Underground Fuel Oil Tank Replacement
at
Thurmont Middle School
408 East Main Street
Thurmont, MD 21788
Frederick County Public Schools
BID# 14C6
October 7, 2013

RHL ENGINEERING
COMPANY, INC.
3 West Second Street
Frederick, Md. 21701
OFFICE: (301) 695-9424
FAX: (301) 293-6338
E-mail:rhlengr@rhlengr.com

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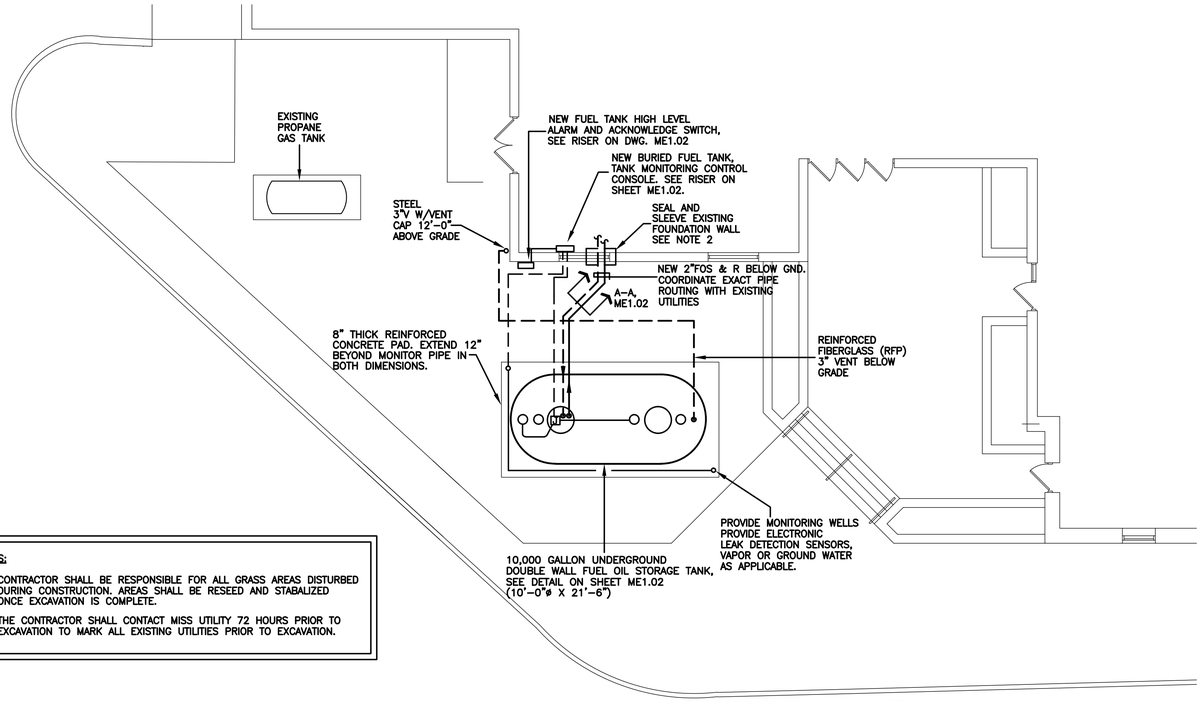
COVER SHEET



NOTES:

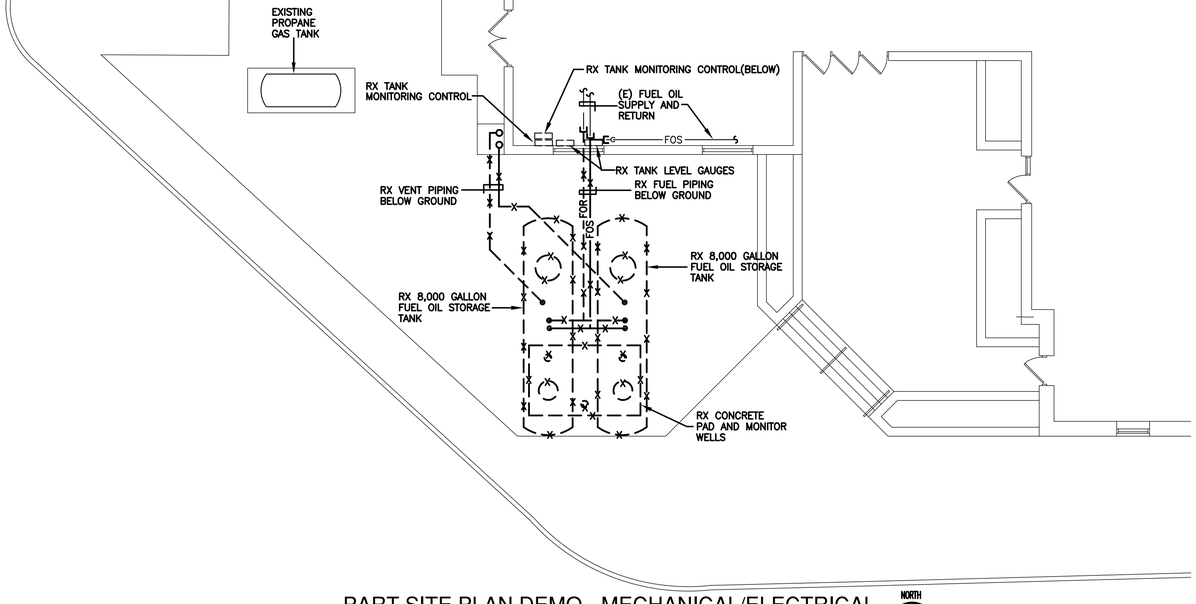
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL GRASS AREAS DISTURBED DURING CONSTRUCTION. AREAS SHALL BE RESEED AND STABALIZED ONCE EXCAVATION IS COMPLETE.
2. THE CONTRACTOR SHALL CONTACT MISS UTILITY 72 HOURS PRIOR TO EXCAVATION TO MARK ALL EXISTING UTILITIES PRIOR TO EXCAVATION.

PART SITE PLAN NEW - MECHANICAL/ELECTRICAL

SCALE: 1/8"=1'-0"

NOTE 1: CONTRACTOR RESPONSIBLE FOR FIRST 10,000 GALLON OIL FILL OF NEW TANK.

NOTE 2: PIPE SEAL SHALL BE "LINK-SEAL" MODEL "O" (NITRILE) INSTALLED WITH A CENTURY-LINE SLEEVE.



PART SITE PLAN DEMO - MECHANICAL/ELECTRICAL

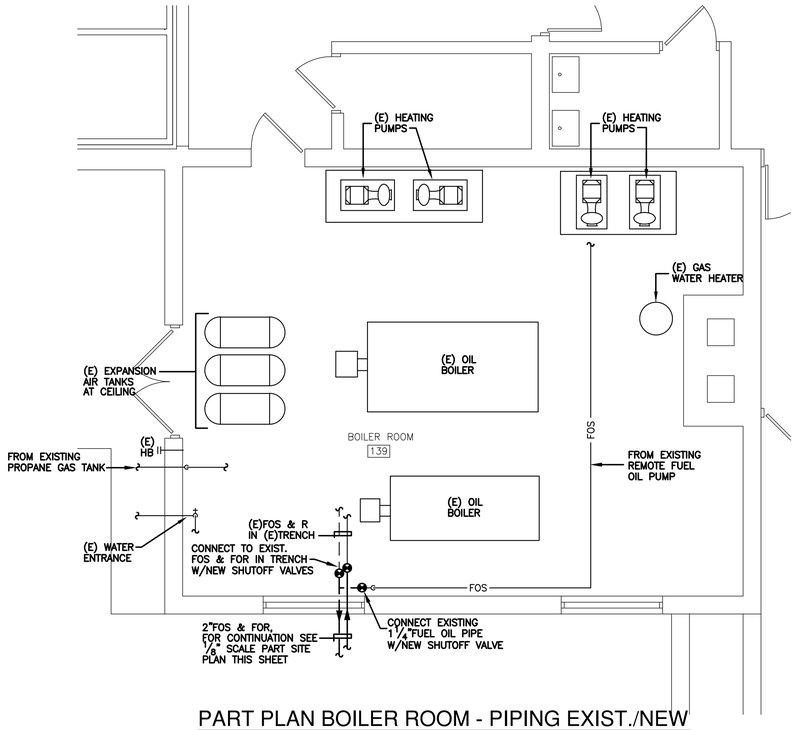
SCALE: 1/8"=1'-0"

NOTE 1: ALL UNDERGROUND VENT, FUEL PIPING, FUEL TANKS, ETC. SHOWN TO BE REMOVED ARE APPROXIMATE LOCATIONS. FIELD VERIFY EXACT LOCATIONS.

NOTE 2: COORDINATE THE REMOVAL OF (2) FUEL OIL TANKS AND ALL ASSOCIATED PIPING WITH MDE. REMOVAL MUST BE DONE PER MDE GUIDELINES.

NOTE 3: CONTRACTOR RESPONSIBLE FOR REMOVAL OF OLD OIL. FCPS HAS RIGHT OF FIRST REFUSAL.

NOTE 4: CONTRACTOR TO REMOVE ALL EXISTING CONDUIT AND WIRING FROM REMOVED TANK LEVEL CONTROLS BACK TO PANEL.

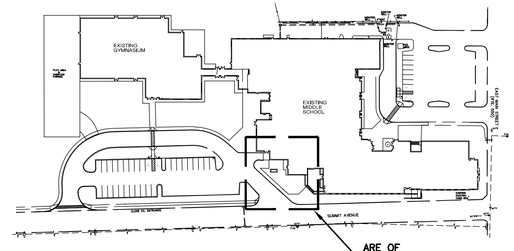


PART PLAN BOILER ROOM - PIPING EXIST./NEW

SCALE: 1/4"=1'-0"

MECHANICAL LEGEND AND ABBREVIATIONS

- - - -	VENT PIPE	— FOS —	FUEL OIL SUPPLY PIPING
V	VENT	— FOR —	FUEL OIL RETURN PIPING
	VALVE IN RISER		PIPE UP
CX,	CONNECT TO EXISTING		PIPE DOWN
(E)	EXISTING TO REMAIN		CAP ON END OF PIPE
RX	REMOVE EXISTING		
	SHUTOFF VALVE		



KEY PLAN

NO SCALE

RHL ENGINEERING COMPANY, INC.
3 West Second Street
Frederick, Md. 21701
OFFICE: (301) 695-9424
FAX: (301) 293-6338
E-mail:rhlengr@rhlengr.com

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No:13954 Expiration Date: 05/18/2014

14C6

UNDERGROUND FUEL OIL TANK REPLACEMENT FOR:

THURMONT MIDDLE SCHOOL

408 East Main Street
Thurmont, MD 21788

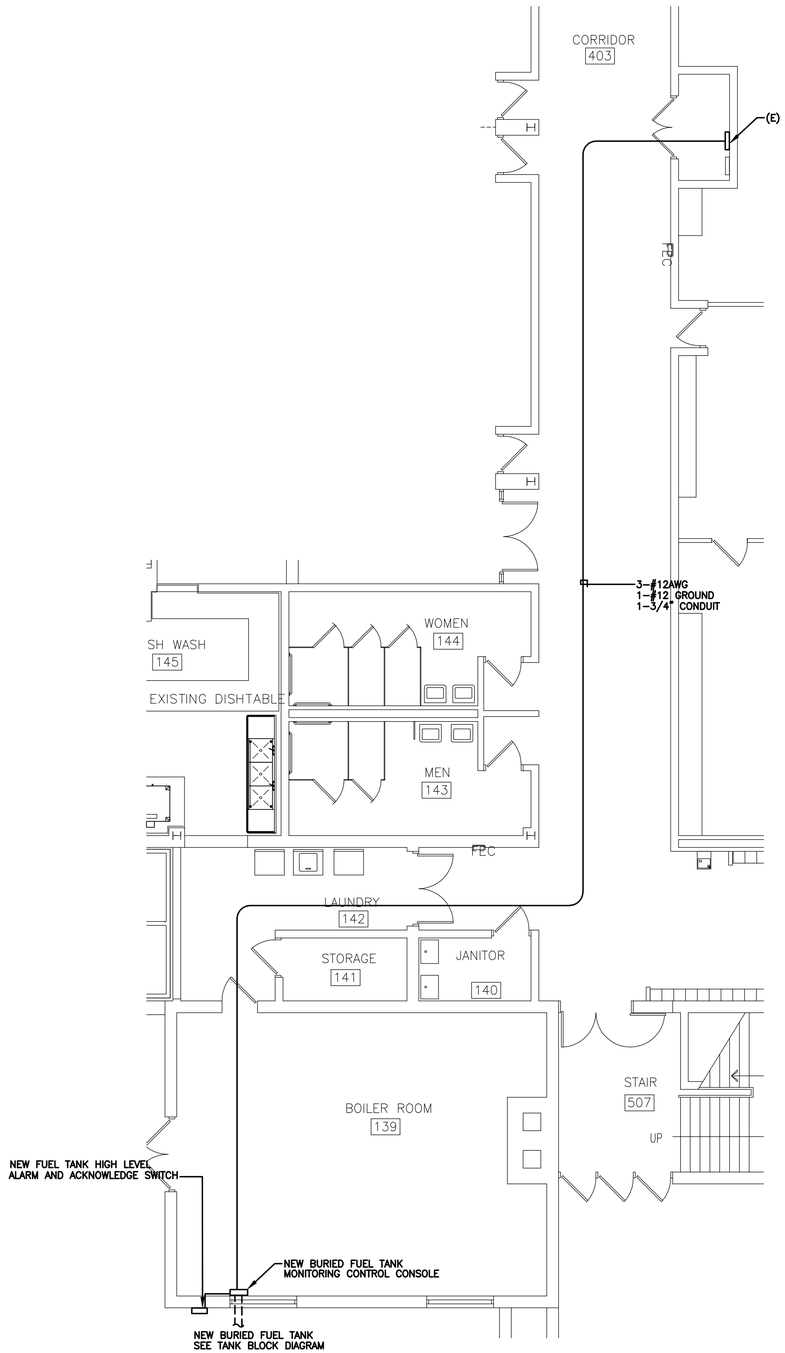
MECHANICAL/SITE FLOOR PLAN DEMO/NEW - PIPING/ELECTRICAL

JOB NUMBER: 13120
DATE: 10/07/13

SHEET:

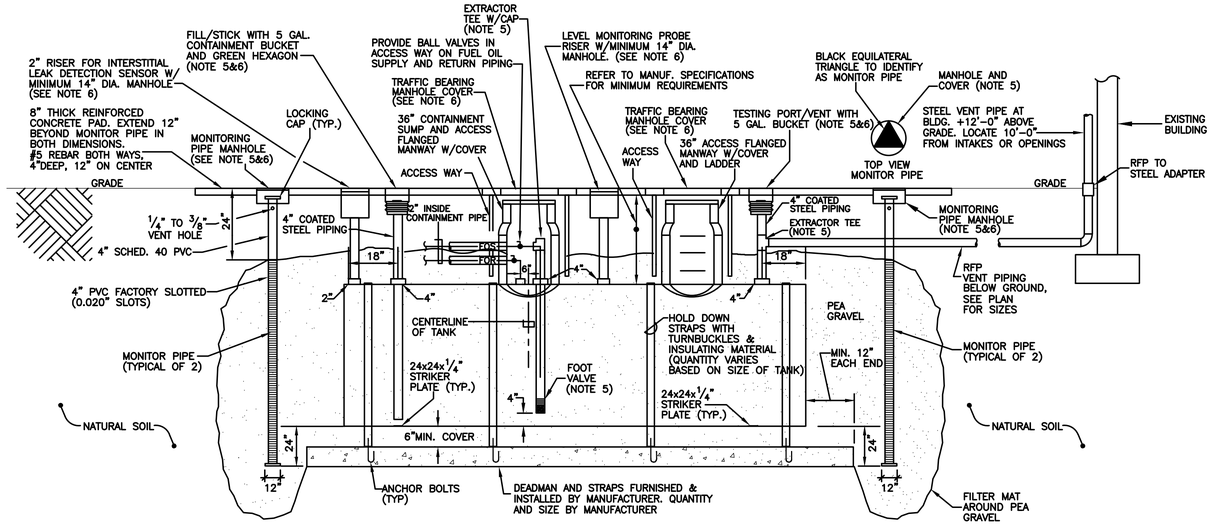
ME1.01

1 OF 3



PART PLAN ELECTRICAL- POWER

3/16"=1'-0"

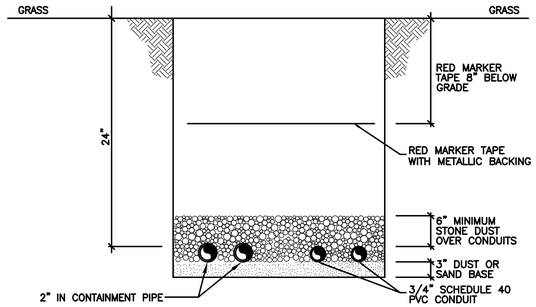


10,000 GALLON, DOUBLE-WALL, UNDERGROUND STORAGE TANK - INSTALLATION DETAIL

NO SCALE

NOTE:

1. PROVIDE A MINIMUM 12" COVER OF PEA GRAVEL AROUND THE ENTIRE TANK.
2. INSTALL TANK WITHIN 2" OF LEVEL (MAXIMUM) IN BOTH DIRECTIONS, OVER THE ENTIRE LENGTH OF THE TANK. VENT END TO BE ON "HIGH" END.
3. TANK DIMENSIONS: 10,000 GALLON: 10'-0" DIA x 21'-6" LONG.
4. PROVIDE CALIBRATED GAUGE MONITORING FILL STICK (QUANTITY OF 2).
5. a. EXTRACTOR TEE (OPW) OR EQUAL.
   b. SPILL CONTAINMENT (OPW) OR EQUAL.
   c. TOP-FILL TOP-SEAL ADAPTERS AND CAPS (OPW) OR EQUAL.
   d. SPILL/OVEFILL PROTECTION VALVE (OPW) OR EQUAL.
   e. VENT CAP ASSEMBLY (MORRISON BROS. CO.) OR EQUAL.
   f. FOOT VALVE (MORRISON BROS. CO.) OR EQUAL.
   g. MONITORING WELL AND MANHOLE (EMCO) OR EQUAL.
6. MOUND UP HIGHER THAN GRADE PER MDE STANDARDS.

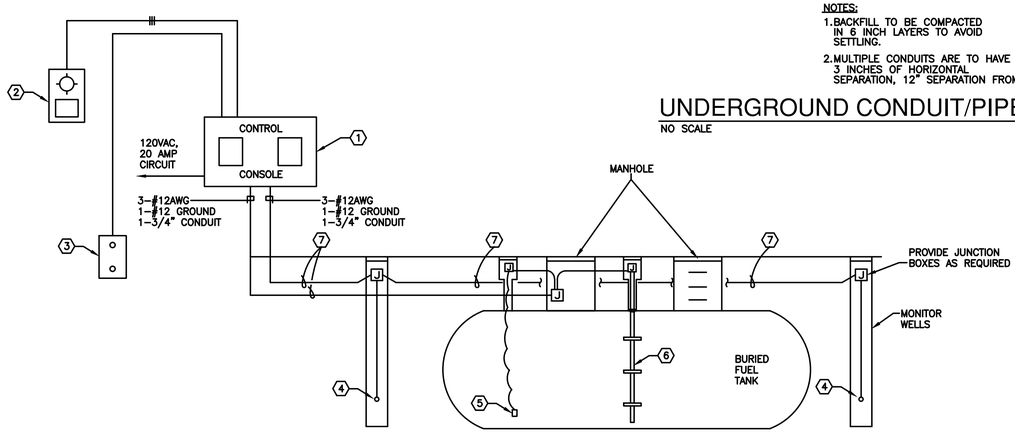


NOTES:

1. BACKFILL TO BE COMPACTED IN 6 INCH LAYERS TO AVOID SETTLING.
2. MULTIPLE CONDUITS ARE TO HAVE 3 INCHES OF HORIZONTAL SEPARATION, 12" SEPARATION FROM PIPING.

UNDERGROUND CONDUIT/PIPE DETAIL "A-A"

NO SCALE (GRASS)



TANK MONITORING SYSTEM BLOCK DIAGRAM

N.T.S.

NOTES-GENERAL-PROVIDE ALL ACCESSORIES FOR A COMPLETE SYSTEM

(1) FUEL TANK LEVEL GAUGING AND LEAK DETECTION CONTROL CONSOLE. PROVIDE VEEDER-ROOT (#TLS-350) SERIES PANEL AND ALL REQUIRED PLUG IN MODULES. CONNECT TO NEW 20AMP BREAKER IN PANEL "1AIL" CIRCUIT 1.

(2) OUTDOOR OVERFILL ALARM LIGHT WITH AUDIBLE TONE. 120 VOLT, FEED POWER FROM CONTROL CONSOLE, +11' AFF.

(3) OUTDOOR ALARM ACKNOWLEDGE PUSHBUTTON, MOUNTED AT +48" AFF.

(4) MONITORING LEAK DETECTION SENSOR, PROVIDE VAPOR TYPE FOR DRY APPLICATIONS OR GROUND WATER TYPE FOR GROUND WATER APPLICATIONS.

(5) INTERSTITUAL LEAK DETECTION SENSOR.

(6) TANK LEVEL PROBE WITH FLOAT SWITCHES FOR HIGH LEVEL ALARM, GAUGING & LEAK DETECTION.

(7) PROVIDE CABLES IN CONDUIT PER FACTORY RECOMMENDATIONS.

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Frederick, Md. 21701
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FAX: (301) 293-6338
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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No: 13954 Expiration Date: 05/18/2014

14C6

UNDERGROUND FUEL OIL TANK REPLACEMENT FOR:

THURMONT MIDDLE SCHOOL
408 East Main Street
Thurmont, MD 21788

ELECTRICAL/PIPING - PART PLAN/SECTION AND DETAILS

JOB NUMBER: 13120
DATE: 10/07/13

SHEET:

ME1.02

2 OF 3

SECTION 15010 – MECHANICAL – GENERAL PROVISIONS

The General Conditions, Supplementary General Conditions, and Division 1 – General Requirements, are a part of this Section.

WORK INCLUDED

A. Furnish all labor, materials, tools, equipment and service necessary and incidental to install all mechanical work and related systems shown on the drawings, indicated in this Specification or necessary to provide a finished installation. The finished installation shall be in perfect working condition and be ready for continuous and satisfactory operation.

B. Work Included: The installation of the mechanical systems shall include but not be limited to the following:

1. Provide installation of a 10,000 gallon #2 fuel oil tank with all appurtenances per COMAR 26.10.02.
2. Provide underground fuel oil piping and vent.
3. Provide vapor monitoring wells.
4. Provide an electronic leak detection system.
5. Provide excavation, concrete, backfill and paving as shown.
6. Provide connections to existing piping systems.
7. Provide demolition as shown.

CODES, STANDARDS, AND MATERIALS

A. All equipment furnished under this Specification shall be free from defects in workmanship and materials. All equipment, systems, and work shall meet the requirements published by the following organizations as minimum standards:

1. National Fire Protection Association.
2. Underwriter's Laboratories, Inc.
3. American National Standards Institute.
4. Local Plumbing Regulations.
5. Maryland COMAR Regulations.

B. All work shall also meet the minimum requirements of codes and standards of local and State agencies having jurisdiction.

REVIEW OF MATERIALS

A. All materials and equipment furnished and installed under this Division of the Contract shall be new, of standard first grade quality and correctly designed for their specific purpose.

B. Where a Subcontractor proposes to use an item of equipment other than the specified or detailed on the drawings that is approved by the Engineer and that requires redesign of the foundations, piping, wiring, or any other part of the mechanical or electrical layout, then such redesign, new drawings, and detailing required for it shall be prepared by the Contractor without extra compensation.

MINOR DEVIATIONS

A. The locations shown on the drawings are approximate, and are to serve as a guide for installation. The shifting of locations to meet conditions (before installation) will be expected, and this shall be done at no increased cost.

B. The Contractor shall coordinate the mechanical work and equipment with the work to be performed by other Subcontractors within.

C. It shall be the responsibility of this Contractor to inform the Electrical Contractor as regards to the exact service requirements for each piece of mechanical equipment.

WARRANTY

A. All materials, equipment and workmanship shall be warranted to be free from defects and shall be maintained by the Contractor for a period ending two (2) year's from the date of formal completion and acceptance of the project.

LICENSES, PERMITS, AND CERTIFICATES

A. This Contractor shall procure and pay for all licenses, permits and certificates necessary to construct and place in operation all work done under this section.

SECTION 15100 – BASIC PRODUCTS AND METHODS

GENERAL

SCOPE

A. Application: The products and methods specified in this Section are to be used wherever applicable in other Sections of this Division.

PRODUCTS

MATERIALS

A. Pipe:

1. RFP pipe ASTM D2992.
2. PVC Pipe: Schedule 40 PVC.
3. Steel Pipe: ASTM A–53 Schedule 40.

B. Valves:

1. Ball valves shall be NIBCO T–180–125# Solder Type.

EXECUTION

INSTALLATION

A. Piping – General:

1. For purposes of clearness and legibility, piping drawings are essentially diagrammatic and indicate only sizes, connection points, and routes. It is not intended or implied that all offsets, rises, and drops are shown.

B. Pipe Joints and Connection:

1. PVC Pipe: Cut pipe square and clean surfaces to be joined. Apply cement to both surfaces and turn pipe slightly while inserting.
2. Fiberglass pipe: Cup pipe square and clean surfaces to be joined, via adhesive apply per manufacturers recommendations.
3. Steel Pipe: Apply pipe dope to the male thread only.

C. Valves:

1. Install valves at all service connections and equipment.

D. Cutting and Patching:

1. This contractor has cutting and patching responsibility.

E. Tests:

1. Leave concealed or insulated work uncovered until required tests have been completed.

SECTION 15420 – FUEL OIL STORAGE SYSTEM

GENERAL

A. Provide installation of a 10,000 gallon double wall underground storage tank with all accessories as shown per COMAR regulations.

B. Provide underground fuel oil containment piping and vent.

C. Provide electronic leak detection systems.

D. Provide vapor monitoring wells.

E. Provide excavation, concrete, backfill and paving as shown.

BASIC PRODUCTS AND METHODS

A. The basic products as specified in Section 15100 shall be used as follows:

1. Fuel Oil Piping (Containment) .
   a. Pipe: Fiberglass RFP in fiberglass containment pipe. U.L. Listed.
   b. Fittings: Fiberglass.
   c. Joints: Solvent Weld.
2. Underground Vent.
   a. Pipe: Fiberglass RFP. U.L. Listed
   b. Fittings: Fiberglass.
   c. Joints: Solvent Weld.
3. Above Ground Vent (Painted).
   a. Pipe: Black Iron Schedule 40.
   b. Fitting: Wrought Iron.
   c. Joints: Screwed.

B. 10,000 Gallon Double Wall Underground Fiberglass Tank:

1. Type.
   a. Provide a 10,000 gallon nominal capacity double wall fiberglass storage tank complete with hold–down straps and turnbuckles. The tank shall be constructed in accordance with NFPA–30 and 31. All connections shall be made through the top of the tank. Provide (2) calibrated gauge sticks.
   b. The double wall tank shall be constructed of fiberglass reinforced polyester designed specifically for underground storage. Resins used in tank construction shall be capable of withstanding the effects of the coil on the exterior and oil on the interior.
   c. The tank shall meet the following design criteria:
      1. External hydrostatic pressure – Buried in the ground with 4 feet of overburden above the tank and backfill around and above the tank flooded, there shall be a safety factor of 2:1 against general buckling.
      2. Surface loads – When installed in accordance with the manufacturer's instructions with a foot cover over the tank shell, without concrete or asphalt paving, the tank shall withstand H–20 axle loads.
      3. Internal load – The tank shall withstand 5 Psig air pressure test with a 5:1 safety factor.
      4. Operating environment – Tank shall be suitable to withstand the corrosivity of the environment up to a specific gravity of 1:1 with a maximum operating temperature of 150 degrees F.
      5. The corrosion control system shall be in strict accordance with STI–P3 specifications as applied by a licensee of the Steel Tank Institute and shall have the STI–P3 limited 30 year warranty against failure due to exterior corrosion and internal corrosion when used with petroleum products or alcohols. Tank shall bear UL and STI–P3 labels.
      6. The tank excavation shall be free from material that may cause damage to the tank coating. Care shall be taken during installation that foreign matter is not introduced into excavation or backfill. The bottom of the excavation shall be covered with clean sand or gravel to depth shown on drawings suitably graded and leveled.
      7. An air test of the tank above ground is required. Pressure should not exceed 5 psi while a bubble solution is applied to welded seams. Refer to instructions on side of tank or per PEI RP100–94.
      8. Before placing the tank in the excavation, all dirt clods and similar foreign matter shall be cleaned from the tank, and areas of coating damage shall be repaired with a compatible coating supplied by the manufacturer.
      9. Equipment to lift the tank shall be of adequate size to lift and lower the tank without dragging and dropping to ensure no damage to the tank or the coating. Tanks shall be carefully lifted and lowered by use of cables or chains of adequate length (not less than 45 including angle) attached to the lifting lugs provided. A spreader bar should be used where necessary. Under no circumstances use chains or slings around the tank shell.
      10. Backfill consisting of sand, #8 crushed stone (#8 crushed aggregate ASTM D–448) or tine gravel, shall be placed along bottom side of tank by shoveling and tamping to ensure the tank is fully and evenly supported around bottom quadrant. The backfill shall be deposited carefully around tank and to a depth over tank to avoid damage to coating.
      11. The plugs at unused tank openings shall be removed, a pipe compound shall be added and the plugs shall be reinstalled in the unused openings. The dielectric bushings or flange isolation devices in STI–P3 tanks shall not be removed from openings. The plugs in tank openings, which are to be used , should not be over–tightened as this may cause the bushing to unscrew with the plug. Care should be taken not to cross–thread or damage the non–metallic bushings when replacing plugs or installing required tank piping.
   d. The tank shall be cylindrical with hemispherical heads the cylinder shall be reinforced by means of ribs of the same material as the shell. No metal straps or banding will be allowed. The tank shall be fitted with steel couplings of the sizes indicated. In addition lifting lugs will be provided along with fiberglass reinforced plastic anchor straps. Each strap shall be capable of withstanding 25,000 pounds tensile load. UL label shall be permanently affixed to the tank.
2. Manufacturer:
   a. Tank to the Owens–Corning or approved equal by Xerxes or Lifetime Fiberglass Products or Containment Solutions.

C. Leak Detection and Inventory Control

1. Electronic probe monitoring/leak detection system shall continuously monitor and display the status of each monitoring well. System shall detect the presence of hydrocarbons. System shall recognize water and PPM levels of hydrocarbon. System shall be capable of determining and displaying for each probe the background contamination levels. System shall have programmable alarm set/target thresholds for each probe. The programmable alarm thresholds shall not lessen the sensitivity of the probe. System shall be Underwriters Laboratories, Inc. listed. Probes shall be intrinsically safe for use in Class 1, Group D hazardous locations. Control unit enclosures shall be painted 16 gauge custom steel with lock and conduit access knockouts. Control unit shall be microprocessor based and capable of receiving input and monitoring up to 4 probes. Control unit shall provide audible and visual alarms. Control unit shall interrogate each probe and report status of each probe individually. Control also shall be capable of reporting power failure and restore, storing prior alarms at each location, reporting automatic site status once every 24 hours, background contamination level and submerged probe indication.
2. Provide vapor monitoring probes where no ground water exists, vapor senors for monitoring wells shall have electrical conduit rough–in to alarm panel.
3. Control unit shall have an RS232 communications port. Control unit also shall be capable of remote programming by providing a menu generated through the RS232 port to external terminal. Control power shall be 110 VAV for low–voltage, UL listed power supply. Alarm signal for any sensor audible 1,200 Hz to 85 Db at .5 M. Indicators are 16 character, 2 line, LCD display indicating time, date, daylight savings, or standard time, all alarms, supervisory, etc. Probes for wells shall be furnished complete with intrinsically safe floats and probes, probe well cap, "Scotchlok" fittings, coil cord, flexible cable. Floating probes shall fit 2" and 4" well casings. Probes shall sense hydrocarbon vapors in the range of 16 to 4,000 PPM. Probes shall be able to desorb as well as absorb to sense the wide range of PPM levels in a typical application. The control unit shall monitor the high level alarm; monitoring well leak detectors; interstitial leak detection; In–tank leak detection and tank level/inventory.
4. Provide an interstitial leak detection alarm to be inserted between the two tank walls. The alarm probe shall be wired to the main control unit.
5. The leak detection and monitoring control console shall be Veeder–Root TLS–350.
6. Provide printer.

D. Overfill Protection.

1. Provide overfill protection to electrically and automatically warn of liquid overfills. A high tank level sensor shall be wired to the main control console.
2. A sensing device shall be installed in the tank and shall activate the pressure switch at a predetermined high liquid level, as directed.
3. The outdoor alarm unit shall be in a NEMA 4 X enclosure and shall have the Red – "Alarm" light and audible horn. A separate acknowledge switch, and silence switch shall be provided. Locate on exterior of building as directed by Architect.
4. Provide Veeder–Root NEMA 4x alarm with remote acknowledge switch and remote sensor, or approved equal.

E. Test.

1. Provide all temporary piping and connections to test the system as follows:
   a. Test and demonstrate tank gauging, leak detection and high level alarm monitoring system.
   b. Air test tank above ground before installation.

END OF SPECIFICATION

SECTION 16010 – ELECTRICAL – GENERAL PROVISIONS

The General Conditions, Supplementary General Conditions, and Division 1 – General Requirements, are a part of this section.

WORK INCLUDED

A. Furnish all labor, materials, tools, equipment and services, necessary and incidental to install all electrical work and related systems shown on the drawings, indicated in this specification or necessary to provide a finished installation. The finished installation shall be in perfect working condition and be ready for continuous and satisfactory operation.

B. The following definitions shall apply:

1. Where the word "provide" is used in connection with a system, equipment or item, it shall be construed to mean the furnishing and installing of the system, equipment or item.
2. Where the phrase "as directed" is used, it shall be construed to mean as directed by the Architect or his authorized representative.

C. Work Included: The installation of the electrical systems shall include but not be limited to the following:

1. New power wiring, control cables, conduits and junction boxes for the fuel oil storage tank leak detection and gauging system
2. Site Work: Including wiring and conduit, trenching and backfill.
3. All final equipment connections.
4. Demolition as shown and specified in the drawings.

LOCAL CONDITIONS

A. If, by reason of this work, there is damage to the building such as cutting holes for conduit, channeling, chasing, openings cut for equipment, etc., such damage shall be patched or repaired to present a smooth surface blending with the surrounding area.

B. Supports for electrical work shall be by means of securely attached fasteners adequately spaced and of type utilizing metal. Wood plugs, plastic or composition plug supports shall not be used.

PERMITS AND INSPECTIONS

A. Obtain and pay for all necessary drawings, permits, and certificates required by the various governing agencies having jurisdiction.

B. Furnish both local and Fire Underwriter's certificates of inspection and approval of the work.

CODES, STANDARDS AND MATERIALS

A. All equipment furnished under this Specification shall be free from defects in workmanship and materials. All equipment, systems, and work shall meet the requirements published by the following organizations as minimum standards.

1. National Fire Protection Association.
2. National Electric Code.
3. Underwriter's Laboratories, Inc.
4. National Electrical Manufacturer's Association.
5. American National Standards Institute.

SHOP DRAWINGS

A. Submit detailed, dimensioned shop drawings covering all items of equipment and brochures for the following:

1. Basic electrical materials.

MINOR DEVIATIONS

A. The general arrangement of conduit, wiring, and equipment shall be as shown on the contract drawings. Detailed drawings of proposed changes because of field conditions or other causes shall be submitted to the Architect for approval. Such changes shall be made without the additional cost to the owner. The Contractor shall carefully examine all contract drawings and shall be responsible for the proper fittings of materials and equipment in each location as indicated, without substantial alteration.

CUTTING AND PATCHING

A. Patch all cuts and damages which occur because of the work outlined. The patches shall be neatly done and shall match existing surfaces in every way including fire rating and painting of color similar to adjoining surfaces.

B. All openings around cables, sleeves, etc., shall be sealed.

SECTION 16100 – BASIC MATERIALS AND METHODS

IDENTIFICATION

A. Provide typed directories for panelboards.

B. Underground marker tape shall be red with metallic backing tracer. Provide manufacturer "Seton" or equal.

OUTLET BOXES

A. Provide an outlet box for each and every outlet, device, fixture, etc., called for on the drawings, specified and required by the NEC. Outlet boxes shall be of approved design, construction form and dimension suitable for the specific location, the kind of device, fixture, etc., to be used, the number of wires used, the arrangement of conduit connected.

WIRE AND CABLES

A. Unless otherwise indicated, all wire cable for feeder and branch circuits shall be coated, soft drawn copper, and shall have 600 volt insulation. Minimum size shall be No. 12 American Wire Gauge. Conductors shall be rated 75 degrees, minimum and suitable for use in wet or dry locations.

B. Conceal all electrical wiring in finished areas. Where wiring is exposed in unfinished areas, it shall be in conduit, 3/4" min.

C. Provide wiring in conduit as follows:

1. Indoors, above grade: EMT with compression fittings.
2. Below slab on grade: Schedule 40 PVC.
3. In concrete: Schedule 40 PVC.
4. Outdoors, exposed: IMC.
5. Outdoors, below grade: Schedule 40 PVC.

WIRE CONNECTIONS AND DEVICES

A. For wire No. 10 AWG and smaller, splices shall be made with wire caps.

SECTION 02160 – STRUCTURAL EXCAVATION SUPPORT

PART 1 – GENERAL:

1.1 SUMMARY
A. Work of this section includes sheeting and shoring and bracing.

1.2 RELATED SECTIONS
A. Section 02000: Clearing
B. Section 02100: Earthwork

1.3 SYSTEM DESCRIPTION DESIGN REQUIREMENTS
A. Shoring systems shall be designed to safely and adequately prevent collapse of adjacent materials and permit construction of Work to arrangement shown on Contract Documents.
B. Secure approvals, including those of local governmental agencies having jurisdiction.
C. Analyze site conditions. Make supplemental investigations as needed for proper design of shoring.

1.4 QUALITY ASSURANCE SUBMITTALS FOR DESIGN DATA
A. Prepare and submit design drawings and calculations showing analysis of work to be performed, including horizontal support for shoring.
B. Drawings shall include methods, equipment and work procedures.

1.5 QUALITY ASSURANCE
A. Qualifications:
1. Bracing and shoring drawings shall be prepared by a registered professional engineer, licensed to practice in the State of Maryland. Drawings and calculations shall bear seal of Professional Engineer registered in the State of Maryland.
2. Personnel performing installation shall be trained or qualified in techniques and procedures of shoring installation with a minimum of three (3) years successful experience in such installation.
3. Installation shall be performed under supervision of a Professional Engineer registered in the State of Maryland, experienced in this type of work.
B. Regulatory Requirements: Conform to requirements of Occupational Safety and Health Administration (OSHA) as well as measures accepted as standards of industry.
C. Certifications: Upon completion of shoring, submit a letter signed and sealed by design engineer stating that, to best of his or her knowledge, systems were constructed in compliance with design drawings and calculations.

PART 2 – PRODUCTS:

2.1 MATERIALS
A. Materials shall be selected and furnished to perform in compliance with design criteria.
B. Structural Steel Shapes and Plates: ASTM A 36 or ASTM A 572. Steel shall be of American manufacturer, new and free from defects in strength, durability, appearance and function.

PART 3 – EXECUTION:

3.1 EXAMINATION
A. Site Verification of Conditions: Prior to commencing work of this Section, check and verify governing dimensions and elevations, including field measurements of existing or adjoining work on which this work is dependent to assure proper fit and clearances between new and existing structures.

3.2 PREPARATION
A. Protection
1. Protect and support drainage, water, sewer, gas, and other pipes and electrical conduits encountered and immediately notify persons, companies or governmental agencies, granting them ample opportunity to take such additional precautions as they may deem necessary.
2. Cut and cap street connections encountered in excavating along curb lines in compliance with local jurisdiction requirements. locations of capped utilities so they may be subsequently located and reconnected as needed.
3. Damage to adjacent properties, streets, sidewalks and utilities caused by work under this Section shall be repaired, restored to original condition, or replaced at no additional expense to Owner.
B. Coordination
1. Prepare a photographic or video survey of existing crack conditions in adjacent facilities and other conditions of structures prior to commencing work.
2. Maintain free flow of pedestrian and vehicular traffic to and from adjacent properties at levels existing prior to start of work.
3. Interior bracing shall be arranged to offer no interference with formwork for new construction.
4. Provide sufficient quantity of materials on hand at all times for protection of Work and for use in event of emergency.
5. Setting of formwork, reinforcing and placement of concrete shall be in compliance with requirements described in other related Sections of this Project Manual.
6. Provide pumps and other equipment as necessary to dewater excavations for shoring operations.
C. Sheeting
1. Provide sheeting of proper lengths and section needed, and anchor or brace to resist earth and hydrostatic pressures and superimposed loads from adjacent structures and/or construction equipment.
2. Install sheeting plumb and true, to lines and locations as indicated on design submittal drawings. Sheeting shall be used to form concrete walls and shall be located and driven to ensure that no part of sheeting is within outline of permanent construction.
3. Sheeting retaining earth on which support and stability of existing structures is dependent shall be left in place at completion of Work.
D. Shoring
1. Locate shoring at distances away from new construction sufficient to allow working room and observation of construction.
2. Shoring shall be set clear of permanent footings, walls and other structural features.
3. Shoring shall be installed to retain earth under surcharges, including such loads as weight of construction materials and equipment, vibration, snow, rainwater, water absorption by soils, and temporary construction.
4. Extend shoring as high as necessary to allow for construction of foundation walls and for berming to divert water run–off. Depth of shoring shall be as deep as necessary to brace excavation to ultimate depth.
5. Shoring supporting formwork may not be left in place without written approval by the Owner's Representative.

3.3 RESTORATION
A. Remove temporary protective installations upon completion of shoring operations.
B. Repair damage to structures caused by shoring operations and restore surfaces to original or better condition.

3.4 CLEANING
A. Remove debris and excess earth resulting from shoring operations as it accumulates. Do not store debris on site or permit debris to be scattered over site.

END OF SECTION 02160

END OF SPECIFICATION

RHL ENGINEERING COMPANY, INC.
3 West Second Street
Frederick, Md. 21701
OFFICE: (301) 695–9424
FAX: (301) 293–6338
E–mail:rhlengr@rhlengr.com

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14C6

UNDERGROUND FUEL OIL TANK REPLACEMENT FOR:
THURMONT MIDDLE SCHOOL
408 East Main Street
Thurmont, MD 21788
MECHANICAL/ELECTRICAL/STRUCTURAL SPECIFICATIONS

JOB NUMBER: 13120
DATE: 10/07/13

SHEET:
ME2.01
3 OF 3

Unit Price for Fuel Oil Tank Replacement and Unit Price Fuel Tank Work:

for

Frederick County Public Schools

BID# 14C6

October 24, 2013

FCPS
Frederick County Public Schools
Reach. Challenge. Prepare.

DRAWING INDEX

UP-ME1.01	MECHANICAL/SITE FLOOR PLAN DEMO/NEW - ELECTRICAL/PIPING
UP-ME1.02	PIPING/ELECTRICAL SECTIONS AND DETAILS
UP-ME2.01	MECHANICAL/ELECTRICAL SPECIFICATIONS

RHL

RHL ENGINEERING COMPANY, INC.
3 West Second Street
Frederick, Md. 21701
OFFICE: (301) 695-9424
FAX: (301) 293-6338
E-mail:rhlengr@rhlengr.com

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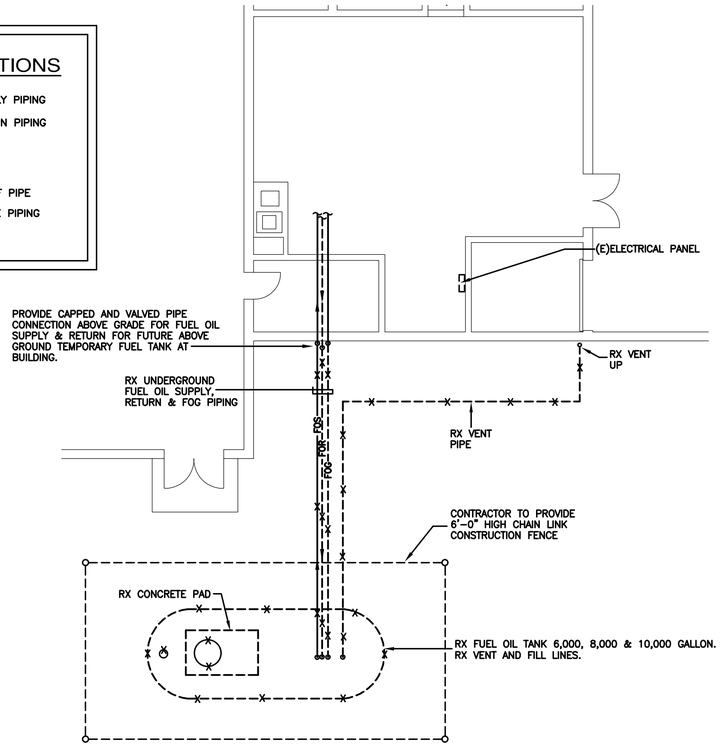
COVER SHEET

MECHANICAL LEGEND AND ABBREVIATIONS

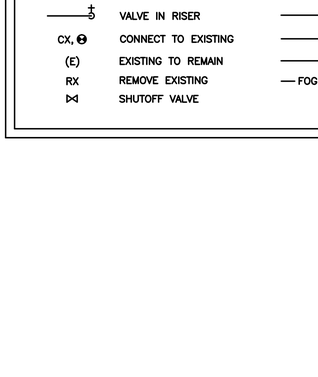
-------	VENT PIPE	— FOS —	FUEL OIL SUPPLY PIPING
V	VENT	— FOR —	FUEL OIL RETURN PIPING
—┼o	VALVE IN RISER	—o	PIPE UP
CX, ⓒ	CONNECT TO EXISTING	—⊃	PIPE DOWN
(E)	EXISTING TO REMAIN	—⊐	CAP ON END OF PIPE
RX	REMOVE EXISTING	— FOG —	FUEL OIL GAUGE PIPING
⋈	SHUTOFF VALVE		



TYPICAL SITE/FLOOR PLAN DEMO - PIPING/ELECTRICAL

SCALE: 1/8"=1'-0"

NOTE: LOCATION OF TANK AND LENGTH OF PIPE TO BE REMOVED VARIES DEPENDING EACH INDIVIDUAL JOB.

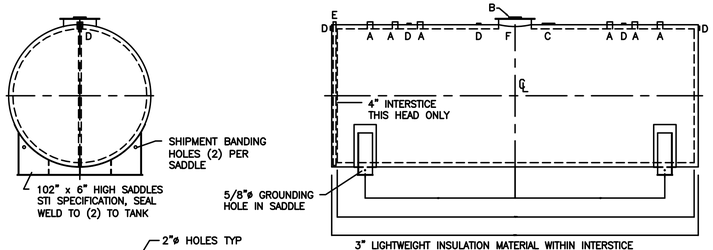


NOTES:

1. USE 6" RIGID GALVANIZED STEEL CONDUIT. CUT TO 8'. REAM SMOOTH AND FILL W/ CONCRETE. ENCASE CONDUIT IN 3" OF CONCRETE AS SHOWN.

VEHICULAR BARRIER

NO SCALE

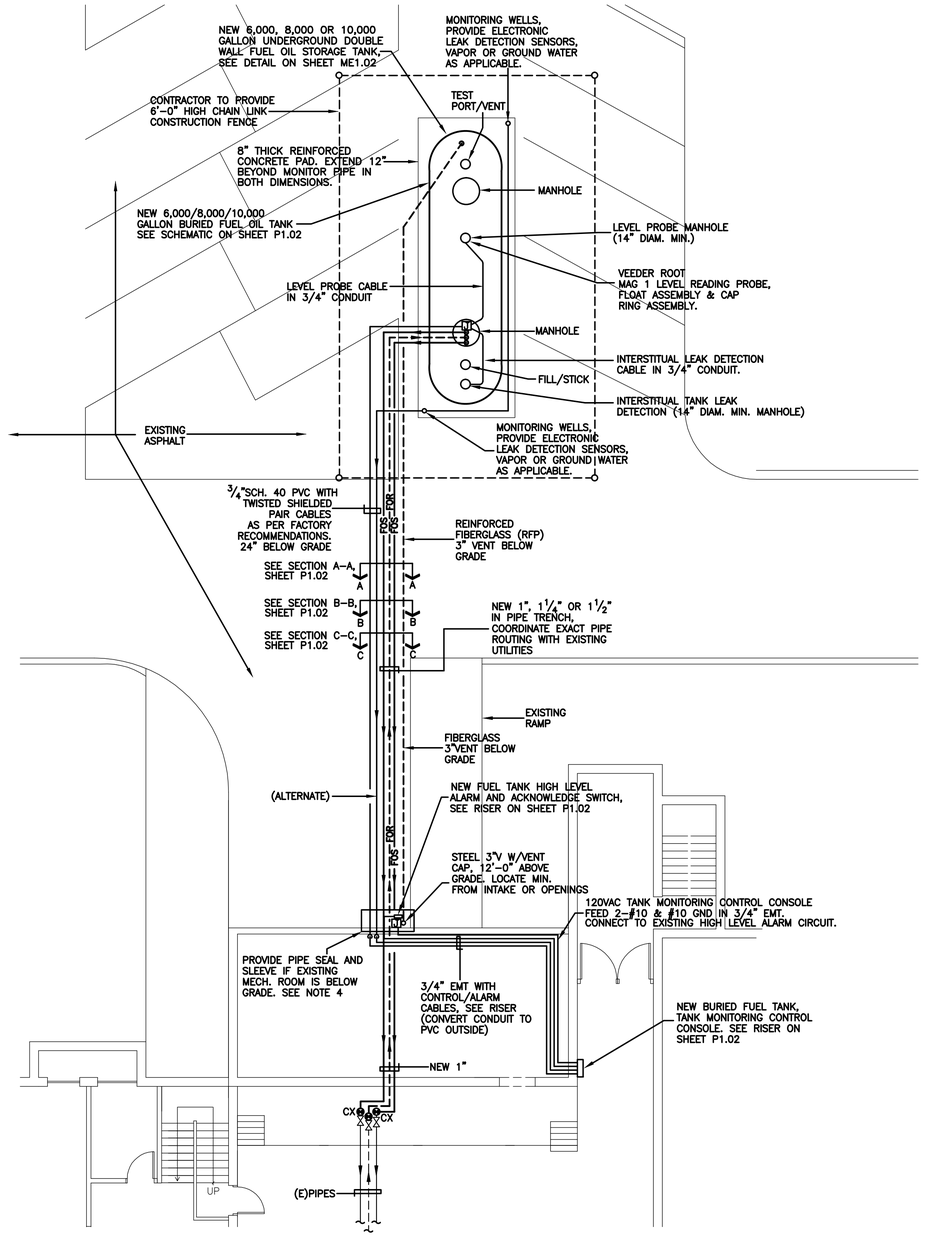


ABOVE GROUND FUEL OIL TANK

NO SCALE (6,000/8,000/10,000 GALLONS)

DESIGN DATA
CAPACITY : 8,000 GALLON
TYPE: FIREGUARD® CYLINDRICAL
FIREGUARD® IS A TRADEMARK OF THE STEEL TANK INSTITUTE
NO. REQ. – –
OPERATING PRESSURE –ATMOSPHERIC
SPECIFIC GRAVITY = 1.0
TANK MATERIAL – MILD CARBON STEEL
THICKNESS – INNER– HEADS: 5/16", SHELL: 1/4" THICKNESS – OUTER– HEADS: 5/16", SHELL: 1/4" MIN. GAUGE OR THICKNESS (PER U.L. 2085)
CONSTRUCTION – INNER – LAP WELD OUTSIDE ONLY CONSTRUCTION – OUTER – LAP WELD OUTSIDE ONLY
TANK TEST –PER UL 2085
INT. FINISH –NONE
EXT. FINISH –SP–6 BLAST, FINISH PAINT WHITE –
LABEL– UL 2085 AND FIREGUARD® PER sti

	FITTING LEGEND
A	4" FEMALE FG COUPLING
B	8" FITTING – FOR PRIMARY EMERGENCY VENT USE
C	8" FITTING THROUGH OUTER SHELL ONLY, MARK WITH SPECIAL WARNING LABEL INTERSTITIAL EMERGENCY VENT USE ONLY
D	2" FITTING TUROUGH OUTER SHELL ONLY WITH CAST IRON PLUG– MFG USE ONLY
E	2" MONITOR PIPE WITH MALE NPT END
F	24" x 1/4" PLATE TIGHT BOLT MANWAY WITH 1/8" THICK NEO–CORK GASKET AND "B" IN COVER ON CL
G	



TYPICAL SITE/FLOOR PLAN NEW - PIPING/ELECTRICAL

SCALE: 1/8"=1'-0"

NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING AND PATCHING OF ALL EXISTING CONCRETE, CURB, AND ASPHALT PAVING TO MATCH EXISTING.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL GRASS AREAS DISTURBED DURING CONSTRUCTION. AREAS SHALL BE RESEED AND STABALIZED ONCE EXCAVATION IS COMPLETE.
3. THE CONTRACTOR SHALL CONTACT MISS UTILITY 72 HOURS PRIOR TO EXCAVATION TO MARK ALL EXISTING UTILITIES PRIOR TO EXCAVATION.
4. PIPE SEAL SHALL BE "LINK–SEAL" MODEL "O" (NITRILE) INSTALLED WITH A CENTURY–LINE SLEEVE.
5. SIZE/LOCATION OF TANK AND LENGTH OF NEW PIPE VARIES DEPENDING EACH INDIVIDUAL JOB.

1/8" = 1'-0" SCALE 2 0 2 4 6 8 10 FEET

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3 West Second Street
Frederick, Md. 21701
OFFICE: (301) 695–9424
FAX: (301) 293–6338
E–mail:rhlengr@rhlengr.com

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Frederick County Public Schools
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UNIT PRICE FOR FUEL OIL TANK REPLACEMENT and UNIT PRICE FUEL TANK WORK:

FREDERICK COUNTY PUBLIC SCHOOLS

FREDERICK COUNTY
FREDERICK, MD

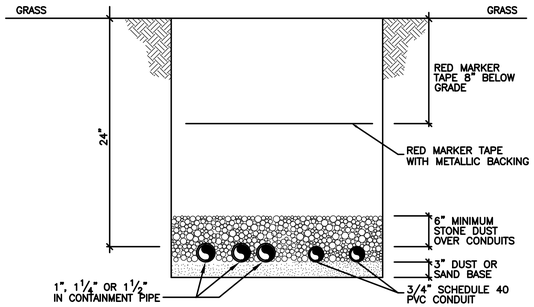
MECHANICAL/SITE FLOOR PLAN DEMO/NEW - ELECTRICAL/PIPING

JOB NUMBER: 13111
DATE: 10/24/13

SHEET:

UP-ME1.01

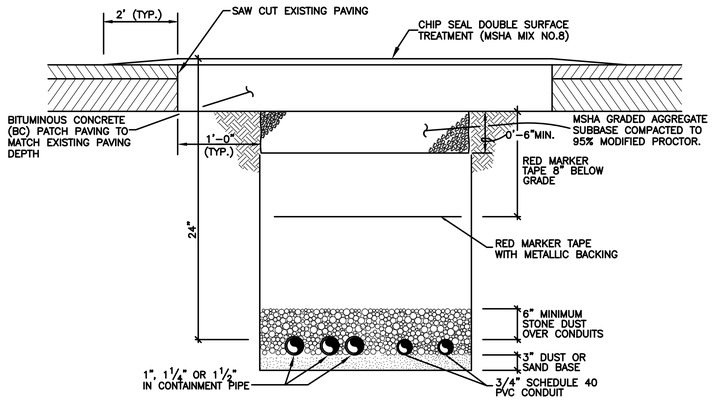
1 OF 3



NOTES:
1. BACKFILL TO BE COMPACTED IN 6 INCH LAYERS TO AVOID SETTLING.
2. MULTIPLE CONDUITS ARE TO HAVE 3 INCHES OF HORIZONTAL SEPARATION, 12" SEPARATION FROM PIPING.

UNDERGROUND CONDUIT/PIPE DETAIL "A-A"

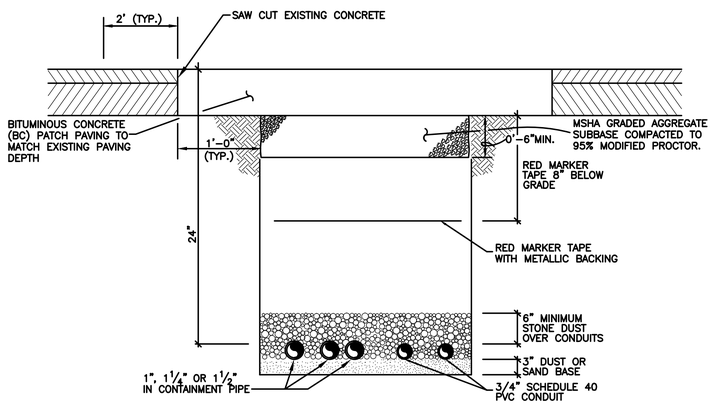
NO SCALE (GRASS)



NOTES:
1. BACKFILL TO BE COMPACTED IN 6 INCH LAYERS TO AVOID SETTLING.
2. MULTIPLE CONDUITS ARE TO HAVE 3 INCHES OF HORIZONTAL SEPARATION, 12" SEPARATION FROM PIPING.

UNDERGROUND CONDUIT/PIPE DETAIL "B-B"

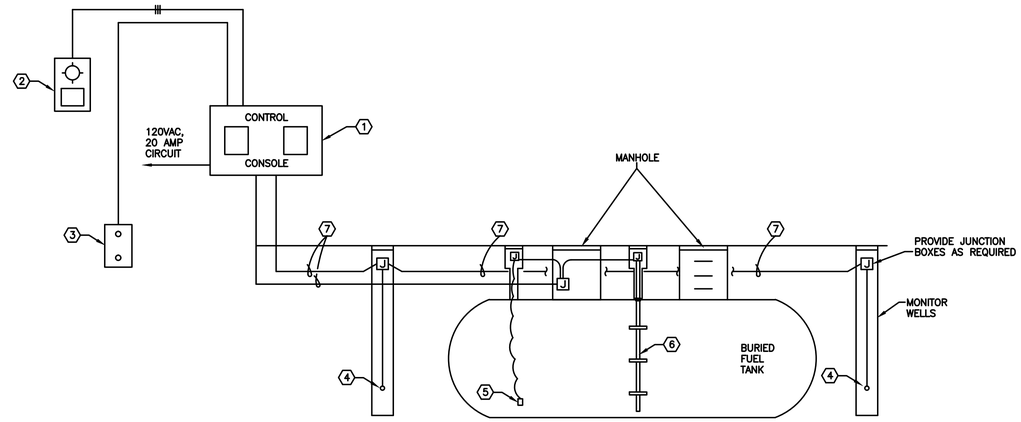
NO SCALE (ASPHALT)



NOTES:
1. BACKFILL TO BE COMPACTED IN 6 INCH LAYERS TO AVOID SETTLING.
2. MULTIPLE CONDUITS ARE TO HAVE 3 INCHES OF HORIZONTAL SEPARATION, 12" SEPARATION FROM PIPING.

UNDERGROUND CONDUIT/PIPE DETAIL "C-C"

NO SCALE (CONCRETE)

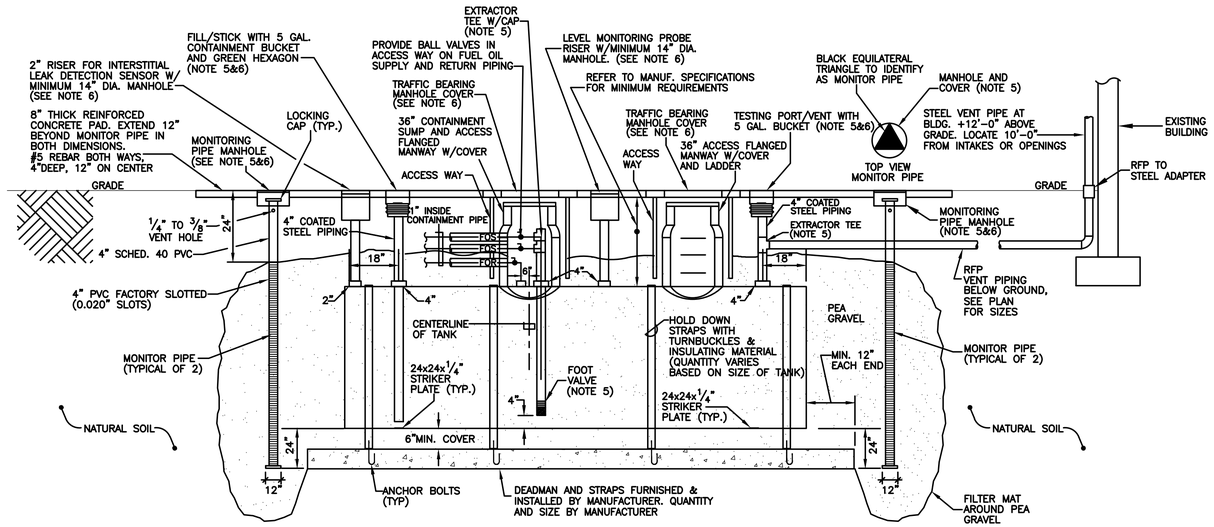


TANK MONITORING SYSTEM BLOCK DIAGRAM

N.T.S.

NOTES–GENERAL–PROVIDE ALL ACCESSORIES FOR A COMPLETE SYSTEM

1. FUEL TANK LEVEL GAUGING AND LEAK DETECTION CONTROL CONSOLE. PROVIDE VEEDER–ROOT (#TLS–350) SERIES PANEL AND ALL REQUIRED PLUG IN MODULES.
2. OUTDOOR OVERFILL ALARM LIGHT WITH AUDIBLE TONE. 120 VOLT, FEED POWER FROM CONTROL CONSOLE, +11' AFF.
3. OUTDOOR ALARM ACKNOWLEDGE PUSHBUTTON, MOUNTED AT +48" AFF.
4. MONITORING LEAK DETECTION SENSOR, PROVIDE VAPOR TYPE FOR DRY APPLICATIONS OR GROUND WATER TYPE FOR GROUND WATER APPLICATIONS.
5. INTERSTITUAL LEAK DETECTION SENSOR.
6. TANK LEVEL PROBE WITH FLOAT SWITCHES FOR HIGH LEVEL ALARM, GAUGING & LEAK DETECTION.
7. PROVIDE CABLES IN CONDUIT PER FACTORY RECOMMENDATIONS.



6,000/8,000/10,000 GALLON, DOUBLE-WALL UNDERGROUND STORAGE TANK - INSTALLATION DETAIL

NO SCALE

NOTE:
1. PROVIDE A MINIMUM 12" COVER OF PEA GRAVEL AROUND THE ENTIRE TANK.
2. INSTALL TANK WITHIN 2" OF LEVEL (MAXIMUM) IN BOTH DIRECTIONS, OVER THE ENTIRE LENGTH OF THE TANK. VENT END TO BE ON "HIGH" END.
3. TANK DIMENSIONS: a. 6,000 GALLON: 8'–0" DIA x 16'–0" LONG.
   b. 8,000 GALLON: 8'–0" DIA x 21'–4" LONG.
   c. 10,000 GALLON: 8'–0" DIA x 30'–6" LONG.
4. PROVIDE CALIBRATED GAUGE MONITORING FILL STICK (QUANTITY OF 2).
5. a. EXTRACTOR TEE (OPW) OR EQUAL.
   b. SPILL CONTAINMENT (OPW) OR EQUAL.
   c. TOP–FILL TOP–SEAL ADAPTERS AND CAPS (OPW) OR EQUAL.
   d. SPILL/OVEFILL PROTECTION VALVE (OPW) OR EQUAL.
   e. VENT CAP ASSEMBLY (MORRISON BROS. CO.) OR EQUAL.
   f. FOOT VALVE (MORRISON BROS. CO.) OR EQUAL.
   g. MONITORING WELL AND MANHOLE (EMCO) OR EQUAL.
6. MOUND UP HIGHER THAN GRADE PER MDE STANDARDS.

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UNIT PRICE FOR FUEL OIL TANK REPLACEMENT and UNIT PRICE FUEL TANK WORK:

FREDERICK COUNTY PUBLIC SCHOOLS

FREDERICK COUNTY
FREDERICK, MD

PIPING/ELECTRICAL SECTIONS AND DETAILS

JOB NUMBER: 13111
DATE: 10/24/13

SHEET:

UP-ME1.02

SECTION 15010 – MECHANICAL – GENERAL PROVISIONS

The General Conditions, Supplementary General Conditions, and Division 1 – General Requirements, are a part of this Section.

WORK INCLUDED

A. Furnish all labor, materials, tools, equipment and service necessary and incidental to install all mechanical work and related systems shown on the drawings, indicated in this Specification or necessary to provide a finished installation. The finished installation shall be in perfect working condition and be ready for continuous and satisfactory operation.

B. Work Included: The installation of the mechanical systems shall include but not be limited to the following:

1. Provide installation of a 10,000 gallon #2 fuel oil tank with all appurtenances per COMAR 26.10.02.
2. Provide underground fuel oil piping and vent.
3. Provide vapor monitoring wells.
4. Provide an electronic leak detection system.
5. Provide excavation, concrete, backfill and paving as shown.
6. Provide connections to existing piping systems.
7. Provide demolition as shown.

CODES, STANDARDS, AND MATERIALS

A. All equipment furnished under this Specification shall be free from defects in workmanship and materials. All equipment, systems, and work shall meet the requirements published by the following organizations as minimum standards:

1. National Fire Protection Association.
2. Underwriter's Laboratories, Inc.
3. American National Standards Institute.
4. Local Plumbing Regulations.
5. Maryland COMAR Regulations.

B. All work shall also meet the minimum requirements of codes and standards of local and State agencies having jurisdiction.

REVIEW OF MATERIALS

A. All materials and equipment furnished and installed under this Division of the Contract shall be new, of standard first grade quality and correctly designed for their specific purpose.

B. Where a Subcontractor proposes to use an item of equipment other than the specified or detailed on the drawings that is approved by the Engineer and that requires redesign of the foundations, piping, wiring, or any other part of the mechanical or electrical layout, then such redesign, new drawings, and detailing required for it shall be prepared by the Contractor without extra compensation.

MINOR DEVIATIONS

A. The locations shown on the drawings are approximate, and are to serve as a guide for installation. The shifting of locations to meet conditions (before installation) will be expected, and this shall be done at no increased cost.

B. The Contractor shall coordinate the mechanical work and equipment with the work to be performed by other Subcontractors within.

C. It shall be the responsibility of this Contractor to inform the Electrical Contractor as regards to the exact service requirements for each piece of mechanical equipment.

WARRANTY

A. All materials, equipment and workmanship shall be warranted to be free from defects and shall be maintained by the Contractor for a period ending two (2) year's from the date of formal completion and acceptance of the project.

LICENSES, PERMITS, AND CERTIFICATES

A. This Contractor shall procure and pay for all licenses, permits and certificates necessary to construct and place in operation all work done under this section.

SECTION 15100 – BASIC PRODUCTS AND METHODS

GENERAL

SCOPE

A. Application: The products and methods specified in this Section are to be used wherever applicable in other Sections of this Division.

PRODUCTS

MATERIALS

A. Pipe:

1. RFP pipe ASTM D2992.
2. PVC Pipe: Schedule 40 PVC.
3. Steel Pipe: ASTM A–53 Schedule 40.

B. Valves:

1. Ball valves shall be NIBCO T–180–125# Solder Type.

EXECUTION

INSTALLATION

A. Piping – General:

1. For purposes of clearness and legibility, piping drawings are essentially diagrammatic and indicate only sizes, connection points, and routes. It is not intended or implied that all offsets, rises, and drops are shown.

B. Pipe Joints and Connection:

1. PVC Pipe: Cut pipe square and clean surfaces to be joined. Apply cement to both surfaces and turn pipe slightly while inserting.
2. Fiberglass pipe: Cup pipe square and clean surfaces to be joined, via adhesive apply per manufacturers recommendations.
3. Steel Pipe: Apply pipe dope to the male thread only.

C. Valves:

1. Install valves at all service connections and equipment.

D. Cutting and Patching:

1. This contractor has cutting and patching responsibility.

E. Tests:

1. Leave concealed or insulated work uncovered until required tests have been completed.

SECTION 15420 – FUEL OIL STORAGE SYSTEM

GENERAL

A. Provide installation of a 10,000 gallon double wall underground storage tank with all accessories as shown per COMAR regulations.

B. Provide underground fuel oil containment piping and vent.

C. Provide electronic leak detection systems.

D. Provide vapor monitoring wells.

E. Provide excavation, concrete, backfill and paving as shown.

BASIC PRODUCTS AND METHODS

A. The basic products as specified in Section 15100 shall be used as follows:

1. Fuel Oil Piping (Containment) .
   a. Pipe: Fiberglass RFP in fiberglass containment pipe. U.L. Listed.
   b. Fittings: Fiberglass.
   c. Joints: Solvent Weld.
2. Underground Vent.
   a. Pipe: Fiberglass RFP. U.L. Listed
   b. Fittings: Fiberglass.
   c. Joints: Solvent Weld.
3. Above Ground Vent (Painted).
   a. Pipe: Black Iron Schedule 40.
   b. Fitting: Wrought Iron.
   c. Joints: Screwed.

B. 10,000 Gallon Double Wall Underground Fiberglass Tank:

1. Type.
   a. Provide a 10,000 gallon nominal capacity double wall fiberglass storage tank complete with hold–down straps and turnbuckles. The tank shall be constructed in accordance with NFPA–30 and 31. All connections shall be made through the top of the tank. Provide (2) calibrated gauge sticks.
   b. The double wall tank shall be constructed of fiberglass reinforced polyester designed specifically for underground storage. Resins used in tank construction shall be capable of withstanding the effects of the coil on the exterior and oil on the interior.
   c. The tank shall meet the following design criteria:
      1. External hydrostatic pressure – Buried in the ground with 4 feet of overburden above the tank and backfill around and above the tank flooded, there shall be a safety factor of 2:1 against general buckling.
      2. Surface loads – When installed in accordance with the manufacturer's instructions with a foot cover over the tank shell, without concrete or asphalt paving, the tank shall withstand H–20 axle loads.
      3. Internal load – The tank shall withstand 5 Psig air pressure test with a 5:1 safety factor.
      4. Operating environment – Tank shall be suitable to withstand the corrosivity of the environment up to a specific gravity of 1:1 with a maximum operating temperature of 150 degrees F.
      5. The corrosion control system shall be in strict accordance with STI–P3 specifications as applied by a licensee of the Steel Tank Institute and shall have the STI–P3 limited 30 year warranty against failure due to exterior corrosion and internal corrosion when used with petroleum products or alcohols. Tank shall bear UL and STI–P3 labels.
      6. The tank excavation shall be free from material that may cause damage to the tank coating. Care shall be taken during installation that foreign matter is not introduced into excavation or backfill. The bottom of the excavation shall be covered with clean sand or gravel to depth shown on drawings suitably graded and leveled.
      7. An air test of the tank above ground is required. Pressure should not exceed 5 psi while a bubble solution is applied to welded seams. Refer to instructions on side of tank or per PEI RP100–94.
      8. Before placing the tank in the excavation, all dirt clods and similar foreign matter shall be cleaned from the tank, and areas of coating damage shall be repaired with a compatible coating supplied by the manufacturer.
      9. Equipment to lift the tank shall be of adequate size to lift and lower the tank without dragging and dropping to ensure no damage to the tank or the coating. Tanks shall be carefully lifted and lowered by use of cables or chains of adequate length (not less than 45 including angle) attached to the lifting lugs provided. A spreader bar should be used where necessary. Under no circumstances use chains or slings around the tank shell.
      10. Backfill consisting of sand, #8 crushed stone (#8 crushed aggregate ASTM D–448) or tine gravel, shall be placed along bottom side of tank by shoveling and tamping to ensure the tank is fully and evenly supported around bottom quadrant. The backfill shall be deposited carefully around tank and to a depth over tank to avoid damage to coating.
      11. The plugs at unused tank openings shall be removed, a pipe compound shall be added and the plugs shall be reinstalled in the unused openings. The dielectric bushings or flange isolation devices in STI–P3 tanks shall not be removed from openings. The plugs in tank openings, which are to be used , should not be over–tightened as this may cause the bushing to unscrew with the plug. Care should be taken not to cross–thread or damage the non–metallic bushings when replacing plugs or installing required tank piping.
   d. The tank shall be cylindrical with hemispherical heads the cylinder shall be reinforced by means of ribs of the same material as the shell. No metal straps or banding will be allowed. The tank shall be fitted with steel couplings of the sizes indicated. In addition lifting lugs will be provided along with fiberglass reinforced plastic anchor straps. Each strap shall be capable of withstanding 25,000 pounds tensile load. UL label shall be permanently affixed to the tank.
2. Manufacturer:
   a. Tank to the Owens–Corning or approved equal by Xerxes or Lifetime Fiberglass Products or Containment Solutions.

C. Leak Detection and Inventory Control

1. Electronic probe monitoring/leak detection system shall continuously monitor and display the status of each monitoring well. System shall detect the presence of hydrocarbons. System shall recognize water and PPM levels of hydrocarbon. System shall be capable of determining and displaying for each probe the background contamination levels. System shall have programmable alarm set/target thresholds for each probe. The programmable alarm thresholds shall not lessen the sensitivity of the probe. System shall be Underwriters Laboratories, Inc. listed. Probes shall be intrinsically safe for use in Class 1, Group D hazardous locations. Control unit enclosures shall be painted 16 gauge custom steel with lock and conduit access knockouts. Control unit shall be microprocessor based and capable of receiving input and monitoring up to 4 probes. Control unit shall provide audible and visual alarms. Control unit shall interrogate each probe and report status of each probe individually. Control also shall be capable of reporting power failure and restore, storing prior alarms at each location, reporting automatic site status once every 24 hours, background contamination level and submerged
2. Provide vapor monitoring probes where no ground water exists, vapor senors for monitoring wells shall have electrical conduit rough–in to alarm panel.
3. Control unit shall have an RS232 communications port. Control unit also shall be capable of remote programming by providing a menu generated through the RS232 port to external terminal. Control power shall be 110 VAV for low–voltage, UL listed power supply. Alarm signal for any sensor audible 1,200 Hz to 85 Db at .5 M. Indicators are 16 character, 2 line, LCD display indicating time, date, daylight savings, or standard time, all alarms, supervisory, etc. Probes for wells shall be furnished complete with intrinsically safe floats and probes, probe well cap, "Scotchlok" fittings, coil cord, flexible cable. Floating probes shall fit 2" and 4" well casings. Probes shall sense hydrocarbon vapors in the range of 16 to 4,000 PPM. Probes shall be able to desorb as well as absorb to sense the wide range of PPM levels in a typical application. The control unit shall monitor the high level alarm; monitoring well leak detectors; Interstitial leak detection; in–tank leak detection and tank level/inventory.
4. Provide an interstitial leak detection alarm to be inserted between the two tank walls. The alarm probe shall be wired to the main control unit.
5. The leak detection and monitoring control console shall be Veeder–Root TLS–350.
6. Provide printer.

D. Overfill Protection.

1. Provide overfill protection to electrically and automatically warn of liquid overfills. A high tank level sensor shall be wired to the main control console.
2. A sensing device shall be installed in the tank and shall activate the pressure switch at a predetermined high liquid level, as directed.
3. The outdoor alarm unit shall be in a NEMA 4 X enclosure and shall have the Red – "Alarm" light and audible horn. A separate acknowledge switch, and silence switch shall be provided. Locate on exterior of building as directed by Architect.
4. Provide Veeder–Root NEMA 4x alarm with remote acknowledge switch and remote sensor, or approved equal.

E. Test.

1. Provide all temporary piping and connections to test the system as follows:
   a. Test and demonstrate tank gauging, leak detection and high level alarm monitoring system.
   b. Air test tank above ground before installation.

END OF SPECIFICATION

SECTION 16010 – ELECTRICAL – GENERAL PROVISIONS

The General Conditions, Supplementary General Conditions, and Division 1 – General Requirements, are a part of this section.

WORK INCLUDED

A. Furnish all labor, materials, tools, equipment and services, necessary and incidental to install all electrical work and related systems shown on the drawings, indicated in this specification or necessary to provide a finished installation. The finished installation shall be in perfect working condition and be ready for continuous and satisfactory operation.

B. The following definitions shall apply:

1. Where the word "provide" is used in connection with a system, equipment or item, it shall be construed to mean the furnishing and installing of the system, equipment or item.
2. Where the phrase "as directed" is used, it shall be construed to mean as directed by the Architect or his authorized representative.

C. Work Included: The installation of the electrical systems shall include but not be limited to the following:

1. New power wiring, control cables, conduits and junction boxes for the fuel oil storage tank leak detection and gauging system
2. Site Work: Including wiring and conduit, trenching and backfill.
3. All final equipment connections.
4. Demolition as shown and specified in the drawings.

LOCAL CONDITIONS

A. If, by reason of this work, there is damage to the building such as cutting holes for conduit, channeling, chasing, openings cut for equipment, etc., such damage shall be patched or repaired to present a smooth surface blending with the surrounding area.

B. Supports for electrical work shall be by means of securely attached fasteners adequately spaced and of type utilizing metal. Wood plugs, plastic or composition plug supports shall not be used.

PERMITS AND INSPECTIONS

A. Obtain and pay for all necessary drawings, permits, and certificates required by the various governing agencies having jurisdiction.

B. Furnish both local and Fire Underwriter's certificates of inspection and approval of the work.

CODES, STANDARDS AND MATERIALS

A. All equipment furnished under this Specification shall be free from defects in workmanship and materials. All equipment, systems, and work shall meet the requirements published by the following organizations as minimum standards.

1. National Fire Protection Association.
2. National Electric Code.
3. Underwriter's Laboratories, Inc.
4. National Electrical Manufacturer's Association.
5. American National Standards Institute.

SHOP DRAWINGS

A. Submit detailed, dimensioned shop drawings covering all items of equipment and brochures for the following:

1. Basic electrical materials.

MINOR DEVIATIONS

A. The general arrangement of conduit, wiring, and equipment shall be as shown on the contract drawings. Detailed drawings of proposed changes because of field conditions or other causes shall be submitted to the Architect for approval. Such changes shall be made without the additional cost to the owner. The Contractor shall carefully examine all contract drawings and shall be responsible for the proper fittings of materials and equipment in each location as indicated, without substantial alteration.

CUTTING AND PATCHING

A. Patch all cuts and damages which occur because of the work outlined. The patches shall be neatly done and shall match existing surfaces in every way including fire rating and painting of color similar to adjoining surfaces.

B. All openings around cables, sleeves, etc., shall be sealed.

SECTION 16100 – BASIC MATERIALS AND METHODS

IDENTIFICATION

A. Provide typed directories for panelboards.

B. Underground marker tape shall be red with metallic backing tracer. Provide manufacturer "Seton" or equal.

OUTLET BOXES

A. Provide an outlet box for each and every outlet, device, fixture, etc., called for on the drawings, specified and required by the NEC. Outlet boxes shall be of approved design, construction form and dimension suitable for the specific location, the kind of device, fixture, etc., to be used, the number of wires used, the arrangement of conduit connected.

WIRE AND CABLES

A. Unless otherwise indicated, all wire cable for feeder and branch circuits shall be coated, soft drawn copper, and shall have 600 volt insulation. Minimum size shall be No. 12 American Wire Gauge. Conductors shall be rated 75 degrees, minimum and suitable for use in wet or dry locations.

B. Conceal all electrical wiring in finished areas. Where wiring is exposed in unfinished areas, it shall be in conduit, 3/4" min.

C. Provide wiring in conduit as follows:

1. Indoors, above grade: EMT with compression fittings.
2. Below slab on grade: Schedule 40 PVC.
3. In concrete: Schedule 40 PVC.
4. Outdoors, exposed: IMC.
5. Outdoors, below grade: Schedule 40 PVC.

WIRE CONNECTIONS AND DEVICES

A. For wire No. 10 AWG and smaller, splices shall be made with wire caps.

SECTION 02160 – STRUCTURAL EXCAVATION SUPPORT

PART 1 – GENERAL:

1.1 SUMMARY
A. Work of this section includes sheeting and shoring and bracing.

1.2 RELATED SECTIONS
A. Section 02000: Clearing
B. Section 02100: Earthwork

1.3 SYSTEM DESCRIPTION DESIGN REQUIREMENTS
A. Shoring systems shall be designed to safely and adequately prevent collapse of adjacent materials and permit construction of Work to arrangement shown on Contract Documents.
B. Secure approvals, including those of local governmental agencies having jurisdiction.
C. Analyze site conditions. Make supplemental investigations as needed for proper design of shoring.

1.4 QUALITY ASSURANCE SUBMITTALS FOR DESIGN DATA
A. Prepare and submit design drawings and calculations showing analysis of work to be performed, including horizontal support for shoring.
B. Drawings shall include methods, equipment and work procedures.

1.5 QUALITY ASSURANCE
A. Qualifications:
1. Bracing and shoring drawings shall be prepared by a registered professional engineer, licensed to practice in the State of Maryland. Drawings and calculations shall bear seal of Professional Engineer registered in the State of Maryland.
2. Personnel performing installation shall be trained or qualified in techniques and procedures of shoring installation with a minimum of three (3) years successful experience in such installation.
3. Installation shall be performed under supervision of a Professional Engineer registered in the State of Maryland, experienced in this type of work.
B. Regulatory Requirements: Conform to requirements of Occupational Safety and Health Administration (OSHA) as well as measures accepted as standards of industry.
C. Certifications: Upon completion of shoring, submit a letter signed and sealed by design engineer stating that, to best of his or her knowledge, systems were constructed in compliance with design drawings and calculations.

PART 2 – PRODUCTS:

2.1 MATERIALS
A. Materials shall be selected and furnished to perform in compliance with design criteria.
B. Structural Steel Shapes and Plates: ASTM A 36 or ASTM A 572. Steel shall be of American manufacturer, new and free from defects in strength, durability, appearance and function.

PART 3 – EXECUTION:

3.1 EXAMINATION
A. Site Verification of Conditions: Prior to commencing work of this Section, check and verify governing dimensions and elevations, including field measurements of existing or adjoining work on which this work is dependent to assure proper fit and clearances between new and existing structures.

3.2 PREPARATION
A. Protection
1. Protect and support drainage, water, sewer, gas, and other pipes and electrical conduits encountered and immediately notify persons, companies or governmental agencies, granting them ample opportunity to take such additional precautions as they may deem necessary.
2. Cut and cap street connections encountered in excavating along curb lines in compliance with local jurisdiction requirements. locations of capped utilities so they may be subsequently located and reconnected as needed.
3. Damage to adjacent properties, streets, sidewalks and utilities caused by work under this Section shall be repaired, restored to original condition, or replaced at no additional expense to Owner.
B. Coordination
1. Prepare a photographic or video survey of existing crack conditions in adjacent facilities and other conditions of structures prior to commencing work.
2. Maintain free flow of pedestrian and vehicular traffic to and from adjacent properties at levels existing prior to start of work.
3. Interior bracing shall be arranged to offer no interference with formwork for new construction.
4. Provide sufficient quantity of materials on hand at all times for protection of Work and for use in event of emergency.
5. Setting of formwork, reinforcing and placement of concrete shall be in compliance with requirements described in other related Sections of this Project Manual.
6. Provide pumps and other equipment as necessary to dewater excavations for shoring operations.
C. Sheeting
1. Provide sheeting of proper lengths and section needed, and anchor or brace to resist earth and hydrostatic pressures and superimposed loads from adjacent structures and/or construction equipment.
2. Install sheeting plumb and true, to lines and locations as indicated on design submittal drawings. Sheeting shall be used to form concrete walls and shall be located and driven to ensure that no part of sheeting is within outline of permanent construction.
3. Sheeting retaining earth on which support and stability of existing structures is dependent shall be left in place at completion of Work.
D. Shoring
1. Locate shoring at distances away from new construction sufficient to allow working room and observation of construction.
2. Shoring shall be set clear of permanent footings, walls and other structural features.
3. Shoring shall be installed to retain earth under surcharges, including such loads as weight of construction materials and equipment, vibration, snow, rainwater, water absorption by soils, and temporary construction.
4. Extend shoring as high as necessary to allow for construction of foundation walls and for berming to divert water run–off. Depth of shoring shall be as deep as necessary to brace excavation to ultimate depth.
5. Shoring supporting formwork may not be left in place without written approval by the Owner's Representative.

3.3 RESTORATION
A. Remove temporary protective installations upon completion of shoring operations.
B. Repair damage to structures caused by shoring operations and restore surfaces to original or better condition.

3.4 CLEANING
A. Remove debris and excess earth resulting from shoring operations as it accumulates. Do not store debris on site or permit debris to be scattered over site.

RHL
RHL ENGINEERING COMPANY, INC.
3 West Second Street
Frederick, Md. 21701
OFFICE: (301) 695–9424
FAX: (301) 293–6338
E–mail:rhlengr@rhlengr.com

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No:13954 Expiration Date: 05/15/2014

FCPS Frederick County Public Schools Reach. Challenge. Prepare.

UNIT PRICE FOR FUEL OIL TANK REPLACEMENT and UNIT PRICE FUEL TANK WORK:

FREDERICK COUNTY PUBLIC SCHOOLS
FREDERICK COUNTY
FREDERICK, MD

MECHANICAL/ELECTRICAL SPECIFICATIONS

JOB NUMBER: 13111
DATE: 10/24/13
SHEET:

UP-ME2.01

3 OF 3