NEW YORK STATE | Office of General Services

DESIGN & CONSTRUCTION GROUP
THE GOVERNOR NELSON A. ROCKEFELLER
EMPIRE STATE PLAZA
ALBANY, NY 12242

ADDENDUM NO. 3 TO PROJECT NO. 47674

CONSTRUCTION WORK
FUEL TANK MODIFICATION & ENVIRONMENTAL REMEDIATION
– SOUTHERN REGION
SERVICE CONTRACT
GNARESP CORNING TOWER
ALBANY, NY 12242

June 3, 2025

NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

SPECIFICATIONS

1. SECTION 231323 ABOVE GROUND FUEL STORAGE TANKS AND FUEL SYSTEMS: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 231323 – 1 thru 231323 – 26) noted "Printed 06/03/2025".

2. SECTION 310000 EARTHWORK: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 310000 – 1 thru 310000 – 18) noted "Printed 05/28/2025".

END OF ADDENDUM

Brady Sherlock, PE
Director, Division of Design
Design & Construction

SECTION 231323

ABOVE GROUND FUEL STORAGE TANKS AND FUEL SYSTEMS

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Cast-In-Place Concrete: Section 033001.

B. Fuel Management System Unit Price: Section 231313 (See Unit Price 231313.24).

C. Wiring, General – 600 Volts and Under: Section 260519.

D. Raceways, Fittings, and Accessories: Section 260532.

E. Transient-Voltage Suppression for Low-Voltage Electrical Power Circuits: Section 264313.

1.02 UNIT PRICE WORK

A. Payment for unit price items includes all associated Work, including transportation, installation, testing, and "de-bugging".

B. The unit prices listed below shall include all Work specified in the Division 1 General Requirements Sections.

C. Definitions for unit price items as listed in the Unit Price Schedule in Document 004143:

1. **Item Nos. 231323.01 thru 231323.07- Type CE-1 Fuel Storage Tanks (500-8,000 gallon size Inclusive):** Payment for this Work will be made at the Contract unit price per tank. The unit price includes the Work required to provide the following:
   a. Above ground tank
   b. Tank accessory package consisting of stair/platform assembly, gaging and venting equipment, tank identification, Stage I vapor recovery valve assembly, fill limiting valve, fill port spill container, and stickport.
   c. Note: Electrical wire and conduit shall be unit priced per section 260519 and 260532. Vehicle and tank pads and stair pads shall be unit priced per section 033001.
2. **Item Nos. 231323.08 thru 231323.20 Type DWS-1 Double Wall Steel Protected Storage Tank (300-30,000 gallon size Inclusive):** Payment for this Work will be made at the Contract unit price per tank. The unit price includes the Work required to provide the following:
   a. Above ground tank.
   b. Tank accessory package consisting of stair/platform assembly, gaging and venting equipment, tank identification, fill limiting valve, hose drip containment chamber at fillport, and stickport.

c. Tank sizes 10,000 gallon capacity and above shall be provided with an overfill prevention (OP) chamber.
d. Note: Electrical wire and conduit shall be unit priced per section 260519 and 260532. Vehicle and tank pads and stair pads shall be unit priced per section 033001.

3. **Item Nos. 231323.21 thru 231323.22 Type DWS-1 Double Wall Steel Protected Split Storage Tank (2,000- and 3,000-gallon size Inclusive):** Payment for this Work will be made at the Contract unit price per tank. The unit price includes the Work required to provide the following:
   a. Above ground tank.
   b. Tank accessory package consisting of stair/platform assembly, gaging and venting equipment, tank identification, fill limiting valve, hose drip containment chamber at fillport, and stickport.
   c. Note: Electrical wire and conduit shall be unit priced per section 260519 and 260532. Vehicle and tank pads and stair pads shall be unit priced per section 033001.
4. **Item No. 231323.23 Type A Tank Gaging, Leak and Overfill Monitor System:** Payment for this Work will be made at the Contract unit price per system. The unit price includes the Work required to provide the following:
   a. Alarm monitor panel.
   b. Leak sensors and magnetostrictive gage probe.
   c. Instrument control cables
   d. Overfill alarm device and sign.
   e. Printer (If printer is thermal type, include 6 rolls of thermal paper).
   f. Heavy duty surge protection.
   g. Uninterruptible power supply
   h. Initial testing, and debugging.
   i. Service of Company Field Advisor for minimum of 8 hours.
5. **Item No. 231323.24 – Type A Tank Gaging, Leak and Overfill Monitor System for an Additional Tank**: Payment for this Work will be at the Contract unit price per tank. The unit price includes the Work required to provide the following:
   a. Leak sensors, and magnetostrictive probe.
   b. Instrument control cables
   c. Initial testing and “debugging”.
   d. Required connections to Alarm Monitor Panel specified in Item 231323.13 above, or to an existing panel.
6. **Item No. 231323.25 Type B Tank Leak and Overfill Monitor System:** Payment for this Work will be made at the Contract unit price per system. The unit price includes the Work required to provide the following:
   a. Alarm controller console.
   b. Remote alarm panel.
   c. Interstitial space sensor(s) and piping sump sensor(s).
   d. High level sensor(s).
   e. Instrument control cables
   f. Overfill alarm device and sign.
7. **Item No. 231313.26 – Remote Tank Gaging, Leak and Overfill Monitor System:** Payment for this Work will be at the Contract unit price per package. The unit price includes the Work required to provide the following:

a. Remote alarm monitor panel.
b. Instrument control cables
c. Heavy duty surge protection and uninterruptible power supply
d. Initial testing and debugging.
e. Service of Company Field Advisor for a minimum of 8 hours.

8. **Item No. 231323.27 – Non-Discriminating Leak Sensor:** Payment for this Work will be made at the Contract unit price per sensor. The unit price includes the Work required to provide leak sensor and connect to existing tank gaging, leak and overfill system.
   a. Electrical wire and conduit shall be unit priced per section 260532.
9. **Item No. 231323.28 Power Integrity Control Panel:** Payment for this Work will be made at the Contract unit price per system. The unit price includes the Work required to provide the following:
   a. NEMA enclosure.
   b. Lockable maintenance switches.
   c. Remote E-stop.
10. **Item No. 231323.29 Type UG-1 Installation Package:** Payment for this Work will be at the Contract unit price per package. The unit price shall include the Work required to provide the following:
   a. Manual shutoff valve, external emergency valve, pressure relief valve, and explosion-proof solenoid valve.
   b. Flexible hose.
11. **Item No. 231323.30 Type D-1 Installation Package:** Payment for this Work will be at the Contract unit price per package. The unit price shall include the Work required to provide the following:
   a. Manual shutoff valve, external emergency valve, pressure/expansion relief valve, and explosion-proof solenoid valve.
   b. Flexible hose.
12. **Item No. 231323.31 Type FO-1 Installation Package (Fuel Oil or Diesel Generator):** Payment for this Work will be at the Contract unit price per package. The unit price shall include the Work required to provide the following:
   a. Manual shutoff valve, external emergency valve, pressure/expansion relief valve, and explosion-proof solenoid valve.
   b. Foot valve.
13. **Item No. 231323.32 Single Hose Unleaded Gasoline Suction Pump Dispenser:** Payment for this Work will be at the Contract unit price per package. The unit price shall include the Work required to provide the following:
   a. Single hose, single pump dispenser with illuminated product panel and register area, and pulser.
   b. Dispenser sump/stand.
   c. Sump leak sensor.
   d. Warning sign.
   e. Hose Assembly: Unleaded gasoline nozzle, reusable dry breakaway fitting, and (1) five-foot length and (1) ten-foot length of 3/4 inch dia. hose with swivel on each end.
   f. Standard high hose retractor.

14. **Item No. 231323.33 Single Hose Diesel Fuel Suction Pump Dispenser:** Payment for this Work will be at the Contract unit price per package. The unit price shall include the Work required to provide the following:
    a. Single hose, single pump dispenser with illuminated product panel and register area, and pulser.
    b. Dispenser sump/stand.
    c. Leak sensor.
    d. Hose Assembly: One inch dia., (2) nine-foot lengths of hose (18' total) with swivel fittings on each end, reusable dry breakaway fitting, and diesel nozzle.
    e. Warning sign.
15. **Item No. 231323.34 Dual Hose/Single Pump Diesel Fuel Suction Pump Dispenser:** Payment for this Work will be at the Contract unit price per package. The unit price shall include the Work required to provide the following:
    a. Dual hose, single pump dispenser with illuminated product panel and register area, and pulser.
    b. Dispenser sump/stand.
    c. Leak sensor.
    d. (2) Hose Assemblies: One inch dia., (2) nine-foot lengths of hose (18' total) with swivel fittings on each end, reusable dry breakaway fitting, and diesel nozzle.
    e. Warning sign.
16. **Item No. 231323.35 Dual Hose/Dual Pump Diesel Fuel Suction Pump Dispenser:** Payment for this Work will be at the Contract unit price per package. The unit price shall include the Work required to provide the following:
    a. Dual hose, dual pump dispenser with illuminated product panel and register area, and pulser.
    b. Dispenser sump/stand.
    c. Leak sensor.
    d. (2) Hose Assemblies: One inch dia., (2) nine-foot lengths of hose (18' total) with swivel fittings on each end, reusable dry breakaway fitting, and diesel nozzle.
    e. Warning sign.
17. **Item No. 231323.36 – High Hose Retractor for Diesel Dispensers:** Payment for the Work will be made at the Contract unit price per system. The unit price includes the Work required to provide the following:
    a. Cast iron high hose retractor head and body, stainless steel cable, and steel base.
    b. Side bracket bolted to the dispenser.
    c. 20lb counterweight.
    d. Hose cradle.
18. **Item Nos. 231323.37 thru 231323.40-Tank Heater Assembly (1,230 watt, 1,845 watt, 3,375 watt, and 5,625 watt sizes):** Payment for this Work will be at the Contract unit price per assembly. The unit price shall include the Work required to provide heater in aboveground tank including disconnect switch (NEMA 4X) and heavy duty surge protection.

19. **Item Nos. 231323.41 - Remote Fill Spill Container (10 gallon single port) and 231323.42 - Remote Fill Spill Container (20 gallon double port):** Payment for this Work will be at the Contract unit price per spill container. The unit price shall include remote fill spill container, fill pipe adapter, locking ball valve for fill, swing check valve, and dust cap.

20. **Item No. 231323.43 – Type DEF Diesel Exhaust Fluid Storage Tank (330 gallon size):** Payment for this Work will be at the Contract unit price per tank. The unit price includes the Work required to provide the following:
    a. 330-gallon tank with heated 50’ hose reel.
    b. 400w continuous duty forced air heating system with thermostat control.
    c. Pulse meter option to connect DEF tank to the Fuel Management System.
    d. Note: Electrical wire and conduit shall be unit priced per section 260519 and 260532. Vehicle and tank pads shall be unit priced per section 033001.

21. **Item No. 231323.44 – Type DEF Diesel Exhaust Fluid Storage Tank (600 gallon size):** Payment for this Work will be at the Contract unit price per tank. The unit price includes the Work required to provide the following:
    a. 600-gallon tank with heated 50’ hose reel.
    b. 400w continuous duty forced air heating system with thermostat control.
    c. Pulse meter option to connect DEF tank to the Fuel Management System.
    d. Note: Electrical wire and conduit shall be unit priced per section 260519 and 260532. Vehicle and tank pads shall be unit priced per section 033001.

22. **Item No. 231323.45 – Type DEF Diesel Exhaust Fluid Storage Tank (396 gallon size):** Payment for this Work will be at the Contract unit price per tank. The unit price includes the Work required to provide the following:
    a. 396 gallon tank with heated 25’ hose reel.
    b. Extreme cube package consisting of a 500W internal probe heater and temperature controller.
    c. Pulse meter option to connect DEF tank to the Fuel Management System.
    d. Note: Electrical wire and conduit shall be unit priced per section 260519 and 260532. Vehicle and tank pads shall be unit priced per section 033001.

23. **Item No. 231323.46 – Type DEF Diesel Exhaust Fluid Storage Tank (660 gallon size):** Payment for this Work will be at the Contract unit price per tank. The unit price includes the Work required to provide the following:
    a. 660-gallon tank with heated 34’ hose reel.
    b. Extreme cube package consisting of a 500W internal probe heater and temperature controller.
    c. Pulse meter option to connect DEF tank to the Fuel Management System.

d. Note: Electrical wire and conduit shall be unit priced per section 260519 and 260532. Vehicle and tank pads shall be unit priced per section 033001.

24. **Item Nos. 231323.47 thru 231323.54 – Type DWS-1 Double Wall Steel Tank Insulation Package (2,000, 4,000, 6,000, 8,000, 10,000, 12,000, 20,000, and 30,000 gallon size inclusive)-** Payment for this Work shall be made at the Contract unit price per tank. The unit price includes the Work to provide the following:
    a. Complete 360° wrap of flexible insulation.
    b. Complete 360° wrap with 26 gauge aluminum skin.
    c. Extended length of fitting on AST to account for insulation thickness.
    d. Bands, fasteners, adhesives required to secure insulation and aluminum skin in place.
25. **Item No. 231323.55 thru 231323.59-Catwalk Assembly (8,000, 10,000, 12,000, 20,000, and 30,000 gallon tank sizes):** Payment for this Work will be at the Contract unit price per catwalk. The unit price shall include the Work required to provide a catwalk system for aboveground tanks.
26. **Item No. 231323.60 Electrical Island Shed:** Payment for this Work will be at the Contract unit price per package. The unit price shall include the Work required to provide the following:
    a. T1-11 Mini Shed, 8’ X 8’ Mini Shed with light switch and light.
    b. Shed, door, and drip edge painted green in accordance with manufacturer.
    c. Arch roof with black shingles.
    d. 3’ house door without windows.
    e. Two metal vents.
27. **Item No. 231323.61 Fuel Management System Enclosure:** Payment for this Work will be at the Contract unit price per package. The unit price shall include the Work required to provide the following:
    a. Fuel Management System Enclosure, 5-1/2’ X 2-1/2’ wood enclosure.
    b. Slanted roof with black shingles.
    c. Enclosure painted per OGS Director’s Representative.

1.03 REFERENCES

A. NFPA 30 - Flammable and Combustible Liquids Code.

B. NFPA 30A - Automotive and Marine Service Station Code.

C. NFPA 31 - Oil Burning Equipment.

D. NFPA 70 - National Electric Code.

E. NFPA 110 – Standards for Emergency and Standby Power Systems.

F. API 1615 - Installation of Underground Liquid Storage Systems.

G. Underwriter’s Laboratories (UL).

H. ETL Testing Laboratories (ETL).

I. Steel Tank Institute (STI).

J. Factory Mutual Engineering and Research (FM).

K. NYS Department of Environmental Conservation Regulations.

L. US Environmental Protection Agency Regulations.

1.04 DEFINITIONS

A. Fuel System for No. 2 Fuel Oil: Fuel storage tank including leak containment and detection for tank and underground piping, overfill prevention, high level alarm, gage system, and required accessories to connect to fuel burning apparatus.

B. Motor Fuel Dispensing System: Fuel storage tank including leak containment and detection for tank and underground piping, overfill prevention, high level alarm, gage system, remote pump, dispenser, and optional automated fuel management system.

C. Fuel System for Diesel-Generators: Fuel storage tank including leak containment and detection for tank and underground piping, overfill prevention, high level alarm, gage system, and required accessories to connect to diesel-generator.

1.05 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section.

B. Submittals Package: Submit the Product Data, and Quality Control Submittals specified below at the same time as a package.

C. Product Data: Catalog sheets, specifications, illustrations, wiring diagrams, CARB Stamp (where applicable), and installation instructions for each item specified for each type of system.

D. Quality Control Submittals:
   1. Tank Installation Contractor's Qualifications Data:
      a. Name of Contractor, business address and telephone number.
      b. Names and addresses of 3 similar projects that the Contractor has worked on during the past 5 years.
   2. Pipe Installer's Qualifications Data:
      a. Name of each person who will be performing the Work and their employer's name, business address and telephone number.
      b. Names and addresses of 3 similar projects that each person has worked on during the past 5 years.
      c. Copy of certification from pipe manufacturer(s).
   3. Factory Test Certificate: For each tank.

4. Company Field Advisor Data:
    a. Name, business address and telephone number of Company Field Advisor secured for the required services.
    b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
    c. Services and each product for which authorization is given by the Company, listed specifically for this project.

1.06 WORK ORDER CLOSEOUT SUBMITTALS

A. Work Order Closeout Submittals: Submit the following to the Director's Representative at substantial completion of each work order:
    1. Operation and Maintenance Data.
    2. Warranty: Copy of specified warranty.
    3. Tank Manufacturer Installation Check List.
    4. Spare parts and special tools.
    5. As-built drawings.

1.07 QUALITY ASSURANCE

A. Qualifications:
    1. Tank Installation Contractor: The firm performing the Work of this Section shall have been regularly engaged in the installation and maintenance of above ground fuel storage tanks for a minimum of 5 years, and shall have completed 3 similar projects.
    2. Pipe Installer: Individual with minimum 5 years experience in installing fuel piping, have worked 3 similar projects, and shall be certified by pipe manufacturer of the type of pipe being installed.

B. Listings: Components of the system(s) for which Underwriters' Laboratories, Inc. (UL) provides product listing service, shall be listed and bear the listing mark.

C. Regulatory Requirements:
    1. Systems for storing No. 2 fuel oil and diesel fuel for diesel-generators shall comply with the applicable requirements of UL 58, NFPA 30, NFPA 31, and NFPA 110.
    2. Systems for storing diesel fuel or unleaded gasoline for motor fuel dispensing systems shall comply with the applicable requirements of UL 58, NFPA 30 and NFPA 30A.
    3. New York State Department of Environmental Conservation Bulk Storage Regulations 6 NYCRR Part 613.
    4. New York State Department of Environmental Conservation Petroleum and Volatile Organic Liquid Storage and Transfer 6 NYCRR Part 229.
    5. New York State Department of Environmental Conservation Dispensing Site and Transport Vehicles 6 NYCRR Part 230.
    6. Stage I vapor recovery system shall be certified by the California Air Resources Board (C.A.R.B.).

D. Company Field Advisor:
1. Secure the services of a Company Field Advisor of the manufacturer of the leak and overfill monitoring system for a minimum of 6 hours for the following:
a. Inspect installation and witness initial startup of system.
b. Train facility personnel in the operation and maintenance of the system (minimum of two 2 hour training sessions. Schedule training sessions with the Director's Representative.
2. Secure the services of a Company Field Advisor of the manufacturer of the fuel management system for a minimum of 6 hours for the following:
a. Inspect installation and witness initial startup of system.
b. Train facility personnel in the operation and maintenance of the system (minimum of two 2 hour training sessions. Schedule training sessions with the Director's Representative.

1.08 WARRANTY

A. Warranty: Thirty year manufacturer's warranty for each tank.

1.09 MAINTENANCE

A. Spare Parts:
1. Two keys for each padlock.

B. Special Tools:
1. One stick gage and two calibration charts for each fuel tank.
2. Two tools for each type and size vandal resistant fastener.

PART 2 PRODUCTS

2.01 TYPE CE-1 FUEL STORAGE TANKS

A. Tanks shall be listed as secondary containment in accordance with UL 2085, and shall be marked for fire resistance, and protected from vehicle impact and projectile hazards.

B. Type: Double wall steel interior tank enclosed within a 6 inch thick concrete secondary tank.
1. Concrete Tank:
a. Minimum Compressive Strength of Concrete: 3,000 psi.
b. Finish: Clear acrylic coating on exposed aggregate tank surface.
1) Top of Tank including Chamfered Edges: Elastomeric coating on exposed aggregate tank surface.
c. Concrete Tank Surface: Free of voids, cracks, and patches.

C. Acceptable Tanks:
1. Convault Tank by Convault, Denair, CA (800) 222-7099.

2.02 DOUBLE WALL STEEL PROTECTED FUEL STORAGE TANKS (NON-SPLIT AND SPLIT TANKS) (TYPE DWS-1)

A. Tanks shall be listed as secondary containment in accordance with UL 2085, and shall be marked for fire resistance, and protected from vehicle impact and projectile hazards.
   a. Tanks shall be shipped from the manufacturer under vacuum at a minimum of 12 inHg. Upon delivery to the site, remeasure vacuum witnessed by the Construction Manager. Vacuum loss shall not exceed 5 inHg.

B. Type: Double wall steel interior tank with minimum 3-inch interstitial space filled with lightweight, porous, monolithic insulation material.
   1. Exterior Protective Coating: Conforming to Steel Tank Institute and NYSDEC Standards.
      a. Surface Preparation: SSPC-SP6 grit blast.
      b. Primer: Corrosion resistant epoxy or urethane in accordance with UL 2085 requirements.
      c. Top Coat: Epoxy or urethane in accordance with UL 2085 requirements.
         1. Paint all aboveground storage tanks white, beige, or cream in accordance with NYSDEC and New York State Legislation ECL Section 17-1016. Coordinate color selection with the EIC.

C. Acceptable Tanks:
   1. Fireguard Thermally Protected Tank by Highland Tanks, Manheim, PA, (717) 664-0600.
   2. Fireguard Thermally Protected Tank by Modern Welding Company, Newark, OH, (740) 344-9425.
   3. Hoover Vault Tank by Containment Solutions, Conroe, TX 77301, (800) 537-4730.

2.03 TANK ACCESSORY PACKAGE

A. Stair/Platform Assembly:
   1. Stairs and railings shall meet OSHA Standard 29 CFR Ch. XVII, Paragraph 1910.25.
   2. Platform Mounting Height: 30 to 36 inches from the top of tank.
   3. Platform provides access to the fill port, and stick gage port.
   4. Assemblies shall either be painted per Section 099103, or galvanized in accordance ASTM Standard A53-96.
   5. Provide right and left hand stairs/platform assemblies with railings on exposed sides only.

B. Gaging Equipment:
   1. Stick Gage Port (Furnished with all tanks): Accessible from ground level or stair/platform assembly.
   2. Mechanical Gaging: Field adjustable float type gage with minimum 4-1/2 inch dia. display face, vapor tight construction, and stainless steel float; 818 Clock Gage by Morrison Bros., Dubuque, IA. Order clock gauge by tank size geometry (unit display in gallons)

C. Venting:
1. Vent primary tank with normal and emergency venting (NFPA 30 and UL 2085 test configuration. Vent interstitial space with emergency venting only.
2. Pipe: Standard weight black steel pipe (2 inch size) with 150 lb malleable iron fittings with fuel resistant thread sealant.
a. Finish: Paint pipe and fittings in accordance with Section 099103.
b. Terminate pipe minimum 12 feet above grade.
3. Vent Caps:
a. Unleaded Gasoline (Client usage under 120,000 gallons per year as per 6 NYCRR Part 230 requirements): Open type with 30 or 40 mesh screen; OPW 23, EMCO Wheaton A4103, Morrison Bros. 749, or EBW 800 series.
b. Fuel Oil, or Diesel Fuel: Open type with 30 or 40 mesh screen; OPW 23, EMCO Wheaton AH10, EBW 800, Morrison Bros. 354, or EBW 800 series.
4. Emergency Vent: Aluminum body with cast iron lid, zinc plated steel shaft, and Buna-N O-ring; OPW 301 or EBW803, Morrison Bros. 2440M.
a. Conforming to NFPA 30, and UL 2085 test configuration.

D. Tank Identification:
1. Type: Two layer etched plastic or metal permanently attached to the tank.
a. Decals or stenciling is not acceptable.
2. Signs shall include the following information:
a. Manufacturer's statement that tank conforms to Bulk Storage Regulation 6 NYCRR Part 613.
b. Standards of Design by which tank was manufactured.
c. List of products and additives which may be permanently stored in tank.
d. Year in which tank was manufactured.
e. Unique identification number.
f. Dimensions, working capacity, and tank model number.
g. Name of tank manufacturer and installer.
h. Date of tank installation.

E. Fill Limiting Valve:
1. Morrison Bros. 9095AA (includes adapter), EBW 709 Warden, or OPW 61FSTOP.
a. Drop tube as required.
b. Adapter: OPW 633AST, Morrison Bros. 800A; 3 inch size.
c. Cap: OPW 634B, EBW 774, or Morrison Bros. 800DC

F. Spill Containment at Fill Port:
1. For 300-500 gallon DWS-1 Tanks: 7 gallon capacity with lockable watertight lid, drain valve, and Master Lock 911-DKA.
2. For 1,000-8,000 gallon DWS-1 Tanks: Welded steel, 24 inch dia x 13-1/2 inch high x 1/4 inch thick, with lockable watertight lid, drain valve, and Master Lock 911-DKA.

G. Stickport:
1. Provide a port for manually gaging the tank including a lockable vapor tight twist off cap; Morrison Bros. 178X, EBW770, or OPW 83-0066.
2. All tanks shall be provided with a stick gage.

2.04 STAGE I VAPOR RECOVERY VALVE ASSEMBLY (Client usage over 120,000 gallons per year as per 6 NYCRR Part 230 requirements)

A. Vapor Recovery Valve: As approved by the N.Y.S. Department of Environmental Conservation.

B. Lockable Cap: OPW Series1711T-7085-EVR, EBW 304, or Morrison Bros. 323C.

C. Vent Cap: Pressure-vacuum type; OPW 523, EMCO Wheaton A84, EBW 802, or Morrison Bros. 749.

D. Padlock: Master Lock 911-DKA.

2.05 REMOTE FILL SPILL CONTAINER

A. Type: 12 gage stainless steel container and lockable cover, with welded hinge, height adjustable legs, lockable ball valve drain, flexible entry boot(s) and reducer insert(s),complete with poppeted fill pipe adapter swing check valve, dust cap, and 3 inch fittings; OPW Model 211SS, Morrison Bros. 715S (single port 10 gallon, and double port 20 gallon sizes).

B. Spill Containment Mounting:
1. Stand Mount: Metal stand mount with cross member support, secured to the concrete pad with wedge anchors.
2. Post Mount: 3” stainless steel post secured to the remote fill spill container with mounting brackets and anchored in the concrete pad with a sonotube concrete support.

2.06 TYPE A TANK GAGING, LEAK AND OVERFILL MONITOR SYSTEM

A. Acceptable Companies:
1. Veeder Root Inc., Simsbury, CT, (800) 873-3313.
2. OMNTEC/Electro Levels Mfg. Co., Ronkonkoma, NY, (516) 467-5787.

B. Type: Continuous operation 7” graphic touchscreen tank gauging, leak detection and overfill monitor system for double wall storage tanks, double wall product piping, and containment sumps.
1. Systems shall have system test capability, and shall be UL listed and/or FM approved.

C. Alarm Monitor Panels: Locate panel inside nearest appropriate building as directed by Director’s Representative.
1. The alarm panel shall visually indicate the following:
a. Status of each tank’s interstitial space.

b. Status of each containment system.
c. Status of high level sensor set at 95 percent of tank operating capacity (on or off). When sensor is tripped, audio alarm shall be activated and be audible at fill port location.

D. Non Discriminating Leak Sensors:
1. Detects leaks in the following:
a. Interstitial space between tank walls.
b. Piping system which drains into containment sump.
2. Sensors: Non discriminating type not sensitive to condensation forming on the sensor surface, or dripping across the sensor surface.

E. Magnetostrictive Gage Probe:
1. Includes temperature sensors, and both product and water floats capable of sensing product level to nearest 0.001 inch.
2. Upon demand, the system shall indicate water level, product level, and average product temperature.
3. System shall sense and alarm leakage rates greater than 0.2 gal/hr.

F. Instrumentation Control Cable: Connect probe and sensor to alarm monitor panel, as recommended by manufacturer of leak and overfill monitor system.

G. Audible Overfill Alarm Device: Weatherproof, surface mounted basic grille type, 120 V ac or as manufactured by tank gauging, leak detection and overfill monitor system manufacturer.

H. Overfill Alarm Device Sign: Constructed of 1/8 inch thick two color laminated plastic engravers stock, with the words “OVERFILL ALARM DEVICE” engraved in white on red background. Size sign and lettering for easy reading from ground level.

I. Printer: As recommended by system manufacturer. If printer is thermal type provide 6 rolls of thermal paper at each location.

2.07 TYPE B TANK LEAK AND OVERFILL MONITOR SYSTEM

A. Type: Continuous operation tank leak detection and overfill monitor system for double wall storage tanks, double wall product piping, and containment sumps; LU series by OMNTEC/Electro Levels Mfg. Co., Ronkonkoma, NY, (516) 467-5787.
1. Systems shall have system test capability, and shall be UL listed and/or FM approved.

B. Alarm Controller Console: NEMA 4X type with remote sensor test capability at console utilizing test button (OMNTEC Model ELP21LU).
1. When pressed, the test button will test entire system electronics from control panel to sensor(s)
2. Provides intrinsically safe output circuits to electro-optic sensors in Class I, Group D hazardous locations.
3. Monitors both interstitial space and 90 percent high level in tank for presence of liquid.

4. Visually indicates each alarm condition by a dedicated red LED indicator which remains lit until alarm condition is corrected.
5. Audibly annunciates each high level alarm by via 95 decibel piezoelectric pulsing horn which can be silenced by horn silence button.
6. Provides green system detecting indicator.
7. Each alarm to have normally open dry contacts for control purposes, as well as low voltage outputs.

C. Remote Alarm Panel: Audio/visual NEMA 4X type mounted by filling area outside hazardous area (OMNTEC Model RA series).
1. Visually indicates each high level alarm by a dedicated red LED indicator which remains lit until alarm condition is corrected.
2. Audibly annunciates each high level alarm via 95 decibel piezoelectric pulsing horn with auto time out..

D. Interstitial Space Sensor and Piping Sump Sensor: Self diagnostic type which alarms at 90 percent of tank capacity, with dry condition creating normally closed light beam, and alarm condition opening (refracting) the normally closed light beam (OMNTEC Model LS-ASC for steel tanks and/or piping sumps or Model LWF for fiberglass tanks).

E. High Level Sensor: Self diagnostic type which alarms at 90 percent of tank capacity, with dry condition creating normally closed light beam, and alarm condition opening (refracting) the normally closed light beam (OMNTEC Model L-1).

F. Overfill Alarm Device Sign: Constructed of 1/8 inch thick two color laminated plastic engravers stock, with the words “OVERFILL ALARM DEVICE” engraved in white on red background. Size sign and lettering for easy reading from ground level.

2.08 REMOTE TANK GAGING, LEAK AND OVERFILL MONITOR SYSTEM

A. Acceptable Companies:
1. Veeder Root Inc., Simsbury, CT, (800) 873-3313.
2. OMNTEC/Electro Levels Mfg. Co., Ronkonkoma, NY, (516) 467-5787.

B. Provide a 7” color touch screen graphic remote display (Part Number RD7CTS) as manufactured by OMNTEC Mfg., Inc, or approved equal. Display must utilize industry standard protocol for use with most Automatic Tank Gauge monitoring systems. The remote ATG monitor shall display current tank inventory and leak sensor alarms. Display shall come equipped with three LED lights on panel face for Ok, Warning, and Alarm Status. Alarms shall be displayed visually on a 7” color touch screen with wide viewing angle as well as Warning and Alarm lights on face of panel. System shall have 85dB piezoelectric horn for audible alarm indication. Enclosure shall be powder coated industrial steel for indoor mounting. Must be capable of flush mount or recess mounting as required. Enclosure shall be compact in size, not to exceed (H) 7.63” (W) 8.08” (D) 3.20”. System must operate on 120/240 VAC or 12VDC via hard wired or power cord kit (Part Number RD-PCK) Include a 75’ extension cable for connection from RD7CTS to ATG monitor (Part Number RD-232C-75) For RS-232 connection at distances

greater than 75’ and up to 3000’ provide an RS-232 booster kit (Part Number C232-422-RD7CTS). For RS-485 connection (port must output industry standard protocol) at distances greater than 75’ and up to 3000’ Part number RD7CTS-485 is also available. If using with Proteus X model ATG, an RS-485 port comes standard. If using with Proteus K model ATG, a DB-485 RS-485 board must be added in order to connect to RD7CTS-485. Provide a wireless link that will allow 500’ line of site communication between main ATG and RD7CTS (Part Number WRS-232) as manufactured by OMNTEC Mfg., Inc. To extend signal an additional 500’ line of site, provide WRS-232R repeater. For distances up to One mile, provide WRS-232XR extended length wireless transceiver in lieu of WRS-232/WRS-232R.

2.09 POWER INTEGRITY CONTROL PANEL

A. Acceptable Companies:
   1. OMNTEC/Electro Levels Mfg. Co., Ronkonkoma, NY, (516) 467-5787.
   2. Franklin Fueling System, Madison, WI, (608) 838-8786
      a. Enclosure:
         1. NEMA 1 for indoor installation
         2. NEMA 3R, 4X for outdoor installation
      b. Provide lockable maintenance switches
      c. Provide remote E-stop as required
      d. cULus listed.
      e. Comply with NEC® 514.11 and NFPA® 30A Section 6.7 requirements for Emergency Disconnects at Motor Fuel Dispensing Facilities.
      f. Comply with NEC® 514.13 requirements for Maintenance Disconnects at Motor Fuel Dispensing Facilities.

B. Emergency shut off shall disconnect power to all dispensing devices, to all remote pumps serving the dispensing devices, to all associated power, control, and signal circuits, and to all other electrical equipment in the locations surrounding the fuel dispensing devices. Resetting from an emergency shut off shall require manual intervention.

2.10 TYPE UG-1 UNLEADED GASOLINE INSTALLATION PACKAGE

A. Manual Shutoff Valve: Steel ball valve, 1 1/2 inch size, Jomar T-2000, or Morrison Bros. 691BSS (stainless steel).

B. Explosion Proof Solenoid Valve: Brass, 1-1/2 inch size; ASCO 8210, or Morrison Bros. 710.

C. Pressure/Expansion Relief Valve: Use one of the following types:
   1. Steel Body: 1/4 inch size; Morrison Bros. 77.
   2. Ductle Iron Body: 1/2 inch size, Morrison Bros. 078DI.

D. Flexible Hose: Fire rated, UL listed, braided steel; as manufactured by Titeflex, Springfield MA, or Flexing, Sherman, TX.

E. External Emergency Valve: Spring loaded fusible link type; OPW 178S-6130 or Morrison Bros. 346DI.

2.11 TYPE D-1 DIESEL FUEL INSTALLATION PACKAGE

A. Manual Shutoff Valve: Brass, full port ball valve, 1 1/2 inch size, Jomar T-100NE, or Morrison Bros. 691B.

B. Explosion Proof Solenoid Valve: Brass, 1-1/2 inch SIZE; ASCO 8210, or Morrison Bros. 710.

C. Pressure/Expansion Relief Valve: Use one of the following types:
1. Steel Body: 1/4 inch size; Morrison Bros. 77.
2. Ductle Iron Body: 1/2 inch size, Morrison Bros. 078DI.

D. Flexible Hose: UL listed, braided steel, by Titeflex, Springfield MA, or Flex-ing, Sherman, TX.

E. External Emergency Valve: Spring loaded fusible link type; OPW 178S-6130 or Morrison Bros. 346DI.

2.12 TYPE FO-1 FUEL OIL AND DIESEL GENERATOR INSTALLATION PACKAGE

A. Manual Shutoff Valve: Steel ball valve, 1 1/2 inch size, Jomar T-2000, or Morrison Bros. 619BSS (stainless steel).

B. Explosion Proof Solenoid Valve: Brass, 1-1/2 inch size; ASCO 8210, or Morrison Bros. 710.

C. Pressure/Expansion Relief Valve: Use one of the following types:
1. Steel Body: 1/4 inch size; Morrison Bros. 77.
2. Ductle Iron Body: 1/2 inch size, Morrison Bros. 078DI.

D. Foot Valve: Double poppet with strainer, EBW 50-201, or Morrison Bros. 335A.

E. External Emergency Valve: Spring loaded fusible link type; OPW 178S-6130 or Morrison Bros. 346DI.

F. Flexible Hose: Fire rated, UL listed, braided steel; as manufactured by Titeflex, Springfield MA, or Flexing, Sherman, TX.

2.13 HEATING OIL DE-AERATORS

A. Acceptable De-aerators:
1. Tigerloop S220 series by Westwood Products - 330 William St. PO Box 610 South River, NJ. (800) 442-1630

B. Description: Provide heating oil de-aerator where indicated for a standard heating oil system to automatically and continuously de-aerate oil before it enters the oil

pump while allowing for a one-pipe connection between the oil tank and the de-aerator.

C. UL Listed.

D. Maximum nozzle capacity: 20 GPH.

E. Maximum return oil flow: 30 GPH.

F. Temperature range: 20F - 105F.

G. Maximum inlet pressure: 8 PSI.

H. Fuel: No. 1 & 2 heating oil, B5 Bio-Heat
1. Not for use with E-diesel or any fuel containing Ethanol (alcohol).

I. Connections: 1/4" – NPT (F)

2.14 SUCTION PUMP DISPENSERS

A. Full Size Suction Pump Dispensers: Pad mounted.
1. Types:
a. Single Hose, Single Product Type: Wayne G6201P/27AGJK/AJS with hose with swivel fittings on each end, breakaway fitting, illuminated product panel and register area, pulser, and high hose retractor; 115/230 V ac.
b. Dual Hose, Single Product Type: Wayne G6202P/27AGJK/AJS with hose with swivel fittings on each end, breakaway fitting, illuminated product panel and register area, pulser, and high hose retractor; 115/230 V ac.
c. Dual Hose, Dual Product Type: Wayne G6202P/27AGJK/AJS with hose with swivel fittings on each end, breakaway fitting, illuminated product panel and register area, pulser, and high hose retractor; 115/230 V ac.
2. Aboveground Dispenser Sump:
a. Acceptable Companies:
1) DP Series by Fairfield Industries, 827 North 6th Street, Newark, NJ 07107, (973-483-0100), www.fairfield-industries.com.
2) Model 434S 17000 series by Morrison Bros.
b. Designed for use with single hose or dual hose, single product or dual product, Dresser/Wayne suction pump dispensers.
c. Heavy gage stainless steel construction.
d. Anchor feet for pad mounting.
e. Provides leak containment during dispenser use and filter change outs.
f. Penetrations for conduit and single or double wall piping.
g. Adjustable stabilizer bar.
3. Hose Mast Kit: Wayne Option “J”. Prevents hose from touching the concrete and out of the fueling lane when the nozzle is hung in its housing

4. Cabinet and Frame:
    a. All stainless steel construction.
5. Pumping Unit: Positive displacement, self priming, gear type with integral centrifugal air separator, adjustable bypass valve, suction strainers at inlet connection, and 1 hp continuous duty motor with thermal overload protection.
6. Dispenser Accessories:
    a. Totalizer.
    b. Double swivel fitting.
    c. Whip hose.
    d. Pulser.
    e. Fuel Filters: As manufactured by Cim-Tek for required fuel type and environmental conditions.
    f. Balance Adapter: OPW 38CS-0380.
    g. Hose Mast Assembly: Wayne 889918-001.

B. Hose and Nozzle Assemblies:
1. Unleaded Gasoline Hose and Nozzle Assembly:
    a. Nozzle: OPW 11AP.
    b. Breakaway Coupling: Dry reusable type; Husky 3360, or EBW 697.
    c. Hose: 3/4 inch dia, minimum 15 feet long (One 5-foot hose and One 10- foot hose).
2. Diesel Fuel Hose and Nozzle Assemblies:
    a. Nozzle: OPW 7H.
    b. Breakaway Coupling: Dry reusable type; Husky 2776, EBW 697, or OPW 66RB.
    c. Hose: One inch dia, minimum 18 feet required (two 9-foot hoses).

C. Warning Sign: Dispenser area mounted, as required per local fire code; with the following text:
"1. NO SMOKING.
2. SHUT OFF MOTOR.
3. DISCHARGE YOUR STATIC ELECTRICITY BEFORE FUELING BY TOUCHING A METAL SURFACE AWAY FROM THE NOZZLE.
4. TO PREVENT STATIC CHARGE, DO NOT REENTER YOUR VEHICLE WHILE GASOLINE IS PUMPING.
5. IF A FIRE STARTS, DO NOT REMOVE NOZZLE – BACK AWAY IMMEDIATELY.
6. IT IS UNLAWFUL AND DANGEROUS TO DISPENSE GASOLINE INTO UNAPPROVED CONTAINERS.
7. NO FILLING OF PORTABLE CONTAINERS IN OR ON A MOTOR VEHICLE. PLACE CONTAINER ON GROUND BEFORE FILLING.
8. TURN OFF HANDHELD ELECTRICAL DEVICES BEFORE DISPENSING FUEL.
9. REMAIN WITH THE VEHICLE WHILE FUELING."

D. Emergency Fuel Shutoff Sign
1. Distinctly label "EMERGENCY FUEL SHUTOFF".
2. Provide in accordance with New York State Fire Code Section 2303.2.

3. Provide sign on dispenser indicating Emergency Fuel Shutoff Switch Location.

E. Emergency Procedures Sign: Dispenser area mounted, as required per local fire code; with the following text:
"INCASE OF FIRE, SPILL OR RELEASE
1. USE EMERGENCY PUMP SHUTOFF.
2. REPORT THE ACCIDENT!
FIRE DEPARTMENT TELEPHONE NO. – (local number entered here).
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION SPILL HOTLINE NO. (Current NYS DEC number entered here).
FACILITY ADDRESS_____ (Street address and name entered here)."

2.15 TANK HEATERS

A. Acceptable Manufacturers:
1. Watlow Industries, Lockport, NY.
2. Chromalox, Pittsburgh, PA.

B. Screw Plug Immersion Heaters: 1,230 and 1,845 watt heater assemblies, 2 inch size.
1. Explosion Resistant Housing: NEMA Type 8 rated enclosure for Class I, Groups B, C and D.
2. Element Sheath: (3) steel elements in 2 inch NPT steel plug.
3. Thermocouples:
a. Process: Type J, located in the thermowell for process sensing.
b. Limit: Type J, attached to element sheath for over temperature sensing.
4. Control Panel (Remote): NEMA 4, with electronic PID controller for controlling process temperature, electronic digital controller for high limit protection, mechanical relays for limit power switching, electronic/mechanical hybrid relay for main power switching, silicone rubber heater with integral thermostat for freeze protection, red strobe light for high limit alarm, control circuit fusing, and reset switch for limit control mounted on door.
5. Electrical Requirements: 208 or 240 volt, single phase as directed.
a. Heater Watt Density for No. 2 Fuel Oil: 23 watts/sq. inch.

C. Flanged Heater: 3,375 watt heater assembly, 4 inch size.
1. Explosion Resistant Housing: NEMA Type 8 rated enclosure for Class I, Groups B, C and D.
2. Element Sheath: (6) incoloy elements.
3. Thermocouple:
a. Process: Type J, located in thermowell for process sensing.
b. Limit: Type J, attached to element sheath for over temperature sensing.
4. Control Panel (Remote): NEMA 4, with electronic PID controller for controlling process temperature, electronic digital controller for high limit protection, mechanical relays for limit power switching, electronic/mechanical hybrid relay for main power switching, silicone

rubber heater with integral thermostat for freeze protection, red strobe light for high limit alarm, control circuit fusing, and reset switch for limit control mounted on door.

5. Electrical Requirements: 208 or 240 volt, single phase as directed.
   a. Heater Watt Density for No. 2 Fuel Oil: 23 watts/sq. inch.

D. Flanged Heater: 5,625 watt heater assembly, 4 inch size.
1. Explosion Resistant Housing: NEMA Type 8 rated enclosure for Class I, Groups B, C and D.
2. Element Sheath: (6) incoloy elements.
3. Thermocouple:
   a. Process : Type J, located in thermowell for process sensing.
   b. Limit: Type J, attached to element sheath for over temperature sensing.
4. Control Panel (Remote): NEMA 4, with electronic PID controller for controlling process temperature, electronic digital controller for high limit protection, mechanical relays for limit power switching, electronic/mechanical hybrid relay for main power switching, silicone rubber heater with integral thermostat for freeze protection, red strobe light for high limit alarm, control circuit fusing, and reset switch for limit control mounted on door.
5. Electrical Requirements: 208 or 240 volt, single phase as directed.
   a. Heater Watt Density for No. 2 Fuel Oil: 23 watts/sq. inch.

2.16 DIESEL EXHAUST FLUID STORAGE ENCLOSURE

A. Self-contained storage and dispensing unit.
1. Acceptable Systems:
   a. Titan Cube DEF Storage System by Blue1 Energy Equipment 3040 White Horse Road, Greenville, SC 29611 (864) 385-7030, www.blue1energyequipment.com
   b. KleerBlue Solutions, 1601 Buchanan Road, Evansville, IN 44720 (800) 320-2122, www.kleerbluesolutions.com

B. System Components: System shall be provided as a complete self-contained unit with all required equipment and hardware including but not limited to the following:
1. For use with 35-foot or less hose: Titan Cube DEF Storage System by Blue1 Energy, or approved equal. 396-gallon or 660-gallon DEF tank.
   A. Enclosure including:
      a. Robust double wall containment.
      b. Outer tank that holds 110% of inner tank volume.
      c. 6 GPM 120V pump.
      d. General construction inspection approval Z-40321-510.
      e. Hinged, lockable lid.
      f. Electronic overfill sensor.
      g. Integral sump.

h. Optical bund alarm.
i. 2” dry-break fill port.
j. Liquid level gauge.
k. Auto nozzle and auto nozzle holder.
l. Fully assembled and pre-wired.
m. Pulse meter to connect to card reader system.
n. 500W internal probe heater.

2. For use with 50-foot hose: KleerBlue Solutions, or approved equal. 330-gallon DEF tank.
   A. Enclosure including:
      a. Exterior Panels: High-performance smooth surface white composite panel using a high density polyethylene core, thermally bonded between (2) high-strength steel skins. Highly resistant to punctures, dents, corrosion. It will not tear or rip, nor will it gouge or splinter like plywood or Fiberglass Reinforced Panels (FRP) found on many enclosures.
      b. R10 insulated top & sides.
      c. Insulated powder coated steel base frame with forklift entry points.
      d. Horizontal fill access door & vertical dispensing access door.
      e. Easy-to-clean durable FRP interior.
      f. Electrical control panel.
      g. 400w continuous duty forced air heating system with highly accurate thermostat control.
      h. Auto exhaust fan control turns on when temperature is greater than 80° F.
      i. LED light with on/off switch.
      j. Adjustable heat setting between 45° F & 75° F.
      k. Audible beeper & color changing display when temperature falls below 20° F.
      l. Power required: 120v 20 amp circuit.
      m. Dimensions: 48" wide x 66" long x 85" total height x 76" side wall height, weighs approximately 650 lbs.
3. 110v Tote pump w/timer, 4' suction/20' discharge hose, no meter, ss auto nozzle, Micro Matic RSV Dispense coupler.
4. Hannay Spring Rewind Hose Reel with 25' hose & 3/4" NPT Thread - bottom roller.
5. 3/4" NPT SS Swivel (suggested for use with hose reel hose - with existing tote pump).
6. Fixed Powder Coated Shelf w/ SS Meter & Pulse Output to Fuel Management System for hose reel (not included), stainless steel meter & remote display (included, mounted on shelf), stainless steel 3/4" solenoid valve (supplied & mounted), electrical junction box (supplied & mounted), 1 micron filter cartridge in poly filter housing (supplied & mounted), nozzle holder.
7. Anchor Kit for Single Tote Enclosure 4 Brackets

2.17 FUEL MANAGEMENT SYSTEM

A. Type A: Stand alone, magnetic strip card, programmable key or keyless activated, self contained, island mounted type capable of 24 hour monitoring, and simultaneous control of maximum of 4 hoses.

1. Acceptable Systems:
   a. FuelMaster 2500 System by Syn-Tech Systems, Inc., 100 Four Points Way, Tallahassee, FL 32305, (800) 888-9136, www.marketing@syntech-fuelmaster.com.
   b. K800 Fuel Control System by OPW , 6900 Santa Fe Drive, Hodgkins, IL 60525, (708) 485-4200, www.opwglobal.com.
   c. FCT-RT Fuel Control Terminal by E.J. Ward, 8801 Tradeway, San Antonio, TX 78217, (210) 824-7383, www.ejward.com.
2. Features:
   a. Microprocessor:
      1) Capable of reprogramming without changing hardware, and communicates with communication controller by internal network or by dial-up phone lines.
      2) Memory: 2 MEG.
   b. Keypad: Heavy duty, alpha-numeric membrane type with separate key for each letter (no shift or function keys required).
   c. Display: Backlit LCD with contrast adjustment that is highly visible and easy to read in total darkness or direct sunlight.
   d. Dispenser selection controlled thru system logic by vehicle and/or operator card data.
   e. Programmable to limit delivery by card or vehicle identification.
   f. Audible “Card Left in Reader” alarm.
   g. Capable of recording and storing transaction data including operator vehicle, quantities, day and time, odometer reading; and printing this information on demand.
   h. Interfaces with fuel dispensers, tank monitoring equipment, and capable of data transfer via modem to facility computers.
   i. Storage capacity with battery backup for minimum 500 transactions.
   j. Transient protection on AC power input and modem communication.
   k. Manual system override switches.
   l. Weatherproof Cabinet and Stand: Powder coated steel construction.
   m. Capable of reconciliation reporting.
   n. Maximum Operating Temperature: -40 degrees F to 122 degrees F.

B. Type B: Stand alone, magnetic strip card, programmable keys or keyless activated, self contained, island mounted type capable of 24 hour monitoring, and simultaneous control of maximum of 16 hoses.

1. Acceptable Systems:
   a. AssetWorks Fuel Focus System by AssetWorks, 998 Old Eagle School Road, Suite 1215, Wayne, PA 19087, (610) 687-9202, www.assetworks.com.

2. Features:
   a. Microprocessor:
      1) Capable of reprogramming without changing hardware, and communicates with communication controller by internal network or by dial-up phone lines.
      2) Memory: 1 GB RAM, battery backed
         4 GB Industrial Flash Drive
   b. Keypad: Heavy duty, alpha-numeric membrane type with separate key for each letter (no shift or function keys required).
   c. Display: Backlit LCD with contrast adjustment that is highly visible and easy to read in total darkness or direct sunlight.
   d. Dispenser selection controlled thru system logic by vehicle and/or operator card data.
   e. Programmable to limit delivery by card or vehicle identification.
   f. Capable of recording and storing transaction data including operator vehicle, quantities, day and time, odometer reading; and printing this information on demand.
   g. Interfaces with fuel dispensers, tank monitoring equipment, and capable of data transfer via modem to facility computers.
   h. 4 GB storage capacity for transactions and database history in the event of loss of communication with FleetFocus database.
   i. Transient protection on AC power input and modem communication.
   j. Manual system override switches.
   k. Weatherproof Cabinet and Stand: Powder coated steel construction.
   l. Capable of reconciliation reporting.
   m. Maximum Operating Temperature: -40 degrees F to 130 degrees F.

2.18 COMPUTER AND ACCESSORIES

A. Computer, monitor, printer and other associated accessories to meet recommended requirements for Fuel Management System.
   1. Data cable for connection of programming computer and dispensing area control terminal: General Cable's GenSpeed 6 or GenSpeed 5000 Outside Plant Cable.
      a. Category 5e or Category 6 certified.
      b. Rated for submersion in water.

B. Hardwired Power Conditioner: Surge protection and power conditioner to meet the recommended requirements of fuel management. Powervar 3.0 amp power conditioner and surge protection; Syntech Model 262684.

2.19 FASTENERS

A. Vandal Resistant Fasteners: Stainless steel, allen or torx head, both with center post.

2.20 FUEL FOR TESTING

A. Coordinate with the Facility thru the Director's Representative for the delivery of a full tank of each appropriate fuel type for testing to verify that fuel transfer equipment and instrumentation is operating properly.
   1. The Facility shall pay for delivery of fuel.

2.21 TYPE DWS-1 INSULATION PACKAGE

A. The DWS-1 insulation package shall apply to cylindrical tanks only and meet the following requirements:

1. Complete 360° flexible insulation with 26 gauge aluminum skin with straps and banding around entire tank.
2. Thickness: 3 inch fiberglass
3. Density: 2.5 pcf
4. Maximum Use Temperature 850°
5. Flame Spread 25 or less
6. Smoke development 50 or less
7. Facing temperature limit 150°
8. Water Vapor performance 0.02 Perms

2.22 CATWALK ASSEMBLY

A. Catwalk Assembly:
   1. Stairs and railings shall meet OSHA Standard 29 CFR Ch. XVII, Paragraph 1910.25.
   2. Platform Mounting Height: 0 to 14 inches above the top of tank.
   3. Platform provides access to the fill port, stick gage port, and all other tank top fittings.
   4. Assemblies shall either be painted safety yellow per Section 099103, or galvanized in accordance ASTM Standard A53-96.
   5. Provide right and left hand stairs/platform assemblies with railings on exposed sides and chain link on tank sides.

2.23 ELECTRICAL ISLAND SHED

A. T1-11 Mini Shed, 8' X 8' Mini Shed with light switch and light.
   1. Acceptable Companies:
      a. Quality Sheds, 1140 Route 17A, Greenwood Lake, NY 10925, (845-477-8800), https://qualitysheds.com
      b. Garden Time Inc., 652 Quaker Road, Queensbury, NY 12804, (518-793-8555), https://www.gardentimeinc.com

   2. Features:
      a. T1-11 construction.
      b. Shed, door, and drip edge painted green in accordance with manufacturer.
      c. Arch roof with black shingles.
      d. 3' house door without windows.
      e. Two metal vents.

2.24 FUEL MANAGEMENT SYSTEM ENCLOSURE

A. Fuel Management System Enclosure, 5-1/2’ X 2-1/2’.
   1. Features:
      a. Wood 2x4 framing with T1-11 walls and door.
      b. Slanted roof with ½” pressure-treated plywood and architectural shingles.
      c. Wood frame secured with #10 X 3” deck screws or 3” framing nails.
      d. Enclosure secured to concrete pad with 18”L – 1/2” X 1/2" X 1/2" X 1/4"T brackets.
      e. Enclosure painted green.

2.25 FUEL MANAGEMENT SYSTEM SHED (PREFABRICATED)

A. Vertical storage shed, 5’ X 2’ with double wall resin construction.
   1. Acceptable Companies:
      a. Rubbermaid, 8900 Northpointe Executive Park Drive, Huntersville, NC 28078, (888-895-2110), https://www.rubbermaid.com
   2. Features:
      a. Double wall construction.
      b. All weather resin material.
      c. impact resistant flooring.

PART 3 EXECUTION

3.01 PREPARATION

A. Proof of Testing Prior to Installation:
   1. Before placing the tank in place, provide the factory pressure test reports with affidavit.
   2. Tank shall arrive to the site under vacuum. Shipping date and vacuum shall be recorded on the delivery receipt. The vacuum upon arrival shall be recorded on the delivery receipt and compared to the vacuum at the time of shipping.

3.02 INSTALLATION

A. Install the Work of this section in accordance with the item manufacturer’s printed installation instructions, unless otherwise shown or specified.

3.03 TANK ACCESSORIES

A. Fuel Identification: Attach laminated plastic nameplate to each tank fill pipe to identify the fuel in the tank.

B. Tank Identification: Affix tank identification label, or plate permanently to tanks and fill ports.

C. Install padlocks on all lockable caps on fill and vapor recovery piping.

D. Terminate vent lines with vent caps.

E. Overfill Alarm Device Sign: Mount sign adjacent to alarm horn in a location easily readable from ground level.

3.04 FIELD QUALITY CONTROL

A. Testing: After installation of tank and piping, test the system in the presence of the Director's Representative, as follows:
   1. Piping:
      a. Flexible Primary Piping and Flexible Containment Piping: Before backfilling, plug ends and test with air at manufacturer's recommended test pressure, and hold for 3 hours without leaking.
      b. Copper Tubing and Steel Piping: Before painting or backfilling, plug ends and test with air at 1-1/2 times operating pressure, and hold for 3 hours without leaking.
   2. Product Level and Overfill Protection:
      a. The Facility through the Director's Representative will arrange for delivery of product as needed to test high level alarm, and fill limiting valve.
      b. During the filling process the Director's Representative will monitor and record the low level alarm, quantity of product as compared to reading on the Control Panel, the overfill alarm, and will test the overfill valve.
      c. Make required repairs and final adjustments.
   3. Fuel System for No. 2 Fuel Oil:
      a. After reconnecting all piping, burning apparatus and tanks, and when directed, perform a system acceptance test in the presence of the Director's Representative to demonstrate that the fuel system is operating properly.
      b. Make required repairs and final adjustments.
   4. Motor Fuel Dispensing System:
      a. After reconnecting all piping, dispensers, and tanks, and when directed, perform a system acceptance test in the presence of the Director's Representative to demonstrate that the fuel dispensing system is operating properly.
      b. Make required repairs and final adjustments.
      c. Minimum flow rate for diesel or gasoline systems is 11.0 gpm.
   5. Fuel System for Diesel-Generators:
      a. After reconnecting all piping, diesel-generator, and tanks, and when directed, perform a system acceptance test in the presence of the Director's Representative to demonstrate that the fuel system is operating properly.
      b. Make required repairs and final adjustments.

END OF SECTION

SECTION 310000

EARTHWORK

PART 1 GENERAL

1.01 UNIT PRICE WORK

A. Payment for the Work listed in the Unit Price Schedule will be made at the unit price indicated multiplied by the units of completed Work including specified adjustments.

B. The unit prices listed below shall include all Work specified in the Division 1 General Requirements Sections.

C. Definitions for unit price items as listed in the Unit Price Schedule in Document 004143:

1. **Item No. 310000.01 - General Excavation (Up to 100 cu yds):** Payment for this Work will be made at the Contract unit price per site. The unit price includes the Work required to stockpile excavated material as contaminated, suitable, or unsuitable, and to place and compact backfill.
   a. Suitable material is defined as material that can be properly compacted as backfill.
   b. Payment for borrow or other materials not available at the Work site shall be made under the appropriate items in the Unit Price Schedule.
   c. Remove any material sliding into the excavation at no expense to the State.
2. **Item No. 310000.02 - General Excavation (Each cu yd over 100 cu yd per Site):** Payment for this Work will be made at the Contract unit price per cubic yard. The unit price includes the Work required to stockpile excavated material as contaminated, suitable, or unsuitable, and to place and compact backfill.
   a. Suitable material is defined as material that can be properly compacted as backfill.
   b. Payment for borrow or other materials not available at the Work site shall be made under the appropriate items in the Unit Price Schedule.
   c. Remove any material sliding into the excavation at no expense to the State.
3. **Item No. 310000.03 - Trenching**: Payment for this Work will be made at the Contract unit price per cubic yard. The unit price includes the Work required to stockpile excavated material as contaminated, suitable, or unsuitable; and to place and compact backfill.
   a. Suitable material is defined as material that can be properly compacted as backfill.
   b. Payment for borrow or other materials not available at the Work site shall be made at the appropriate item in the Unit Price Schedule.
   c. Trench Excavation: Any excavation where the length is more than 4 times the width, and depth is greater than the width.

1) Trench width shall be limited to 2'-0" plus the diameters of the pipe or conduit plus 3 inch space between each pipe or conduit.
2) Payment will be made for the material removed within the following limits:
a) Actual width measured at trench bottom times actual depth for trenches up to 4'-6" deep.
b) For trenches deeper than 4'-6", additional excavation required for stepback will be paid for at the unit price for general excavation.

d. When grading and trenching operations occur in the same area, the term "original ground surface" is the ground surface existing at the time trenching commences.
1) The sequence of trenching-grading operations will be as directed by the Director's Representative.

e. Pipe Line Trenches in Earth: Excavation will be computed from original ground surface to the bottom of the pipe, measured vertically, and between vertical planes to a width of 24 inches plus the internal diameter of the pipe regardless of the actual width of the trench."

4. **Item No. 310000.04 - Hand Excavation:** Payment for this Work will be made at the contract unit price per cubic yard in place. The unit price includes the Work required for the following:
a. Removing, classifying (as contaminated or uncontaminated), and stockpiling contaminated and uncontaminated excavated materials, backfilling, compaction.
b. Any additional costs for moving materials into or out of the Work area, whether excess excavated material or fill material.
c. Hand excavation shall be limited to areas that are not accessible to equipment and with prior approval of the Director's Representative

5. **Item No. 310000.05 - Saw Cutting Pavement:** Payment for this Work will be made at the Contract unit price per linear foot. The unit price includes the Work required for the saw cutting of any type of pavement to a 12-inch depth, and providing a neat line for patching.

6. **Item No. 310000.06 - Removal of Asphalt Concrete Pavement or Concrete Sidewalk:** Payment for the Work will be made at the Contract unit price per cubic yard in place. The unit includes the Work required for the removal of pavement regardless of depth, thickness,woven wire mesh, rebar, and any additional cutting done inside the original cut line or below the 3-inch depth.

7. **Item No. 310000.07 - Removal of Concrete Surface Pads:** Payment for the Work will be made at the Contract unit price per cubic yard in place. The unit includes the Work required for the removal of concrete surface pad up to 12 inches thick, and steel reinforcement.

8. **Item No. 310000.08 - Removal of Tank Concrete Hold Down Pads:** Payment for this Work will be made at the Contract unit price per cubic yard in place. The unit price includes the work required for the removal of tank hold down pads regardless of depth, thickness, and steel reinforcement.

9. **Item No. 310000.09 - Disposal of Construction Debris:** Payment for this Work will be made at the Contract unit price per cubic yard. The unit

price includes the Work required for loading, trucking and disposal of the material, including landfill tipping fees.

a. Construction Debris shall include concrete, any steel reinforcement or wire mesh and asphalt pavement and other materials which in the opinion of the Director's Representative cannot be used for backfill or fill, and cannot be disposed of on the Work site.

10. **Item No. 310000.10 - Disposal of Unsuitable Excavated Material:** Payment for this Work will be made at the Contract unit price per cubic yard. The unit price includes the Work required for loading, trucking and disposal of the material, including landfill tipping fees and any laboratory characterization testing required for landfill disposal.

    a. Unsuitable excavated material shall include clay, silt, stumps or other material which in the opinion of the Director's Representative cannot be used for backfill or fill, and cannot be disposed of on the Work site.

11. **Item No. 310000.11 – Sub-base Course Type 2, Item No. 310000.12 - Pea Gravel, and Item No. 310000.13 - Cushion Material**: Payment for these materials will be made at the Contract unit price per ton delivered to the Work site placed, compacted and incorporated into the Work.

12. **Item No. 310000.14 - Selected Fill, and Item No. 310000.15 – Suitable Material:** Payment for these materials will be made at the Contract unit price per ton delivered to the Work site placed, compacted, and incorporated into the Work.

13. **Item No. 310000.16- Filter Fabric:** Payment for filter fabric will be made at the Contract unit price per square yard measured in place.

14. **Item No. 310000.17- Lawn Restoration**: Payment for this Work will be made at the Contract unit price per square yard. The unit price includes the Work required for raking and leveling subsoil, two inches of new topsoil, raking, de-clumping, leveling topsoil, compaction, seeding, watering, and furnish sufficient amount of grass seed for one complete reseeding. Seed type shall match existing grass type.

    a. The Contractor shall be responsible for watering the seeded area immediately thereafter to insure seed is continuously moist, and at regular intervals until the construction work is complete, or grass is growing, which ever occurs first.

    b. The facility will maintain the restored lawn areas thereafter.

15. **Item No. 310000.18 - Remove and Stockpile Topsoil:** Payment for this Work will be made at the Contract unit price per cubic yard. The unit price includes the Work required for stripping the top 4 inches of material from the Work area; loading, transporting and stockpiling of contaminated and uncontaminated material at nearby area where directed.

    a. Where lawn restoration is required, the Contractor may elect not to salvage the topsoil, and provide new topsoil for the restoration work.

    b. In the event that the Contractor exercises this option, payment will be made for the actual topsoil provided at the unit price to remove and stockpile topsoil.

16. **Item No. 0310000.19 - Dewatering:** Payment for this Work will be made at the Contract unit price per day for pumping unit required to maintain a workable excavation.

a. A day shall be considered as an 8-hour period during normal working hours.
b. No additional payment will be made for hours beyond the 8 hours.
c. The pump shall be gasoline driven mud sucker or sewage pump of a minimum 3-inch inlet and outlet size.
d. Provide a minimum 12-foot long suction hose with filter and 25-foot long discharge hose.
e. Payment for additional pumps will be made at the published rental rate.

17. **Item No. 310000.20 - Moving and Stockpiling Unsuitable Excavated Material to Another Location at Work Site**: Payment for this Work shall be made at the Contract unit price per cubic yard. The unit price includes the following:
    a. Work required for loading, trucking and disposal of the material to another location on the site as directed by Director's Representative.
    b. Unsuitable excavated material shall include clay, silt, stumps or other material which in the opinion of the Director's Representative cannot be used for backfill or fill, and cannot be disposed of on the Work site.
18. **Item No. 310000.21 – Item B-12 Crushed Stone**: Payment for this material will be made at the Contract unit price per ton delivered to the Work site placed, and incorporated into the Work.
19. **Item No. 310000.22 – Reuse excavated material classified as Selected Fill:** Payment for these materials will be made at the Contract unit price per cubic yard. The unit price includes the following:
    a. The required testing to classify excavated materials as Selected fill and for determination of compaction requirements.
    b. Removal of all organic material and culling out particles greater than 4 inches in size.
    c. Placement and compaction testing.
20. **Item No. 310000.23 – Reuse excavated material classified as Suitable Material:** Payment for these materials will be made at the Contract unit price per cubic yard. The unit price includes the following:
    a. The required testing to classify excavated materials as Suitable and for determination of compaction requirements.
    b. Placement and compaction testing.

1.02 DEFINITIONS

A. The following terms shall have the meanings ascribed to them in this Article, wherever they appear in this Section.
    1. Earth Excavation: The removal of all surface and subsurface material not classified as rock (as defined below).
    2. Rock: Limestone, sandstone, shale, granite, or similar material in solid beds or masses in its original or stratified position which can be removed only by blasting operations, drilling, wedging, or use of pneumatic tools, and boulders with a volume greater than 1.0 cu yd. Concrete building foundations and concrete slabs, not indicated, with a volume greater than 1.0 cu yd shall be classified as rock.

a. Materials which can be loosened with a pick or backhoe, frozen materials, soft laminated shale or hardpan, pavements, curbs, and similar materials shall be classified as earth excavation. Concrete building foundations and concrete slabs, where indicated, shall be classified as earth excavation. Masonry building foundations, whether indicated or not, shall be classified as earth excavation.

3. Subgrade Surface: Surface upon which subbase or topsoil is placed.
4. Subbase: Select granular material or subbase course Type 2, which is placed immediately beneath pavement or concrete slabs.
5. Foundation Bearing Grade: Grade/elevation at which the bottom-of-footings are constructed.
6. Maximum Density: The dry unit weight in pounds per cubic foot of the soil at "Optimum Moisture Content" when determined by ASTM D 698 (Standard Proctor), or ASTM D 1557 (Modified Proctor).
7. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
8. Landscaped Areas: Areas not covered by structures, walks, roads, paving, or parking.
9. Unauthorized Excavation: The removal of material below required elevation indicated on the Drawings or beyond lateral dimensions indicated or specified without specific written direction by the Director.
10. Grading Limit Line (Shown on Drawings): Limits of grading, excavations and filling required for the work of this contract. Unless specifically noted otherwise, the Grading Limit Line and Contract Limit Line shall be considered the same.

1.03 SUBMITTALS

A. Product Data:
   1. Permanent Sheeting, Shoring, and Bracing: Specifications for materials and accessories.
   2. Filter Fabric: Manufacturer's catalog sheets, specifications, and installation instructions.

B. Quality Control Submittals:
   1. Subbase Materials: Name and location of source and the DOT Source Number. If the material is not being taken from an approved DOT Source the results of the gradation and soundness tests performed by an ASTM certified soils laboratory will be required.
   2. Other Aggregates: Name and location of source and soil laboratory test results.
   3. Sheeting, Shoring, and Bracing (Not shown on the Drawings): Submit a detailed plan of intended sheeting, shoring and bracing, signed by a New York State licensed Professional Engineer, for the Director's information. This submittal will not relieve the Contractor of responsibility for the successful performance of the intended sheeting, shoring and bracing methods.
   4. Excavation Procedure: Submit a lay out drawing or detailed outline of intended excavation procedure for the Director's information. This

submittal will not relieve the Contractor of responsibility for the successful performance of intended excavation methods.

1.04 QUALITY ASSURANCE

A. Provide prepackaged seed readily available to the public with quality and purity equal to product of Scotts Miracle-Gro Company, Marysville, OH 43041. On-the-job or made-to-order mixes will not be accepted.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect filter fabric from sunlight during transportation and storage.

B. Deliver fertilizer in manufacturer's standard size bags or cartons showing weight, analysis, and the name of the manufacturer. Store as approved by Director's Representative.

C. Store all seed at the site in a cool dry place as approved by the Director's Representative. Replace any seed damaged during storage.

1.06 SCHEDULING

A. Time For Seeding: Sow grass seed between April 1 and May 15th or between August 15th and October 15th, except as otherwise approved in writing by the Director.

1.07 PROJECT CONDITIONS

A. Protect existing trees and plants during performance of the Work. Box trees and plants indicated to remain within the grading limit lines with temporary steel fencing or solidly constructed wood barricades as required. Protect root systems from smothering. Do not store excavated material, or allow vehicular traffic or parking within the branch drip line. Restrict foot traffic to prevent excessive compaction of soil over root systems.

B. Cold Weather Requirements:
   1. Excavation: When freezing temperatures are anticipated, do not excavate to final required elevations for concrete work unless concrete can be placed immediately.
   2. Backfilling: If backfill is being placed during freezing temperatures the backfilling operations shall be monitored by the Director's Representative and the following procedures shall be followed:
      a. Frozen ground shall be removed in its entirety from beneath and five feet beyond the area of fill placement.
      b. The fill material placed shall consist of Selected Fill and shall be free of all frozen chunks that exceed four inches in size. The material transported to the project site shall only consist of material excavated from below the frost depth.
      c. At the end of the work day, the area of fill placement shall be covered with insulated blankets, or left unprotected. Other means of protection (hay, wood chips, etc.) may also be used for

protection provided it is approved by the Director's Representative.

d. Following work day, remove the insulated blankets and/or strip the area of all frozen material as specified previously.

e. Upon establishing the subgrade elevations, protect the grades with insulated blankets or place additional material that will adequately insulate the exposed earth surface from frost. This additional fill or protective material shall be stripped just prior to pouring concrete.

PART 2 PRODUCTS

2.01 MATERIALS

A. Select Granular Material: Stockpiled, sound, durable, sand, gravel, stone, or blends of these materials, free from organic and other deleterious materials. Comply with the gradation and material requirements specified below:

Sieve		Percent Passing
Sieve Size	Size opening (mm)	
2 inch	50.8	100
1/4 inch	6.35	30-65
No. 40	0.425	5-40
No. 200	0.075	0-10

1. Magnesium Sulfate Soundness Test: 20 percent maximum loss by weight after four test cycles.
2. Plasticity Index: The plasticity index of the material passing the No. 40 mesh sieve shall not exceed 5.0.
3. Elongated Particles: Not more than 30 percent, by weight, of the particles retained on a 1/2 inch sieve shall consist of flat or elongated particles. A flat or elongated particle is defined as one which has its

B. Subbase Course Type 2: Stockpiled, crushed ledge rock or approved blast furnace slag. Comply with the gradation and material requirements specified below:

Sieve		Percent Passing
Sieve Size	Size opening (mm)	
2 inch	50.8	100
1/4 inch	6.35	25-60
No. 40	0.425	5-40
No. 200	0.075	0-10

1. Magnesium Sulfate Soundness Test: 20 percent maximum loss by weight after four test cycles.
2. Plasticity Index: The plasticity index of the material passing the No. 40 mesh sieve shall not exceed 5.0.
3. Elongated Particles: Not more than 30 percent, by weight, of the particles retained on a 1/2 inch sieve shall consist of flat or elongated

particles. A flat or elongated particle is defined as one which has its greatest dimension more than three times its least dimension.

C. Item B-12: Equal Blend of No.1 and No. 2 Crushed Stone that complies with material requirements of DOT Article 703-02, crushed stone only.

Sieve		Percent Passing
Sieve Size	Size opening (mm)	
1-1/2 inch	38.1	100
1 inch	25.4	95-100
½ inch	12.7	45-60
¼ inch	6.35	0-15

D. Selected Fill: Sound, durable, sand, gravel, stone, or blends of these materials, free from organic and other deleterious materials. Comply with the gradation requirements specified below:

Sieve		Percent Passing
Sieve Size	Size opening (mm)	
4 inch	101.6	100
No. 40	0.425	0-70
No. 200	0.075	0-15

E. Suitable Material (Fill and Backfill for Landscaped Areas): Material consisting of mineral soil (inorganic), blasted or broken rock and similar materials of natural or man-made origin, including mixtures thereof. Maximum particle size shall not exceed 2/3 of the specified layer thickness prior to compaction. NOTE: Material containing cinders, industrial waste, sludge, building rubble, land fill, muck, and peat shall be considered unsuitable for fill and backfill, except topsoil and organic silt may be used as suitable material in landscaped areas provided it is placed in the top layer of the subgrade surface.

F. Cushion Material: Shall consist of clean, hard, durable, uncoated particles, free from lumps of clay and all deleterious substances and shall meet the following gradation requirements:

Sieve Size		Percent Passing
Sieve Size	Size opening (mm)	
1/4 inch	6.35	100
No. 60	0.25	0-35
No. 100	0.15	0-10

G. Pea Gravel: Comply with DOT Article 703-02 for screened gravel.

Sieve		Percent Passing
Sieve Size	Size opening (mm)	
1/2 inch	12.7	100
1/4 inch	6.35	90-100
1/8 inch	3.17	0-15
No. 200 Sieve	0.075	0-1

H. Fertilizer: Mixed commercial fertilizers shall contain total nitrogen, available phosphoric acid and soluble potash in the ratio of 10-6-4 (50% N/UF). 50% of total nitrogen shall be derived from ureaform furnishing a minimum of 3.5% water insoluble nitrogen (3.5% WIN). The balance of the nitrogen shall be present as methylene urea, water-soluble urea, nitrate and ammoniacal compounds.

1. Other fertilizers meeting DOT Specification Section 713-03 Fertilizer can be used.

I. Grass Seed:

1. Furnish fresh, clean, new-crop seed mixed in the proportions specified for species and variety, and conforming to Federal and State Standards.
2. Acceptable material in a seed mixture other than pure live seed consists of nonviable seed, chaff, hulls, live seed of crop plants and inert matter. The percentage of weed seed shall not exceed 0.1 percent by weight.
3. All seed will be rejected if the label indicates any noxious weed seeds.
4. Provide seed mixture equal to Scotts Classic Sun and Shade Grass Seed Mixture, comprised of the following:

ED MIXTURE			
AMOUNT BY WEIGHT IN MIXTURE	**SPECIES OR VARIETY ***	**PERCENTAGE**	
		PURITY	**GERMINATION**
30 PERCENT	FENWAY RED FESCUE	97 PERCENT	80 PERCENT
30 PERCENT	ABBEY KENTUCKY BLUEGRASS BLEND	95 PERCENT	80 PERCENT
20 PERCENT	DEVINE PERENNIAL RYE	98 PERCENT	85 PERCENT
20 PERCENT	ENCHANTED PERENNIAL RYE	98 PERCENT	85 PERCENT
100 PERCENT			

*Variety may be altered depending on availability of seed from manufacturer.

J. Mulch: Dry Application, Straw: Stalks of oats, wheat, rye or other approved crops that are free of noxious weed seeds. Weight shall be based on a 15 percent moisture content.

K. Marker Tape: Blackburn/Elastimoid Type YT6, or Seton Nameplate Corporations Style 85524, imprinted with message suited to item buried below.

2.02 GEOTECHNICAL FABRICS

A. Filter Fabric (GeoTextile)

1. Drainage and Erosion Control: Ten Cate Geosyntietics Mirafi 140N & 160N.
2. Separation for foundation drains, underdrains, undercuts: Propex Geotex 250ST & 315ST,and Ten Cate Geosyntietics Mirafi Geolon HP570 & HP1500.

2.03 SHEETING, SHORING, AND BRACING

A. Steel Sheetpiling: Continuous interlock type complete with all required accessories conforming to ASTM A 328 or ASTM A 572.
   1. Furnish steel sheet-piling of design, configuration, and length to sustain pressure of earth to be retained.

B. Timber Sheeting, Shoring, and Bracing: Structural grade timber or lumber uprights, stringers and cross braces of sufficient dimension to resist pressure of Work to be retained.
   1. Timber and lumber used for permanent sheeting shall be pressure creosoted.

C. Sheeting, shoring, and bracing Work will be handled on a per work order basis as non-unit price Work

PART 3 EXECUTION

3.01 CLEARING AND GRUBBING

A. Clear and grub trees, shrubs, brush, other prominent vegetation, debris, and obstructions except for those items indicated to remain. Completely remove stumps and roots protruding through the ground surface.

B. Fill depressions caused by the clearing and grubbing operations in accordance with the requirements for filling and backfilling, unless further excavation is indicated.

3.02 REMOVAL OF TOPSOIL

A. Remove existing topsoil from areas where excavation or fill is required.

B. Stockpile approved topsoil where directed until required for use. Place, grade, and shape stockpiles for proper drainage.
   1. Topsoil shall be tested prior to stockpiling. Stockpile only quantities of topsoil approved in writing for re-use. Dispose of excess topsoil as specified.

3.03 UNDERGROUND UTILITIES

A. Locate existing underground utilities prior to commencing excavation work. Determine exact utility locations by hand excavated test pits. Support and protect utilities to remain in place.

B. Do not interrupt existing utilities that are in service until temporary or new utilities are installed and operational.

C. Utilities to remain in service: Shall be re-routed as shown on the Contract Drawings.

D. Utilities abandoned beneath and five feet laterally beyond the structure's proposed footprint shall be removed in their entirety. Excavations required for their removal shall be backfilled and compacted as specified herein.

E. Utilities located outside the limits specified above may be abandoned in place provided their ends are adequately plugged as described below.
   1. Permanently close open ends of abandoned underground utilities exposed by excavations, which extend outside the limits of the area to be excavated.
   2. Close open ends of metallic conduit and pipe with threaded galvanized metal caps or plastic plugs or other approved method for the type of material and size of pipe. Do not use wood plugs.
   3. Close open ends of concrete and masonry utilities with concrete or flow-able fill.

3.04 EXCAVATION AND TRENCHING

A. Excavate earth as required for the Work.

B. Install and maintain all erosion and sedimentation controls during all earthwork operations as specified on the Contract Drawings or as directed by local officials. If the erosion and sedimentation controls specified by the local officials are more stringent than those specified on the Contract Drawings contact the Director's Representative.

C. Maintain sides and slopes of excavations in a safe condition until completion of backfilling. Comply with Code of Federal Regulations Title 29 - Labor, Part 1926 (OSHA).
   1. Trenches: Deposit excavated material on one side of trench only. Trim banks of excavated material to prevent cave-ins and prevent material from falling or sliding into trench. Keep a clear footway between excavated material and trench edge. Maintain areas to allow free drainage of surface water.

D. Stockpile excavated materials classified as suitable material where directed, until required for fill. Place, grade, and shape stockpiles for proper drainage as approved by the Director's Representative.

E. Concrete Slabs, Floors, and Bases: Excavate to the following depths below bottom of concrete for addition of Subbase Course Type 2:
   1. Interior: 6 inches unless otherwise indicated.
   2. Exterior: 12 inches unless otherwise indicated.

F. Conduit, Cable, Tubing and Piping: Provide sufficient trench width for installation and to accommodate special backfill when specified.

G. Underground Storage Tanks: Excavate as required to install tank and to accommodate special backfill.

1. The excavation shall have a bottom four feet wider and four feet longer than the tank with wall slope of 30 degrees off vertical.

H. Pavement: Excavate to subgrade surface elevation.

I. Open Ditches: Cut ditches to cross sections and grades indicated.

J. Unauthorized Excavations: Unless otherwise directed, backfill unauthorized excavation under footings, foundation bases, and retaining walls with compacted select granular material without altering the required footing elevation. Elsewhere, backfill and compact unauthorized excavation as specified for authorized excavation of the same classification, unless otherwise directed by the Director.

1. Unauthorized excavations under structural Work such as footings, foundation bases, and retaining walls shall be reported immediately to the Director before any concrete or backfilling Work commences.

K. Notify the Director's Representative upon completion of excavation operations. Do not proceed with the Work until the excavation is inspected and approved. Inspection of the excavation by the Director's Representative will be made on 3 working days notice.

3.05 DEWATERING

A. Prevent surface water and subsurface or ground water from flowing into excavations and trenches. Pump out any accumulated water.

B. Do not allow water to accumulate in excavations or trenches. Remove water from all excavations immediately to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to the stability of subgrades and foundations. Furnish and maintain pumps, sumps, suction and discharge piping systems, and other system components necessary to convey the water away from the Site.

C. Convey water removed from excavations, and rain water, to collecting or run-off area. Cut and maintain temporary drainage ditches and provide other necessary diversions outside excavation limits for each structure. Do not use trench excavations as temporary drainage ditches.

D. Provide temporary controls to restrict the velocity of discharged water as necessary to prevent erosion and siltation of receiving areas.

3.06 SHEETING, SHORING, AND BRACING

A. Temporary Sheeting: Install temporary sheeting (or sheet-piling) with shoring and bracing as required to create a safe working environment and prevent settlement or other damage to adjacent grounds and structures resulting from excavation operations. Shore and brace sheeting in a manner which will not interfere with progress of other Work or related contracts (if any) on this project. Check shoring and bracing for settlement, and adjust for settlement. Promptly remove temporary sheeting, shoring, and bracing when no longer required.

B. Permanent Sheeting: Install permanent steel sheet-piling or timber sheeting where shown. Cut off top of permanent sheeting 12 inches below finish grade.

C. Sheeting, shoring, and bracing Work will be handled on a per work order basis as non-unit price Work

3.07 SETTLEMENT DETECTION

A. Establish a settlement detection method approved by the Director's Representative for structures subject to settlement from excavation, sheeting or sheet-piling operations. Maintain surveillance to detect any settlement.

3.08 PLACING FILTER FABRIC

A. Place and overlap filter fabric in accordance with the manufacturer's installation instructions, unless otherwise shown.

B. Cover tears and other damaged areas with additional filter fabric layer extending 3 feet beyond the damage.

C. Do not permit traffic or construction equipment directly on filter fabric.

D. Backfill over filter fabric within two weeks after placement. Backfill in accordance with the fabric manufacturer's instructions and in a manner to prevent damage to the fabric.

3.09 PLACING FILL AND BACKFILL

A. Surface Preparation of Fill Areas: Strip topsoil, remaining vegetation, and other deleterious materials prior to placement of fill. Break up or scarify old pavements to a maximum of 2 square feet. Prior to placement of fill, smooth out and compact areas where wheel rutting has occurred due to stripping or earthwork operations.

B. Excavations: Backfill as promptly as Work permits, but not until completion of the following:
   1. Inspection, testing, approval, and recording locations of underground utilities.
   2. Removal of concrete formwork.
   3. Removal of temporary sheeting (or sheet-piling) and backfilling of voids caused by removals.
   4. Cutting off top of permanent sheeting (or sheet-piling).
   5. Removal of trash and debris.

C. Place backfill and fill materials in layers not more than 8 inches thick in loose depth unless otherwise specified. Before compaction, moisten or aerate each layer as necessary to facilitate compaction to the required density. Do not place backfill or fill material on surfaces that are muddy, frozen, or covered with ice. Do not backfill with excavated material unless it meets the requirements of this Section.

1. Place fill and backfill against foundation walls, and in confined areas (such as trenches) not easily accessible by larger compaction equipment, in maximum 6 inch thick (loose depth) layers.

D. Prevent wedging action of backfill against fuel storage tanks by placing the material uniformly around the tank to approximately the same elevation in each layer.

E. Under Concrete Surface Pads Not over Fuel Storage Tank(s), and Pump Islands:
1. Up to Subgrade Surface Elevation: Place selected fill when fill or backfill is required.
2. Subbase Material: Place 12 inches of Subbase Course Type 2 over subgrade surface.

F. Under Concrete Surface Pads Over Fuel Storage Tank(s): Backfill with pea gravel as shown. Do not compact pea gravel.

G. Under Interior Concrete Slabs and Bases:
1. Up to Subgrade Surface Elevation: Place selected fill when fill or backfill is required.
2. Subbase Material: Place 6 inches of Subbase Course Type 2 over subgrade surface.

H. Under Exterior Pavement and Walks:
1. Up to Subgrade Surface Elevation: Place selected fill when fill or backfill is required.
2. Subbase Material: Subbase Course Type 2 over subgrade surface.

I. Landscape Areas: Place suitable material when required to complete fill or backfill areas up to subgrade surface elevation. Do not use material containing rocks over 4 inches in diameter within the top 12 inches of suitable material.
1. Item B-12 crushed stone may be used in lieu of suitable material to within 12 inches of subgrade surface elevation when directed by Director's Representative. Complete remainder of backfill with suitable material.

J. Rigid Nonmetallic Conduit: Except where concrete encasement is required place cushion material a minimum of 4 inches deep under conduit, 4 inches on both sides, and 12 inches above top of conduit. Complete balance of backfill as specified. Compact in layers.

K. Copper Tubing: Place cushion material a minimum of 6 inches deep under pipe, 6 inches on either side, and 12 inches above top of pipe. Complete balance of backfill as specified. Compact all backfill in layers.

L. Underground glass-fiber-reinforced thermosetting-resin pipe and Polyethylene Piping: Place cushion material a minimum of 4 inches deep under pipe, 4 inches on either side and 12 inches above top of pipe. Complete balance of backfill as specified. Compact all backfill in layers.

M. Underground Storage Tanks: Place pea gravel a minimum of 12 inches deep between tank and concrete mat. Backfill around sides and ends of tank with a minimum of 24 inches of pea gravel. Backfill over top of tank with a minimum of 24 inches of pea gravel. Do not compact pea gravel.

N. Direct Burial Cable: Place sand a minimum of 6 inches deep under cable, 6 inches on either side, and 12 inches above top of cable. Complete balance of backfill as specified. Compact in layers.

O. Marker Tape: Install marker tape 4 inches below finish grade directly over the following:
   1. Direct burial cable.
   2. Conduit.
   3. Motor fuel product and gage piping.
   4. Fuel oil product and gage piping.

3.10 COMPACTION

A. All materials with exception of open graded stone (No. 2 Crushed Stone, No. 1 Crushed Stone, Item B-12, etc.):
   1. Compact each layer of fill and backfill for the following area classifications to the percentage of maximum density specified below and at a moisture content suitable to obtain the required densities, but at not less than three percent drier or more than two percent wetter than the optimum content as determined by ASTM D 698 (Standard Proctor) or 1557 (Modified Proctor).
      a. Structures (entire area within ten feet outside perimeter): 95 percent.
      b. Concrete Slabs and Steps: 95 percent.
      c. Landscaped Areas: 90 percent.
      d. Pavements and Walks: 95 percent.
      e. Pipes and Tunnels: 95 percent.
      f. Pipe Bedding: 95 percent.If a compacted layer fails to meet the specified percentage of maximum density, the layer will be re-compacted and retested. If compaction cannot be achieved the material/layer will be removed and replaced. No additional material may be placed over a compacted layer until the specified density is achieved

B. Open graded Stone (Item B-12 crushed stone, etc): Place material in maximum twelve inch lifts. Each lift shall be raked smooth and compacted through several passes of a walk behind vibratory roller. Compaction Testing is **not** required.

C. Moisture Control:
   1. Where fill or backfill must be moisture conditioned before compaction, uniformly apply water to the surface and to each layer of fill or backfill. Prevent ponding or other free water on surface subsequent to, and during compaction operations.
   2. Remove and replace, or scarify and air dry, soil that is too wet to permit compaction to specified density. Soil that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing, until moisture

content is reduced to a value which will permit compaction to the percentage of maximum density specified.

3.11 ROUGH GRADING

A. Interior Grading: Trim unexcavated spaces within the building to levels indicated.
   1. Subgrade for Interior Slabs: Compact as specified to receive fill material. Finish subgrade surface within 1 inch above or below level specified for fill required.

B. Exterior Grading: Trim and grade excavations required by this Contract, to a level of 4 inches below the finish grades indicated unless otherwise indicated. Provide smooth uniform transition to adjacent areas.

3.12 FINISH GRADING

A. Finish surfaces free from irregular surface changes, and as follows:
   1. Grassed Areas: Finish areas to receive topsoil to within 1 inch above or below the required subgrade surface elevations.
   2. Walks: Place and compact subbase material as specified. Shape surface of areas under walks to required line, grade and cross section, with the finish surface not more than 1/2 inch above or below the required subbase elevation.
   3. Pavements: Place and compact subbase material as specified. Shape surface of areas under pavement to required line, grade and cross section, with the finish surface not more than 1/2 inch above or below the required subbase elevation.
   4. Building Slabs: Grade subbase material smooth and even, free of voids, compacted as specified, and to required subbase elevation. Finish final grades within a tolerance of 1/4 inch when tested with a 10 foot straightedge.

B. Spread topsoil directly upon prepared subgrade surface to a depth measuring 4 inches after natural settlement of the topsoil has occurred in areas to be seeded or to receive sod. Place to greater depth when necessary to adjust grades to required elevations.
   1. Approved existing topsoil shall be used.

C. Finish topsoil surface free of depressions which will trap water, free of stones over 1 inch in any dimension, and free of debris.

3.13 SPREADING TOPSOIL

A. Perform topsoil spreading operations only during dry weather.

B. To insure a proper bond with the topsoil, harrow or otherwise loosen the subgrade to a depth of 3 inches before spreading topsoil.

C. Spread topsoil directly upon prepared subgrade to a minimum depth measuring 4 inches after natural settlement in areas to be seeded. Smooth out unsightly

variations, bumps, ridges, and depressions that will hold water. Remove stones, litter, or other objectionable material. Finished surfaces shall conform to the contour lines and elevations indicated on the drawings or fixed by the Director's Representative.

3.14 PREPARATION FOR SEEDING

A. Seed Bed: Scarify soil to a depth of 2 inches in compacted areas. Smooth out unsightly variations, bumps, ridges, and depressions that will hold water. Remove stones, litter, or other objectionable material.

3.15 FERTILIZING

A. Apply 10-6-4 fertilizer evenly at the rate of 40 pounds per 1000 sq ft .

3.16 SEEDING

A. Assume all risks when seed is sowed before approval of seed analysis.

B. Do not seed when the wind velocity exceeds 5 miles per hour.

C. Application Rate: 8 pounds per 1000 sq ft.

D. Dry Application: Sow seed evenly by hand or seed spreader on dry or moderately dry soil.

3.17 MULCHING

A. Dry Application: Within 3 days after seeding, cover the seeded areas with a uniform blanket of straw mulch at the rate of 50 pounds per 1000 sq ft of seeded area.

3.18 LAWN ESTABLISHMENT

A. Maintain the grass at heights between 2-1/2 inches and 3-1/2 inches and include a minimum of 2 mowings.

B. Water and protect all seeded areas until final acceptance of the lawn.

3.19 FINAL LAWN ACCEPTANCE

A. Final acceptance of seeded areas will be granted when a uniform stand of acceptable grass is obtained, with a minimum of 95 percent coverage. Portions of the seeded areas may be accepted at various times at the discretion of the Director's Representative.

B. Unacceptable seeded areas, dry application: Reseed as specified and fertilized at one-half the specified rate.

C. Once accepted, the State will assume all maintenance responsibilities.

3.20 MAINTENANCE AND RESTORATION

A. Restore pavements, walks, curbs, lawns, and other exterior surfaces damaged during performance of the Work to match the appearance and performance of existing corresponding surfaces as closely as practicable.

B. Topsoil and seed or sod damaged lawn areas. Water as required until physical completion of the Work.

3.21 DISPOSAL OF EXCESS AND UNSUITABLE MATERIALS (OTHER THAN PETROLEUM CONTAMINATED SOIL AND WATER)

A. Excess and Unsuitable Materials including materials resulting from clearing and grubbing and removal of existing improvements: Use one of the following as directed for each Site:
   1. Remove of materials from State Property and dispose off site.
   2. Transport materials to spoil areas on State property designated by the Director's Representative, and dispose of such materials as directed.

B. Excess Topsoil: Transport topsoil to areas on State property designated by the Director's Representative. Smooth grade deposited topsoil.

3.22 FIELD QUALITY CONTROL

A. Compaction Testing: Notify the Director's Representative at least 3 working days in advance of all phases of filling and backfilling operations.

B. Compaction testing will be performed by the State Term Consultant to ascertain the compacted density of the fill and backfill materials.

C. Compaction testing will be performed on certain layers of the fill and backfill as determined by the Director's Representative.

D. If a compacted layer fails to meet the specified percentage of maximum density, the layer shall be recompacted and will be retested.

E. No additional material may be placed over a compacted layer until the specified density is achieved.

3.23 PROTECTION

A. Protect graded areas from traffic and erosion, and keep them free of trash and debris.

END OF SECTION