

**CITY OF PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS**

FUEL SYSTEM UPGRADE PROJECT

BID #14-23
March 23, 2023

ADDENDUM NO. 2

Bidders are hereby advised to make the following revisions to the Plans and Proposal:

1. **Replace**, in the Contract Documents and Specifications, the Bid Schedule (formerly pages 18-20) with the attached **Bid Schedule** (pages 18-21). The changes include new base bid items for asphalt and base gravel (for pavement) installation which are included in the base scope of work, but outside the lump sum base bid item. This itemization of pavement materials allows the project to carry an allowance for Asphalt AC Adjustment per NHDOT standards.
2. **Replace**, in the Contract Documents and Specifications, Appendix TS-1, Specification Section 132000 with the attached **Specification 132000** in its entirety. The changes are to Sections 2.1 and 3.1 which refer to new Special Provisions for asphalt and base gravel materials and construction requirements.
3. **Add** to the Contract Documents and Specifications, Appendix TS-1 new **SPECIAL PROVISION, SECTION 304, AGGREGATE BASE COURSES** and new **SPECIAL PROVISION, SECTION 401 and 403, ASPHALT PAVEMENT**. These Special Provisions provide new, more detailed requirements for pavement and base course materials and construction requirements.
4. **Replace**, in the Plans, Drawing FS.212 with attached **Drawing FS.212A** (sheet 6 of 28), titled *PROPOSED SITE PLAN*. The revised drawing clarifies the extent of full depth pavement restoration.
5. **Replace**, in the Plans, Drawing FS.213 with attached **Drawing FS.213A** (sheet 7 of 28), titled *GRADING AND DRAINAGE PLAN*. The revised drawing clarifies the extent of full depth pavement restoration and refers to the updated full depth pavement reconstruction detail 03/FS.222.
6. **Replace**, in the Plans, Drawing FS.222 with attached **Drawing FS.222A** (sheet 10 of 28), titled *PLB, BOLLARD AND PAVEMENT DETAILS*. Detail 3/FS.222 was revised to include 18" of gravel base, 4.5" of Winter Binder and 1.5" of Wearing. New Paving notes were also added.
7. **Replace**, in the Plans, Drawing FS.323 with attached **Drawing FS.323A** (sheet 17 of 28), titled *UST PIPING SUMP PLAN AND DETAILS*. The revised drawing amends the extractor fitting part number and sump lid part number.
8. The Bidders are hereby advised of the Department's replies to questions received from perspective Bidders, as follows:

Q1: Will Asphalt be included with in materials subject to escalation?

A1: Asphalt and base gravels have now been made separate base bid items with estimated quantities for each. An allowance pay item has been created for Asphalt AC Adjustments per NHDOT standards.

Q2: Why is a suction system proposed?

A2: Owner preference.

Q3: Will interior work be permitted to be completed outside the 70 calendar day period of performance?

A3: Yes, as long as it does not interfere with facility operations or extend the 70 day fuel system “down time” window.

Q4: Is a preferred vendor identified for the fencing and motorized gate?

A4: Yes, refer to bid section preferred vendor identified by City of Portsmouth.

Q5: Are HID cards to be owner provided?

A5: No, 300 ProxCard II HID cards are to be provided as part of the project for use with the Wayne iX Fuel Management System.

Q6: Tank size as indicated on the plans page FS.320 the tank sump says 38” minimum. Xerxes watertight cover is 28.75” I.D. is the acceptable to bid out.

A6: The design intends to specify largest tank sump lid available for 48” tank sump by tank manufacturer. For Xerxes tank 36” I.D. top opening is required.

Q7: The tank pad section 7 the curb that is pointed out, is that separate from the raised section and the grade section and is it concrete making it 3 pours or is that section of concrete just 2 pours – one being the raised section and the second grade section?

A7: The raised concrete curb, raised tank pad and grade section are all to be constructed of concrete, and may be constructed to the means and methods (number of pours) the contractor deems appropriate. In any case, all joints shall be compliant with NHDES rules and sealed as shown on the plans.

Q8: Could I get more clarification on the canopy such as the canopy manufacturer?

A8: The Contractor may supply a canopy designed and fabricated by any manufacturer that can meet the requirements of Specification Section 132010, is appropriately qualified and experienced with the design and fabrication of fuel system canopies, and is appropriately licensed in the State of New Hampshire (as required in the Specification). Refer to Section 132010 for additional details.

Q9: On the drawings FS 213 are we paving the entire area also it looks like they want all the material removed to a 24” depth and still leave an area that trucks can enter and exit.

A9: The intent is to repave the area, including full-depth restoration, as required. It is understood that there may be some need to phase the subgrade work and divert traffic on gravel, and that on the day of final paving there may need to have short periods of interruption coordinated with the City.

THE CONTRACTOR SHALL ACKNOWLEDGE
THIS ADDENDUM
AS PART OF THE BID

BID SCHEDULE

This project will be bid as lump sum for items a, b, and c, and unit priced for pavement and crushed stone for pavement base:

1. PORTSMOUTH MOTOR VEHICLE FUEL SYSTEM REPLACEMENT

BASE BID – Scope of Work Items:

- a) Remove existing motor fuel system including underground storage tanks.
- b) Install new motor fuel system including underground storage tanks.
- c) Install new rigid metal canopy.

In Figures \$ _____

In Words \$ _____

- d) Install gravel base and pavement.

Unit Items				
Item	Unit	Unit Cost	Bid Evaluation Quantity	Total Bid Evaluation Cost
NHDOT 304.4 – Crushed Stone (fine)	Cubic Yard		1150	
NHDOT 403.12 – Pavement, Hand Method	Ton		775	
NHDOT Asphalt Cement Adjustment	Allowance	\$1.00	8,000	\$8,000.00

Total Gravel Base and Pavement:

In Figures \$ _____

In Words \$ _____

Total BASE BID ITEMS, including Items a, b, c, and d above:

In Figures \$ _____

In Words \$ _____

NOTE:

The base scope of work including a complete project as depicted and described on the contract documents is included entirely within the lump sum for Work Item #1, with the exception of the installation of gravel base for pavement and pavement. Installation of gravel base and pavement are included in the base scope of work and bid but itemized to allow for a pavement escalation allowance.

The unit price items outlined in Work Item #2 are contingent items that may be used (at the City's sole option) for assigning values to unit priced portions of contract changes and are included in the total price herein only for the purpose of bid evaluation. The Owner makes no representation that any quantity of any unit item will be awarded for the performance of the project.

2. CONTINGENT UNIT PRICE Work Items:

Unit Items				
Item	Unit	Unit Cost	Bid Evaluation Quantity	Total Bid Evaluation Cost
Labor and Equipment Associated with excavation of Petroleum-Impacted Soil beyond that included in the Scope of Work (Presumes that excavation will be conducted concurrent with or immediately following tank removal/installation such that additional mobilization will not be required)	half day		4	
Transport and Disposal of 1-6 drums of Petroleum-Impacted Soil (Including mobilization, transportation, labor, equipment, and tipping fees)	drum		6	
Transport and Disposal of >6 drums and less than 15 tons of Petroleum-Impacted Soil (Including mobilization, transportation, labor, equipment, and tipping fees)	ton		10	

PRICE PROPOSAL (Continued)

Transport and Disposal of >15 tons of Petroleum Impacted Soil (Including mobilization, transportation, labor, equipment, and tipping fees)	ton		300	
Backfill to replace Petroleum-Impacted Soil excavated from the Site (Including delivery, placement, and compaction)	ton		15	
Excess Residual Fuel/Sludge Removal, Transport, and Disposal	gal		500	
Frac tank rental	wk		1	

Frac tank mobilization, cleaning and demobilization (waste disposal to be handled under separate units)	ea		1	
Carbon Treatment System for water disposal, two (2), 1,000 lb vessels	ea		1	
Disposal of carbon vessels for treatment system	lb		1000	
Offsite transport and disposal of petroleum contaminated groundwater (min 5,000 gals)	gal		500	
Secure Groundwater Discharge Permit, including initial sampling, application, operational sampling, reporting, mobilization and compliance	ea		1	
Labor, equipment, and materials for additional asphaltic paving (beyond designated disturbance limits), installed as shown detailed on construction drawings	ton		10	
Labor, equipment, and materials for additional concrete paving, including reinforcement - #4 rebar, 12" off center, top and bottom (beyond designated disturbance limits), installed 9" thick	cy		10	
Labor, equipment, and materials for additional crushed gravel backfill sub base (including delivery, placement and compaction)	cy		25	
Labor, equipment, and materials for additional crushed stone backfill sub base (including delivery, placement and compaction)	cy		25	
Labor, equipment, and materials for additional 3/4" PVC conduit (installed underground, with RMC end connections, sealoffs, no excavation, in existing conduit trench)	lf		500	

PRICE PROPOSAL (Continued)

Labor, equipment, and materials for additional 1" PVC conduit (installed underground, with RMC end connections, sealoffs, no excavation, in existing conduit trench)	lf		500	
Labor, equipment, and materials for additional 3/4" Electric Metal Tubing (EMT), installed aboveground	lf		500	
Labor, equipment, and materials for additional 1" Electric Metal Tubing (EMT), installed aboveground	lf		500	
Labor, equipment, and materials for additional electrical trench excavation, backfill (paving/concrete separate)	lf		500	

Total of **UNIT COST ITEMS** in Bid Evaluation Cost Column (total from three-page table):

In Figures \$ _____

In Words \$ _____

Total of 1 and 2 above;

In Figures \$ _____

In Words \$ _____

SECTION 132000

MOTOR FUEL STORAGE AND DISPENSING SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Work under this section is subject to the requirements of the Contract Documents.
- B. Furnish and install a gasoline storage and dispensing system as shown on the Contract Drawings and as specified herein, including but not limited to the following:
 - 1. Underground fiberglass storage tanks.
 - 2. Geotextile fabric.
 - 3. Earthworks and excavation support.
 - 4. Concrete.
 - 5. Tank top equipment.
 - 6. Spill and overflow protection.
 - 7. Sump and riser assemblies.
 - 8. Fuel dispensers.
 - 9. Underground piping.
 - 10. Signage.
 - 11. Valves.
 - 12. Fire extinguishers.
 - 13. Dispenser equipment.
 - 14. Other motor fuel system equipment.
- C. Related Sections:
 - 1. Section 132010 – Rigid Metal Fuel System Canopy.

1.2 REFERENCES:

- A. ASME B31.3 – Code for Process Piping.
- B. API Spec 12P - Fiberglass Reinforced Plastic Tanks.
- C. API 1615 - Installation of Underground Petroleum Storage Systems.
- D. PEI - RP100 - Installation of Underground Liquid Storage Systems.
- E. PEI - RP300 - Installation and Testing of Vapor Recovery Systems.
- F. PEI - RP400 - Testing Electrical Continuity.
- G. API 2000 - Venting Atmospheric and Low Pressure Storage Tanks.
- H. ASME Sec. 9 - Welding and Brazing Qualifications.

- I. NFPA 30 - Flammable and Combustible Liquids Code.
- J. NFPA 30A – Motor Fuel Dispensing Facilities and Repair Garages.
- K. NFPA 70 – National Electric Code.
- L. UL 971 - Nonmetallic Underground Piping For Flammable Liquids.
- M. UL 1316 - Glass-Fiber-Reinforced Plastic Underground Tanks for Petroleum Products.
- N. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- O. ASTM D2996 - Standard Specification for Filament-Wound "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe.
- P. ASTM D2310 - Standard Classification for Machine Made "Fiberglass" (Glass Fiber Reinforced Thermosetting Resin) Pipe.

1.3 DEFINITIONS

- A. City or Owner: The City of Portsmouth, New Hampshire

1.4 PERFORMANCE

- A. Perform work and provide material and equipment as shown on Drawings and as specified or indicated in this Section of the Specifications. Completely coordinate work of this Section with work of other trades and provide a complete and fully functional installation.
- B. Give notices, file plans, obtain permits and licenses, pay fees and back charges, and obtain necessary approvals from authorities that have jurisdiction as required to perform work in accordance with all legal requirements and with the contract documents.
- C. In general, the work of this Section includes furnishing labor, equipment and materials necessary to perform the excavation, trenching, de-watering, bedding, backfilling, compaction, shoring and off-site disposal of excess and unsuitable materials during installation of fuel piping, underground storage tanks, fuel related electrical conduit, and all other related utilities specified or indicated in the Contract Documents.

1.5 SUBMITTALS

- A. Refer to General Requirements for Submittal Requirements.
- B. Shop Drawings: Submit original copies of product data submittals for materials and equipment in Part 2 of this section including, but not limited to:
 - 1. Pipe bedding and backfill material.
 - 2. Tank bedding and backfill material.
 - 3. Dewatering Plan. (if required)

4. Groundwater Discharge Permits (if required)
5. Underground Storage Tanks.
6. Anchors and Supports.
7. Leak detection and monitoring.
8. Asphalt.
9. Concrete.
10. Shoring.
11. Piping.
12. Ball Valves.
13. Containment Sumps.
14. Spill Containment Manholes.
15. Dispensers and Fuel Management System.
16. Hose Retractors.
17. Nozzles.
18. Hoses.
19. Breakaways.
20. Hose Swivels.

Shop drawings for all equipment shall be submitted to the City for approval within 21 days of contract award. Realizing the long lead time associated with certain equipment, e.g., underground storage tanks, the Contractor shall make every effort to submit these shop drawings as soon as possible after the contract award date. If the Contractor does not submit shop drawings in the allotted time, no consideration will be given on the project schedule for supply problems.

- C. Contractor's certificates certifying that installers are licensed and qualified to install equipment as required by the Project, including NH Master Electrician's license, ICC UST Installer Certification and piping and monitoring system manufacturer issued installer certifications. Provide certifications and licenses no later than the pre-construction meeting.
- D. Each operator's certificate must be on file at the site and must be made available upon request.
- E. At no expense to the City, the Contractor must obtain State, City of Portsmouth, and other authorities having jurisdiction, permits and certificates required for tank and system installations. The Owner will provide a UST Conditional Construction Approval issued by the New Hampshire Department of Environmental Services.
- F. Provide certification that a tank and piping tightness test has been performed according to State and Federal EPA standards, and system is free of leaks.
- G. Provide certification that inspections and tests, as described in PART 3 of this Section, have been performed, system is free of leaks, and has passed specified testing requirements.
- H. Manufacturer's Field Reports: Submit report of each visit of manufacturer's representative to provide technical assistance during installation.

- I. State Installer Certification: Certify tank installers employed on the Work, verifying that all work meet State installer requirements.
- J. Operation and Maintenance Manuals: Submit copies of the Operation and Maintenance Manuals in compliance with closeout submittals.
- K. Closeout Submittals:

The Contractor shall provide the City with one (1) electronic copy of the following closeout documentation within 30 days of project completion. Closeout documents shall be organized into appropriate folders and in Portable Document Format (PDF) format. Index all documents. Provide documents on a USB 2.0 or 3.0 Flash Drive or Portable Hard Drive. The City reserves the right to withhold final payment to the Contractor until the City is in receipt of all required documentation. Note: Hard copies shall be provided for manufacturer provided hard copy operating manuals (generator, dispenser, etc.). When these bound books are provided, they need not be provided electronically.

- 1. UST installation/warranty checklist with proof of delivery to manufacturer.
- 2. Piping installation checklist with proof of delivery to manufacturer.
- 3. Monitoring System Installation and Intrinsic Safety Checklist with proof of delivery to manufacturer.
- 4. Monitoring System final setup printout.
- 5. NHDES backfill approval.
- 6. NHDES authorization to use system.
- 7. NHDES Annual Leak Monitoring Test Form with proof of delivery to NHDES.
- 8. NHDAM&F – Bureau of Weights & Measures Placed in Service/Inspection Report Form.
- 9. A minimum of one hundred (100) photographs of key phases of the project such as; foundation and bollard installation, system component and equipment installation (i.e. tank placement, conduit runs and connections, etc.).
- 10. As-Built Construction Drawings. All sheets shall be submitted, even if there are no changes, each signed and dated by the Contractor. If any sheets do not require editing, the Contractor shall indicate “No changes this sheet” then sign and date the notation.
- 11. Primary Tank and Piping Test Results and Test Results for all secondary containment structures or annuluses and all containment sumps.
- 12. Final NHDES Registration Form (signed by installer), including proof of submission to NHDES.
- 13. Tank certificate.
- 14. Warranties for all equipment and apparatus not already listed above. In general, any product/manufacturer documentation that was provided with the equipment shall be provided as part of the closeout documents.
- 15. Training certification for the fuel management system, monitoring system, and dispenser operation signed by the individuals trained on these systems.
- 16. All instruction bulletins, preventive maintenance schedules, operational instructions, and parts lists provided with the tanks, dispensers, and monitoring system (only 1 copy of owner operating manuals required).
- 17. General Release of Liens.
- 18. Release of Liens for all subcontractors.

19. Waste disposal documentation (if any).
20. Other environmental information (if any).
21. Copies of receipts for any keys, locks, or other equipment turned over to the City. Signatures of recipient and printed names required

1.6 QUALITY ASSURANCE

- A. Perform site work in accordance with City of Portsmouth construction standards. In the absence of City of Portsmouth standards, comply with the New Hampshire Department of Transportation Standards for Road and Bridge Construction.
- B. Regulatory requirements from the following agencies must be followed as minimum requirements for equipment required by the Project. Stricter requirements indicated in the Contract Drawings or the Specifications must have precedence over the requirements listed below:
 1. Materials and Equipment shall be manufactured, installed, and tested as specified in latest editions of applicable publications, standards and ruling of:
 - a. Local and State building, plumbing, mechanical, electrical, fire and health department codes.
 - b. National Fire Protection Association (NFPA).
 - c. Occupational Safety and Health Act (OSHA).
 - d. Factory Mutual Association (FM).
 - e. Underwriter's Laboratories (UL).
 - f. American Petroleum Institute (API).
 - g. Manufacturer recommendations and requirements.
 2. The most recent editions of applicable specifications and publications of the following organizations form part of the Contract Documents:
 - a. American National Standards Institute (ANSI).
 - b. American Society of Mechanical Engineers (ASME).
 - c. National Electric Manufacturers Association (NEMA).
 - d. American Society for Testing of Materials (ASTM).
 - e. American Welding Society (AWS).
 - f. Manufacturers Standardization Society of the Valve and Fitting Industry (MSS).
- C. Specific reference is made to the following Standards of the National Fire Protection Association (NFPA) which shall govern provision of work as specified and as required by codes and authorities:
 1. NFPA 30 - Flammable and Combustible Liquids Code.
 2. NFPA 30A – Code for Motor Fuel Dispensing Facilities.
 3. NFPA 70 – National Electrical Code
- D. Qualifications: Use adequate numbers of skilled, licensed individuals who are thoroughly trained and experienced in the installation and testing of the specified systems and who are completely familiar with the requirements and the methods needed for proper performance of the work of this Section.

- E. All fuel system equipment shall be compatible with oxygenated fuel blends including up to 15% Ethanol.
- F. Complete the gasoline system installation in accordance with the requirements of State of New Hampshire Fire and Building Codes and the NHDES.
- G. Comply with the testing and field quality control requirements elsewhere in this section.
- H. Qualifications:
 - 1. Manufacturer: Utilize companies specializing in manufacturing products specified in this section with minimum five years documented experience.
 - 2. Leak Detection Systems: The installing contractor of the monitoring system shall be the highest grade technician as certified by the leak detection manufacturer.
 - 3. Tank Installer: Company specializing in performing Work of this section with minimum ten years documented experience. The Contractor installing the Gasoline System shall be a Certified tank installer in accordance with Local and State requirements.
 - 4. Provide a manufacturer certified installer to supervise the installation of the underground UL-971 piping systems (both flexible and fiberglass reinforced plastic). Provide installers of the aboveground pre-manufactured piping system that have a resume of significant experience installing the system, including at least 5 years of demonstrated experience with that system.

1.7 PERMITS AND SUBMISSIONS

- A. The Contractor shall be responsible for all permits and notifications required by State and Local codes and regulations, with the following exceptions:
 - 1. The Owner will provide a Conditional Construction Approval for the Installation of an Underground Storage Tank System pursuant to Env-Or 400, issued by the NH Department of Environmental Services.
- B. Specifically at a minimum, the Contractor shall make the following submission:
 - 1. New Hampshire Department of Environmental Services Registration for Underground Storage Tank Systems.
 - 2. Application for Building, Demolition, and appropriate Trade permits to the City of Portsmouth Building and Fire Departments
- C. If required, the Contractor shall apply for and obtain a Temporary Groundwater Discharge Permit issued by the New Hampshire Department of Environmental Services in the event that the discharge of groundwater is required for the installation of the Underground Storage Tanks. The contractor shall be responsible for securing all samples required to apply for the permit.
- D. The Contractor shall also be responsible for the making the following submission to the New Hampshire Department of Agriculture, Markets & Food (NHDAM&F) – Bureau of Weights and Measures:
 - 1. Placed in Service/Inspection Report Form, Retail Motor Fuel Devices.

- E. Copies of all submissions and permits/registrations received shall be provided as part of the closeout documentation.

PART 2 PRODUCTS

2.1 EARTHWORK AND PAVEMENT

- A. The following materials shall be used for earthwork activities conducted under this Contract:
 - 1. Structural Fill. Per NHDOT Standard Specifications Section 508 – Structural Fill.
 - 2. Pea Gravel. As specified by the tank manufacturer.
 - 3. Aggregate Base Courses. Per NHDOT Standard Specification Section 304, as amended by the Special Provision included in other sections of the Construction Documents..
 - 4. Pavement: Per NHDOT Sections 401 and 403, as amended by the Special Provision included in other sections of the Construction Documents.

2.2 UNDERGROUND STORAGE TANKS

- A. Materials for the UST installations shall be as specified on the construction drawings and herein.
- B. The Contractor shall provide two (2) 10,000-gallon USTs that shall be: factory-fabricated, double-walled, fiberglass, fuel storage tank, of capacity, dimension, and use as scheduled. The secondary containment underground fuel storage tank shall be UL 1316 listed. The approved manufacturers are:
 - 1. Containment Solutions Double Wall FRP UST
 - 2. Xerxes/ZCL Double Wall FRP UST
- C. Primary and secondary tanks shall withstand pressure test requirements as specified by the tank manufacturer.
- D. Tank storage requirements shall conform with the following:
 - 1. Capacity: 10,000-gallon (Nominal capacity) tanks. Size shall be consistent with those depicted on the construction drawings.
 - 2. Venting: Tanks shall be vented and operated at atmospheric pressure in accordance with the construction drawings.
 - 3. Specific Gravity: Tanks must store liquids with specific gravities up to 1.1.
 - 4. Chemical Resistance: Tanks must be chemically inert to the petroleum products being stored.
- E. The tanks shall be tested, manufactured, and certified for tightness per UL 1316 Standards.
- F. The double-wall tanks shall comply with all of the requirements of the State of N.H. Administrative Code Env-Or 400.

- G. Tanks shall be warranted for 30 years of service.
- H. The Contractor shall provide documentation for each tank indicating that the tank was factory tested for tightness and guaranteed by the manufacturer to be tight. The contractor shall provide all documentation required for the 30 year warranty to the City within 30 days of tank installation.
- I. The Contractor shall provide the following tank accessories:
 - 1. Certification Plate: The Contractor shall provide a plate bearing the UL label, and permanently affix it to the tank.
 - 2. Fittings: The Contractor shall provide threaded fittings on top of tanks of sizes and number as specified on the construction drawings.
 - 3. All tanks shall include appropriate size gauge stick calibrated in inches.
 - 4. Tank manufacturer supplied deadmen. Field constructed deadmen will not be accepted.
- J. The Contractor shall provide a standard aluminum drop tube extension into each tank compartment, as specified on the construction drawings. The drop tube shall include an automatic shutoff valve set to stop the filling process at 95 percent of the actual tank capacity.
- K. Fill pipe shall conform to specifications on construction drawings.
- L. The monitoring equipment must meet Env-Or 400 requirements, be compatible with the tank installed, and include all wiring, sensors and components for a complete operational system.
- M. The hydrostatic interstitial space sensor shall be capable of detecting a breach in either the inner and/or outer tank. Any solution used in the tank's annual space shall have UL approval for compatibility with the tank and be a contrasting color to the tank surface to facilitate visual inspection of the tank for leaks prior to burial.
- N. The internal tank sensor shall be capable of measuring water level and product high and low levels.
- O. The leak monitor shall be capable of sensing any liquid that has entered the piping containment sump. The sensor is to be connected to the same unit used for the tank monitor.
- P. The tank piping sumps shall be manufactured by the tank manufacturer, and made of fiberglass. The base shall be 48 inches in diameter and the top to be 38 inches in diameter, use Model Numbers as specified in the construction drawings. Tank piping sumps shall be the "polygon" type.
- Q. Dispenser piping sumps shall be manufactured by Bravo, made of fiberglass, and provided with a offset frame to allow conduit installation with limited sump penetrations.. Use Model Number specified on the construction drawings with appropriate watertight boots, mounting, hardware, gaskets, and watertight cover.

- R. The overflow alarm visible indicators and horn shall be the same manufacturer as the tank monitor.
- S. The overflow alarm horn sign shall be constructed in accordance with the construction drawings with the words "OVERFILL ALARM WHEN ALARM SOUNDS TANK IS FULL" and with other language as specified on the construction drawings. Size the sign and lettering in accordance with the construction drawings for easy reading from ground level.
- T. Manhole covers shall comply with the following:
 - 1. The interstitial sensor shall have a manhole manufactured by OPW / Flexworks with a composite locking cover and 18 inch extended skirt and 18 inch inner diameter as specified on the construction drawings.
 - 2. The manhole covers for the piping sumps shall be as specified in the construction drawings.
- U. The Contractor shall provide one (1) Master lock (#2359) for each fill port.

2.3 PIPING

- A. Vent Piping shall comply with the following:
 - 1. Piping exposed above grade shall be Schedule 40 minimum, galvanized carbon steel.
 - 2. Buried piping shall be double wall fiberglass product pipe as manufactured by NOV, 2-inch, UL 971 listed.
 - 3. All fittings on steel piping shall be galvanized 150 pound malleable iron.
- B. 2.3.2 Product Piping shall be 2-inch double wall flexible product pipe as manufactured by APT, Inc., APT XP-200-SC, UL 971 listed. Product piping within containment sumps shall be seamless schedule 40 steel conforming to ASTM A53. Product carrying piping shall not be galvanized.
- C. Duct Piping shall be flexible ducting as manufactured by the APT, Inc., 4-inch, APT DCT-400.
- D. Alternates: Not Authorized

2.4 TANK TOP EQUIPMENT

- A. All tank top equipment, including vent caps, shall meet the Phase I EVR standard as defined by the California Air Resources Board, and be certified as a complete system by CARB Executive Order.

2.5 CONTAINMENT SUMPS

- A. All containment sumps shall be constructed of fiberglass reinforced plastic (FRP) and of a make and model as shown on the construction drawings..

2.6 ENVIRONMENTAL MONITORING SYSTEM

- A. Manufacturer: Veeder Root
- B. Console Model: TLS 450 Plus
- C. Alternates: Not Authorized
- D. Provide probes and sensors of the same manufacturer as shown on the construction drawings
- E. Provide all wire and cabling in accordance with the Veeder Root installation and site setup manuals.
- F. Environmental monitoring console shall be configured with dispensers and associated pumps to provide positive shutdown upon detection of a leak in a dispenser or piping sump. Refer to construction drawings for additional information.

2.7 ELECTRICAL

- A. Electrical conduits shall comply with the following:
 - 1. EMT Conduit: Conduits installed overhead or above the equipment and in the building shall be galvanized EMT conduit, sized as per latest edition of National Electrical Code (NFPA 70), minimum size to be 3/4" diameter. Size conduits per the construction drawings.
 - 2. Rigid Conduit: Conduits (other than overhead runs under canopies and/or over the equipment and building) shall be new rigid galvanized steel sized in accordance with NFPA 70, but no smaller than 3/4" diameter. Rigid non-metallic conduit is permitted underground when allowed by NFPA 70 and by the dispenser and fuel management system manufacturer. All rigid non-metallic conduit shall be Schedule 40 PVC. All underground non-metallic conduit shall be installed with magnetic warning tape.
 - 3. Flexible Conduit: Flexible conduit in NEC, Class I, Division 1 Classified Areas shall be Crouse-Hinds, flexible couplings type "ED" series or equal. Flexible conduit in NEC, Class I, Division 2 or Non-Classified Areas shall be liquid-tight metallic-core galvanized steel, grounding type with extruded PVC cover. Adapters and connectors shall be liquid-tight Crouse-Hinds "LT" type connectors or equal.
- B. Junction/outlet boxes in Classified Hazardous Areas shall be explosion proof, Class I, Division 1 or Division 2, Crouse-Hinds, Appleton, or approved equal, and sized in accordance with NEC requirements.
- C. All electrical wire and cable for circuits shall be properly sized to conform to NFPA 70.
- D. All wire and cable installed within conduits that exit, enter, or go through a hazardous area must conform to NEC, Article 501-13 for conductor insulation.

- E. Cable and wire for conduit installation shall be of the size and type specified on the construction drawings. All wire shall be stranded. All cable and wire conductors shall be copper.
- F. Control cable shall consist of multi-conductors of stranded wires, 95% shield coverage, black PVC jacket, oil and grease resistant; manufactured by Belden.
- G. Ground wires and bonds shall be #2 AWG stranded copper cable with approved type solderless connectors and lugs.

2.8 DISPENSING EQUIPMENT AND INTEGRATED FUEL MANAGEMENT SYSTEM

- A. The Contractor shall provide two (2) electronic, dual hose, dual product suction dispensers with under dispenser containment in accordance with the construction drawings. Dispensers shall be equipped with an integrated fuel management system and ethernet switch.
- B. The dispenser shall each be supplied with in-dispenser HID card readers and associated fuel management system controllers. Fuel management pedestal configurations are not authorized.
- C. The dispensers shall have stainless steel cabinets and doors.
- D. The dispensers shall be equipped with a dual-pulse output board.
- E. The fuel management system and dispenser shall be supplied from the same manufacturer.
- F. Manufacturers:
 - 1. Wayne, iX Fuel Management System (Basis of Design)
 - 2. Gasboy, Atlas Prime Fuel Management System
- G. Note: The Wayne iX is the basis of design. The drawings depict diagrams required for this system. Alternate systems may require different design elements, equipment, wiring, materials, and/or configuration. The Contractor shall be responsible for providing all necessary alternate design and installation documents required, and shall submit to the Owner for approval, should an alternate be selected and approved.
- H. The fuel management system shall be a standalone unit that does not require additional software subscriptions, cloud services, or any other connection to the internet to operate.
- I. The fuel management system shall have the capability for remote monitoring.
- J. Supply fuel management system with 125 kHz HID proximity readers capable of reading HID ProxCard II and ProxCard Plus, and the same HID protocols used by other Owner HID readers. HID readers shall be mounted within the dispenser cabinet and supplied with the dispenser from manufacturer as factory installed. There shall be one (1) dedicated HID card reader for each nozzle (i.e., two HID readers for every 2-hose dispenser). Each HID reader is associated with a single nozzle.

- K. Supply 300 ProxCard II HID Cards with the system.
- L. Provide one (1) Fuel Management/Revenue Controller (supplied with the Fuel Management and Revenue Control System). This is a dedicated terminal for the Fuel Management and Revenue Control System only. Only one controller shall be required. The controller shall have the following requirements:
1. Controller shall be designed for industrial applications & include a fan-less SBC (single board computer) with 4 gig RAM, 1.86 GHz dual core processor, 120GB solid state drive.
 2. Controller shall use SQL Server database and all necessary software shall be pre-installed on the controller.
 3. Controller shall include battery back-up for managed shutdown under power loss conditions.
 4. Controller shall include Windows Imbedded Industry Pro 8.1 operating system
 5. Controller shall include 19" color LCD monitor, keyboard, & mouse; 5 USB ports (4 in back, 1 in front); & (2) two Ethernet ports
 6. USB printer will be supplied by site owner or network printer will be available.
 7. Controller shall be designed to be either desk or wall-mounted.
 8. Controller shall communicate to the dispensers via a direct LAN cable connection or over a local area network.
 9. Controller shall be managed from a remote computer at the facility (within the facility LAN) or be managed remotely from a computer over the internet.
 10. Data for authorizing & controlling fueling transactions shall be entered at the controller & downloaded to each dispenser.
 11. Each dispenser shall independently authorize the fuel transactions without communicating to the system controller.
 12. Controller & dispensers shall communicate automatically on a periodic basis (e.g. every 5 minutes), or on demand, to exchange data.
 13. Vehicle controls shall include:
 - a) Authorized fuel dispensers(s)
 - b) Maximum fuel per transaction
 - c) Maximum fuelings per day
 - d) Odometer reasonability minimum and maximum miles
 14. Employee controls shall include:
 - a) Authorized fuel dispensers(s)
 - b) Authorized vehicle types
 - c) Maximum fuelings per day
 15. Data shall be able to be entered directly into the database, or optionally through an excel template.
 16. System shall be able to handle a minimum of 2500 employee attendants
 17. Software shall include a management dashboard showing the status of all fueling sites on a single screen.
 18. Dashboard shall provide alerts of equipment, inventory, or communication issues; & transaction errors.
 19. Controller shall allow for central control of fueling at the entire facility, collectively or on an individual dispenser basis. That is, the manager, from the control computer, shall be able to immediately "turn-on" or "turn-off" any

- fueling position, or any individual card, at the facility at any time by allowing or dis-allowing the system to authorize any particular position or employee card.
20. Dashboard shall include key graphs and tables for monitoring fueling activity.
 21. An ad hoc report generator shall be included to create custom transaction reports with up to 5 sort levels.
 22. Reports shall be able to be filtered for specific or ranges of data and time/date range.
 23. Transaction data in reports shall include:
 - a) Site number and name
 - b) Transaction number
 - c) Date/Time
 - d) Department number and name
 - e) Vehicle number and name
 - f) Employee number and name
 - g) Fueling point number
 - h) Product number and name
 - i) Quantity of fuel dispensed accurate to 0.1 gallon
 - j) Odometer or hours
 - k) Miles traveled or hours used
 - l) Unit price or cost
 - m) Total price or cost
 - n) Miles per gallon
 - o) Cost per mile or hour
 - p) Errors
 - q) Subtotals and grand totals
 24. A transaction export file in XML format shall be created for use by third party software or Excel.
 25. Warranty: One year parts and labor.
 26. Standards/Approvals: C-UL-US listed, FCC approval

2.9 CAST-IN-PLACE CONCRETE

- A. Unless otherwise specified on the construction drawings, concrete mix shall be 4,000 psi minimum, Class AA, 658 lbs. and 3.0 bags per cubic yard with fiber mesh (complying with ASTM C 1116 Type III 4.1.3). Conform to NHDOT Standard Specifications Division 500 Section 520.
- B. All concrete shall be coated with a water repellent sealer in accordance with NHDOT Standard Specifications Section 534.
- C. Reinforcing: As specified in the construction drawings and conforming to NHDOT Standard Specifications Section 544.

2.10 ADDITIONAL EQUIPMENT

- A. Alarm Lights. The Contractor shall furnish and install alarm lights and alarm signs in accordance with the construction drawings.

- B. Signage. The Contractor shall add static discharge and no smoking signs as specified on the construction drawings.

2.11 FIRE EXTINGUISHERS

- A. The Contractor shall provide fire extinguishers and associated cabinets as specified in the construction drawings. Supply and install identification stickers on both sides of the outside of the cabinets.

PART 3 EXECUTION

3.1 EARTHWORK

- A. Excavation
 1. Excavate earth as required for the work and as specified in the construction drawings.
 2. Maintain sides, slopes, and shoring of excavations in a safe condition until completion of backfilling. All excavations shall comply with Code of Federal Regulations Title 29-Labor, Part 1926 (OSHA).
 3. Stockpile excavated materials classified as suitable material so as not to interfere with the progression of the work, until required for fill. Place, grade, and shape stockpiles for proper drainage as specified under the Environmental Considerations section of this document.
 4. Excavated materials classified as unsuitable material shall be immediately removed from the Site and transported to an approved facility.
 5. Excavation Limits: Conform to elevations, lines, and limits as indicated on the construction drawings. Excavate vertically and shore as directed. Extend excavation a sufficient lateral distance to provide clearance to execute all required work activities.
 6. The Contractor shall notify the City and/or the City's representative upon completion of excavation operations. Work activities shall not proceed until the City has inspected the excavation and provided clearance to execute work.
- B. Dewatering
 1. The Contractor shall provide dewatering services in accordance with the following specifications:
 - a. Prevent surface and subsurface water from flowing into excavations and trenches and from flooding the Site and surrounding areas.
 - 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 excavation. If groundwater is uncontaminated, all dewatering is included in this scope. If groundwater treatment is being provided under another item, pumping

of all groundwater to the frac tank or treatment system is included in this scope.

- c. If required, the Contractor shall apply for and obtain a Temporary Groundwater Discharge Permit issued by the New Hampshire Department of Environmental Services in the event that the discharge of groundwater is required for the installation of the Underground Storage Tanks. The contractor shall be responsible for securing all samples required to apply for the permit.

C. Settlement.

1. The Contractor shall maintain surveillance to detect any settlement of structures, concrete, or pavement and notify the Owner immediately if settlement occurs. Immediate action shall be taken by the Contractor to prevent further settlement.

D. Placing Fill and Backfill

1. Excavations and trenches shall be backfilled as promptly as work permits, but not until completion of the following:
 - a. Acceptance by the City of final excavation limits.
 - b. Inspection, testing, approval, and recording locations of underground utilities.
 - c. Removal of all trash and debris.
 - d. Acceptance by NHDES to backfill. A copy of the Backfill Approval form received from the NHDES must be submitted as part of closeout documentation.
2. Place backfill materials in layers not more than 12 inches thick in loose depth (6 inches for confined areas such as trenches) unless otherwise specified or approved. 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.
3. Additional excavation resulting from the removal of unsuitable material and not specified on the construction drawings shall be backfilled with compacted structural granular material.

E. Compaction

1. Compact each layer of fill and backfill for the following area classifications to 95 percent of maximum density, and at a moisture content suitable to obtain the required densities, but at not less than 3 percent drier or more than 2 percent wetter than the optimum content as determined by ASTM D 698.
2. When the existing ground surface to be compacted has a density less than that specified for the particular area classification, break up and pulverize, and moisture condition to facilitate compaction to the required percentage of maximum density.
3. 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.
4. 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 disking, harrowing or pulverizing, until moisture content is reduced to a value which will permit compaction to the percentage of maximum density specified.

F. Subgrade Surface for Concrete Pavement

1. Shape and grade subgrade surface as follows:
 - a. Concrete: Shape the surface of areas under concrete to required line, grade and cross section, with the finished surface not more than 1 inch above or below the required subgrade surface elevation.
 - b. Pavement: Shape the surface of areas under pavement to required line, grade and cross section, with the finished surface not more than 1/2 inch above or below the required subgrade surface elevation.
2. Grade Control: During construction, maintain lines and grades including crown and cross-slope of subbase course.
3. Thoroughly compact subgrade surface for concrete and pavement by mechanical rolling, tamping, or with vibratory equipment as approved to the density specified.
4. Finish surfaces free from irregular surface changes, and as follows:
 - a. Concrete: Place and compact subbase material as specified. Shape surface of areas under walks to required line, grade and cross section, with the finished surface not more than 1/2 inch above or below the required subbase elevation.
 - b. Pavements: Place and compact subbase material as specified. Shape surface of areas under pavement to required line, grade and cross section, with the finished surface not more than 1/2 inch above or below the required subbase elevation.

G. Maintenance and Restoration

1. Restore grades to indicated levels where settlement or damage due to performance of the work has occurred. Correct conditions contributing to settlement. Remove and replace improperly placed or poorly compacted fill materials.
2. 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.

H. Field Quality Control.

1. Compaction Testing: The Contractor shall notify the City in advance of all phases of filling and backfilling operations. Compaction testing will be performed on the fill and backfill as determined by the City's representative. If a compaction layer fails to meet the specified percentage of maximum density, the layer shall be recompacted and will be retested. No additional material may be placed over a compacted layer until the specified density is achieved.

I. Protection.

1. The Contractor shall protect graded areas from traffic and erosion, and keep them free of trash and debris.

J. Shoring

1. ***The Contractor shall install engineered shoring for the installation of the new underground storage tanks.***
2. The Contractor shall furnish all labor, materials, equipment, tools, and appurtenances required to complete the work of sheeting, shoring and bracing as necessary to complete the installation and/or removal of underground storage tanks, and as required by OSHA and other applicable regulatory agencies for any trenching or similar excavation. The required construction shall meet all applicable federal, state, and local regulations. All shoring materials used shall be in good, serviceable condition, and carried down as the excavation progresses. ***All shoring shall be installed with corner sheet piles or other means to minimized groundwater intrusion into the excavation.***
3. All material shall conform to the minimum requirements of applicable Federal, State, and local codes and/or regulations.
4. Pressures on sheeting and the stability of the sheeting and bottom of the excavation are dependent not only on soil conditions but on many procedures and options available to the Contractor, such as dewatering, staging of excavation, installation of bracing, flexibility of sheeting, construction equipment used, and time of completing the work. All such factors shall be considered in the design of the sheeting and bracing.
5. The Contractor shall submit drawings, computations and substantiating data prepared, signed, and sealed by a professional engineer licensed in the State of New Hampshire, and shall be submitted to the City within 30 days of contract award, but in no case later than 14 days prior to the commencement of excavation work. The plans shall show the proposed sheeting design and method of construction. Any review or comments by the City shall not relieve the Contractor of his responsibility for proper sheeting and bracing.
6. During the installation of the shoring and bracing and as long as the excavation is open, the Contractor shall monitor the work to ensure that it is carried out in accordance with the design and procedures.
7. Before commencing work the Contractor shall check and verify all dimensions and elevations. The Contractor shall be solely responsible for the proper alignment and fit of the proposed tank installation.
8. The Contractor shall remove all shoring and bracing material at the completion of work.
9. Because dewatering and groundwater treatment will occur in conjunction with the sheeting and shoring operation, it is the Contractor's responsibility to ensure that such dewatering activities do not adversely impact upon the sheeting and shoring. Any movement in the sheeting and shoring shall be corrected immediately, and corrective measures enacted to ensure no further movement.

K. Pavement

1. Refer to the Special Provision included in other sections of the Construction Documents for Construction Requirements

3.2 UNDERGROUND STORAGE TANKS

- A. Underground storage tanks and associated equipment shall be installed in strict accordance with the construction drawings and manufacturer requirements.
- B. The Contractor shall provide and install the appropriate breaker, conduit and wiring from a power source to the panel, and from the panel to the overfill alarm and tank locations as specified on the construction drawings. All wiring shall be in accordance with the NEC, paying particular attention to Chapter 514.
- C. The Contractor shall install an overfill alarm, warning lights, and signs approximately in the location shown on the construction drawings. The contractor shall install the emergency stop switch, sign, and circuitry in strict accordance with the construction drawings.
- D. Rigidly adhere, step by step, to manufacturer's installation instructions for excavation, bedding, tank setting, anchoring, and backfill. Backfill with pea stone as specified by the tank manufacturer.
- E. STORAGE TANK TESTS - Provide air pressure tests in accordance with the construction drawings and tank manufacturer's instructions. Repair or replace tanks as required to eliminate leaks and retest as specified to demonstrate compliance. The Contractor shall submit, as part of the closeout documentation, a copy of all tank test results.
- F. The USTs shall be located as shown on the construction drawings.
- G. Manholes shall be installed where indicated. See construction drawings for crowning specifications around manholes.
- H. Brine filled interstitial space systems are specified for all new tanks on this project. Brine levels shall be monitored by the Contractor for a minimum of 120 days after final inspection and acceptance. During this period, the Contractor shall add additional brine to the tank as necessary to maintain proper liquid level. The Contractor shall also provide five (5) gallons of brine to the City within 30 days of final inspection and acceptance. The contractor is responsible for including a signed receipt of the brine solution by City personnel. The receipt shall include printed name, signature and phone number.
- I. The Contractor shall submit a request for initial fuel delivery to the Owner in writing. That request should include the NHDES authorization to store product for each tank, the tank capacity chart, the final tank manufacturer "cut sheet" with final tank dimensions, a copy of the posted tank certificate, and each tank serial number. A copy of the NHDES Authorization to Use System should also be submitted as part of the closeout documentation.
- J. The Contractor shall post a tank certificate, per NHDES requirements, listing all information regarding the tank that was submitted on the tank registration form. The

Contractor shall submit, as part of the closeout documentation, a copy of the tank certificate posted on-site.

- K. The Contractor shall complete and submit to the manufacturer the UST installation/warranty checklist. A copy of the completed checklist as well as confirmation of delivery of the checklist to the manufacturer shall be submitted as part of the closeout documentation.

3.3 PIPING

- A. The Contractor shall install product and vent piping in accordance with manufacturer's requirements. Piping shall be installed in trenches as indicated on the construction drawings using backfill and spacing as required by the manufacturer.
- B. All product pipes shall be horizontal and slope down toward the piping sump at a minimum of 1/8-inch per foot, and terminate within the piping sumps and the dispenser sumps. All joints and sump entries shall be made with piping manufacturer supplied fittings and be liquid tight.
- C. Product piping shall be connected to the tanks and fueling dispensers in accordance with manufacturer's requirements and applicable codes.
- D. All vent pipes shall be horizontal and slope down to the piping sump at a minimum of 1/4-inch per foot, and terminate within the piping sump at the UST and as shown on the construction drawings at the vent riser location. All joints and sump entries shall be made with piping manufacturer supplied fittings and be liquid tight.
- E. The Contractor shall install vertical galvanized carbon steel vent piping to 12-feet above grade in accordance with the construction drawings.
- F. A diesel vent cap shall be installed on the diesel vent pipe in accordance with applicable codes. A pressure vacuum vent cap shall be installed on the gasoline vent pipe in accordance with applicable codes.
- G. PIPING TESTS: Test gasoline and diesel piping in accordance with requirements on the construction drawings, manufacturer's instructions, and Env-Or 400. Repair or replace piping as required to eliminate leaks and retest as specified to demonstrate compliance. Piping must be tested prior to being secured in flexible ducting and buried. The Contractor shall submit, as part of the closeout documentation, a copy of all piping test results.
- H. The Contractor shall submit manufacturer's technical product data and installation instructions for piping systems materials and products.
- I. The Contractor shall complete and submit to the manufacturer, the APT Installation Checklist & Warranty Start-up Form. A copy of the completed checklist as well as confirmation of delivery of the checklist to the manufacturer shall be submitted as part of the closeout documentation.

3.4 TANK TOP EQUIPMENT

- A. Install tank top equipment in accordance with manufacturer instructions and NHDES requirements.

3.5 CONTAINMENT SUMPS

- A. Install containment sumps in accordance with manufacturer instructions and NHDES requirements.

3.6 ELECTRICAL

A. General

1. All circuits and systems shall be grounded in accordance with applicable sections of Articles 250 and 500 of the NEC.
2. All power conductors shall be THHN or THWN, with Oil and Gas Resistant option.
3. All Communications cabling shall be vapor tight, and Oil and Gas Resistant
4. The contractor shall complete all electrical work in accordance with all provisions of the NEC and New Hampshire Building and Electrical Codes, paying particular attention to Sections 500 and Chapter 514.
5. All control devices, motors or other apparatus, including non-current carrying enclosures, frames, and conduit for power and control, are to be permanently and effectively grounded.
6. All wiring shall be labeled and color-coded to identify each wire from the point of origin, intermediate junction points, and point of termination. In enclosures containing numbered terminal boards, a directory of the purpose of the wire connected to each terminal board shall be sufficient. An as-built drawing of the color-coded wires identifying each as actually installed shall be provided to the City upon completion of the project.
7. The Contractor shall furnish and install an emergency electrical disconnect switch that provides a means to disconnect all electrical power to the motor fuel dispensing equipment and all associated power, control, signal circuits and other electrical equipment in hazardous/classified areas during an emergency, as specified on the construction drawings. The Contractor shall label all emergency stop circuit relays for function and provide a breaker lock for the emergency stop circuit breaker.
8. The Contractor shall be responsible for sizing and specifying all circuit breakers and conductors when not specified on the construction drawings. All conductors shall be sized to meet the recommendations for maximum voltage drop in the NEC.
9. The emergency electrical disconnect switch shall be located not less than 20 feet or more than 100 feet from the fuel dispenser.
10. All control systems shall be in proper operating condition and approval must be given by the control system apparatus manufacturer, as well as by the City, before any final acceptance is made.
11. The Contractor shall thoroughly test all wiring for shorts and grounds before current is turned on.

12. All panel boards shall include a circuit directory or circuit identification in accordance with the NEC/New Hampshire Electric Code. In addition, the inside panel of all enclosures shall include a diagrammatic depiction of the purpose of each device in that enclosure, as shown on the construction drawings. For example, each enclosure containing relays shall be labeled with a quick reference diagram showing the location of each relay and its purpose. Text associated with the diagram shall be Arial Font, or equivalent, no smaller than 18 point.
13. All conduits shall be labeled as indicated on the construction drawings. Labels shall be included on all interior and exterior conduits at the point of exit from a panel board or enclosure and at the point the conduit enters the ground, realizing that some or all conduits may be labeled more than once. Labels shall be affixed with a permanent paint marking pen. Adhesive paper/tape labels are not acceptable.

B. Conduit

1. The Contractor shall securely fasten conduits to outlet boxes, panel-boards, etc., with two nuts and one bushing or thread hub. Conduits shall have ends butted inside couplings.
2. All below-grade conduit shall be bedded with suitable material, free from muck, asphalt, deleterious material, broken concrete or debris of any kind. The backfill material shall be compacted to a minimum of 95% of maximum dry density.
3. All fittings on underground rigid metal conduits shall be steel. Aluminum conduit fittings shall not be permitted underground.

C. Environmental Monitoring System

1. The Contractor's monitoring system installer shall be a certified manufacturer technician and installer.
2. The system shall be configured in strict accordance with the construction drawings.
3. The Contractor shall install all monitoring equipment, including monitor console and communications module, magnetostrictive probes, leak sensors, and hydrostatic sensors, in strict accordance with manufacturer installation instructions. All sump sensors shall be installed in an accessible location so as to facilitate future testing. Sensors shall be secured as shown on the construction drawings. Do not secure sensors to test boots.
4. The Contractor, as part of the initial startup and testing, shall perform the appropriate tests and complete an NHDES Annual Leak Monitoring Test Form. The Contractor shall be responsible for submitting the completed form to the NHDES and providing a copy with proof of delivery to the NHDES as part of the closeout documentation.
5. The system must be programmed with, at a minimum, the following parameters:
 - a. Proper tank size, product, and gallonage.
 - b. Water level warning at 1.5".
 - c. High water alarm at 1.5".
 - d. Overfill Alarm – 90%.
 - e. High-High Level – 95%
 - f. Delivery needed – 30%.
 - g. Low Product level – 15%.

- h. Tank profile shall be programmed with 20 points.
 - i. Tank tilt (if any).
 - j. The audible timer shutoff on the overflow alarms shall be set at 60 seconds.
 - k. All liquid sensors shall be identified as to their location. The Contractor shall post a laminated drawing adjacent to the monitor to indicate the location of the sensors by name and number. In addition, the Contractor shall fabricate and mount a sign stating "Tank Monitoring System" adjacent to the Environmental Monitoring Console. Liquid sensors shall be programmed as follows:
 - L1 GAS INTERSTITIAL SENSOR
 - L2 GAS PIPING SUMP SENSOR
 - L3 DIESEL INTERSTITIAL SENSOR
 - L4 DIESEL PIPING SUMP SENSOR
 - L5 PUMP #1 SUMP SENSOR
 - L6 PUMP #2 SUMP SENSOR
 - l. The system shall be programmed to send an output signal to the red alarm light.
 - m. The gasoline tank shall be programmed and labeled as Tank #1 and the diesel tank shall be programmed and labeled as Tank #2.
- 6. The Contractor shall provide, as part of the closeout documentation, the final setup print-out.
 - 7. The Contractor shall locate all monitoring equipment, including the console and all sensors, in accordance with the construction drawings.
 - 8. The Contractor shall be responsible for the provision of an authorized technician for system start-up and training of the on-site manager and other key personnel. The Contractor shall supply as part of the closeout documentation a list of the individuals/personnel trained on the system signed by each individual.
 - 9. The Contractor shall complete and submit to the manufacturer the Installation and Intrinsic Safety Checklist. A copy of the completed checklist as well as confirmation of delivery of the checklist to the manufacturer shall be submitted as part of the closeout documentation.
 - 10. The Contractor shall supply, as part of the closeout documentation, any instruction bulletins, preventative maintenance schedules, operational instructions and parts lists associated with the system.

D. Fuel Management System

- 1. The Contractor shall supply and install the Fuel Management System (FMS) in accordance with the Construction Drawings and as outlined site-specifically below. The Contractor shall furnish and install conduit and manufacturer cable from the FMS to the internet router/switch as shown on the Construction Drawings. Additionally, the Contractor shall install fuel management disconnect relays and all supporting electrical and telecommunications equipment as shown on the construction drawings.
- 2. Alarm Lights. The Contractor shall install one (1) alarm light on the exterior of the building or on a unistrut mount in accordance with the construction drawings. The alarm light will indicate if the Environmental Monitoring Console is

indicating an environmental sensor alarm. Do not activate red light on high or low product level indications.

3. Testing. The Contractor shall test all emergency, fire alarm, and monitoring switches, systems, and lights. Correct all discrepancies.

3.7 DISPENSING EQUIPMENT

- A. The Contractor shall install two (2) dual hose, dual product suction dispensers in accordance with the construction. Dispensers shall be equipped with an integrated fuel management system.
- B. Dispensers shall be provided with appropriate manufacturer installed product label branded appropriately as "diesel" or "gasoline".
- C. The Contractor shall install the fuel management systems in accordance with manufacturer instructions. Supply all cards to the owner upon installation.
- D. The Contractor shall furnish and install a liquid-tight containment sump below the dispensing pump in accordance with the Construction Drawings and the manufacturer's installation instructions. The containment sump shall be liquid tight and shall be hydrostatically tested before being backfilled. The Contractor shall submit, as part of the closeout documentation, a copy of all sump testing results.
- E. The Contractor shall furnish and install filters for two (2) gasoline and two (2) diesel dispenser/pumps. Activate the dispenser and inspect filter for leaks. Allow approximately 100 gallons of product to flow through the filter, then remove and replace filter again.
- F. The Contractor shall calibrate and "seal" new dispensing meters in accordance with State of New Hampshire Weights and Measures regulations. Set the delivery calibration as close to "zero" as possible. The Contractor must return all motor fuel used in the calibration of the dispensing pump meters back to the storage tank. The Contractor must provide written documentation on the flow rate of the nozzle. The contractor shall complete and submit to the Bureau of Weights and Measures a Placed In Service/Inspection Report Form and provide a weights and measures certification sticker on the dispenser. The yellow owner/operator copy of the Placed In Service/Inspection Report form shall be submitted as part of the closeout documentation.
- G. The Contractor shall perform the following electrical circuit test for the facility dispenser:
 1. Turn off all circuit breakers controlling the pump and check to assure that the pump is not running.
 2. Confirm that the nozzle is in the dispenser boot with the boot electrical switch off.
 3. Turn on circuit breaker controlling the pump and on the dispensing pump:
 - a. Remove nozzle, turn operating handle on, and dispense product to confirm hose is pressurized.
 - b. Assure that only the correct pump turns on.

4. If circuit disconnection or other problems are detected using the above procedure, make correction and repeat entire system checkout.
- H. The Contractor shall add, where applicable, ULSD (15 ppm sulfur), 87 Octane, and ethanol (10%) stickers to the appropriate dispensers, as well as other stickers, signs and decals as depicted on the Construction Drawings.
- I. The Contractor shall label the dispenser with the appropriate pump number (i.e., 1,2,3, etc.). The Contractor shall ensure that the pump number label is not affixed to the removable dispenser doors.
- J. The Contractor shall provide the City with two (2) dispenser keys for the dispenser.
- K. The Contractor shall ensure that the hose retractor wire is properly finished so as to avoid any frayed edges.
- L. The Contractor shall supply, as part of the closeout documentation, any instruction bulletins, preventative maintenance schedules, operational instructions and parts lists provided with the pumps/dispensers.

3.8 CAST-IN-PLACE CONCRETE

- A. Cast-in-place concrete shall be in accordance with Section 520 of the NHDOT Standard Specifications.
- B. The work includes, but is not necessarily limited to the following:
 1. Install concrete tank pads as indicated on the Construction Drawings. The tank pads shall be installed with a raised curb around manholes with a 6" average reveal from grade.
 2. Install concrete fueling pads as indicated on the Construction Drawings. The fueling pads shall be sloped to 1 inch above finished grade.
 3. Install tank deadmen as indicated on the construction drawings.
- C. All concrete material and workmanship shall include reinforcing steel, anchor bolts, form work, etc. and furnishing and finishing of the concrete structure.
- D. All concrete shall be ready mixed as produced by a plant acceptable to the City.
- E. Forms or screeds shall be used for all concrete and shall be so constructed and placed that the resulting concrete will be of the shape, lines, dimensions, and to the elevations indicated on the Construction Drawings.
- F. No concrete shall be placed until reinforcing anchors, etc. and other work required to be built into the concrete have been inspected and approved by the City.
- G. Reinforcing shall be formed and spaced, secured in place by rebar chairs to withstand all construction shocks. Other methods for securing rebar are not acceptable.

- H. Consolidate placed concrete using mechanical vibrating equipment with hand-rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into parts of all forms.
- I. The top face of concrete slabs shall be given a broom finish. Slabs shall be kept wet during the curing period and be covered with curing paper. Concrete shall be sealed within 24 hours of the pour.
- J. The Contractor shall not drive on or allow others to drive on the concrete until sufficiently cured.
- K. All grouting and repair work shall be done using an approved non-shrink grout mixed and applied in accordance with manufacturer's directions.

3.9 FIELD QUALITY CONTROL

- A. Test all tanks, piping systems, sumps, interstitial spaces in accordance with manufacturer requirements and guidelines, local requirements and PEI RP100. All test results shall be submitted to the Owner within 24 hours of completion. The primary and secondary chambers of all product carrying vessels (pipes and tanks) shall be tested prior to and after final backfill. The test pressure on the interstitial piping space shall be maintained through the final backfill process and verified after backfill is complete.
- B. After completion of the gasoline system installation, and after backfilling and setting concrete, test all underground piping and tanks with a precision method capable of detecting leaks of 0.005 gallons per hour. The precision test shall be performed by a third party independent testing company and shall provide a certified report of tightness to the Owner within 5 days of completion. Also complete a precision test of all piping prior to pouring concrete protective slab.
- C. Pressure test piping in accordance with NFPA 30A, NFPA 30, and ASME B31.3.
- D. In addition to the requirements outlined above, hydrostatically test all dispenser containment sumps, tank sumps, turbine enclosures, and other containment structures by filling each sump with water in accordance with NHDES requirements. This test shall be conducted by a testing agency and the results reported to the Owner within 24 hours of completion.
- E. Provide documentation of all tests signed by certified personnel to the Owner prior to the operation of the facility and in the closeout documents.
- F. Test all safety devices, including but not limited to emergency valves, emergency stop devices, and leak detection devices, in the presence of the Owner. Provide a written report of all tests.
- G. Test all leak detection sensors and level probes. Report results on State required forms that document annual test for these devices. Tests shall be in accordance with manufacturer requirements for startup tests and in accordance with State requirements for annual testing.

- H. Commission and calibrate the fuel dispensers using the services of a manufacturer certified service organization. Provide a report of startup and calibration from that agency.
- I. Perform Static Pressure Performance Test using CARB Test Method TP-201.3 on all USTs/UST systems.
- J. Perform Pressure Vacuum Vent Valve Test using CARB Test Method TP-201.1E on all USTs/UST systems.
- K. Perform other vapor recovery tests as required by New Hampshire Regulation.
- L. Test the flow rate of fuel at each dispenser in the presence of the Owner. Flow rate shall be 9-10 gallons per minute (gasoline) and 9 gallons per minute minimum (diesel).

3.10 COMMISSIONING

- A. The Contractor shall commission the gasoline fuel system. Commissioning shall include all testing, start-up, calibration, programming, and documentation. At the conclusion of the commissioning, the facility shall be ready for the Owner to conduct unrestricted operations and use all systems to their full intended and designed capacity.
- B. Provide Closeout documents at completion of commissioning.

3.11 TRAINING

- A. The Contractor shall provide a minimum of 8 hours of training to field operating personnel, including fuel management system, monitoring system, safety system and dispenser operation. Additionally, the Contractor shall provide a detailed system “walk thru” to facility maintenance personnel. The Contractor shall supply, as part of the closeout documentation, a list of the individuals/personnel trained at each location, signed by each individual.

END OF SECTION

SPECIAL PROVISION

SECTION 304

AGGREGATE BASE COURSES

Amend Section 304 to include:

Material Requirements

Add 2.12: Sources of Aggregate and preliminary test results shall be submitted ten working days prior to any placement of material on the job. Failure of these preliminary tests will be grounds for rejection of material from that source. Aggregates will be tested on the job and shall meet these specifications as the material is incorporated into the work. All Measurements shall be in-place compacted quantities in accordance with the plans and specifications.

Method of Measurement

Amend 4.1: Roadbed base course materials of sand, gravel, crushed gravel, crushed aggregate for shoulders, crushed stone (fine and course gradation) shall be measured by the cubic yard using average lengths, widths and depths of the areas to be filled to the nearest 0.1 cubic yard, or as determined by the engineer. Measurement shall be compacted, complete in place.

Basis of Payment

Amend 5.1: Roadbed base course materials of sand, gravel, crushed gravel, crushed aggregate for shoulders, crushed stone (fine and course gradation) shall be measured and paid for by the Contract unit price, by the cubic yard.

Add 5.4: The cost of the all laboratory testing including compaction testing at 1 test per 50' in areas to be designated by the Engineer, shall be the responsibility of the Contractor and subsidiary to the pay item.

Add 5.5: The cost of grading (rough and fine) shall be the responsibility of the Contractor and subsidiary to the pay item.

Pay item

304.4 Crushed Stone (Fine)

Pay unit

Cubic Yard

END OF SECTION

SPECIAL PROVISION

SECTION 401 and 403

ASPHALT PAVEMENT

Description

- 1.1 This work shall consist of furnishing and installing bituminous pavement courses in accordance with Sections 401 of the NHDOT Standard Specifications for Road and Bridge Construction (latest edition) and as specified in this section.
- 1.2 All references to NHDOT, NHDOT Personnel or the Department may be construed as the Engineer, the City of Portsmouth, their agents and representatives.
- 1.3 Work shall conform to NHDOT Section 401, Tier 2 except as noted herein:
 - 1.3.1 Ride Smoothness: Section 401.3.17.3.4.1 shall apply except variations exceeding $\frac{3}{8}$ inch in profile or cross slope shall be eliminated.
 - 1.3.2 Ride smoothness: Section 401.3.17.3.4.4 shall apply except high points **0.5** inches in 25 shall be corrected.

Materials:

- 2.1 **Materials:** Materials shall conform to NHDOT 401 except the following:
 - 2.1.1 **The maximum amount of Total Reused Binder (TRB) in the pavement mix shall be 0.5% and the mix shall meet all volumetric mix design criteria.**
 - 2.1.2 Asphalt Cement shall not contain any form of used, recycled or refined oil. Suppliers of PG Binder shall certify that the PG Binder does not contain any used, recycled or refined oil.
 - 2.1.3 All $\frac{3}{4}$ " (19mm) and 1 inch (25mm) pavement mixes shall be designed using the 50 gyration N design, unless otherwise specified.
 - 2.1.4 Liquid asphalt cement binder shall have Performance Grade (PG) of PG64-28 for all standard bituminous and PG 64-E for all high strength bituminous pavements. NHDOT QC/QA Specifications shall be followed for high strength mixes.
- 2.2 **Pavement Mix Designs:** Pavement mix designs shall meet NHDOT Section 401.2.5.1 except the following:
 - 2.2.1 Minimum asphalt binder content shall be as follows:

Minimum Asphalt Binder Content		
Mix Type	50 Gyration	75 Gyration*
3/8-in (9.5mm)		5.9%
1/2-in (12.5mm)	5.9%	*
3/4-in (19.0mm)	5.3%	*

The required minimum asphalt content is based on the use of aggregate with a

specific gravity of 2.65 to 2.70. The minimum asphalt content requirement may be adjusted when aggregate with higher specific gravity is used, or the minimum may be adjusted at the Engineer's discretion if it is believed to be in the best interest of the Owner. All mix designs shall be submitted to the Engineer for verification and approval. *75 Gyration mix with stone size above 3/8" not allowed without expressed written permission of the Engineer.

- 2.2.2 Method requirements NHDOT Section 401.2.6 shall include the following:
 - 2.2.2.1 Coarse Aggregate: Stockpiled coarse aggregate shall meet the requirements of 2.6.1, Table 2.
 - 2.2.2.2 Tolerances: All mixtures shall conform within range of tolerances provided in NHDOT Section 401.2.6.2.
 - 2.2.2.3 When Non-Compliant test result, it shall be the Contractor's responsibility to correct non-compliant pavement. The Contractor may be required to remove non-compliant material that is poorly graded or material exhibiting cracks, open joints or other imperfections. **No payment will be made for this material or its removal.**

Construction Requirements: Construction requirements shall be in accordance with Section 401 of the NHDOT Standard Specifications **and** as specified in this section.

- 3.1 Prior to placing any mix, a pre-paving conference shall be held with the Owner, Contractor, and Engineer to discuss the proposed paving schedule, source mix, type and amount of equipment to be used, sequence of paving pattern, rate of mix supply, traffic control, and general continuity of the operation. Special attention shall be made to the paving pattern sequence to minimize cold joints.
- 3.2 The Contractor shall notify the Engineer one week in advance of paving operations to allow sufficient time for scheduling personnel.
- 3.3 Any pavement course four inches (compacted depth) or greater shall be placed and compacted in two lifts.
- 3.4 Existing pavement or previously laid courses shall be thoroughly dry and free from all dust, dirt, and loose material. Sweeping with a power broom, supplemented by hand brooming, may be necessary.
- 3.5 Surfaces of any pavement course shall have a tack coat of emulsified asphalt applied in accordance with NHDOT Specifications. Application of emulsified asphalt shall be between 0.02 and 0.05 gal/yd².
- 3.6 **Joint adhesive shall be used for all transverse and lateral seams when placing 100 tons of asphalt or more. This item is subsidiary unless a separate pay item is provided.**
- 3.7 Utility covers, frames and grates, valves and other castings shall be set and raised. Contact surfaces of the drainage and utility castings shall be painted with a thin coating of suitable bituminous material. Surface pavement shall be removed from covers and

casting immediately following pavement operations. Open grates shall be covered to ensure pavement material does not fall into structure.

3.8 Method requirements NHDOT Section 401.3.1.2 shall apply.

<u>Pay item</u>		<u>Pay unit</u>
403.12	Hand Method	Ton
1010.2	Asphalt Cement Adjustment	Allowance

END OF SECTION

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Project Notes

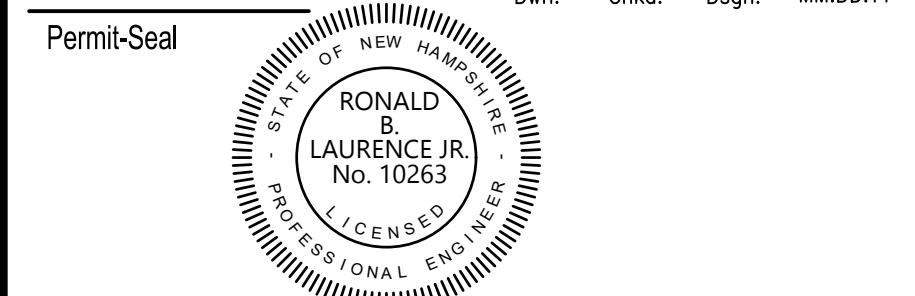
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Sheet Notes

NOTE:
 TANK ARRANGEMENT ON THIS PLAN SHALL BE CONSIDERED APPROXIMATE AND IS SUBJECT TO VARY WITH MANUFACTURER SELECTION.

ADDENDUM 1	CLC	RBL	03.14.23
Revision	By	Appd.	MM.DD.YY
ISSUED FOR BID	CLC	RBL	08.26.22
ISSUED FOR NHDES PERMIT	CLC	RBL	05.12.22
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File Name: 2_195602217_Portsmouth-DPW_C.dwg	CLC	RBL	CLC	05.12.22
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RONALD B. LAURENCE JR.
 NEW HAMPSHIRE PROFESSIONAL ENGINEER #10263

Client/Project
 CITY OF PORTSMOUTH
 DEPARTMENT OF PUBLIC WORKS
 FUEL SYSTEM REPLACEMENT

680 PEVERLY HILL RD
 PORTSMOUTH, NH 03801

Title
 PROPOSED SITE PLAN

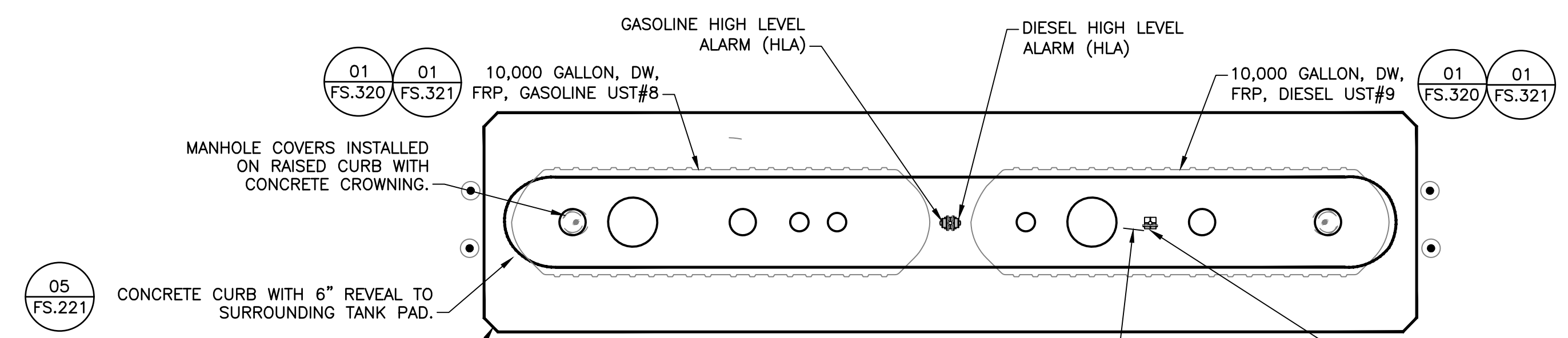
Project No. 195602217	Scale AS SHOWN
Drawing No. FS.212	Sheet 6 of 28
	Revision A

NOTES:
 1. THIS PLAN IS BASED ON AN AERIAL IMAGERY AND LIMITED TOPOGRAPHICAL SURVEY. IT DOES NOT DEPICT ALL UNDERGROUND UTILITIES AND SHALL NOT BE RELIED UPON AS A COMPREHENSIVE UTILITY PLAN.
 2. THE CONTRACTOR SHALL CONTACT DIGSAFE AND CONDUCT A PRIVATE UTILITY LOCATE PRIOR TO ANY EXCAVATION WORK.

APPROXIMATE LIMITS OF DISTURBANCE AND FULL DEPTH PAVEMENT RESTORATION (TYP)

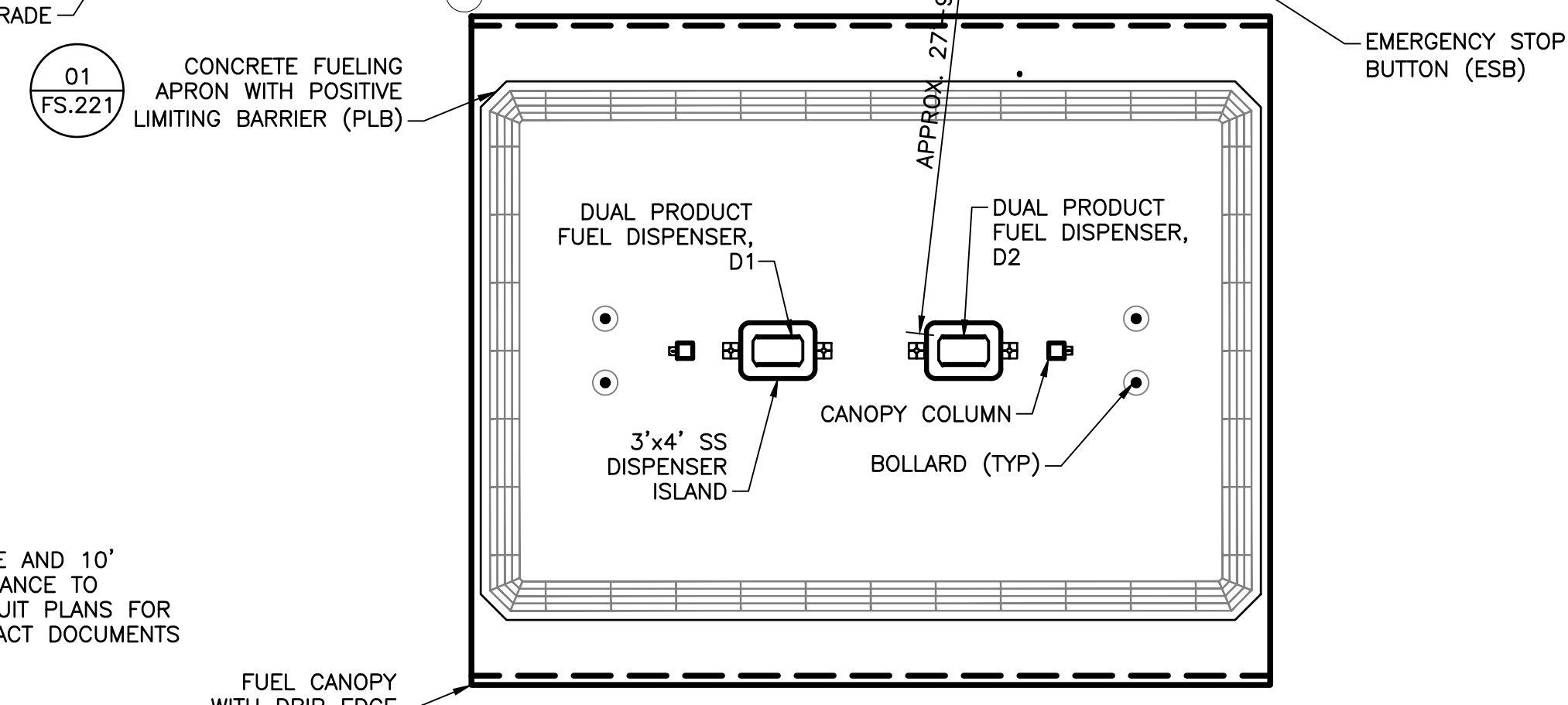


EDGE OF PAVEMENT



CONTINUATION OF CONDUIT TRENCH TO MAINTENANCE GARAGE. REFER TO CONDUIT PLAN FOR ENTIRETY OF APPROXIMATE LIMITS OF DISTURBANCE.

MANHOLE COVERS INSTALLED ON RAISED CURB WITH CONCRETE CROWNING.
 CONCRETE CURB WITH 6" REVEAL TO SURROUNDING TANK PAD.
 PERIMETER OF CONCRETE TANK PAD INSTALLED AT GRADE.



APPROXIMATE LIMITS OF DISTURBANCE AND FULL DEPTH PAVEMENT RESTORATION (TYP)

24' MOTORIZED SLIDING VEHICLE GATE AND 10' PEDESTRIAN GATE INSTALLED AT ENTRANCE TO RECYCLING FACILITY. REFER TO CONDUIT PLANS FOR ADDITIONAL DETAIL. REFER TO CONTRACT DOCUMENTS FOR PREFERRED FENCE VENDOR.

INSTALL CHAINLINK FENCE 6' FURTHER TOWARDS RECYCLING CENTER THAN EXISTING FENCE. MATCH EXISTING HEIGHT.

1 PROPOSED SITE PLAN
 SCALE: AS INDICATED
 SCALE: 1/8"=1'-0"

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ADDENDUM 1	CLC	RBL	03.14.23
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Issued	By	Appd.	MM.DD.YY

File Name	CLC	RBL	CLC	05.12.22
3_195602217_Portsmouth-DPW_Grading.dwg	Dwn.	Chkd.	Dsgn.	MM.DD.YY

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 NEW HAMPSHIRE PROFESSIONAL ENGINEER #10263

Client/Project

CITY OF PORTSMOUTH
 DEPARTMENT OF PUBLIC WORKS
 FUEL SYSTEM REPLACEMENT

680 PEVERLY HILL RD
 PORTSMOUTH, NH 03801

Title

GRADING AND DRAINAGE PLAN

Project No.	Scale
195602217	AS SHOWN

Drawing No.	Sheet	Revision
FS.213	7 of 28	A

NOTES:

PROTECT ALL EXISTING ABOVEGROUND AND UNDERGROUND UTILITIES DURING CONSTRUCTION WITH ROAD PLATES, BARRIERS, OR AS NECESSARY TO ALLOW THE NHDOT TO MAINTAIN 24/7 OPERATION

CONCRETE FUELING APRON GRADING NOTE:
 CONCRETE FUELING APRON WILL CONSISTENTLY SLOPE 1/4" / FT RADIATING DOWNWARD AND OUTWARD FROM DISPENSER ISLAND TOWARD PLB (POSITIVE LIMITING BARRIER) PERIMETER UNLESS INDICATED OTHERWISE. (TYP.)

APPROXIMATE LIMITS OF DISTURBANCE AND FULL DEPTH PAVEMENT RESTORATION (TYP.)

EXISTING STRAIGHT GRANITE SLOPE CURB TO REMAIN

EXISTING ELECTRIC HANDHOLE TO REMAIN

PROPOSED FULL-DEPTH PAVEMENT RECONSTRUCTION

REMOVE AND REPLACE PORTIONS OF GRANITE SLOPE CURB TO FACILITATE VENT PIPING INSTALLATION.

TOP OF CURB: 50.26'

TOP OF CURB: 50.65'

TOP OF CURB: 51.45'

TOP OF CURB: 50.92'

TOP OF ISLAND: 51.25'

TOP OF ISLAND: 51.25'

APPROXIMATE LIMITS OF DISTURBANCE AND FULL DEPTH PAVEMENT RESTORATION (TYP.)

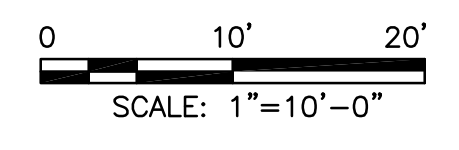
PROPOSED FULL-DEPTH PAVEMENT RECONSTRUCTION

EXISTING SURVEY DATUM.
 MAG NAIL SET IN PAVEMENT
 49.74'

REMOVE AND REPLACE CHAIN LINK FENCE BETWEEN FUEL CANOPY AND RECYCLING FACILITY. REFER TO CONTRACT DOCUMENTS FOR PREFERRED FENCE VENDOR.

1 GRADING AND DRAINAGE PLAN

SCALE: AS INDICATED



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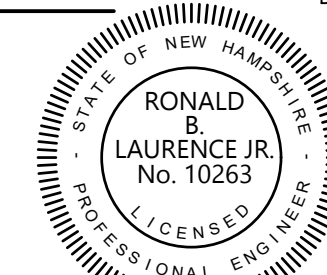
Project Notes

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Sheet Notes

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Revision	By	Appd.	MM.DD.YY
ISSUED FOR BID	CLC	RBL	08.26.22
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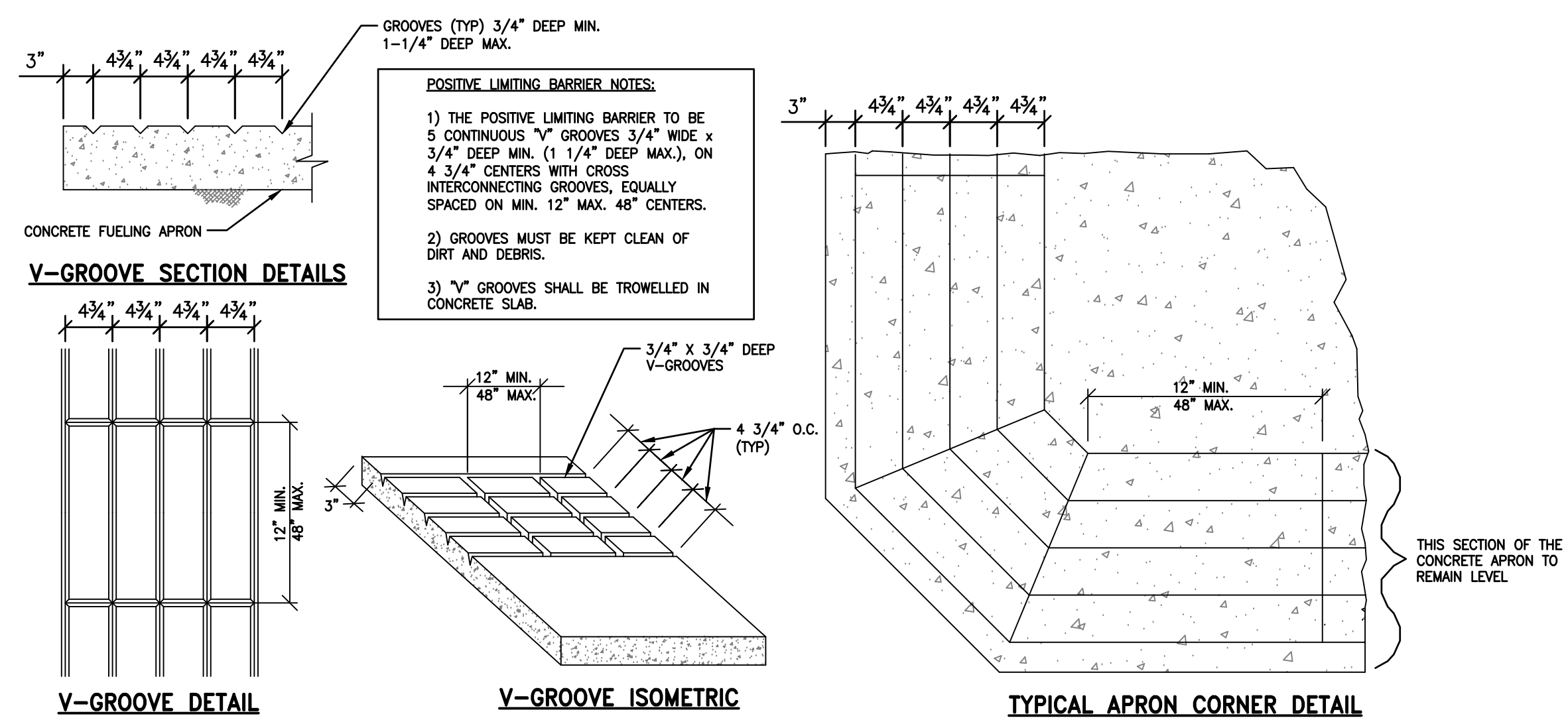
RONALD B. LAURENCE JR.
 NEW HAMPSHIRE PROFESSIONAL ENGINEER #10263

Client/Project
 CITY OF PORTSMOUTH
 DEPARTMENT OF PUBLIC WORKS
 FUEL SYSTEM REPLACEMENT

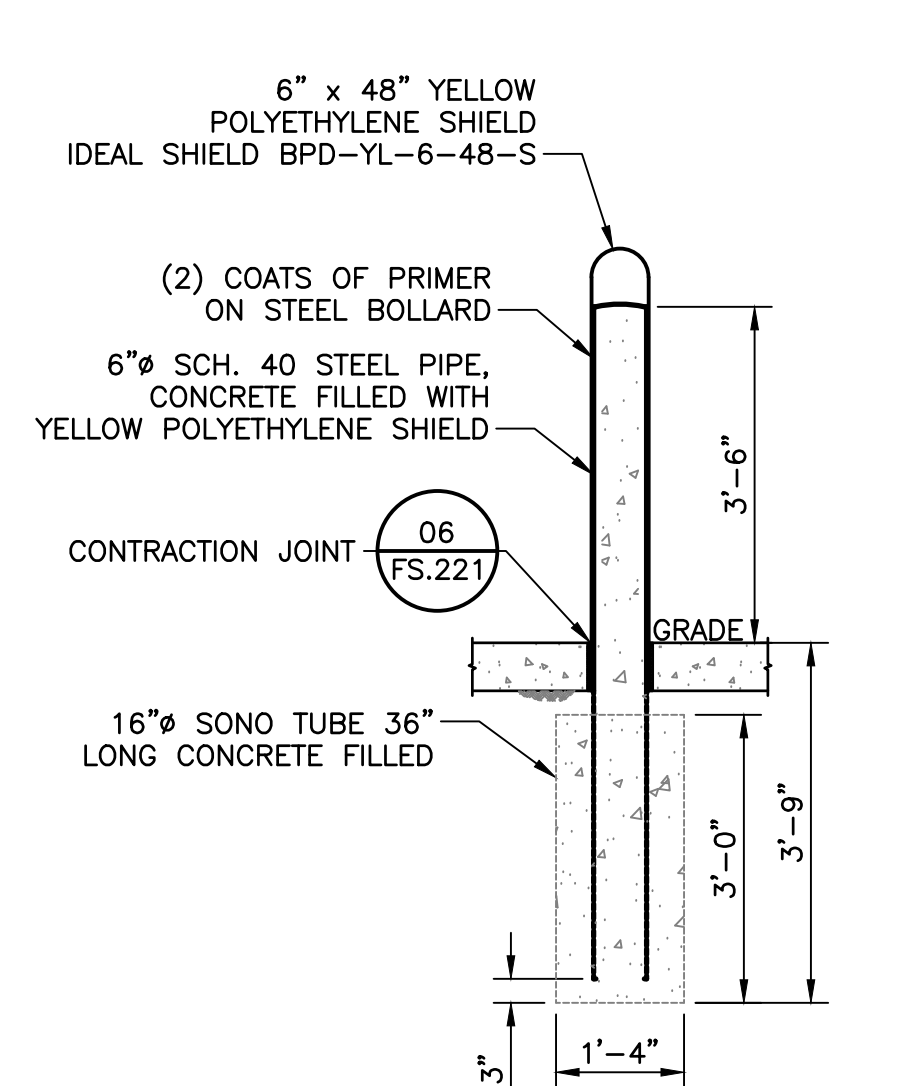
680 PEVERLY HILL RD
 PORTSMOUTH, NH 03801

Title
 PLB, BOLLARD AND PAVEMENT DETAILS

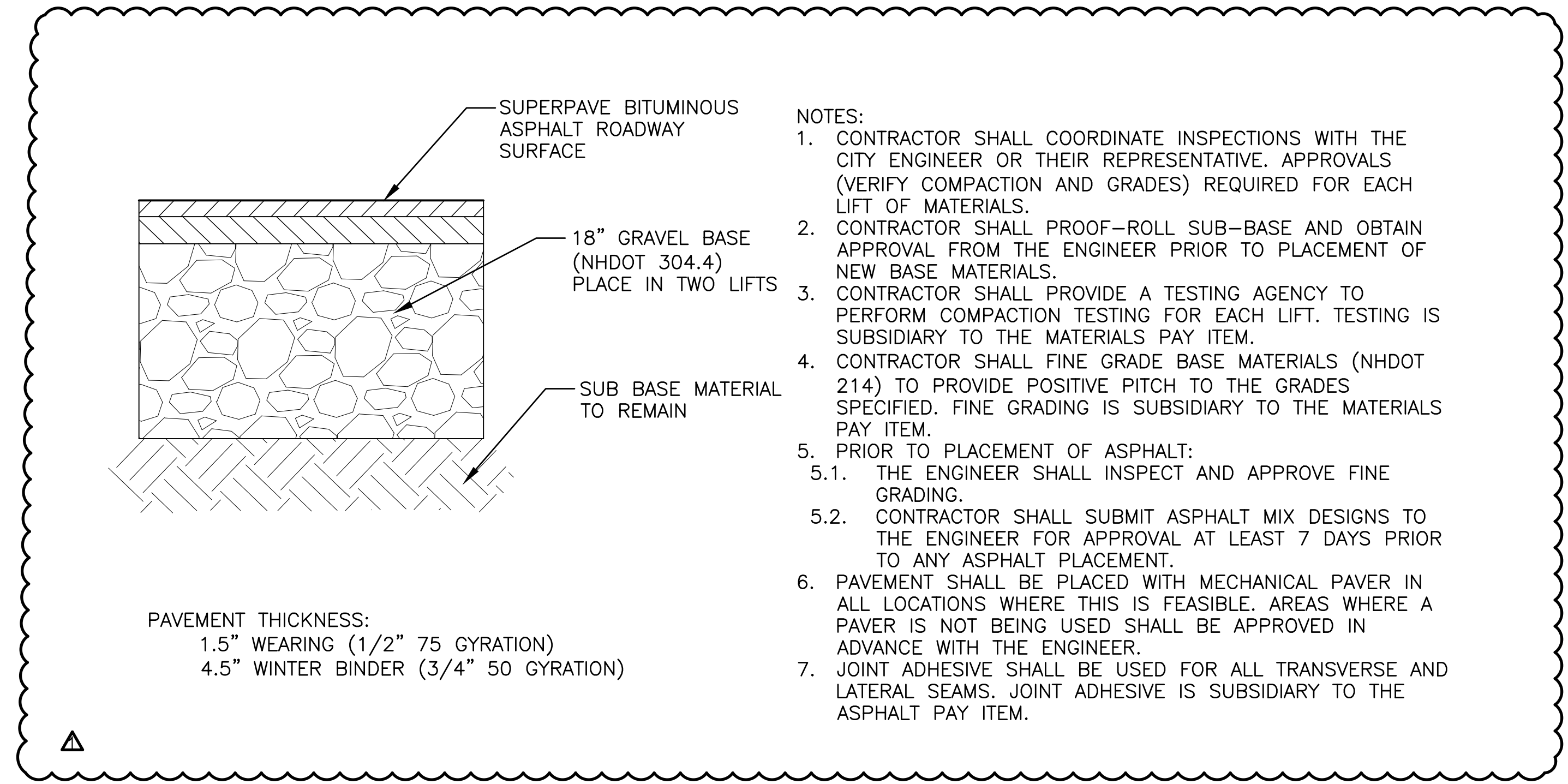
Project No. 195602217	Scale AS SHOWN
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	Revision A



1 POSITIVE LIMITING BARRIER DETAILS
 SCALE: N.T.S.



2 BOLLARD DETAIL
 SCALE: N.T.S.



3 FULL DEPTH ASPHALT RESTORATION DETAIL
 SCALE: N.T.S.

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Project Notes

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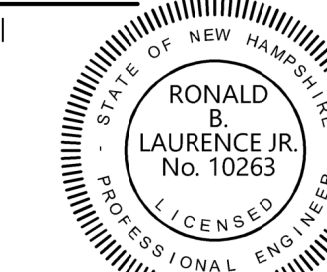
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ISSUED FOR BID	CLC	RBL	08.26.22
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File Name: 4_195602217_Portsmouth-OPW_M.dwg	CLC	RBL	CLC	05.12.22
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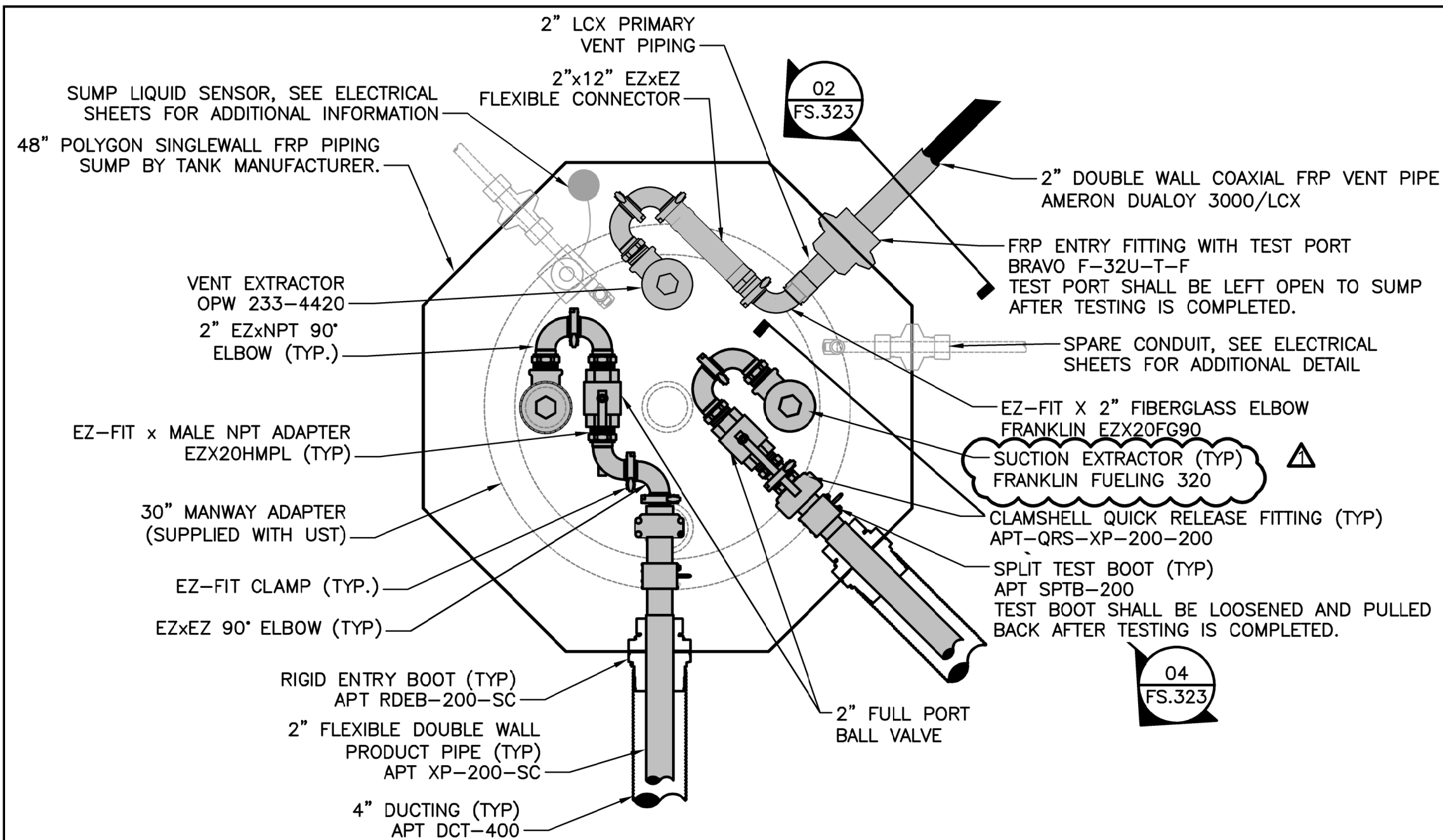
Client/Project
 CITY OF PORTSMOUTH
 DEPARTMENT OF PUBLIC WORKS
 FUEL SYSTEM REPLACEMENT

680 PEVERLY HILL RD
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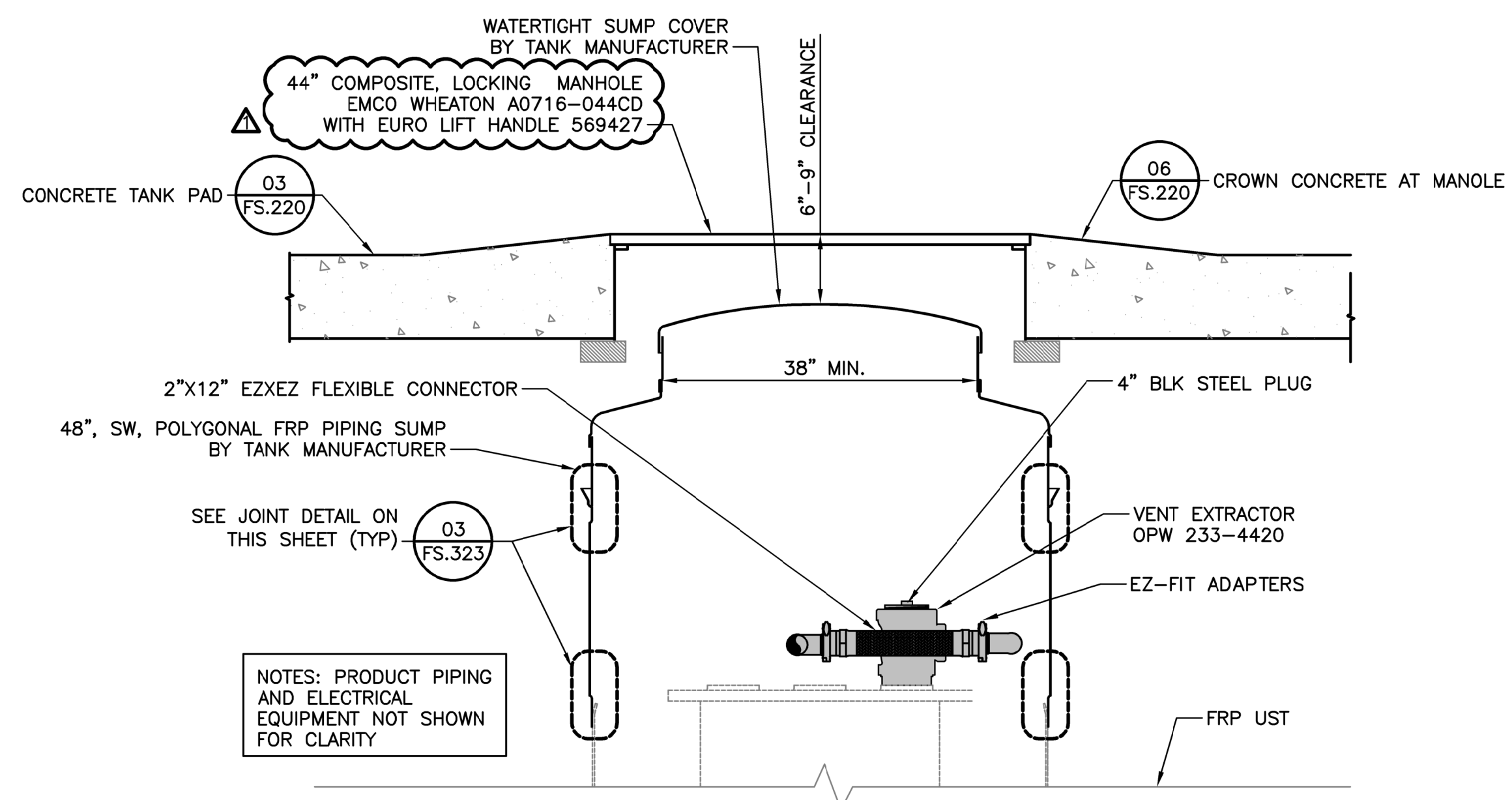
Title
 UST PIPING SUMP PLAN AND DETAILS

Project No.	Scale	
195602217	AS SHOWN	
Drawing No.	Sheet	Revision

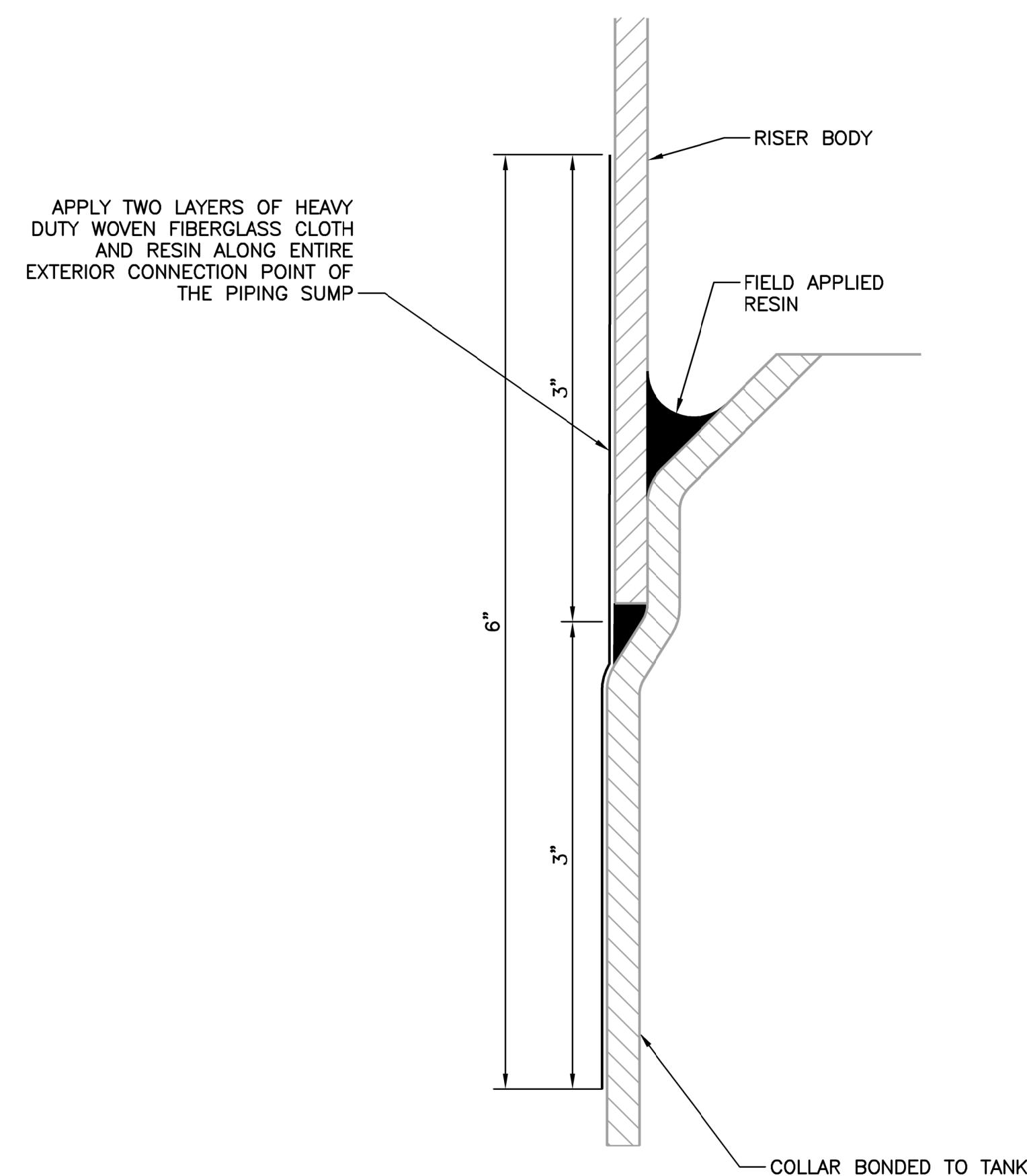
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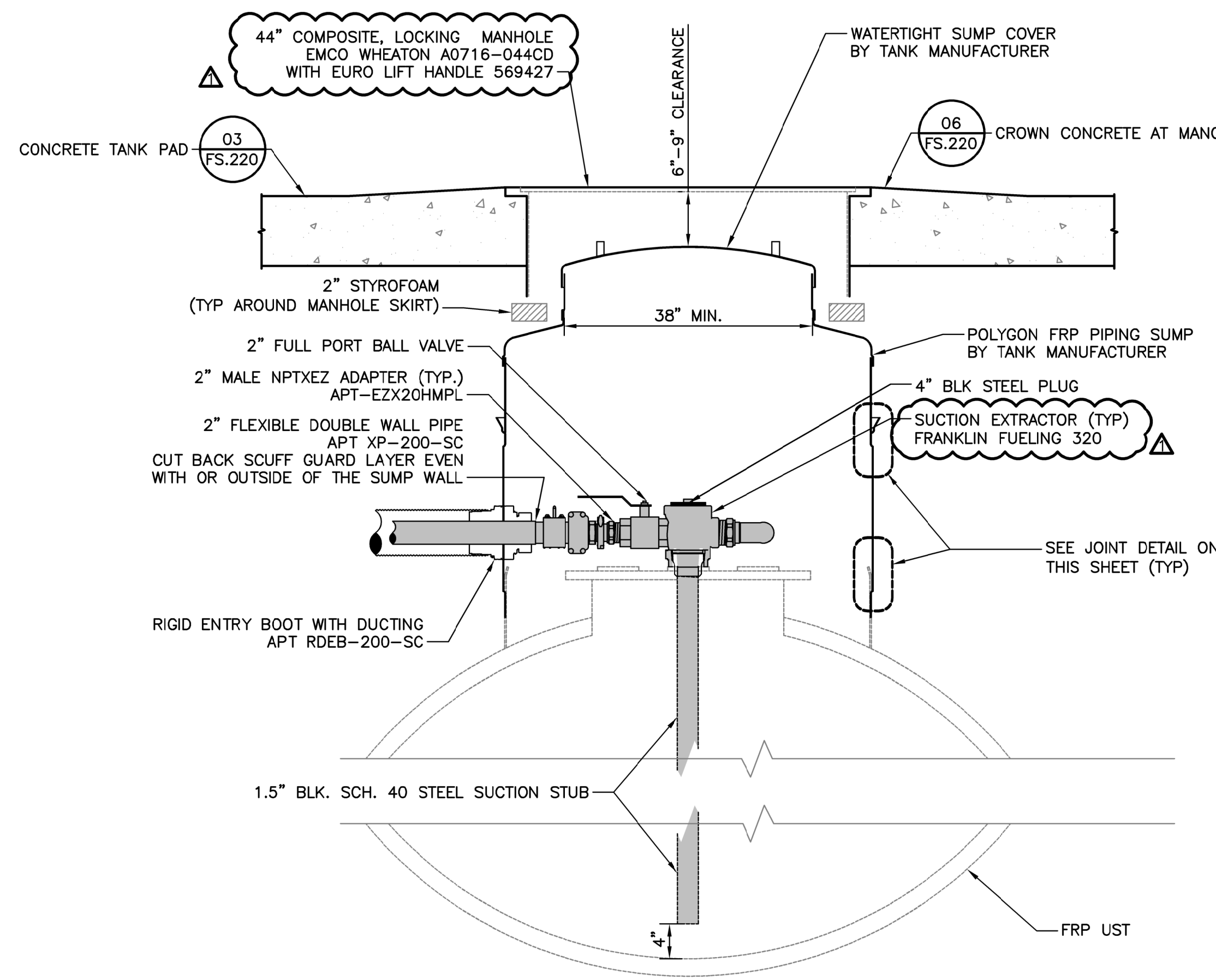
1 TYPICAL UST SUMP PIPING PLAN
 SCALE: N.T.S.



2 TYPICAL UST SUMP VENT PIPING DETAIL
 SCALE: N.T.S.



3 JOINT DETAIL FOR UST SUMP ATTACHMENTS
 SCALE: N.T.S.



4 TYPICAL UST SUMP PRODUCT PIPING DETAIL
 SCALE: N.T.S.

NOTE:
 CONTRACTOR TO COMPLETE
 SUCTION STUB VERIFICATION FORM

NOTE: PIPING ARRANGEMENT IN
 EACH SUMP MAY VARY. ALL
 OTHER ITEMS NOT SHOWN FOR
 CLARITY. REFER TO PIPING
 PLAN FOR PROPOSED PIPE
 CONFIGURATIONS.