Brooklyn Wastewater Pumping Station Rehabilitation and Thioguard Chemical Feed Facility at Baltimore Street

Category:	Water and Sewage Treatment Plants	Project ID #:	1004618468
Street Address:	Baltimore St. Baltimore MD 21231	Staff Estimate Value	$4,000,000.00
County:	Baltimore City	Stage:	BIDDING - Biddate Set
Bid Date:	2/28/2018 , 11:00AM		
Architect:			
Documents Available:	Specs available in Insight		Plans available from City of Baltimore - Public Works
Last Update:	1/23/2018		Specs were Added/Updated

Project Events

Event	Date	Details
Bid Date	2/28/2018 , 11:00AM	Sealed Bids will be received by Board of Estimates of the Mayor and City Council of Baltimore at the Office of the Comptroller, Room 204, City Hall, Baltimore, Maryland.
Bids Open	2/28/2018 , 12:00PM	Bids will be publicly opened by the Board of Estimates in Room 215, City Hall at Noon.
Pre-Bid Meeting	1/18/2018 , 10:00AM	Held at Administration Building Lobby at the Patapsco Wastewater Treatment Plant (3501 Asiatic Avenue, Baltimore, MD 21226)
Start Date	4/27/2018	Actual Start Date

Notes

Scope

Renovation of a water / sewer project in Baltimore, Maryland. Completed plans call for the renovation of a water / sewer project. All contractors bidding on this Contract must first be prequalified by the City of Baltimore Contractors Qualification Committee. Interested parties should call 410-396-6883 or contact the Committee at 4 South Frederick Street, 4th Floor, Baltimore, Maryland 21202. If a bid is submitted by a joint venture (JV), then in that event, the document that established the JV shall be submitted with the bid for verification purposes. The Prequalification Category required for bidding on this project is E13003-Water and/or Sewer Treatment Plants and Pumping Stations. Cost Qualification Range for this work shall be $3,000,000.01 to $4,000,000.00. All questions by bidders must be submitted by January 25, 2018 Upgrade of pump station control and communication, replacement of pumps power cables, replacement of existing buried conduits with a duct bank, installation of two perforated plates next to existing bar screen, replacement of a bar screen with perforated plate screen, replacement of four Tideflex valves, and other miscellaneous work.

Notes

Bid Date: 02/28/2018 11:00AM Sealed Bids will be received by Board of Estimates of the Mayor and City Council of Baltimore at the Office of the Comptroller, Room 204, City Hall, Baltimore, Maryland. Bids Open: 02/28/2018 12:00PM Bids will be publicly opened by the Board of Estimates in Room 215, City Hall at Noon. Pre-Bid Meeting: 01/18/2018 10:00AM Held at Administration Building Lobby at the Patapsco Wastewater Treatment Plant (3501 Asiatic Avenue, Baltimore, MD 21226) Development include(s): Renovation

Details

[Division 2]: Building Demolition, Dewatering, Earthwork, Grading, Paving & Surfacing, Water Systems, Sewerage & Drainage, Landscaping. [Division 3]: Concrete Formwork, Concrete Reinforcement, Structural Concrete, Structural Precast Concrete, Concrete Restoration & Cleaning. [Division 4]: Concrete Unit Masonry. [Division 5]: Metal Fabrications, Metal Railings. [Division 6]: Rough Carpentry, Wood Timber. [Division 7]: Membrane Roofing. [Division 8]: Metal Doors, Hardware. [Division 9]: Tile, Painting. [Division 10]: Compartments & Cubicles, Partitions. [Division 11]: Audio-Visual Equipment. [Division 14]: Elevators, Material Handling Systems, Hoists & Cranes. [Division 15]: Mechanical Insulation, Plumbing Piping, Plumbing Fixtures, Water Heaters, Boilers, Air Handling, Ductwork, Testing & Balancing. [Division 16]: Service/Distribution, Interior Lighting, Exterior Lighting, Emergency Lighting, Standby Power Generator Systems, Alarm & Detection Systems.

Additional Details

Listed On:	1/18/2018	Floor Area:	
Contract Type:		Work Type:	Alteration
Stage Comments 1:		Floors Below Grade:	
Stage Comments 2:		Owner Type:	City
Bid Date:	2/28/2018	Mandatory Pre Bid Conference:	
Invitation #:	948	Commence Date:	4/27/2018
Structures:	1	Completion Date:	
Single Trade Project:		Site Area:	
Floors:		LEED Certification Intent:	

Parent Project ID:
Parking Spaces:

Units:

Project Participants

Company Role	Company Name	Contact Name	Address	Phone	Email	Fax
Owner	City of Baltimore - Public Works	Irekpitan Iwuoha	200 N. Holliday St. Suite 600, Baltimore, MD 21202	(410) 396-7300	irekpitan.iwuoha@baltimorecity.gov	(410) 539-6119

Bidders

Company Name	Contact Name	Added Date	Address	Phone	Email	Bidding Role	Bid Rank	Bid Value	Fax Number
W.M. Schlosser Company, Inc. - Main Office / Hyattsville	Candice Geter	1/18/2018	2400 51st Place , Hyattsville, MD 20781	(301) 773-1300	cgeter@wmschlosser.com	Bidder - General Contractor			(301) 773-9263

Contracts

Classification	Conditions	Bonding	Bid Date	Bids To	Bid Type
General Contractor			2/28/2018	Owner	Open Bidding

History

User	Viewed	First Viewed Date	Currently Tracked?	Date Tracked
Adam Sweet	True	1/23/2018	False	

SECTION 23 11 13

FUEL OIL PUMPING SYSTEMS AND CONTROLS FOR CRITICAL MISSION APPLICATIONS

PART 1- GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them.

1.02 SUMMARY

A. Perform all Work required to provide and install fuel oil pumping system and controls.

B. This Section includes critical mission fueling systems and the following:

1. Pipes, tubes and fittings
2. Piping and tubing joining materials
3. Piping specialties
4. Valves
5. Double Wall ASTs with interstitial leak detection monitoring
6. AST accessories
7. Underground sumps with leak detection monitoring
8. Generator Day Tanks
9. Fuel Distribution Supply/Return Pumps
10. Submersible pumps
11. Underground containment fuel supply piping with interstitial space monitoring for leak detection.
12. Underground transition Sump with leak detection monitoring

13. NFPA and IBC safety signage

14. Provide all electrical work required for complete and operational system, but not shown on the electrical contract documents.

C. Provide a complete integrated emergency fuel system for all diesel driven equipment as shown in the Contract Documents. This specification requires system coordination, equipment, installation guidance, programming, startup, and training to be the responsibility of a single specialized fuel system supplier. This specification section includes Contractor responsibility for all materials, labor, design, code compliance, permits, inspections, piping, specialty components, fuel leak detection, fuel monitoring, and control systems installation. The system shall be in accordance with design standards and shall be designed and built for reliability. The system shall be fitted out with all required fittings, products, NFPA and IMC required safety signage, and components for a complete and operable system. Above Ground Storage Tank (AST) sizes shall be:

1. #2 Diesel fuel: 8,000 gallon

1.03 REFERENCE STANDARDS

A. All materials, installation and workmanship shall comply with the *applicable* requirements and standards addressed within the following references:

1. NFPA 30 – Flammable and Combustible Liquids Code.

2. NFPA 31 – Installation of Oil Burning Equipment.

3. NFPA 37 – Installation and Use of Stationary Combustion Engines and Turbines.

4. NFPA 70 - National Electric Code.

5. NFPA 99 – Standard for Health Care Facilities.

6. NFPA 110 – Standard for Emergency and Standby Power Systems

7. UL 508A – The UL Safety Standard for Industrial Control Equipment.

8. IFC 2012 – Chapter 57 Flammable and Combustible Liquids.

9. IFC 2012 – Chapter 6 Building Services and Systems.

10. PEI / RP200 – Recommended Practices for Installation of ASTs.

11. PEI / RP100 – Recommended Practices for Installation of USTs.

12. ASTM A36 – Standard Specification for Carbon Structural Steel.

13. ASTM A53 – Specification for Pipe, Steel, Black/Hot Dipped, Zinc Coated, Welded, SS.

14. All applicable state and local requirements.

1.04 DEFINITIONS

A. AST: Aboveground storage tank

B. Exposed, Interior Installations: Exposed to view indoors. Examples included generator enclosure service corridor and vestibules.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

1.05 QUALITY ASSURANCE

A. Equipment, controls, tanks and all fuel oil specialty devices shall be provided by a single supplier to ensure a complete functional and coordinated system with single source responsibility.

B. Supplier shall provide guidance for equipment and device installation and shall complete all programming, commissioning and owner training. The supplier shall be a firm with 5 years of documented experience in the installation of integrated emergency fuel systems.

C. Installer: Company specializing in performing the work of this Section with minimum three (3) years documented experience. Bidding installation contractor shall hold license(s) as required by the Authority Having Jurisdiction.

1.06 SUBMITTALS

A. Shop Drawings:

1. The drawing(s) shall indicate system layout with the location and elevation of the fuel oil pumping systems and related equipment.

2. The drawings shall also indicate conduit requirements and routing for electrical power and control wiring.

3. The drawings shall include comprehensive documentation of the fuel delivery controls system including controls schematics, points lists, control panel details, monitoring sensor lists and all required work to interface with the building Distributed Process Controls System RIO P3A (DCPS)

B. Product Data:

1. Provide submittal data on all controls, pumps, associated valves, piping, tanks and other equipment including material of construction, dimensional data and ratings.

2. Provide manufacturer's products installation instructions and calibration charts.

C. Record Documents:

1. Record documents shall include as-built drawings indicating the location of fuel oil pumping system and system components.

2. Fuel oil system installation, start-up and commissioning check-lists and other applicable documentation shall be provided.

D. Operation and Maintenance Data:

1. Include manufacturers' installation, operation and maintenance (O&M) instructions, spare parts lists, and training information for distribution and review in electronic format; when approved, a minimum of one complete O&M binder shall be provided for use on-site.

E. Equipment Certification:

1. Equipment Certification: At the time of submitting shop drawings submit the equipment manufacturer's certification as detailed per Specification 01 78 24, attesting that the manufacturer has examined the Contract Drawings and specifications and that the equipment provided will meet the performance criteria and conform to specification requirements. Shop drawings will not be reviewed prior to the receipt by the Engineer of an acceptable equipment certification form. The equipment certification form must be signed by an officer of the company manufacturing the equipment, and witnessed by a notary public. All other documents required per Specification 01 78 24 shall be submitted as required during equipment installation and startup.

F. Manufacturer's Certificates

1. Manufacturer's Certificates: The Contractor shall furnish the Engineer with Manufacturer's Certificates as specified under Specification Section 01 78 24 – Manufacturer's Certificates certifying the equipment and all auxiliary supports and equipment have been installed in complete and satisfactory manner ready for operation.

G. Warranty Certificate

1. Warranty Certificate: Submit manufacturer's sample warranty certificate with product data submittal for Engineer's review. Warranty certificate shall reflect the warranty requirements and duration and as specified herein.

1.07 REGULATORY REQUIREMENTS

A. Submit and comply with all the requirements of the EPA, state and local authorities having jurisdiction. Include installation permit/fees for fuel storage tank and all accessories and appurtenances.

B. Comply with "National Electric Code" for equipment, wiring, and conduit installed under this section.

1.08 PRODUCT CERTIFICATION

A. Manufacturer shall provide documentation for tanks, with all of the standards and codes listed herein.

1. UL Standard 2085 – Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids.

1.09 FIELD SERVICES, STARTUP AND WARRANTY

A. Provide services of a manufacturer's agent as needed to allow for complete configuration, commissioning, optimization, and full operational testing of all provided fine screens and associated appurtenances. At a minimum, manufacturer's services shall be provided for the following service activities:

Type	Trips	Days Per Trip	Total Days
Installation Inspection	1	1	2
Controls Inspection & Testing	1	1	2

Equipment Start-Up	1	2	2
Operator Training	2	1	2
Follow-Up Visit (12 months after Start-Up)	1	1	1
TOTAL	6		9

B. Provide for the above services to be performed during separate visits to the project site. Notification of coordinating the site visits shall be provided to the Engineer in writing at the preceding Project Progress Meeting but in no case less than fourteen (14) days in advance of each site visit. The Engineer reserves the right to reschedule each of the site visits within a 7-day period.

C. Each site visit shall be confirmed in writing by a daily log signed by the Engineer and the manufacturer's representative. Failure of the manufacturer's representative to obtain a signature from the Engineer will result in the disqualification of the site visit made and will not be attributed to the completion of the total specified number of site visits.

D. After each installation, inspection, field testing, and start-up trip a written report covering the representative's findings shall be submitted. Report shall include inspection findings, field test results, installation approval, any deficiencies noted, and remedies for the deficiencies. Trip reports shall be submitted within three (3) days following the field service.

E. The manufacturer shall warrant all equipment manufactured by it to be free from defects in workmanship or material for a period of two (2) years from date of conditional acceptance by the City. If during said warranty period, any components prove to be defective in workmanship or material under normal use and service they will be replaced or repaired free of charge.

1.10 DELIVERY, STORAGE AND HANDLING

A. Lift and support fuel storage tanks only at designated lifting or supporting points, as shown on Shop Drawings. Do not move or lift tanks unless empty.

B. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

PART 2-PRODUCTS

2.01 GENERAL REQUIREMENTS

A. All current carrying equipment, devices and terminations associated with the equipment scope of supply shall be listed and labeled for 75° C. All motors associated with the equipment scope of supply shall be NEMA Design B, C or D.

2.02 INTEGRATED CRITICAL MISSION FUEL TRANSFER SYSTEM (CMFTS)

A. Controls shall be provided and be designed to continuously monitor and control the level of fuel in day tanks, provide leak detection and alarms for all tanks and piping, as well as control of pumps and valves for critical emergency power applications. CMFTS shall integrate the following into one system: Main storage tank monitoring; multiple generator day tank monitoring; duplex pump controls; return pump controls; automatic pump alternation sequencing; pump motor status monitoring; and piping and piping sump monitoring.

B. CMFTS Controllers shall include a NEMA 4 stainless steel 304 enclosure with the following components:

1. The enclosure will be capable of being wall mounted or floor mounted if required.

2. Microprocessor programmable logics control (PLC).

3. Microprocessor controlled, three built-in communication ports (two rs-232 ports and one rs-485 port).

4. Graphic interface Touch screen display (HMI) with 8.4" diagonal color TFT (thin film, transfer) LC display with 64k colors, 640 x 480 pixel resolution, 300 nits display brightness, 50,000 hour average backlight lifetime, user replaceable analog resistive (1024 x 1024) touch, screen allowing unlimited touch areas USB port b (program/download) and USB port a (USB device options), Ethernet 10/100 base-t port, (program/download & plc communication), remote internet access, serial PLC interface (rs232/422/485), compact flash card slot, built-in expansion assembly for compact flash devices (use with optional CF card interface module), 24 VDC powered, 110 VAC power adapter (optional), audio line out, stereo - requires amplifier and speaker(s), 10 mbyte project memory, data logging, 0 to 50°C (32 to 122°F) operating, temperature range, NEMA 4/4x, ip65 compliant., slim design saves panel space, UL, CUL & CE agency approvals, and 2-year warranty from date of purchase. The HMI will have the capabilities to send e-mail, access ftp server, act as a web server, remote internet access.

5. Surge protection.

6. Circuit breaker protection (fuses not allowed).

7. Power transformer.

8. 110dB buzzer and strobe.

9. "Hand-Off-Auto" switches.

10. Magnetic motor starters.

11. Motor circuit protectors.

12. Emergency Stop.

13. Keyed emergency manual override switch.

C. CMFTS controller shall bear the inspection labels of the Underwriters Laboratories (UL508A). The system shall comply with NFPA 70 and NFPA 30, 31, 37, 110 IFC 34 & 6 and labeled accordingly for its intended use.

CMFTS System shall consist of controls that house all the components necessary to monitor and control the complete fuel oil system for the emergency generators including and not limited to the main storage tanks, day tanks, the fuel oil return pumps and the fuel polishing system in relation to the entire project. The system will have one incoming power source, and is housed in one single enclosure. The system shall be a duplex lead pump control system. The system shall have three modes of operation as per the following:

1. Full Auto Mode – the system shall maintain the fuel level in all day tank(s) between 60% (pump start) - 80% (pump stop) full capacity of each day tank. The lag pump will automatically come on if the level in any day/belly tank falls below 50% or if the lead pump registers a low flow alarm.

2. Supervised Manual Mode – the pumps will not automatically start, all alarms and warning are still monitored. Each pump will have to be placed in the hand position to operate and the system will monitor the day/belly tank levels and shut off all pump if any day tank reaches 90% (high level alarm).

3. Emergency Manual Keyed Mode – the alarm will sound and the strobe will flash, the pumps will not automatically start. All alarms and warning are still monitored. When an H-O-A selector switch is placed in the hand position the corresponding device (pumps and valves) will active without being supervised. The operator assumes full responsibility of all levels. This mode is only used in case of a PLC failure.

D. Programmable System Parameters - the CMFTS system shall be capable of making parameter modifications without the use of a computer. The following parameters shall be password protected and must be able to be modified on the HMI touch screen:

1. System time and date (24 hour clock).

2. Periodic maintenance reminders (day/month).

3. Main tank high level alarm percent set points.

4. Main tank high level warning percent set points.

5. Main tank low level warning percent set points.

6. Main tank low level alarm percent set points.

7. Main tank level probes setup and calibration.

8. Main tank profile types selectable from (horizontal cylindrical, rectangular, or vertical cylindrical).

9. The system must be able to perform math functions to convert inches to gallons for all three tank profile types.

10. Add or subtract main or day tank leak sensors.

11. Add or subtract piping leak sensors.

12. Seven-day filtration circulation schedule (day, time, duration) one entry per tank.

13. Lead pump select.

E. The CMFTS system shall be capable of the following remote communications capable of interfacing with the Distributed Process Control System (DPCS):

1. Dry contacts shall be provided for the following status indications to the DPCS:

a. Main Fuel Tank #1 System Failure

b. Main Fuel Tank #1 Fuel Level Low

c. Main Fuel Tank # 1 System Redundancy Lost

d. Main Fuel Tank #2 System Failure

e. Main Fuel Tank #2 Fuel Level Low

f. Main Fuel Tank # 2 System Redundancy Lost

g. Fuel System Leak Detected

h. 8 spare, user configurable dry contacts shall be provided and terminated at both the CMFTS panel and the local DPCS Marshalling / I/O termination cabinet to allow for future use and configuration by the City.

2. The following shall be provided as 4-20mA outputs.

a. Main Fuel Tank #1 Fuel Level Indication

b. Main Fuel Tank #2 Fuel Level Indication

c. 4 spare, user configurable 4-20mA outputs shall be provided and terminated at both the CMFTS panel and the local DPCS Marshalling / I/O termination cabinet to allow for future use and configuration by the City.

3. ModBus/Ethernet/RS232/422/485 – Associated Cabling shall be provided and terminated at both the CMFTS panel and the local DPCS Marshalling / I/O termination cabinet to allow for future use and configuration by the City.

4. System Summary Alarms (4 dry)

5. Critical system alarm summary.

6. Non critical system warning summary.

7. Emergency Stop button depressed.

8. System not in full Auto Mode Alarm.

F. The CMFTS HMI touch screen(s) shall be capable of displaying the follow:

1. Main Tank:

a. Gallons.

b. Inches.

c. Percent.

d. Pump Flow Switch Status.

e. Leak Sensor Status.

f. H-O-A Selector Switch Position

2. Day Tanks:

a. 90% High Level Status.

b. High Level Alarm: Liquid-level device operates alarm and redundant fuel shutoff contacts at midpoint between overflow level and 100 percent of normal fuel level.

c. Low-Level Alarm: Liquid-level device operates alarm contacts at 25 percent of normal fuel level.

d. Very Low-Level Alarm: Very Low-Level Alarm Sensor: Liquid-level device operates alarm contacts at 10 percent of normal fuel level.

e. 85% Pump Stop Level Status.

f. Normal Level Status

g. 60% Pump Start Level Status.

h. 50% Low Level Status.

i. Pipe Flow Switch Status.

j. Leak Sensor Status.

k. H-O-A Selector Switch Position.

l. 95% Return Pump Start Status.

m. 70% Return Pump Stop Status.

n. H-O-A Selector Switch Position.

3. Supply Pumps:

a. Pump On Status.

b. Motor Starter Status.

c. Motor Overload (MCP) Status.

d. Hour Meter.

e. Pipe Flow Switch Status.

f. H-O-A Selector Switch Position.

4. Return Pumps:

a. Pump On Status.

b. Motor Starter Status.

c. Motor Overload (MCP) Status.

d. Hour Meter.

e. Pipe Flow Switch Status.

f. H-O-A Selector Switch Position.

G. CMFTS Controller shall be capable displaying the following *present and historical alarms* on the HMI touch screen display:

1. System Warnings (all).

2. System Alarms (all).

3. System Out of Service Alarm.

4. Not in Auto Mode Warning.

5. In Manual Mode Warning.

6. Emergency Stop Depressed Alarm.

7. Call for Fuel Alarm.

8. Emergency Manual Mode Selected Alarm.

9. Main Tank High Levels.

10. Main Tank High Warnings.

11. Main Tank Low Level Warnings.

12. Main Tank Low level Alarms.

13. Main Tank Leak Alarms.

14. Main Tank Low Flow Alarms.

15. Day Tank High Level Alarms (midpoint between overflow and 100% of normal fuel level).

16. Day Tank Low Level Alarms (25% of normal fuel level)

17. Day Tank Very-Low Level Alarm (10% of normal fuel level)

18. Day Tank Leak Alarms.

19. Day Tank Low Flow Alarms.

20. Day Tank Return Pump Activated Alarm.

21. Filter Low Flow Alarms.

22. Pump Trouble Alarm.

23. Pump Failure Alarm.

24. Pump Low Flow Alarm.

25. Pump Enclosure Leak Alarm.

26. Return Pump Activated Alarm.

27. Piping Sump Leak Alarms (all).

H. System hardware and software shall be fully tested and ready for field installation. Final configuration to be performed by an authorized factory representative.

2.03 MAIN TANK DOUBLE WALL ABOVEGROUND STORAGE TANK

A. Provide two (2) 8,000 gallon rectangular Aboveground Storage Tanks constructed and listed in accordance with Underwriters Laboratories, Inc. (UL) Standard 2085, Protected Aboveground Storage Tanks for Flammable and Combustible Liquids. Tank shall include 304SS primary tank, 304SS integral steel secondary containment and a minimum two-hour fire rating.

B. Tanks shall be labeled for Underwriters Laboratories UL 2085 Standard for Insulated Secondary Containment Aboveground Tank for Flammable Liquids. The tank design shall comply with UL 2085 "Protected" Tank standard and shall be tested for Ballistics, Impact, Hose Stream, and Pool Fire UL-2085 performance standards in accordance with UL Standard 752, Levels 5, 6 and 8. Each tank shall be delivered as a complete UL-listed assembly.

C. Tanks shall be equipped with stairs and service platforms with handrails, supplied by the manufacturer and other accessories to meet OSHA requirements.

D. The interstitial space between tanks must be able to be monitored for leaks.

E. Code Compliance: The tank system must comply with all provisions of: 1) UFC 79-7, Appendix A- II-F, for both Vehicle Impact Protection and Projectile Resistance; 2) NFPA 30 and 30A; 3) IFC Chapter 57; and 4) IFC Chapter 23.The tank system shall be tested, certified and approved for Vapor Recovery by the State of California Air Resource Board (CARB) under Executive Order VR- 302-B Standing Loss Control Recovery System for New Installations of Aboveground Storage Tanks effective 11/30/09.

F. Warranty: The tank system shall be warranted by the manufacturer against defects in material or workmanship for 30 years following the delivery of the tank. Warranties that limit such coverage for shorter periods and/or limit the primary tank warranty to failure solely due to non- corrosion related cracking, breakup or collapse will not be permitted. See warranty documents.

G. Quality Assurance: The tank system shall be manufactured and labeled in strict accordance with Convault® standards as applied by a licensee of Convault, Inc. The tank system shall be subject to the Convault Quality Assurance Program.

H. Tank Construction: The tank shall be of double wall construction and provide secondary containment of the primary storage tank contents by a steel outer wall. The tank shall be rectangular in shape and listed per UL Standard 142 and designed for possible future relocation. Welds shall be continuous on all sides and exterior seams, conforming to the American Welding Society Standard for continuous weld. The primary steel tank shall be pressure tested at 5 psig for a minimum of 24 hours. All openings shall be from the top only. The tank shall be supplied with emergency vents for the primary and secondary tanks.

I. Secondary Containment and Corrosion Protection: The interstitial monitoring area between the primary and secondary tanks shall be a true void, insuring reliability for testing and immediate migration of any liquid contents to the monitoring point. Designs incorporating insulation or other material in the secondary containment area will not be permitted. The secondary containment must be tested for tightness (at the manufacturing plant and in the field before commissioning and use as may

be required by local jurisdiction and code). A 6 Mil High-Density Polyethylene liner shall enclose the double wall tank and insulating material to protect against corrosion by isolating the tank and secondary containment from the concrete or other corrosive material. Tank designs that do not protect the secondary containment from corrosion will not be permitted. All exposed steel, with the exception of stainless steel, shall be anti-oxidant powder coated to inhibit corrosion and meet ASTM B117.Secondary containment comprised of an (unprotected) exposed outer steel jacket will not be permitted.

J. Concrete Encasement: A vaulted concrete enclosure shall encase and must protect both the primary and secondary containment steel tanks. The concrete encasement shall be 6" thick with a minimum design strength of 4000 psi. The concrete design shall include the following for long-term durability: air entrainment, water-reducing admixture, and steel reinforcement. Concrete placement shall be a visually verifiable monolithic (seamless) pour to ensure the absence of voids on all sides and beneath the steel tank. The double wall steel tank shall be pressurized to 5 psig during concrete encasement to allow for expansion and contraction of the tank. The vault enclosure shall have concrete support legs of unitized monolithic construction raising the concrete enclosure a minimum of 3" above the ground to meet visual inspection requirements. A mid-level seam or other cold joint construction which could compromise the liquid tightness (secondary containment) and fire protection capability of the vault is not permitted.

K. Thermal Protection: The tank system construction shall include thermal insulation by covering the double wall steel tank with a minimum of .25" thick (6.4mm) polystyrene panels to protect against extreme temperatures.

L. Ballistics and High Explosive (HE) Blast Resistance: The tank system shall carry a listing under UL Ballistics Standard 752, Levels 5,6, and 8 (see table below), signifying bullet-resisting protection against penetration, passage of fragments of projectiles, or fragmentation of the vault enclosure to the extent that any protected material, including the secondary containment and primary tank are not damaged.

UL 752		Ballistics Tests
Protection Level	Shots	Ammunition
Level 5	1	7.62mm Rifle Lead Core Full Metal Copper Jacket, Military Ball (.308 caliber)
Level 6	5	9.00mm Full Metal Copper Jacket with Lead Core
Level 8	5	7.62mm Rifle Lead Core Full Metal Copper Jacket, Military Ball (.308 caliber)

The tank system shall have been tested and passed the requirements to meet the following Ratings for Bullet Resistant Materials at a National Institute of Justice (NIJ) approved laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP):

Rating	Shots	Ammunition

UL 752 Level 9	1	CAL .30 AP, M2, 166 gr.
National Institute of Justice (NIJ) Level 4	1	CAL .30 AP, M2, 166
State Department (SD-STD-.02.01) Revision G	3	CAL .30 AP, M2, 166 gr.
ASTM F-1233	3	CAL .30 AP, M2, 166

Blast Effects Analysis (BEA)
The tank system design shall have been subjected to a Blast Effects Analysis (BEA) assessing resistance and performance under the following blast threat scenarios per the FEMA 426 - Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings: 1) a 50-pound man- portable improvised explosive device (MPIED) at the standoff distance of 5 ft. ; 2) a 500-pound vehicle-born improvised explosive device (VBIED) at the standoff distance of 20 ft.; and 3) a vapor cloud explosion (VCE) with a load of 10 psi. The BEA shall conclude that the tank system will resist the explosion loads and remain intact, without failure of the primary tank or movement of the tank exceeding 2".

Tank designs that do not protect the primary tank AND secondary containment by providing both Ballistics and Blast Effect resistance as specified in this Section 2.5 will not be permitted.

M. Fire Resistance: The tank system shall be designed and tested to provide 2 hour fire protection for the primary tank as per UL 2085 2-hour furnace fire test and 2 hour simulated pool fire test. The average maximum rise in temperature of the primary tank during the test shall not exceed 260° F and the maximum temperature of any single point on the primary tank shall not exceed 400° F. No steel members shall penetrate the walls or floor of the concrete encasement to assure isolation from pool fire heat.

N. Leak Monitoring: A thru-tank leak detection monitoring tube terminating between the primary tank and the secondary containment tank shall be provided to monitor any leaks from the primary tank.

O. Spill/Overfill Containment: The tank system shall include a UL listed 7 or 15 gallon spill/overfill container manufactured as an integral part of the primary tank, surrounding the fill pipe, and protected by 2 hour fire rating of the enclosure. The spill/overfill container shall include a stick port and normally closed drain valve to release spilled product into the main tank. Exterior steel shall be stainless steel or anti-oxidant powder coated to inhibit rust. Overfill containment systems that are designed to release spilled product into the interstitial area will not be accepted.

P. Overfill Protection: Overfill protection shall be provided by the following methods: a) direct reading level gauge visible from fill pipe access; b) valve rated for

pressurized delivery located within fill pipe to close automatically at 95% full level; and c) high level alarm.

Q. Exterior Finish: The tank system exterior shall be a low maintenance architectural coating or exposed aggregate concrete finish. Models with fiber clad or painted steel exterior tanks will not be accepted.

R. Signage: Tanks shall be marked on all sides as per state and local codes. Signs will be recessed in concrete exterior to insure against damage during off-loading, refilling or general functions.

2.04 SUBMERSIBLE FUEL OIL PUMP – SUPPLY

A. Submersible fuel oil supply pumps shall be provided per the drawing (single or duplex).

B. Configuration: 1/3 hp fixed speed, two-stage centrifugal type pump motor with integral, automatic, thermal overload protection requiring single-phase, 208-230 VAC, 60 Hz incoming power.

C. Compatibility: UL and ULC 79 listed for flammable and combustible fuel mixtures containing up to 10% ethanol, and 20% MTBE, 20% ETBE or 17% TAME with gasoline.

D. Pump shall be provided with an integral check valve, air eliminator, and pressure relief. An anti-siphon solenoid valve and ball/isolation valve at pump discharge shall be included.

Submersible fuel oil supply pumps shall be provided per the drawing (single or duplex).

E. Configuration: 1/3 hp fixed speed, two-stage centrifugal type pump motor with integral, automatic, thermal overload protection requiring single-phase, 208-230 VAC, 60 Hz incoming power.

F. Compatibility: UL and ULC 79 listed for flammable and combustible fuel mixtures containing up to 10% ethanol, and 20% MTBE, 20% ETBE or 17% TAME with gasoline.

G. Pump shall be provided with an integral check valve, air eliminator, and pressure relief.

H. An anti-siphon solenoid valve and ball/isolation valve at pump discharge shall be included.

2.05 POSITIVE DISPLACEMENT FUEL OIL PUMP – RETURN

A. Pump type shall be of heavy-duty internal gear type. One rotor of internally cut gear teeth will mesh with one externally cut gear. Fluid shall be carried between gear teeth and shall be displaced when the gear teeth mesh. The surfaces of the rotors and housing shall cooperate to provide continuous sealing. Internally cut rotor shall terminate at the end of the drive shaft. The drive shaft shall be supported by bearings at two (2) locations, where by both radial and axial support is provided.

B. Pump shall be High Speed Compact series. Pumps shall be of a Heavy Duty design, with thrust control and micrometer adjustments for accurate rotor positioning. Designed to operate at motor speeds, they shall be provided in a close-coupled version for minimum footprint.

C. See pump schedule in drawings for performance requirements.

2.06 DAY TANKS WITH RETURN PUMP SYSTEMS:

A. Day Tanks shall be a UL 142 listed and labeled, secondarily contained, double-walled rectangular steel tank. As an option, day tank shall be a UL 2085 listed and labeled fire-rated tank, as to allow the day tank primary emergency vent to relieve indoors (if applicable or as required by Code).

B. Construction: Day tank shall be constructed in accordance with NFPA 30 and NFPA 37. Electrical components shall comply with all applicable sections of UL-508A Industrial Control Panels. Day tank shall have an epoxy coated interior, inspection plate, removable cover and all necessary fittings for a complete installation.

C. Installation General: Day tanks shall be shipped to the Generator Manufacturer for inclusion into the package Emergency Generator Enclosure

D. Physical Size: The maximum dimensions of the day tank shall be 6'-0" L x 4'-0" D x 3'-0" H for the tank. The valving, etc. on top may extend up to 5'-4" above the floor. Conformance with the listed dimensions is critical to allow for inclusion into the Pre-manufactured generator enclosure.

E. Tank Fittings

1. Engine fuel supply

2. Engine fuel return

3. Vent size in accordance with NFPA 37 or local codes

4. UL emergency relief vent sized according to fuel supply to tank

5. Drain connection, sized accordingly

6. Fuel inlet to tank, sized accordingly

7. All fitting threaded connections shall be plumb to the surface in which they are installed; i.e. pipe shall be perpendicular to the surface when threaded into the connection

8. Communications protocol shall be Profibus.

9. Control Levels: The tank shall contain liquid-level devices separate from alarm devices for the proper function of the fill control.

10. Redundant High-Level Fuel Shutoff: Actuated by high-level alarm sensor in day tank to operate a separate solenoid device that close fuel supply to the day tank. Sensor shall signal solenoid valve

11. Control Levels: The tank shall contain liquid-level devices separate from alarm devices for the proper function of the fill control

12. Piping Connections: Factory-installed fuel supply and return lines from tank to engine; local fuel fill, vent line, overflow line, and tank drain line with shutoff valve. Connections shall be made at the Generator Enclosure Manufacturer's factory for assembly of a complete system.

13. Redundant High-Level Fuel Shutoff: Actuated by high-level alarm sensor in day tank to operate a separate solenoid device that closes fuel supply to day tank. Sensor shall signal solenoid valve, located in fuel suction line between main fuel storage tank and day tank, to close. Both actions shall remain in shutoff state until manually reset. Shutoff action shall initiate an alarm signal to control panel but shall not shut down engine-generator set.

14. Return Pump: Provide a pump to return the excess fuel flow from the engine to the main fuel tank to reduce heating of the day tank fuel.

F. Day tank ratings

1. Capacity: 400 gallons

2. Power requirements: 120V AC, single-phase, 60Hertz, 15A dedicated branch circuit

3. Day tank construction

   a. All welded steel atmospheric tank of rectangular, double-wall secondary containment, welded construction built in accordance with codes and standards noted above for indoor use with fuel oil.

   b. Pipe thread connections shall be provided for fuel oil supply from remote pump set, supply to prime mover, return from prime mover, overflow to main tank, vents, and drain with fire rated ball valve. A weatherproof, screened vent cap shall be provided as a loose item for field installation at the outdoor vent termination. A weighted type emergency vent cap shall be supplied installed on the primary tank and secondary containment emergency vent ports.

   c. The tank shall be equipped with a welded steel channel base suitable for bolt attachment to a concrete pad

   d. The tank shall have interior corrosion inhibitor to deter corrosion prior to installation and use

   e. The exterior of the day tank shall receive a heavy-duty industrial anti-corrosion coating and be finish painted

   f. All day tank system components shall be protected by a removable or hinged steel equipment cover.

   g. Day tank shall be factory leak tested at 3PSI.

   h. The tank shall be steel double-wall secondary containment construction bearing the UL 142 label. The containment shall be equipped with a leak detector that shall activate the "leak" alarm described below. A drain with fire rated ball valve is to be supplied. The containment shall be equipped with a separate e-vent as required by UL 142.

   i. Supply fire rated ball valves as follows:

      1) Day tank drain

      2) Secondary containment drain

G. Fuel delivery system: Provide installed upon the day tank, a duplex fuel oil pump and duplex pump controller with automatic alternator for supply of fuel from the main tank to the day tank. This is a suction-lift application: adequate pipe sizes must be used in the system and a foot valve must be installed in the main tank if main is below level of day tank. Manual priming of the system is required.

1. Duplex pumps: Flow rate per the drawings at 1725 rpm, when operating with fuel oil having a viscosity of 32SSU.

2. Direct drive, motor driven pumps coupled via flexible coupling.

3. Motors to be TEFC construction, HP as required for pump at 50 PSI NEMA type B, continuous duty at 40°C, 1725 RPM, 120V AC, 60 hertz, 1.15 service factor

4. Pumps to be directly driven, positive displacement, internal gear type with mechanical shaft seal and cast iron body, machined steel gears.

5. Fire rated shutoff ball valves on pump inlets

6. Pump check valve, spring-type, cast iron construction

7. Flowswitch each pump

8. Suction strainer, cast iron wye type fuel oil strainer on each pump suction

9. Provide a piston type, 0.1 gallon per stroke hand pump installed and piped and equipped with fire-rated shutoff valves.

10. (If source tank is above day tank) Inlet flow control solenoid valve each pump. Stainless steel construction, with fire-rated bypass valve.

11. (If source tank is above day tank) Supply an overflow return pump at 150% minimum capacity, of supply pump and of identical construction. Add overflow return pump controller to paragraph 1.5 below.

E. Day tank level controller. A UL Listed, integrated design, digital level controller shall be supplied which provides differential level control for activation of pumps, duplex pump alternator, tank level indication, system alarms and manual operating controls. Level controller shall be self-contained as a unit within a NEMA4 enclosure integral with the day tank assembly.

1. PLC based with 6-inch, color, touch-panel operator interface

2. Dual level sensor input:

   a. 4-20mA continuous sensor, analog-to-digital input

   b. Point sensing float switches: low, refill start, refill stop, high, checkpoint for automatic cross check of sensors.

3. Leak sensor

4. Spare I/O for options and design-build features

5. MODBUS and Ethernet network compatible

6. 4-20mA loop output for tank level

7. Operator touch-panel interface functions:

    a. HOA switch

    b. Test

    c. Reset

    d. Alarm silence

    e. Numeric display of tank level in gallons (liters)

    f. Graphic condition display of tank level and pump/status/alarm condition

    g. Message indicators for status and alarm, including:

        1) Normal operation

        2) Pump running (fill, return, single or multiple pumps)

        3) Tank filling

        4) Loss of flow

        5) Low

        6) Critical low

        7) High

        8) Critical high

        9) Leak

        10) Not in auto

        11) Controller failure with specific message

        12) Other messages as determined by design-build option configuration

h. Relay dry contact outputs for the following (5A, SPDT):

1) Low alarms

2) High alarms

3) Leak

4) Not in auto

5) Other alarms as determined by design-build option configuration

F. Day tank testing

1. The day tank shall be supplied with manufacturers test certificates as below Tank test: pressure test, leak proof test and structural integrity/appearance test.

2. Level controller: operational test of level sensors, level indicator, level control, alarms, backup devices.

3. Pump: vacuum test, flow test, pressure test, leak proof test, ampere/voltage test, load test, overload test.

G. Day tank manual

1. The day tank shall be supplied with an illustrated manufacturer's manual that includes the following:

a. Registration certificate

b. Glossary

c. Equipment list

d. Detailed description of operation

e. Pump specifications

f. Installation instructions

g. Troubleshooting instructions

h. Maintenance instructions

i Piping diagram

j. Electrical drawing

k. Exploded view parts drawing/parts list

l. Dimensional drawing

m. Warranty card

H. Supply a manufacturer's 2-year field service warranty which covers all parts and all labor for guarantee of parts and workmanship as specified herein.

I. The day tank system, shall be designed and manufactured by a single supplier and be a standard product in serial production. The manufacturer shall have at least 10 years experience in the design and manufacture of these products.

J. Manufacturers: Provide day tank as manufactured by one of the following:

1. Core Engineered Solutions (Basis of Design)

2. Simplex Reliant Series

3. Phillips Fuel Systems SR Series

4. Pryco Standard Series.

2.07 FUEL POLISHING SYSTEM

A. System shall be designed for diesel, kerosene and biodiesel fuels. The system shall be located and configured per the drawings on a skid, in an enclosure or in a transition box. The system efficiently removes water and solids to 2 microns, insuring clean, dry, contaminant-free fuel for emergency diesel generators and other fuel storage facilities.

B. The Fuel Polishing System is fully automated with remote monitoring capabilities.

C. The FPS Control shall be through the fuel management system control panel and shall meet the following requirements:

1. Automatic Unattended Pump and Filtration Operation.

2. Fully programmable 7 day event schedule.

3. Integrates with Distributed Process Control System (DPCS). Each fuel polishing system shall be provided with 4 (3 spare and 1 configured) user configurable dry contacts terminated at the main fuel management system

filter.

1. Acceptable Manufacturer's: Algae-X, DE Bug

H. Fuel Polishing System shall also include pre-filter; strainer; visual flow indicator, solenoid control valve with manual override and ball/isolation valves as required and as indicated in the drawing.

2.08 ABOVE GRADE PIPING

A. Steel Pipe: ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.

1. Wrought-Steel Welding Fittings: ASTM A 234/A 234M, for butt and socket welding.

2. Forged-Steel Flanges and Flanged Fittings: ASME B16.5, minimum Class 150, including bolts, nuts, and gaskets of the following material group, end connections, and facings:

a. Material Group: 1.1.

b. End Connections: Threaded or butt welding to match pipe.

c. Lapped Face: Not permitted underground.

d. Gasket Materials: Asbestos free, ASME B16.20 metallic, or ASME B16.21 nonmetallic, gaskets compatible with fuel oil.

e. Bolts and Nuts: ASME B18.2.1, cadmium-plated steel.

2.09 BELOW GRADE STAINLESS STEEL PIPE AND MONITORING SYSTEM

A. Stainless steel product piping and fitting systems with integrated Pipe Monitoring System shall be provided where required by the Project Drawings. The Project Drawings show the type, number, size and location of stainless steel product piping systems for each piping branch.

B. Each piping system shall be constructed of stainless steel and shall be suitable for use with the products to be stored in the tank system. The piping system shall be UL-listed and approved for use with petroleum products. In addition, the containment piping systems shall be suitable for use with 100% methanol, 100% ethanol and 100% biodiesel.

C. Each stainless steel piping and fitting joint shall be mechanically bonded. The pipe shall have a minimum pressure rating of 140 psig with a 35,000 lb. burst at up to

150 degrees and contain no epoxy liners.

D. Each secondary containment piping system shall be designed and constructed to retain any leakage and to channel such leakage to a location equipped with an automatically monitored leak detection system. The secondary containment piping system shall provide 100 percent containment of the underground primary piping.

E. The contractor will supply a recent (3 years) certification of training from the pipe manufacture with their submittal.

F. The Fuel System Controls (See Section 2.0) must have the capability of testing the integrity of the double wall piping for tightness and leaks.

G. The piping system will have an integrated vacuum/pressure pump and associated control devices. The integrated vacuum / pressure pump must be mounted in an enclosure and pre- wired to the Fuel System Controls.

PART 3 -EXECUTION

3.01 EXAMINATION

A. Do not begin CMFTS installation until substrates and adjacent construction have been properly constructed. Verify concrete tank slab, electrical service stub-ups, ESO location, bollard/barrier installation, clearances, setbacks, and other site related work that have impact to fueling system.

B. If unsatisfactory conditions are encountered, notify Architect in writing. Do not proceed until unsatisfactory conditions have been corrected.

C. Notify Manufacturer of any detail or design deviations as may be determined by site conditions.

3.02 EARTHWORK

A. Comply with requirements in Division 02 for excavating, trenching and backfilling

3.03 SYSTEM INSTALLATION

A. Provide a complete, functional diesel fueling including double wall above ground storage tanks, day tanks, foundations, protection bollards, leak detection and monitoring system, interconnecting piping, circulation pumps and fuel filtration and polishing. Design and installation shall comply with all local, state and federal codes. System configuration, valves, pumps and piping shall comply with manufacturer's recommendations.

3.04 FUEL TANK INSTALLATION

A. The tank system shall be installed in strict accordance with the manufacturer's recommendations, industry standards, and applicable fire and environmental codes. All state and local permits shall be obtained prior to installation. The tank system shall be handled, lifted, stored and installed in accordance with the manufacturer's instructions on a reinforced concrete base slab designed to support the fully loaded tank. Protective bollards shall be installed where required by state and local codes. Tanks shall be marked on all sides with warning signs and product identification as required by applicable codes. Grounding conductors shall be connected to the two (2) bolts on the tank system for lightning protection in accordance with NFPA 780 and all electrical work shall be in accordance with applicable codes.

B. Install CMFTS systems in strict accordance with the manufacturer's recommendations, and applicable fire and environmental codes. State and local permits shall be obtained prior to installation.

C. Tanks shall be grounded in accordance with electrical code.

D. Tanks shall be clearly marked on all sides with warning signs "COMBUSTIBLE" or "NO SMOKING", tank volume, product identification, and other signs as required by local jurisdictions and applicable code.

3.05 DAY TANK INSTALLATION

A. Day tanks and all associated installation and connection accessories shall be shipped to the Generator Enclosure Manufacturer's factory per specification section 263213 for inclusion within the generator enclosure.

B. Installation and final connections will be by the generator manufacturer

C. Documentation for all testing and certifications shall accompany the tank.

3.06 LEAK-DETECTION AND MONITORING SYSTEM INSTALLATION

A. Install leak-detection monitoring system

B. Double Wall, Diesel Fuel Tanks: Provide factory-installed integral probes within interstitial space.

C. Install liquid-level gauge system

3.07 CONNECTIONS

A. Install piping adjacent to equipment to allow service and maintenance.

B. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment having threaded pipe connection.

C. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.

D. Connect piping to equipment with ball valve and union. Install union between valve and equipment.

3.08 ELECTRICAL SYSTEMS

A. All wiring shall be designed and installed to meet the requirements of the NEC and NFPA 70. All necessary branch circuit conduit and wiring shall be installed, providing for a stub-up at designated location to which the turn-key CMFTS fueling system can be tied.

B. All electrical devices used with or located within 20' of the CMFTS system shall conform to NFPA.

3.09 FIELD QUALITY CONTROL

A. Engage a factory-authorized service representative to inspect and adjust components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Test fueling distribution in accordance with NFPA 30 and other applicable codes. Properly dispose of any fuel generated in adherence to environmental regulations.

C. Tanks: Minimum hydrostatic or compressed-air test pressures for diesel fuel storage tanks that have not been factory tested and do not bear the ASME code stamp or a listing mark acceptable to authorities having jurisdiction:

1. The primary tank shall be pressure tested to UL 142 Standard (minimum 3 to maximum 5 psi) at the factory, and shall be field-tested by the contractor to a maximum 3-psi, according to the company's recommended testing procedure.

2. The secondary tank shall be tested liquid tight at the factory (minimum 3 to maximum 5 psi), and shall also be field-tested by the contractor to a maximum 3-psi according to the company's field testing procedure.

3. Where vertical height of fill and vent pipes is such that the static head

imposed on the bottom of the tank is greater than 10 psig, hydrostatically test the tank and fill and vent pipes to a pressure equal to the static head thus imposed.

4. Maintain the test pressure for one hour.

D. Piping: Minimum hydrostatic or pneumatic test-pressures measured at highest point in system:

1. Distribution Piping: Minimum 5 psig for minimum 30 minutes.

2. Suction Piping: Minimum 20-in. Hg for minimum 30 minutes.

3. Isolate storage tanks if test pressure in piping will cause pressure in storage tanks to exceed 10 psig.

4. Inspect and test diesel fuel and gasoline piping according to NFPA 31, "Tests of Piping" Paragraph; and according to requirements of authorities having jurisdiction.

E. Test liquid-level gauge for accuracy by manually measuring fuel levels at not less than four different depths while filling tank and checking against gauge indication.

F. Test leak-detection and monitoring system for accuracy by manually operating sensors and checking against alarm panel indication.

G. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

H. Bleed air from fuel piping using manual air vents.

I. Provide final flush of the piping system to eliminate all initial particulate matter in the distribution piping. Then after flushing, fill the distribution piping system and allow a calcification period of a few days. Upon settlement, then flush the system again to ensure that the fluid piping system is completely ready for a quality maintenance use program.

J. Submit field installation inspection report to system supplier's representative.

K. The final CMFTS system installation shall be inspected by the manufacturer or its certified contractor.

3.10 SYSTEM ACTIVATION

A. Prior to activating the CMFTS system, perform the following procedure:

1. Flush system piping with grade of fuel to be used by Owner to remove any debris and foreign matter in piping prior to filling tank for the first time.

2. Service all system filters and screens and dispose of fuel in accordance with EPA and NFPA regulations after flushing.

3. Open valves to correct position for system operation.

4. The Installation Contractor shall be responsible for the review of, and compliance with local requirements for system inspection, reporting and registration, as well as administrative paperwork requirements.

3.11 ADJUSTING AND CLEANING

A. Touch-up any abraded areas with the application of same coating used by the manufacturer. Manufacturer to include sufficient quantity of touch-up paint for this purpose.

B. Repair or replace damaged components.

3.12 LABELING AND IDENTIFYING

A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on or near each service regulator, service meter, and earthquake valve.

1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

2. Provide tank and pipe labeling in accordance with NFPA, IBC, IMC, IFC, and local governing authorities.

3.13 FIELD PAINTING OF ABOVE GROUND PIPING

A. Paint exposed, exterior metal piping, valves, and piping specialties, except components with factory-applied paint or protective coating.

1. Alkyd System: MPI EXT 5.1D.

a. Prime Coat: Alkyd anticorrosive metal primer.

b. Intermediate Coat: Exterior alkyd enamel matching topcoat.