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# **Waste Oil Heating Equipment Bid Specification**

**Waste Oil Heating Equipment  
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## Section 15600 – Primary Heating Equipment

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### **PART 1 - GENERAL**

#### **1.1 RELATED WORK**

- A. Section 15890 - Smokestack, Breeching and Vent Piping

#### **1.2 REFERENCE**

- A. The Work under this Section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 1 General Requirements.

#### **1.3 SUBMITTALS**

- A. Shop drawings for all items in this Section including, but not limited to, the following:
  - 1. Manufacturer's name and model number
  - 2. Identification as referenced in the documents
  - 3. Capacities/ratings
  - 4. Materials of construction
  - 5. Dimensions and weights
  - 6. Outlet air temperature specification
  - 7. UL file number
  - 8. Wiring diagrams
  - 9. Manufacturer's installation instructions
  - 10. All other appropriate data

#### **1.4 CERTIFICATES**

- A. Secure all registration and installation permits required by the State and local authorities and complete these requirements before system is placed in operation.

#### **1.5 REFERENCE STANDARDS**

- A. Furnace shall be constructed, tested and stamped in accordance with the UL296A "Waste Oil Burning, Air-Heating Appliances."

#### **1.6 OPERATION AND MAINTENANCE DATA**

- A. Manufacturer shall provide services of factory trained field representative to approve installation; start-up, test and adjust for proper operation; and instruct and train Owner's representative in operation and maintenance of equipment.
- B. Upon completion of this service, submit complete report, signed by manufacturer's service representative, including start-up and test log.



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- C. In addition, submit the following flue gas analysis for furnaces.
  - 1. % oxygen
  - 2. % carbon dioxide
  - 3. % carbon monoxide
  - 4. stack temperature
  - 5. % combustion efficiency
  
- D. These readings shall be through entire firing ranges.

### 1.7 COORDINATION

- A. Design and drawings are based on one of acceptable manufacturers listed in this specification. Where requirements of equipment provided differ, from equipment on which design is based, this Contractor shall be responsible for coordinating requirements of equipment with other contractors involved.
  
- B. This Contractor shall be responsible for any additional cost incurred due to such requirements.

## PART 2 - PRODUCTS

### 2.1 WASTE OIL FURNACE UNIT

- A. General
  - 1. Provide packaged type horizontal firing chamber waste oil-fired furnace suitable for firing used crankcase oils, ATF, hydraulic fluid, no. 2 fuel oil, and up to 90W gear oil.
  - 2. Units shall be equal to manufacturer's model with capacity and operating characteristics indicated on schedules.
  - 3. Performance rating shall be in accordance with UL Testing and Rating Standard.
  
- B. Burner
  - 1. Furnace shall be equipped with an oil burner, which is listed by Underwriters' Laboratories and displays the listing label. All controls and trim shall be in compliance with UL Standard 296A. The burner shall be the low pressure atomizing type approved for operation with A.S.T.M. D396 Commercial No. 2 Oil, and shall be complete with electronic flame safeguard and direct electric spark ignition. Burner must be single-stage firing with an on-board air compressor.



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### C. Heat Exchanger

1. Heat exchanger must be constructed of stainless steel and have no internal target walls, only baffles shall be allowed.
2. Heat exchanger shall have no inside tubes for heat exchange.
3. Internal heat shield shall be used for blower air scrubbing.
4. An easily accessible cleanout port shall be located on the bottom of the heat exchanger.

### D. Fuel Pump

1. Furnace fuel pump shall be of a metering type design with a trochoidal gear set construction.
2. Flow rate of the pump shall be 1.0 GPH for each 140,000 BTU of input rating on the furnace.
3. Fuel pump shall be fitted with external relief bypass to prevent over pressurization of the fuel system.

### E. Oil Pre-Heater

1. Pre-Heating shall be accomplished via an external pre-heater.
2. Pre-Heat shall have a standby mode and run mode.
3. Pre-Heater will use self-regulating PTC heater cartridges to prevent overheating.

### F. Blower

1. Furnace blower shall be of a squirrel cage design.

### G. Flue

1. Stainless Steel Tee and Barometric Damper are to be included.
2. Draft Manometer is to be included.
3. Flue connection shall be on the top of the furnace and shall be 8" ID.
4. A Flue Kit is to be included that includes a single to double wall adaptor, two 3' sections of Class A double wall pipe, a roof mounting kit, and a rain cap.

### H. Power Requirements

1. Furnace shall be designed to operate on 120V/60Hz power and operate on a single 20 or 25 Amp circuit breaker.

### I. Mounting

1. Furnace shall have various mounting options, including wall mounting, suspension from ceiling, and mounting on tank brackets supplied with tank supplied by furnace manufacturer.



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### 2.2 Gravity Feed System (optional)

- A. General
  - 1. Gravity Feed System shall be provided that transfers oil from a primary waste oil storage tank to an inside small, wall-mounted day tank.
  - 2. Oil flows from the small day tanks to the furnace metering pump(s) by gravity, such that the metering pumps are flooded.
  - 3. The oil level in the day tank shall be controlled by a float switch assembly and controller.
- B. Transfer Pump & Piping
  - 1. Transfer of oil shall be accomplished with a 40 GPH electric transfer pump located inside on a wall mount bracket.
  - 2. Piping shall include a return line from the day tank to the outside tank and Isolation valves around the pump for ease of maintenance.
  - 3. A cleanable strainer shall be installed prior to the pump to remove debris.
- C. Day Tank
  - 1. Day Tank shall have a holding capacity of 20 gallons.
  - 2. Tank shall be equipped with wall mount brackets.
  - 3. Tank have a 2" NPT opening on the top for installing a float switch assembly.
  - 3. Tank shall be equipped with ports on the side for piping oil in and a return line to the primary tank.
  - 4. Tank shall have two take-off ports on the bottom for feeding oil to the metering pump(s).
- D. Level Control
  - 1. Level control shall be accomplished via float sensors and accompanying control system. Control system shall automatically shut off the furnaces in the event the day tank runs out of oil.
  - 2. Control system shall automatically shut off the furnaces in the event the day tank runs out of oil and display an alarm.
  - 3. Control system shall have a vacuum switch on the pump and display an alarm message when the strainer is clogged and needs to be cleaned.



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### PART 3 - EXECUTION

#### 3.1 *INSTALLATION*

- A. Install units as shown on plans, as detailed, and according to manufacturer's installation instructions. Care should be given to follow NFPA 30 and 31 guidelines.
- B. Install all items shipped loose by equipment manufacturer according to manufacturer supplied I&O manual or under the direct supervision of factory qualified personnel.
- C. Provide all field electrical wiring required in this Section of the specification. Install wiring in metal conduit except for low voltage thermostat wire.

**END OF SECTION**



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