Part 1 General

1.1 QUALITY ASSURANCE

.1 Where the internal diameter exceeds 610 mm, comply with the requirements of Alberta Regulation 49/2006 Safety Codes Act, Pressure Equipment Safety Regulation.

.2 Comply with Provincial Regulations and have CGA label. Construct to CAN1-4.1 for inputs less than 75,000 BTUH; and CAN1-4.3 for input capacities 75,000 BTUH and greater.

.3 Units shall be approved and labelled by Underwriter's Laboratories of Canada.

1.2 SUBMITTALS

.1 Submit shop drawings. Include maintenance data for incorporation into maintenance manuals.

1.3 WARRANTY AND WARRANTY EXTENSION

.1 The pressure vessel/heat exchanger of the water heater shall carry a prorated 10-year warranty against failure due to condensate corrosion, thermal stress, mechanical defects or workmanship. The individual circuit boards of the control panel assembly shall carry a 2-year warranty against failure due to defective materials or workmanship. A Warranty Certificate must be issued to the Departmental Representative from the manufacturer and a copy of warranty must be submitted for Departmental Representative’s approval.

.2 Refer to Article 1.8 of Section 01 11 18.1 – Subcontract Package No. 8B Description of Work for warranty extension requirements.

Part 2 Products

2.1 DOMESTIC WATER HEATERS

.1 Gas Fired (Condensing) Pressure Vessel Type:

.1 Quality Control: ASME stamped for 1100 kPa working pressure, ULC listed.

.2 Tank: Multi-flue constructed to ASME Code, Section IV, glass lined and protected, insulated and finished with baked enamel steel jacket.

.3 Controls: Solid state electric safeguard primary control for pre-purge, direct spark pilot ignition, automatic shutdown on flame failure. Controller to be complete with internal diagnostics, graphic user interface, fault history display, and shall have digital temperature readout.

.4 Power Burner: UL listed, designed for up to 96% combustion efficiency, mounted on outside of unit, complete with automatic gas valve with positive shut-off.

.1 Positive blower safety

.2 Manual main burner gas valve

.3 Pilot valve

.4 Draft regulator

.5 Continuous duty motor with overload protection

.5 Accessories:

.1 Temperature limit thermostat

.2 Upper and lower operating thermostats

.3 ASME rated temperature and pressure relief valve

.4 Drain valve

.5 High/low pressure and low water protection device

.6 Flame inspection port

.7 Dial thermometer

.8 Dial pressure gauge

Part 3 Execution

3.1 INSTALLATION

.1 Install unit and secure in place, plumb and level, make piping and flue connections. Install shut-off valves with unions and dielectric fittings on piping connections.

.2 Install with proper clearances around water heaters for service maintenance and for adequate piping connection clearances.

.3 Install and connect all accessories and trim.

.4 Arrange piping and wiring connections to avoid access panels and openings to allow burner removal without interference.

.5 Extend piping from temperature and pressure relief valve and drain valve to floor drain.

.6 Extend vent piping from gas pressure regulators to outdoors.

.7 Provide condensate drain piping (CPVC) for every five water heaters to a single condensate neutralization tank.

3.2 CERTIFICATION

.1 Submit certification from boiler manufacturer that this equipment has been installed, connected and is ready to be put into operation in accordance with factory recommended procedures.

3.3 START-UP

.1 Start-up procedure to be executed by manufacturer's personnel. Submit check out list as follows:

.1 Pre-Starting:

.1 Check specified and shop drawing data against installed data including:

.1 Make/model/size

.2 Nameplate input and output (altitude corrected).

.3 Clearances for servicing and from combustibles

.4 Fuel or heating medium

.5 Flue sizes

.6 Auxiliaries and controls

.7 Labels (CSA, ASME, ULC)

.8 Gas pressure

.9 Combustion air sizes as per drawings

.2 Check the installation is as drawn and specified and in accordance with manufacturer's recommendations including manufacturer's installation check sheet and the following:

.1 Heater is level on housekeeping base

.2 Flues and chimneys installed without visible damage

.3 No visible damage to jacket

.4 No visible damage to refractory or combustion chamber

.5 Safeties are properly installed and operating

.6 Piping is flanged for easy removal and servicing

.7 Ensure labels are clearly visible

.8 Burner set to manufacturer's specifications

.9 Heater, burner and flue completely clean and free of construction debris

.3 Verify cleaning of domestic piping system is completed.

.4 Ensure recirc pumps are operational.

.5 Check PRV on gas train including venting.

.6 Measure gas pressure on manifold and certify.

.2 Starting:

.1 Start recirc pumps.

.2 Follow manufacturer's recommendations for starting heaters.

.3 Run-in as per manufacturer's requirements.

.3 Post Starting:

.1 Perform flue gas analysis.

.2 Adjust heater burner for peak efficiency.

.3 Measure flue gas temperature at heater discharge.

.4 Measure natural flue draft.

.5 Perform all tests for 100% load.

.6 Determine the following:

.1 heater combustion efficiency (%)

.2 overall thermal efficiency (%)

.3 heater flue losses (% input)

.4 heater jacket losses (% input)

.7 For multiple heaters, determine thermal losses when each boiler is off.

.8 Check PRV's for correct operation and adjust as required.

.9 Measure combustion air flow and boiler room negative pressure at full heater firing.

.10 Determine combustion air flow with all fuel fired appliances within the space in full operation.

.11 Verify operation of temperature and pressure relief valve.

.12 Collect all documentation supplied with heater. Submit in accordance with Section 23 05 02.

3.4 TRAINING

.1 Arrange for manufacturer's representative to attend training seminar and instruct Departmental Representative on routine maintenance procedures and operation.

END OF SECTION