1.00DL
6	1.20DL
7	1.33DL
8	Reduce to lock-off load
9	AL (optional)
10	Adjust to lock-off load

DL: Tieback Design Load
AL: Alignment Load

a. The tie-back tendon shall be locked-off, at the stated load on the plans, but not less than 80% of the required design load.

b. The Test Load in the performance and proof test shall be held for at least 10 minutes. Incremental loads leading to the test load shall be held for at least one minute. The total movement with respect to a fixed reference shall be measured and recorded at 1, 2, 3, 4, 5, 6, and 10 minutes. Once at either the proof or performance test load, if the total movement between 1 minute and 10 minutes exceeds 0.04 inch, the test load shall be held for an additional 50

minutes. The total movements shall be recorded at 15, 20, 25, 30, 45 and 60 minutes.

c. Upon completion of the tie-back test, the load shall be reduced to the lock-off load specified by the SOE designer and transferred to the permanent stressing anchorage. After transferring the load to the stressing anchorage and prior to removing the jack, an initial lift-off reading shall be made. The load determined shall be within 10 percent of the specified lock-off load. If the load is not within 10 percent of the specified lock-off load, the stressing anchorage shall be reset, and another initial lift-off reading shall be made.

d. A test report shall be submitted to the ENGINEER for review within 24 hours of each tieback test completion.

e. Project schedule needs to be maintained including the anchor installation and testing.

3.03 PROTECTION OF EXISTING STRUCTURES

K. CONTRACTOR shall establish survey marker reference points on top of the SOE wall every 25 feet along the wall alignment to monitor displacements.

1. Survey marker locations shall be selected such that they do not interfere with construction operations and which shall remain available for monitoring for the duration of the Contract. The locations and frequency of measurement shall be submitted to ENGINEER for review and approval at least 14 days before starting the Work.
2. CONTRACTOR shall obtain three (3) initial readings of the survey marker reference points for review by ENGINEER, before the excavation begins.
3. CONTRACTOR shall perform surveys of the survey marker reference points once every two (2) days for vertical and horizontal/lateral movement and submit results to OWNER within 24 hours. CONTRACTOR shall record, plot and submit all information pertinent to the excavation support and cooperate with other testing and inspection personnel to provide data for all required reports.
4. Vertical pile movement shall be limited to one-quarter (1/4) inch downward.
5. Lateral SOE wall movement shall be limited to one (1) inch at locations where above ground structures are present.
6. If the surveyed displacement of the SOE wall equals or exceeds the allowable vertical or horizontal movement, defined above, from the initial position at any survey marker reference point, or anywhere else along the wall, CONTRACTOR

shall stop all nearby excavation work and notify ENGINEER and OWNER.

L. CONTRACTOR shall maintain site stability during construction of all elements of the temporary SOE wall and excavations. If excavation or site instability are detected, the construction shall be immediately halted, and the excavation stabilized with corrective measures implemented by CONTRACTOR under the direction and supervision of ENGINEER.

3.04 QUALITY ASSURANCE – QUALITY CONTROL

A. CONTRACTOR shall provide a qualified superintendent and/or field engineer who will be the point of contact for and responsible for contractor quality control. The contractor's quality control representative will be present at the project site at all times during construction of the wall, and shall conduct all testing and monitoring as described in CONTRACTOR's approved quality control plan.

B. Quality assurance testing or inspections performed by OWNER in no manner relieves CONTRACTOR of the responsibility to construct all work to conform to the Drawings.

C. All welds shall be visually inspected.

SECTION 32 13 13

CONCRETE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete sidewalks

1.02 RELATED REQUIREMENTS

A. Section 31 23 23 - Soils.

1.03 REFERENCE STANDARDS

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).

B. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).

C. ACI 305R - Hot Weather Concreting; 2010.

D. ACI 306R - Cold Weather Concreting; 2010.

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.

F. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2015a.

G. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.

H. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2014.

I. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2014.

J. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).

K. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and

Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2004a (Reapproved 2013).

1.04 SUBMITTALS

A. See Section 01 33 00 for submittal procedures.

B. Product Data: Provide data on joint filler, admixtures, and curing compound.

1.05 TOLERANCES

A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.

B. Maximum Variation from True Position: 1/4 inch.

1.06 FIELD QUALITY CONTROL

A. ENGINEER will perform field quality control tests, as specified in Section 01 43 00.

1. Provide free access to concrete operations at project site and cooperate with appointed firm.

2. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

3. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.

B. Compressive Strength Tests: ASTM C39/C39M; for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.

1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

2. Perform one slump test for each set of test cylinders taken.

C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

PART 2 PRODUCTS

2.01 PAVING ASSEMBLIES

A. Comply with applicable requirements of NYSDOT Standards.

2.02 FORM MATERIALS

A. Form Materials: As specified in Section 03 10 00.

B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).

2.03 REINFORCEMENT

A. Reinforcing Steel and Welded Wire Reinforcement: Types specified in Section 03 20 00.

B. Dowels: ASTM A615/A615M, Grade 40 - 40,000 psi yield strength; deformed billet steel bars; unfinished finish.

2.04 CONCRETE MATERIALS

A. Obtain cementitious materials from same source throughout.

B. Concrete Materials: As specified in Section 03 30 00.

2.05 ACCESSORIES

A. Curing Compound: Meeting NYSDOT Standards.

B. Liquid Surface Sealer: Meeting NYSDOT Standards.

C. Surface Retarder: Meeting NYSDOT Standards.

2.06 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.

1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.

D. Concrete Properties:

1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; As indicated on drawings.

2. Fly Ash Content: Maximum 20 percent of cementitious materials by weight.

3. Cement Content: Minimum 605 lb per cubic yard.

4. Water-Cement Ratio: Maximum 40 percent by weight.

5. Total Air Content: 5.0 to 8.0 percent, determined in accordance with ASTM C173/C173M.

6. Maximum Slump: 4 inches.

7. Maximum Aggregate Size: 1 inch.

2.07 MIXING

A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.

B. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

3.02 SUBBASE

A. See Section 32 11 23 for construction of base course for work of this Section.

3.03 PREPARATION

A. Moisten base to minimize absorption of water from fresh concrete.

B. Coat surfaces of manhole frames with oil to prevent bond with concrete pavement.

C. Notify Architect minimum 24 hours prior to commencement of concreting operations.

3.04 FORMING

A. Place and secure forms to correct location, dimension, profile, and gradient.

B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.05 REINFORCEMENT

A. Place reinforcement at as indicated on the construction drawings.

B. Interrupt reinforcement at expansion joints.

3.06 COLD AND HOT WEATHER CONCRETING

A. Follow recommendations of ACI 305R when concreting during hot weather.

B. Follow recommendations of ACI 306R when concreting during cold weather.

C. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

3.07 PLACING CONCRETE

A. Coordinate installation of snow melting components.

B. Place concrete as specified in Section 03 30 00.

C. Do not place concrete when base surface is wet

D. Place concrete using the slip form technique.

E. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.

F. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

G. Place concrete to pattern indicated.

H. Apply surface retarder to all exposed surfaces in accordance with manufacturer's instructions.

3.08 JOINTS

A. Align curb, gutter, and sidewalk joints.

B. Place 1/4 inch wide expansion joints at 20 foot intervals and to separate paving from vertical surfaces and other components and in pattern indicated.

C. Form joints with joint filler extending from bottom of pavement to within 1/4 inch of finished surface.

D. Secure to resist movement by wet concrete.

E. Provide scored joints.

F. As indicated on plan.

G. At 5 feet intervals.

H. Between sidewalks and curbs.

I. Between curbs and pavement.

J. Scores to be a 2" tooled joint.

K. Provide keyed joints as indicated.

L. Saw cut contraction joints 3/16-inch-wide at an optimum time after finishing. Cut 1/3 into depth of slab.

3.09 FINISHING

A. Area Paving: Light broom, texture perpendicular to pavement direction.

B. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.

C. Median Barrier: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.

D. Curbs and Gutters: Light broom, texture parallel to pavement direction.

E. Inclined Vehicular Ramps: Broomed perpendicular to slope.

F. Place sealer on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.10 PROTECTION

A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

B. Do not permit pedestrian or vehicular traffic over pavement for 7 days minimum after finishing.

*** END OF SECTION ***

SECTION 330100

TEMPORARY PROTECTION AND ABANDONMENT OF EXISTING UTILITIES

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. CONTRACTOR shall furnish all materials, implements, machinery, equipment, tools, supplies, transportation, labor and supervision required to temporarily protect and/or abandon and remove existing underground utilities, including potable water, sanitary sewer, natural gas, electric, and storm sewer. The work shall include all temporary shoring and support, removals and temporary utility disconnection, relocations, removal of debris from the site, and reconstruction of in-kind utilities.

B. Permits and Certificates: The CONTRACTOR shall obtain and pay for all permits and certificates required in conjunction with the work.

1.03 LOCATION OF UTILITIES

A. CONTRACTOR shall be responsible for locating all underground structures and utilities, such as water mains, sewers, telephone and electric conduits, etc., which may be encountered during excavation. The locations of existing structures and utilities as shown on the plans is simply for the guidance of the CONTRACTOR and have not been field located and, since the information is as furnished by the respective utilities, or taken from non-as-built plans, the ENGINEER is not responsible for the accuracy of the plans in this respect.

B. CONTRACTOR shall excavate holes to determine the position, type, and size of underground structures and utilities using “soft dig” or other suitable techniques. Uncovered utilities shall be surveyed as required in Section 017829.

C. Utility depths will vary, therefore, exploratory excavations may be up to 6 feet deep. Exploratory locations shall be maintained outside the delineated limits of TSCA wastes, such that no TSCA materials will be disturbed during utility exploration.

D. De minimis quantities of soils will be removed as part of the exploration program. Soils that are removed shall be placed on plastic tarps within the limits of the

excavation and covered with plastic tarps at the end of the day. These materials will be managed with other non-TSCA soils in accordance with the IRM Work Plan during the general excavation.

E. Equipment used for utility location shall be decontaminated prior to leaving the site per Section 025100.

1.02 SUBMITTALS

A. CONTRACTOR shall submit record surveying following existing utility location.

B. CONTRACTOR shall submit a plan that identified the utilities are intended for temporary abandonment and replacement and the utilities that are intended to remain in-place and be supported during construction. The plan will include a description of the proposed methods for supporting utilities that are to remain in place. Methods shall conform with the performance requirements of this Section.

C. CONTRACTOR shall submit proposed materials to be used for replacement utilities as well as the proposed mix design for flowable fill as required.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.01 UTILITY PROTECTION AND SUPPORT

A. For utilities that are designated to remain in service and protected during excavation, CONTRACTOR shall provide temporary support through the use of blocking, straps, sleepers, or other means that will securely support the utility and prevent damage.

B. CONTRACTOR shall uncover utilities and shall organize the work in a manner to provide continuous support or shoring during the excavation of underlying soils. Temporary support for existing utilities shall be provided at a maximum 6 feet on center and shall result in less than 2-inches of displacement per 10 linear feet. Utilities that function by gravity flow shall be supported in a manner that maintains continuous slope in the direction of flow.

C. Utility backfill shall consist of structural fill and be compacted in accordance with Section 312323.

3.02 UTILITY DISCONNECTION

A. For utilities that are designated for temporary disconnection and removal, CONTRACTOR shall arrange to have the utility service shut off prior to demolition.

B. CONTRACTOR shall provide by-pass service for potable water and electric should these utilities be temporarily abandoned. By-pass pumping of disconnected storm sewer piping shall also be provided as required.

C. All methods of disconnecting utilities shall allow for the reconstruction and connection of in-kind utilities.

D. A demolition sequence shall be submitted to the OWNER for approval.

3.03 UTILITY RESTORATION

A. After excavation of PCB impacted soils has been completed, during backfilling, temporarily abandoned utilities shall be restored with in-kind material types, dimensions, and structures.

B. Do not remove temporary support or shoring of existing utilities until after backfill is placed. For utilities that have been temporarily supported during excavation, CONTRACTOR shall backfill beneath the utility line using flowable fill that consists of a mixture of cement, water, fine aggregate, and admixtures that is self-compacting and produces a minimum 28-day compressive strength of 50 pounds per square inch.

C. Utility backfill shall consist of structural fill and be compacted in accordance with Section 312323.

*** END OF SECTION ***

SECTION 330112

LEAK TESTING OF PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This specification identifies the minimum requirements for leak testing of all piping performed by the CONTRACTOR.

1.02 REFERENCED SECTIONS - none

1.03 CITED STANDARDS – none

1.04 NOTED RESTRICTIONS

A. Leak testing shall be limited to 1,000-foot intervals or between isolation valve locations, whichever is the shorter distance.

B. Changes in temperature will increase or decrease the apparent test pressure in any piping system. The effect depends on the rate of expansion of the pipe wall compared to the water in the pipe. When possible, testing should be done during periods of relatively stable atmospheric temperatures. Early mornings and late afternoons are good times to test the pipe when it has not been buried.

C. Under no circumstances shall the total time under the test exceed eight (8) hours at 1.5 times the pressure rating of the lowest rated component in the system. If the test is not completed due to leakage, equipment failure, etc., the test section shall be allowed to "relax" for eight (8) hours prior to the next test.

1.05 QUALITY CONTROL

A. The CONTRACTOR shall perform hydrostatic testing of all single-walled piping and the inner pipe of double-walled piping.

B. The CONTRACTOR shall conduct pneumatic leak testing on the secondary containment piping of the environmental pipeline (double

walled HDPE pipeline) and instruments, tubing and connections operating with an air or gaseous media.

C. The CONTRACTOR shall develop detailed procedures for leak testing based on the minimum requirements of this specification, and manufacturer's instructions. All leak testing procedures shall be submitted to the OWNER's REPRESENTATIVE for review and approval.

D. All leak testing shall be witnessed by the OWNER or OWNER's REPRESENTATIVE.

E. In general, service leak testing shall be conducted on the following systems:

1. All equipment, equipment connections and pipelines.

2. Instruments and instrument tubing connections to equipment, piping, or ducting.

3. Flanges or other connections temporarily blinded or capped for hydrostatic or pneumatic testing.

F. Requirements Prior to Testing

1. Before testing, the pipe trench shall be backfilled with a minimum of 2-1/2 feet of material, or center loaded to hold the pipe in place while testing.

1.06 SUBMITTALS

A. Two weeks prior to the start of leak testing, the CONTRACTOR shall submit detailed leak testing procedures for the OWNER's REPRESENTATIVE's review and approval.

PART 2 PRODUCTS

2.01 GENERAL

A. All temporary test gauges, fittings, hoses, valves, pumps, compressors, test media, relief devices, and leak inspection materials, including soap solutions, shall be specified and provided by the CONTRACTOR at least 2 weeks before carrying out the test.

B. Any replacement piping components required to repair leaks, shall be provided by the CONTRACTOR at no additional cost to the OWNER.

C. Water

1. Make-up water for testing shall be potable water.

D. Test Bulkheads

1. Design and fabricate test bulkheads per Section VIII of the ASME Boiler and Pressure Vessel Code. Materials shall comply with Part UCS of said code. Design pressure shall be at least 2.0 times the specified test pressure for the section of pipe containing the bulkhead. Limit stresses to 70 percent of yield strength of the bulkhead material at the bulkhead design pressure. Include air-release and water drainage connections.

E. Vents and Drain for Aboveground Piping

1. Install vents on the high points of aboveground piping, whether shown on the Drawings or not. Install drains on low points of aboveground piping, whether shown on the Drawings or not. Provide a valve at each vent or drain point. Valves shall be 3/4-inch for piping 3 inches and larger and 1/2-inch for piping smaller than 3 inches.

F. Manual Air-Release Valves for Buried Piping

1. Provide temporary manual air-release valves for pipeline test. Construct the pipe outlet in the same manner as for a permanent air valve and after use, seal with a blind flange, pipe cap, or plug and coat equal to the adjacent pipe.

2.02 TESTING EQUIPMENT

A. The CONTRACTOR shall provide all equipment required for hydrostatic and pneumatic testing, including, but not limited to:

1. All fittings bleed points, pumps, flanges, connections, etc., necessary to perform hydrostatic test.

2. Clean water, with sufficient quantity to fill pipeline section under test.

3. A strainer on the inlet side of pump to prevent foreign matter from entering the pipeline.

4. Flange connections and/or valves suitable to isolate the pipeline section being tested without leaking.

5. A relief valve capable of permitting pressure relief if pressure exceeds 20 to 25 percent above required test pressure to prevent pipeline failure.

6. Testing pressure gauge(s)

a. Sufficient number of pressure gauges capable of measuring 50 percent over the intended test pressure. Pressure gauges shall be accurate within 1.0 percent.

b. Pressure gauges and relief valves shall be checked for accuracy prior to use during actual testing of the pipeline.

7. A booster pump with sufficient capacity to boost the source water pressure to the required test pressure.

8. An air compressor with sufficient capacity to provide air pressure to the required test pressure for the leak tests.

PART 2 EXECUTION

2.03 GENERAL EXAMINATION

A. The system or portion of the system to be tested shall be verified to determine that the system is mechanically complete and the following requirements have been met:

1. All solvent welded, or bonded joints have cured for at least 8 hours unless the ambient temperature is less than 70 degrees Fahrenheit (°F). If the ambient temperature is less than 70°F, the cure time shall be in accordance with the manufacturer's instructions.

2. All welding has been completed, including the acceptance of all required nondestructive examinations on pressure retaining welds.

3. All fusion joints have been completed, including the acceptance of all required nondestructive examinations on pressure-retaining welds.

4. All flanged connections have been completed, including bolting and gaskets.

5. All expansion joints have been installed and suitably anchored or guided in accordance with the manufacturer's instructions.

6. All nipples and valves have been installed for vents, drains, and instrument connections as specified on the applicable design Drawings.

7. All anchors and supports have been placed as specified on the applicable design Drawings.

8. All joints, including welds, bonds, and piping joints have been left uninsulated and/or unburied and exposed for examination during testing.

B. Verification shall include a comparison of the system to be tested to the mechanical flow, piping, and other applicable design Drawings**,** as applicable.

2.04 GENERAL PREPARATION

A. The CONTRACTOR shall have a written plan, approved by the OWNER's REPRESENTATIVE, in place as required by this section and shall follow the requirements of the plan.

B. Equipment or piping that is not to be tested shall either be disconnected or isolated by blinds or other means. A valve may be used in place of a blind if the valve is rated to the test pressure.

C. Instrumentation shall not be installed prior to testing unless the instrument is vented.

D. If the OWNER's REPRESENTATIVE approves hydrostatic testing of vapor or gas lines, temporary supports shall be provided, if necessary, to support the weight of the test liquid.

E. Sufficient vents and drains shall be located and installed by the CONTRACTOR to allow the removal of air.

F. All temporary test connections shall be completed.

G. If impractical to test in place and if specifically approved by the OWNER or the OWNER's REPRESENTATIVE, short runs or spools of piping may be interconnected and tested together.

H. Check valve internals shall be disassembled if the direction of the check valve does not allow complete filling or depressurizing of the system.

I. Booster pump(s) shall provide sufficient capacity to boost the source water pressure to the required test pressure.

J. Prior to testing the pipeline shall be properly flushed**.**

2.05 HYDROSTATIC LEAK TESTING REQUIREMENTS

A. Hydrostatic leak tests shall conform to the requirements of this specification and the manufacturer's instructions.

B. Test pressures for all piping systems shall not exceed 150% of the design pressure for the least-rated pipe, fitting, or valve installed in the system.

C. Air vents shall be provided by the CONTRACTOR at high points in the system to ensure that all air is purged from the system during filling. The number and location of all high point air bleeds shall also be approved by the OWNER's REPRESENTATIVE.

D. The CONTRACTOR shall conduct a leak test on all installed piping. The CONTRACTOR shall also furnish all necessary equipment and materials and make all taps in the pipe as required. The OWNER shall be notified at least 72 hours in advance of testing.

E. Drain valves shall be provided to facilitate filling and draining of all test liquid from the system. Drain valves may be omitted if the system is to operate liquid filled.

F. Tests shall not be performed unless weather conditions ensure a dry surface on the system to be tested or suitable weather protection can be provided.

G. Testing shall not commence until all sections of the pipeline to be tested have been secured to prevent damage to adjacent piping and equipment in the event of a joint failure. Any appurtenant instruments or devices that could be damaged by the test shall be removed from the piping or suitably isolated prior to applying the test. The CONTRACTOR will be held responsible for any damage caused by the testing.

H. During hydrostatic leak testing, joints shall be exposed for visual inspection. It is advised to cover the pipeline in intervals, especially at curves to hold the pipe in place during pressure testing.

I. Expansion joints and/or expansion compensators shall be restrained, isolated, or removed during pressurized leak testing.

J. All leaks identified shall be repaired and retested at no additional expense to the OWNER, including labor and replacement of any material. After repair, the system shall be retested.

K. After testing, the CONTRACTOR shall remove all temporary blinds and remake all connections disassembled for the leak test.

L. The pipe shall not be backfilled until visual inspection has been completed. Joints shall not be backfilled until successful completion of the leak test.

2.06 HYDROSTATIC LEAK TESTING PROCEDURE

A. The hydrostatic test procedure developed by the CONTRACTOR shall include the following provisions:

1. Air vents shall be opened to allow elimination of air from the system.

2. The tested pipeline shall be slowly filled (<1fps) with test fluid at the lowest point in the system. The CONTRACTOR shall provide means for increasing pressure to the required test pressures.

3. The test section shall be completely filled with the test medium, taking care to bleed off any trapped air.

4. When the tested pipeline is completely filled with the test fluid, the vents shall slowly be closed and line pressure shall slowly be brought up to the indicated test pressure.

5. Piping shall be tested up to 150% of the max. operating pressure (MAOP) of the lowest-rated component of each specified line segment.

B. The primary system shall be pressure tested hydrostatically in the phases as follows:

1. Initial Phase - Using clean water, the piping shall be tested up to 150% of the MAOP. Once the target is reached, allow 3 hours for diametric expansion.

2. Test Phase - After the pipeline has had time for equilibration, the test section shall be returned to 150% of the MAOP, the pump turned off, and a final test pressure held for 2 to 3 hours. If there is a leak observed, then the pipeline fails the test. Since double contained HDPE pipe is being tested, the DRISCO® test procedures shall be followed which includes allowable makeup. These conditions are described below.

C. Procedures Following Results

1. Examination for leakage shall be made of all welds, joints, and connections.

2. If a pressure test fails, the pipe shall be relieved, and the test section allowed to "relax" for a minimum of 8 hours before another test is attempted.

3. Upon satisfactory completion of the test, the system shall be slowly depressurized and completely drained. Air vents shall be opened as required to prevent inducing a vacuum on the system.

4. Provisions shall be made to divert draining test fluid from excavated and trenched areas and to maintain well formed and supported excavations throughout the testing procedure.

D. Test Records

1. Records shall be made of each piping system installation during the test. These records shall include:

a. Date of test.

b. Description and identification of piping tested including a marked up plan and profile.

c. Starting test pressure and end pressure.

d. Remarks, to include leaks (type, location) and repairs made on leaks

e. Certification by the CONTRACTOR and signed acknowledgement by the OWNER’s REPRESENTATIVE.

2.07 PNEUMATIC LEAK TEST

A. General Requirements

1. The CONTRACTOR shall conduct pneumatic leak testing on the secondary containment piping of the environmental pipeline (double walled HDPE pipeline) and instruments, tubing and connections operating with an air or gaseous media.

2. The inner pipe of double walled HDPE piping shall remain full of water throughout the pneumatic testing of the outer pipe to prevent collapsing.

3. Pneumatic leak tests shall conform to the requirements of this specification and ANSI B31.3. Pneumatic leak testing of double-contained piping shall also conform to the manufacturer's instructions. Special precautions for pneumatic leak testing are identified in ANSI B31.3.

4. Test pressures shall not exceed 10 psig.

5. A pressure relief device shall be provided with a set pressure that does not exceed 110 percent of the test pressure. Sizing and selection of the pressure relief device shall be determined by the CONTRACTOR.

6. Tests shall not be performed unless weather conditions ensure a dry surface on the system to be tested or suitable weather protection can be provided.

7. All leaks shall be repaired at no additional expense to the OWNER, including labor and replacement of any material. After repair, the system shall be retested.

8. A "leak" shall be defined as a formation of bubbles observed when a soap solution is applied or as indicated by the criteria for double walled HDPE piping in Paragraph B. 5. below.

9. Upon satisfactory completion of the test, the pressure shall be slowly released.

B. Special Procedural Requirements for Doubled Walled HDPE Piping

1. Cap off the inner pipe and the containment annulus separately and provide pressure gauges on each end of the inner pipe and each end of the annulus. (Four gauges).

2. Using low-pressure compressed air, charge the annular space to the lesser of approximately one-half of the test pressure or 2.5 pounds per square inch gauge (psig) at which time a preliminary check of the system shall be conducted.

3. Thereafter, the pressure shall be gradually increased in increments of approximately one-tenth of the test pressure. The incremental pressure shall be held long enough to equalize the system, until the test pressure (10psig) is attained.

4. The test pressure shall be maintained for a minimum of 2 hours.

5. In a tight system, the containment gauge should read 10 psi (minus losses due to expansion), and the carrier gauge should be zero. If there is a leak in the containment piping, the containment gauge will begin to drop. If, however, there is a leak in the carrier piping, the inner piping will become pressurized.

6. If a leak is detected, the leak shall be located and the leaking section shall be replaced. The leak detection procedure shall be repeated until satisfactorily completed at no cost to the OWNER.

7. Upon satisfactory completion of the test, the system shall be slowly depressurized.

*** END OF SECTION ***

ATTACHMENT 1
HYDROSTATIC AND PNEUMATIC TEST DATA SHEET

Project Number: Project Name:

Piping System/Equipment:

Description of Piping System/Equipment Being Tested:

Reference Criteria:	
Type of Test:	Test Medium:
Operating Pressure:	Operating Temperature:
Test Pressure:	Test Temperature:
Examination Pressure:	Examination Temperature:
Minimum Holding Time at Test Pressure:	Minimum Holding Time at Examination Pressure:
Allowable Leakage:	

Pressure Test Gauge(s) Identification Number: _____
Calibration Due Date: _____

Test Relief Valve(s) Identification Number: _____
Calibration Due Date: _____

PRETEST RELEASE SIGN-OFF

Mechanical	Eng. _____	Date: _____	Supt: _____	Date: _____
Welded Joints	Eng. _____	Date: _____	Supt: _____	Date: _____
Instrumentation	Eng. _____	Date: _____	Supt: _____	Date: _____

Time Test Started:	Time Test Completed:

Comments:

Performed by Name: Date:	Witnessed by Client Name: Date:
Verified by	Witnessed by OWNER's REPRESENTATIVE

Name:	Date:	Name:	Date:

SECTION 331400
WATER UTILITY DISTRIBUTION PIPING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, installation equipment, and incidentals necessary to complete the Work specified herein and shown on the Drawings. The Work shall include, but not be limited to:

1. Pipe and fittings for water lines including domestic water lines
2. Exterior Ductile Iron Pipe and Fittings;
3. Tracer Wire, Underground Warning tape.
4. Joint Restraint Appurtenances. and
5. Valves, Fire hydrants, and Domestic water hydrants.

B. Permits and Certificates: The CONTRACTOR shall obtain and pay for all permits and certificates required in conjunction with the work.

1.02 RELATED REQUIREMENTS

A. Section 026113 – Excavation, Removal, And Handling of PCB-Impacted Soils

B. Section 312300 – Trenching and backfilling.

C. Section 330112 – Leak Testing of Piping

D. Section 15140 – Disinfecting of Potable Water Mains

1.03 REFERENCE STANDARDS

A. AWWA C104/A21.4 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water; 2013.

B. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems; 2010.

C. AWWA C 11O/A21.10 – American National Standard for Ductile-Iron and Gray-Iron Fittings, 3-inch through 48-inch, for Water and Other Liquids.

D. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; 2012.

E. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast; 2009.

F. AWWA C153/A21.53 -American National Standard for Ductile-Iron Compact Fittings, 3-inch through 24-inch and 54-inch through 64-inch, for Water Service.

G. AWWA C502 - Dry-Barrel Fire Hydrants; 2014.

H. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service; 2009.

I. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances; 2010.

J. UL 246 - Hydrants for Fire-Protection Service; Current Edition, Including All Revisions.

K. ASTM D1784 – 08 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.

L. ASTM D1785 – 06 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.

M. ASTM D 3034 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

N. AWWA C900-07, AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Transmission and Distribution.

O. ANSI/AWWA C905-08, AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. Through 48 In. (350 mm Through 1,200 mm), for Water Transmission and Distribution

P. ASTM D 2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

Q. National Sanitation Foundation (NSF International STD 61, STD 14).

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with utility company requirements.

PART 2 PRODUCTS

2.01 WATER PIPE

A. Exterior Ductile Iron Pipe: AWWA C151:

1. Pipe: Ductile iron, having a wall thickness Class 52. Pipe shall be furnished with cement mortar lining in conformance with AWWA C-104.
2. Fittings: Ductile iron, having a wall thickness Class 52. Fittings shall conform in all respects to AWWA C-153. Fittings shall be furnished with cement mortar lining in conformance with AWWA C-104. All M/J fittings shall be restrained using a wedge action retainer gland as approved by the engineer or specified on the engineering drawings. Push on joints located within two joints of the restrained fitting shall have a bolt-less restraining gasket as approved by the engineer or specified on the engineering drawings.
3. Joints: Unless otherwise specified on the drawings, all pipe shall have rubber gasket joints conforming to AWWA C-111 unless otherwise noted.
4. Jackets: AWWA C 105 polyethylene jacket double layer, half lapped, 10 mil polyethylene tape. Polyethylene Jackets shall be used when required by the engineering drawings.

B. Exterior PVC Pipe: ASTM D1785:

1. Pipe: All pipe shall be manufactured by one of the following, or an equal approved by the OWNER's REPRESENTATIVE.

    1. Harvel® Plastics, Inc., Easton, PA
    2. J-M Pipe, Livingston, NJ
    3. Hunter Engineered Plastics, Lincoln, AL
    4. National Pipe Co., Vestal, NY.

    The material used in the manufacture of the pipe shall be domestically produced rigid polyvinyl chloride (PVC) compound, Type I Grade I, with a Cell Classification of 12454 as defined in ASTM D1784.

The pipe shall be manufactured in the USA, using domestic materials, by an ISO 9001 certified manufacturer. This compound shall be white or gray in color as specified, and shall be approved by NSF International for use with potable water (NSF Std 61).

2. Dimensions: 1. PVC Schedule 40 pipe shall be manufactured in strict accordance to the requirements of ASTM D1785 for physical dimensions and tolerances.

   Each production run of pipe manufactured in compliance to this standard, shall also meet or exceed the test requirements for materials, workmanship, burst pressure, flattening, and extrusion quality defined in ASTM D1785.

   All belled-end pipe shall have tapered sockets to create an interference-type fit, which meet or exceed the dimensional requirements and the minimum socket length for pressure-type sockets as defined in ASTM D2672.

3. Joints: Solvent-cemented joints should be utilized when working at or near maximum temperatures. Threaded connections are not recommended for PVC pipe at temperatures above 110F. The CONTRACTOR shall use flanged joints, unions, or roll grooved couplings where disassembly is necessary at elevated temperatures.

4. Threads: Thread only Schedule 80 or heavier PVC walls. ***Threading requires a 50% reduction in pressure rating stated for plain end pipe @73F***. Threading of Schedule 40 PVC pipe is not a recommended practice due to insufficient wall thickness.

2.02 VALVES

A. Gate Valves 3 Inches and Over:
   1. Manufacturers:
      a. Kennedy Valve.
   2. AWWA C509, ductile iron body, bronze trim, non-rising stem with square nut, single wedge, resilient seat, mechanical joint ends, stainless steel bonnet bolts, valve key, and extension box.

2.03 HYDRANTS

A. Hydrants: Type as required by utility company.

B. Hydrants: AWWA C502, UL 246, dry barrel type.

1. Manufacturer: Kennedy Valve, Model# K81D Guardian Hydrant.
2. Inside dimension: 7 inches minimum, with minimum 5 inches diameter valve seat opening.
3. Minimum net water area of barrel not less than 190 percent of valve opening.
4. 6-inch bell or mechanical joint inlet connection with accessories, gland bolts, and gaskets.

C. Hydrant Extensions: Fabricate in multiples of 6 inches with rod and coupling to increase barrel length.

D. Hose and Streamer Connection: Match sizes with utility company, two hose nozzles, one pumper nozzle.

E. Finish: Primer and two coats of enamel; color yellow.

2.04 BEDDING AND COVER MATERIALS

A. Bedding: As specified on Construction Drawings.

B. Cover: As specified on Construction Drawings.

2.05 ACCESSORIES

A. Concrete for Thrust Restraints: As specified on Construction Drawings.

2.06 UNDERGROUND WARNING TAPE

A. Plastic Ribbon Tape: Bright colored, continuously printed, minimum 6 inches (150 mm) wide by 4 mil (0.10 mm) thick, manufactured for direct burial service.

2.07 UNDERGROUND PIPE MARKER

A. Utility Witness marker shall be lightweight, flat-style marker installed using a manual driving tool. Marker shall be made from fiberglass reinforced composite material.

B. Marker color & size: Blue; 66" L x 3. 75" W

2.08 UNDERGROUND TRACE WIRE

A. Magnetic detectable conductor, clear plastic covering, imprinted with 'Water Service" in large letters.

2.09 JOINT RESTRAINT APPURTENANCES

A. M/J Joint Thrust Restraint Glands shall meet consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of AWWA C110 and have a working pressure rating of 350 psi.

B. Push on Joint Thrust Restraint shall meet or exceed the performance criteria of U.S. Pipe Field Lok Gaskets, Gripper Gaskets, or Approved Equal.

PART 3 EXECUTION

3.01 PREPARATION

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

3.02 TRENCHING

A. See the sections on excavation and fill for additional requirements.

B. Hand trim excavation for accurate placement of pipe to elevations indicated.

C. Form and place concrete for pipe thrust restraints at each change of pipe direction. Place concrete to permit full access to pipe and pipe accessories. Provide 2,000 sq ft thrust restraint bearing on subsoil.

D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.03 BEDDING

A. Place bedding material according to the trench details provided on the Engineering Drawings.

B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact to 95 percent.

C. Place fill material in accordance with Section 312300.

3.04 INSTALLATION- PIPE

A. Maintain separation of water main from sewer piping in accordance with DOH code.

B. Ductile Iron:
1. Maintain 10-feet horizontal and 18-inch vertical separation distance between water mains and sanitary sewer piping.
2. Install pipe to indicated elevation to within tolerance of 5/8 inches.
3. Install ductile iron piping and fittings to AWWA C600.
4. Route pipe in straight line.
5. Install pipe to allow for expansion and contraction without stressing pipe or joints.
6. Install access fittings to permit disinfection of water system performed under Section 15140.
7. All mechanical joint fittings shall be reinforced with a thrust restrain joint gland. Boltless restraining gaskets shall be used two push on joints each side of a mechanical joint fitting. Mechanical Joint Fittings located within 15 ft. from one another shall be rodded together. Manufacturer's specifications for gaskets or glands shall be submitted to the ENGINEER according to 013300 - Submittal Procedures.
8. Install water pipe with a minimum 5 ft of cover.
9. Backfill trench in accordance with Section 312300.
10. Group piping with other site piping work whenever practical.

C. PVC:
1. Before placement of the pipe, each pipe or fitting shall be thoroughly cleaned of any foreign substance which may have collected thereon and shall be kept clean at all times thereafter. For this purpose, the openings of all pipes and fittings in the trench shall be closed during any interruption to the Work. As pipe laying progresses, the CONTRACTOR shall keep the pipe interior free of all debris. The CONTRACTOR shall completely clean the interior of the pipe of all sand, dirt, rocks and any other debris following completion of pipe laying prior to testing, disinfecting and placing the completed pipeline in service
2. Pipe shall be laid directly on the imported bedding material. No blocking will be permitted and the bedding shall be such that it forms a continuous, solid bearing for the full length of the pipe. Bell holes shall be formed at the ends of the pipe to prevent joint loading at the bells or couplings.
3. Where necessary to raise or lower the pipe grade due to unforeseen obstructions or other causes, the CONTRACTOR may change the alignment and/or the

grades following approval from the OWNER's REPRESENTATIVE. Such change shall be made by the deflection of joints or by the use of additional fittings. However, in no case shall the deflection in the joint exceed the maximum deflection recommended by the pipe manufacturer.

4. No pipe shall be installed upon a foundation into which frost has penetrated or any time that there is a danger of the formation of ice or penetration of frost at the bottom of the excavation. No pipe shall be laid unless it can be established that the trench will be backfilled before the formation of ice and frost occurs.
5. Immediately before jointing bell and spigot pipe, both the bell and spigot end of the pipe shall be thoroughly cleaned and lubricated with an approved vegetable-based lubricant. The spigot end of the pipe section shall then be inserted into the bell of the previously laid joint and telescoped into its proper alignment. Tilting of the pipe to insert the spigot into the bell will not be permitted.
6. Solvent-welded and heat-fused joints shall be carefully and thoroughly cleaned immediately before joining the pipe. Particular care shall be taken in making solvent-welded joints to ensure a uniform, homogeneous and complete bond.

3.05 INSTALLATION -VALVES AND HYDRANTS

A. Set valves on solid bearing.

B. Center and plumb valve box over valve. Set box cover flush with finished grade.

C. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway.

D. Set hydrants to grade, with nozzles at least 20 inches above ground.

E. Locate control valve 4 inches away from hydrant.

F. Provide a drainage pit 36 inches square by 24 inches deep filled with 2 inches washed gravel. Encase elbow of hydrant in gravel to 6 inches above drain opening. Do not connect drain opening to sewer.

G. Paint hydrants in color yellow.

3.07 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with Section 014500.

B. Pressure test water piping to 200 psi.

1. Pressure After test completion water of piping to pipeline 200 psi. installation, including backfill, but prior to final connection to existing pressure and system, leakage conduct, tests in in presence of Engineer, AWWA C600. concurrent hydrostatic pressure and leakage tests in accordance with AWWA C600.
2. Provide equipment required to perform leakage and hydrostatic pressure tests.
3. Test Pressure: Not less than to 200 psi or 50 psi in excess of maximum static pressure, whichever is greater.
4. Conduct hydrostatic test for at least two-hour duration.
5. No pipeline installation will be approved when pressure varies by more than 5 psi at completion of hydrostatic pressure test.
6. Before applying test pressure, completely expel air from section of piping under test. Provide corporation cocks so air can be expelled as pipeline is filled with water. After air has been expelled, close corporation cocks and apply test pressure. At conclusion of tests, remove corporation cocks removed and plug resulting piping openings.
7. Slowly bring piping to test pressure and allow system to stabilize prior to conducting leakage test. Do not open or close valves at differential pressures above rated pressure.

8. Examine exposed piping, fittings, valves, hydrants, and joints carefully during hydrostatic pressure test. Repair or replace damage or defective pipe, fittings, valves, hydrants, or joints discovered, following pressure test.

9. No pipeline installation will be approved when leakage is greater than that determined by the following formula:

   L = (S*D*VP)/133,200
   L = allowable, in gallons per hour
   S = length of pipe tested, in inches
   D = nominal diameter of pipe, in inches
   p = average test pressure during leakage test, in pounds per square inch (gauge)

10. When leakage exceeds specified acceptable rate, locate source and make repairs. Repeat test until specified leakage requirements are met.

C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

*** END OF SECTION ***