

**SOW Attachment 1**  
**"Steam Plant Device Deficiencies"**  
**Veterans Healthcare System of the Ozarks**  
**Fayetteville, Arkansas**

**Overview:**

Contractor shall furnish all management, supervision, labor, material, equipment, supplies, tools, parts, travel, and related services to complete all corrective actions listed for issues and device deficiencies affecting the steam plant.

**General Information:**

1. The Contractor shall provide turnkey installation of all components resulting in a complete and functioning system.
2. Prior to starting any work the Contractor shall submit for VA approval submittals of all equipment, parts, and devices to be installed (refer to specifications for additional information).
3. Installation shall be in accordance with all requirements and recommendations of the equipment manufacturers.
4. Contractor shall fully test and demonstrate proper operation of each corrected device to VA personnel.

**Requirements:**

(See next page)

Issue No.	Description	Corrective Action(s)
1	Condensate Tank High Water Alarm is not functioning properly.	<ul style="list-style-type: none"> <li>• Replace existing float switch with new conductivity probe.</li> </ul>
2	Deaerator Tank High Water Alarm set point is not correct and the probe column valves must be such that they can only be locked in the open position.	<ul style="list-style-type: none"> <li>• Raise set point of High Water Alarm to a recommended level above Low Water Alarm set point.</li> <li>• Modify valves (if acceptable to VA Engineer) or install new valves to be Lockable Only in the Open Position (LOOP).</li> </ul>
3	Deaerator Tank Low Water Alarm set point is too low and probe column valves must be such that they can only be locked in the open position.	<ul style="list-style-type: none"> <li>• Raise set point to a minimum of 1/3 of tank height.</li> <li>• Modify valves (if acceptable to VA Engineer) or install new valves to be LOOP.</li> </ul>
4	Deaerator Tank Overflow drain line has a manual valve that must be such that it can only be locked in the open position.	<ul style="list-style-type: none"> <li>• Modify valve (if acceptable to VA Engineer) or install new valve to be LOOP.</li> </ul>
5	Deaerator steam valve cannot be tested due to no record of non-destructive testing (NDT) of Deaerator Tank.	<ul style="list-style-type: none"> <li>• Provide NDT of Tank.</li> <li>• Provide testing of Deaerator steam valve if NDT results indicate it is safe to do so.</li> </ul>
6	Pressure gauge on Steam Pressure Reducing Valve Station should be replaced.	<ul style="list-style-type: none"> <li>• Furnish &amp; Install new pressure gauge.</li> </ul>
7	Combustible and Carbon Monoxide Monitoring: <ul style="list-style-type: none"> <li>• Sensor inaccessible for testing or maintenance.</li> <li>• Sensor has malfunctioned.</li> <li>• No test gas available.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace and test all sensors.</li> <li>• Provide remote testing collars for inaccessible sensors.</li> <li>• Provide cylinder of 10% LEL Methane and training for VA Personnel to test sensors.</li> </ul>
8	Heater with muffler does not have vent valve.	<ul style="list-style-type: none"> <li>• Furnish &amp; install vent valve.</li> </ul>
9	Main plant gas regulator is not functioning properly.	<ul style="list-style-type: none"> <li>• Furnish &amp; install new gas regulator.</li> </ul>
10	Propane back-up system should be replaced with permanent, hard-piped system	<ul style="list-style-type: none"> <li>• Replace existing propane backup with new larger tank located outside and hard piping.</li> </ul>

**SOW Attachment 2**  
**“Boilers 1, 2, and 3 Device Deficiencies”**  
**Veterans Healthcare System of the Ozarks**  
**Fayetteville, Arkansas**

**Overview:**

Contractor shall furnish all management, supervision, labor, material, equipment, supplies, tools, parts, travel, and related services to complete all corrective actions listed for issues and device deficiencies affecting boilers 1, 2, and 3 in the steam plant.

**General Information:**

1. The Contractor shall provide turnkey installation of all components resulting in a complete and functioning system.
2. Prior to starting any work the Contractor shall submit for VA approval submittals of all equipment, parts, and devices to be installed (refer to specifications for additional information).
3. Installation shall be in accordance with all requirements and recommendations of the equipment manufacturers.
4. Contractor shall fully test and demonstrate proper operation of each corrected device to VA personnel.

**Requirements:**

(See next page)

**Boiler 1:**

Issue No.	Description	Corrective Action(s)
1	Actual lift pressure exceeds set points and drains are not piped separately.	<ul style="list-style-type: none"> <li>• Calibrate first and second safety valves to lift within allowable tolerance of set point.</li> <li>• Install separate piping for each safety valve drain.</li> </ul>
2	Steam pressure limit switch transducer connected to Fireye system is not working properly. System is displaying "F-41" Transducer Fault and "C-41" Safety Limits Fault.	<ul style="list-style-type: none"> <li>• Correct Faults in Fireye Controller.</li> <li>• Replace transducer with new model that is properly rated for temp and pressure conditions.</li> <li>• Install a new, secondary dedicated steam pressure cutoff switch (recycling).</li> </ul>
3	High Steam Pressure Limit Switch (Non-recycling) is not set to the correct set point.	<ul style="list-style-type: none"> <li>• Adjust set point to approx. 5 psig above set point of recycling pressure switch and 5 psig below lowest set point of boiler safety valves.</li> </ul>
4	Low Pressure Gas Fuel Cutoff Switch (LPGFCS) is set point is too low but cannot be raised in current configuration due to performance of regulator.	<ul style="list-style-type: none"> <li>• Install test port.</li> <li>• Adjust gas regulator performance to prevent drop in pressure during boiler light off.</li> <li>• Adjust LPGFCS set point to 15-20% of normal operating pressures after gas regulator performance is corrected.</li> </ul>
5	High Pressure Gas Fuel Cutoff Switch does not have test plumbing.	<ul style="list-style-type: none"> <li>• Install test port.</li> </ul>
6	Gas Train Solenoid Vent Valve, the manual valve is not Lockable Only in the Open Position (LOOP) type.	<ul style="list-style-type: none"> <li>• Modify existing (if acceptable to VA Engineer) or install new manual valve to be LOOP type.</li> </ul>
7	Pilot Gas Train Solenoid Vent Valve manual valve is not LOOP type.	<ul style="list-style-type: none"> <li>• Modify existing (if acceptable to VA Engineer) or install new manual valve to be LOOP type.</li> </ul>
8	Low Pressure Oil Fuel Cutoff Switch (LPFCS) set point is too low (less than 90% of regulated pressure) and has too much dead band (offset between make and break pressures) to function correctly.	<ul style="list-style-type: none"> <li>• Install new switch with proper set point and dead band.</li> </ul>

**Boiler 1 (cont'd):**

Issue No.	Description	Corrective Action(s)
9	High Pressure Oil Fuel Cutoff Switch (HPFCS) set point is too high (greater than 110% of regulated pressure) and has too much dead band (offset between make and break pressures) to function correctly. Valve between switch and fuel oil line is not LOOP type.	<ul style="list-style-type: none"> <li>• Install new switch with proper set point and dead band.</li> <li>• Modify existing (if acceptable to VA Engineer) or install new manual valve to be LOOP type.</li> </ul>
10	Low Oil Atomizing Media Pressure Switch set point is too low and there is no pressure gauge or test port.	<ul style="list-style-type: none"> <li>• Adjust set point to at least 80% of the minimum typical atomizing pressure.</li> <li>• Install pressure gauge near sensing location</li> <li>• Install diverter valve on the ½" iron pipe to divert atomizing air to atmosphere for testing.</li> </ul>
11	Burner management system combines combustion control and burner safety features into a single device and the low-fire and forced draft damper wide open pre-purge proving switches are not functioning with the existing Fireye controller.	<ul style="list-style-type: none"> <li>• Adjust, repair, and calibrate existing pre-purge and low-fire proving switches for the combustion management system.</li> <li>• Install an additional independent Burner Safety system with low-fire and forced draft damper wide open pre-purge proving switches.</li> </ul>
12	Flame scanner does not meet current VA regulations	<ul style="list-style-type: none"> <li>• Replace existing IR scanner with new self-checking UV scanner.</li> </ul>
13	Low-Fire Proving Switches are not functioning with Fireye System.	<ul style="list-style-type: none"> <li>• Rectify during installation of new Burner Safety System.</li> </ul>
14	Forced Draft Damper Wide-Open Pre-Purge Proving Switch is not functioning with the Fireye System.	<ul style="list-style-type: none"> <li>• Rectify during installation of new Burner Safety System.</li> </ul>
15	Combustion Air Pressure Switch is not installed in accordance with VA requirements and cannot be properly tested.	<ul style="list-style-type: none"> <li>• Modify installation of switch to conform to requirements of VA Boiler Plant Safety Device Testing Manual (3<sup>rd</sup> Edition).</li> </ul>
16	Pre-Purge airflow proving switch is not piped correctly and is not functioning with Fireye Controller	<ul style="list-style-type: none"> <li>• Modify piping where high side is plumbed to the Wind box, upstream of FD Damper.</li> <li>• Connect switch to new independent Burner Safety system.</li> </ul>

**Boiler 1 (cont'd):**

Issue No.	Description	Corrective Action(s)
17	Forced Draft Motor Interlock cannot be testing with solid core type switch.	<ul style="list-style-type: none"> <li>• Replace with new split core type transformer switches.</li> </ul>
18	Low Flue Gas Oxygen Alarm and Cutout does not function as audible alarm nor interlock (cutout of boiler operation).	<ul style="list-style-type: none"> <li>• Adjust, repair, and calibrate alarm to be audible and provide interlock to boiler operation.</li> <li>• Connect to new independent Burner Safety system.</li> </ul>
19	Economizer is not accessible under normal circumstances. Relief valve, isolation valves, and test ports are not readily accessible.	<ul style="list-style-type: none"> <li>• Modify such that tag data is in an accessible location.</li> <li>• Relocate relief valve, isolation valves, and test ports near floor level</li> </ul>
20	VFD drive has multiple faults when starting.	<ul style="list-style-type: none"> <li>• Adjust, repair, and calibrate VFD Drive.</li> </ul>

**Boiler 2:**

Issue No.	Description	Corrective Action(s)
1	High water alarm not functioning properly.	<ul style="list-style-type: none"> <li>• Repair, adjust, and calibrate high water alarm.</li> </ul>
2	The boiler cycled off before reaching lift pressure of second safety valve.	<ul style="list-style-type: none"> <li>• Adjust Fireye set points or repair as necessary to allow test of safety valves.</li> <li>• Verify first and second safety valves lift within allowable tolerance of set point.</li> <li>• Install separate piping for each safety valve drain.</li> </ul>
3	Steam pressure limit switch transducer connected to Fireye system is not working properly. System is displaying "F-41" Transducer Fault and "C-41" Safety Limits Fault.	<ul style="list-style-type: none"> <li>• Correct Faults in Fireye Controller.</li> <li>• Replace transducer with new model that is properly rated for temp and pressure conditions.</li> <li>• Install a new, secondary dedicated steam pressure cutoff switch (recycling).</li> </ul>
4	High Pressure Gas Fuel Cutoff Switch is not installed in accordance with VA Requirements and cannot be properly tested.	<ul style="list-style-type: none"> <li>• Install device in accordance with VA requirements.</li> <li>• Test Device.</li> </ul>
5	Gas Train Solenoid Vent Valve manual valve is not LOOP type.	<ul style="list-style-type: none"> <li>• Modify existing (if acceptable to VA Engineer) or install new isolation valve to be LOOP type.</li> </ul>
6	Pilot Gas Train Solenoid Vent Valve is leaking by and manual valve is not LOOP type.	<ul style="list-style-type: none"> <li>• Repair or Replace vent valve and verify it does not leak through.</li> <li>• Modify existing (if acceptable to VA Engineer) or install new isolation valve to be LOOP type.</li> </ul>
7	Low Pressure Oil Fuel Cutoff Switch (LPFCS) should be replaced with a switch with lower max range to improve operation at set point.	<ul style="list-style-type: none"> <li>• Install new switch with proper set point and dead band.</li> </ul>
8	High Pressure Oil Fuel Cutoff Switch (HPFCS) did not function properly.	<ul style="list-style-type: none"> <li>• Install new switch with proper set point and dead band.</li> </ul>

**Boiler 2 (Cont'd):**

Issue No.	Description	Corrective Action(s)
9	Low Oil Atomizing Media Pressure Switch has too much dead band for proper operation.	<ul style="list-style-type: none"> <li>• Install new switch with proper dead band.</li> <li>• Install pressure gauge near sensing location</li> <li>• Install diverter valve on the ½" iron pipe to divert atomizing air to atmosphere for testing.</li> </ul>
10	Burner management system combines combustion control and burner safety features into a single device and the low-fire and forced draft damper wide open pre-purge proving switches are not functioning with the existing Fireye controller.	<ul style="list-style-type: none"> <li>• Adjust, repair, and calibrate existing pre-purge and low-fire proving switches for the combustion management system.</li> <li>• Install an additional independent Burner Safety system with low-fire and forced draft damper wide open pre-purge proving switches.</li> </ul>
11	Flame scanner does not meet current VA regulations.	<ul style="list-style-type: none"> <li>• Replace existing IR scanner with new self-checking UV scanner.</li> </ul>
12	Low-Fire Proving Switches are not functioning with Fireye System.	<ul style="list-style-type: none"> <li>• Rectify during installation of new Burner Safety System.</li> </ul>
13	Forced Draft Damper Wide-Open Pre-Purge Proving Switch is not functioning with the Fireye System.	<ul style="list-style-type: none"> <li>• Rectify during installation of new Burner Safety System.</li> </ul>
14	Combustion Air Pressure Switch is not installed in accordance with VA requirements and cannot be properly tested.	<ul style="list-style-type: none"> <li>• Modify installation of switch to conform to requirements of VA Boiler Plant Safety Device Testing Manual (3<sup>rd</sup> Edition).</li> </ul>
15	Pre-Purge airflow proving switch is not piped correctly and is not functioning with Fireye Controller.	<ul style="list-style-type: none"> <li>• Replace airflow proving switch</li> <li>• Modify piping where high side is plumbed to the Wind box, upstream of FD Damper.</li> <li>• Connect switch to new independent Burner Safety system.</li> </ul>
16	Forced Draft Motor Interlock cannot be testing with solid core type switch.	<ul style="list-style-type: none"> <li>• Replace with new split core type transformer switches.</li> </ul>
17	Low Flue Gas Oxygen Alarm and Cutout does not function as audible alarm nor interlock (cutout of boiler operation).	<ul style="list-style-type: none"> <li>• Adjust, repair, and calibrate alarm to be audible and provide interlock to boiler operation.</li> <li>• Connect to new independent Burner Safety system.</li> </ul>



**Boiler 3:**

Issue No.	Description	Corrective Action(s)
1	Steam pressure limit switch transducer connected to Fireye system is not working properly. System is displaying "F-41" Transducer Fault and "C-41" Safety Limits Fault.	<ul style="list-style-type: none"> <li>• Correct Faults in Fireye Controller.</li> <li>• Replace transducer with new model that is properly rated for temp and pressure conditions.</li> <li>• Install a new, secondary dedicated steam pressure cutoff switch (recycling).</li> </ul>
2	Low Pressure Gas Fuel Cutoff Switch (LPGFCS) set point is too low.	<ul style="list-style-type: none"> <li>• Install test port.</li> <li>• Adjust 80% or more of the low fire regulated pressure.</li> </ul>
3	High Pressure Gas Fuel Cutoff Switch is not installed in accordance with VA requirements and cannot be tested.	<ul style="list-style-type: none"> <li>• Modify installation to meet VA Requirements.</li> <li>• Verify proper operation and testing.</li> </ul>
4	Gas Train Solenoid Vent Valve – manual valve in the vent line is not LOOP Type.	<ul style="list-style-type: none"> <li>• Modify existing (if acceptable to VA Engineer) or install new isolation valve to be LOOP type.</li> </ul>
5	Automatic Gas Fuel Shutoff Valves Proof of Closure are operating at limit.	<ul style="list-style-type: none"> <li>• Replace valves.</li> </ul>
6	Pilot Gas Train Solenoid Vent Valve manual valve is not LOOP type.	<ul style="list-style-type: none"> <li>• Modify existing (if acceptable to VA Engineer) or install new isolation valve to be LOOP type.</li> </ul>
7	High Pressure Oil Fuel Cutoff Switch (HPFCS) set point is too high (greater than 110% of regulated pressure) and has too much dead band (offset between make and break pressures) to function correctly.	<ul style="list-style-type: none"> <li>• Install new switch with proper set point and dead band.</li> <li>• Modify existing (if acceptable to VA Engineer) or install new isolation valve to be LOOP type.</li> </ul>
8	Low Oil Atomizing Media Pressure Switch set point is too low and there is no pressure gauge or test port.	<ul style="list-style-type: none"> <li>• Adjust set point to at least 80% of the minimum typical atomizing pressure.</li> <li>• Install pressure gauge near sensing location</li> <li>• Install diverter valve on the ½" iron pipe to divert atomizing air to atmosphere for testing.</li> </ul>

**Boiler 3 (cont'd):**

Issue No.	Description	Corrective Action(s)
9	Burner management system combines combustion control and burner safety features into a single device and the low-fire and forced draft damper wide open pre-purge proving switches are not functioning with the existing Fireye controller.	<ul style="list-style-type: none"> <li>• Adjust, repair, and calibrate existing pre-purge and low-fire proving switches for the combustion management system.</li> <li>• Install an additional independent Burner Safety system with low-fire and forced draft damper wide open pre-purge proving switches.</li> </ul>
10	Flame scanner does not meet current VA regulations	<ul style="list-style-type: none"> <li>• Replace existing IR scanner with new self-checking UV scanner.</li> </ul>
11	Flame scanner test for flame failure response time could not be tested because the high gas pressure switch tripped boiler off line too early.	<ul style="list-style-type: none"> <li>• Repair, adjust, and calibrate High Gas Pressure Switch.</li> </ul>
12	Low-Fire Proving Switches are not functioning with Fireye System.	<ul style="list-style-type: none"> <li>• Rectify during installation of new Burner Safety System.</li> </ul>
13	Forced Draft Damper Wide-Open Pre-Purge Proving Switch is not functioning with the Fireye System.	<ul style="list-style-type: none"> <li>• Rectify during installation of new Burner Safety System.</li> </ul>
14	Combustion Air Pressure Switch is not installed in accordance with VA requirements and cannot be properly tested.	<ul style="list-style-type: none"> <li>• Modify installation of switch to conform to requirements of VA Boiler Plant Safety Device Testing Manual (3<sup>rd</sup> Edition).</li> </ul>
15	Pre-Purge airflow proving switch is not piping correctly and is not functioning with Fireye Controller	<ul style="list-style-type: none"> <li>• Modify piping where high side is plumbed to the Wind box, upstream of FD Damper.</li> <li>• Connect switch to new independent Burner Safety system.</li> </ul>
16	Forced Draft Motor Interlock cannot be testing with solid core type switch.	<ul style="list-style-type: none"> <li>• Replace with new split core type transformer switches.</li> </ul>
17	Low Flue Gas Oxygen Alarm and Cutout does not function as audible alarm nor interlock (cutout of boiler operation).	<ul style="list-style-type: none"> <li>• Adjust, repair, and calibrate alarm to be audible and provide interlock to boiler operation.</li> <li>• Connect to new independent Burner Safety system.</li> </ul>
18	Economizer is not accessible under normal circumstances. Relief valve, isolation valves, and test ports are not readily accessible.	<ul style="list-style-type: none"> <li>• Modify such that tag data is in an accessible location.</li> <li>• Relocate relief valve, isolation valves, and test ports near floor level</li> </ul>

**SOW Attachment 3**  
**“Fuel Oil Storage Deficiencies”**  
**Veterans Healthcare System of the Ozarks**  
**Fayetteville, Arkansas**

**Overview:**

Contractor shall furnish all management, supervision, labor, material, equipment, supplies, tools, parts, travel, and related services to install a new 10,000 gallon fuel oil storage tank to increase the total capacity of fuel oil storage for the boiler plant and calibrate the fuel oil level indicators of two existing fuel oil storage tanks and the new fuel oil storage tank. There are two existing 6,000 gallon ConVault fuel oil storage tanks that are to remain in service throughout the project. The new tank will be placed adjacent to the existing tanks and piped into the existing system.

**General Information:**

1. The Contractor shall provide turnkey installation of all components resulting in a complete and functioning system which includes all piping, valves, electrical, concrete, trenching, equipment, and appurtenances as necessary.
2. Prior to starting any work the Contractor shall submit for VA approval scaled shop drawings of all work to be completed including electrical, piping, pump, tank, concrete pad, and bollards (Note: Shop drawings shall be reviewed and approved by tank manufacturer prior to submittal to the VA).
3. Installation shall be in accordance with all requirements and recommendations of the tank manufacturer.
4. The contractor will be responsible for all excavation, backfill, sodding, and paving of the site as necessary to bring it back to pre-construction conditions once the project is complete.

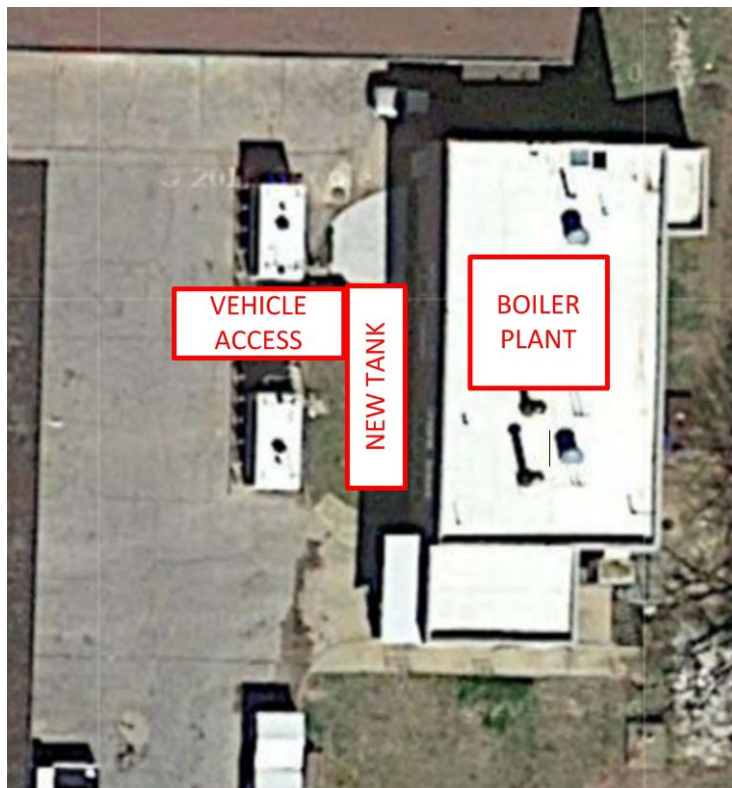
**Requirements:**

The following information is supplemental to the drawings and specifications included in the request for proposal.

1. Furnish and Install one (1) fuel oil storage tank equal to the following:
  - a. Tank Type: ConVault 10,000 gallon fuel oil storage tank or equal with overspill
  - b. Tank Characteristics: 3/16 inch steel tank enclosed in 6 inches of 4,000 PSI reinforced concrete with 30 MIL high density polyethylene geo liner.
  - c. Tank Warranty: 30 year warranty.
  - d. Generator Package: Emergency vent sized to tank requirements, Suction pipe with foot valve, Pipe “T” for return fuel supply, 2” vent pipe to equal 12’ above grade, Pressure vacuum vent cap for vent pipe, Krueger liquid level gauge or equal, Krueger leak detection gauge or equal, Placards. No smoking, tank size, etc., Lockable fill cap, if overspill is in tank, Gauge stick, sized for tank, Caps for all non-used openings.
  - e. Provide clock gauge (Morrison Bros Series 818 or equal).

- f. Provide Galvanized Stairs and Handrails (furnished by tank manufacturer, assembled and field installed by Contractor).
  - g. Provide Neoprene Bearing Pads between the feet of the tank and the foundation.
  - h. Provide electronic tank level monitoring (to match existing tanks)
- 2. Furnish and Install Lightning Protection
  - a. In accordance with NFPA 780 Standard for the Installation of Lightning Protection Systems (latest edition) and tank manufacturer installation instructions.
- 3. Furnish, install, and paint (prep, prime 1 coat and finish 2 coats) new piping.
  - a. Extend the existing header within the boiler plant for the new tank.
  - b. Provide full throat ball type shut-off valve rated for fuel oil.
  - c. Provide Emergency Valve (Morrison Bros 346DI-0400 AV or equal).
  - d. Provide concrete pad for support and protection where piping penetrates the ground (match existing pads).
  - e. Provide sleeve for penetration through boiler plant wall.
  - f. Relocated existing piping and valves as necessary.
- 4. Provide Electronic Tank Monitoring
  - a. Provide sensors, conduit, wiring, and set-up (match existing tanks).
  - b. Provide detection for high and low levels of fuel oil supply.
  - c. Provide detection for ground leakage of fuel oil.
  - d. Connect all points to existing panel within boiler plant.
- 5. Furnish and install a poured-in-place concrete foundation for tank installation:
  - a. Submit signed drawings from the manufacturer's engineers.
  - b. See attached drawings for foundation dimensions and requirements.
  - c. Provide steel pipe bollards. Paint safety yellow and affix reflective tape.
  - d. If after review by the manufacturer's engineers it is determined that the characteristics of the foundation required are different and additional to what is detailed within this proposal a change order may be requested for the additional cost.
  - e. Check for existing utilities. If there are existing utilities that have to be relocated the tank location may be altered or a contract change may be issued based on differing site conditions.
  - f. Bearing Capacity: minimum 2,000 lb. per sq. ft.
  - g. Total settlement: 1 inch maximum.
  - h. Differential settlement: 1/2 inch maximum.
  - i. Provide a minimum six inch (6") thick granular sub-grade, compacted and graded to a level uniform subsurface prior to the cast slab placement or pouring of the cast-in-place slab.
  - j. Soil surface under foundation should be flat within 1/16" per foot. Soil around foundation should be sloped away 1/8" per foot minimum for 5 feet.
- 6. Extend concrete paving flush from edge of vehicle access area (located between the two existing tanks) to the new tank foundation.
  - a. Install in accordance with American Concrete Institute's ACI 330: Guide for the Design and Construction of Concrete Parking Lots.
  - b. 5,000 psi minimum compressive strength.

- c. 5 inch thick concrete with 4 inch base course properly compacted.

**Reference Photos:**

**Reference Photos (Cont'd):**