

1 General

1.1 REFERENCES

- .1 American Boiler Manufacturer's Association (ABMA)
- .2 American National Standards Institute (ANSI)
 - .1 ANSI Z21.13/CSA 4.9, Gas-Fired Low-Pressure Steam and Hot Water Boilers.
- .3 American National Standards Institute (ANSI)/ American Society of Mechanical Engineers (ASME)
 - .1 ANSI/ASME Boiler and Pressure Vessel Code, Section IV.
- .4 Canadian Gas Association (CGA)
 - .1 CAN1-3.1, Industrial and Commercial Gas-Fired Package Boilers.
 - .2 CAN/CSA-B149.1, Natural Gas and Propane Installation Code.
- .5 Canadian Standards Association (CSA International)
 - .1 CSA B51, Boiler, Pressure Vessel, and Pressure Piping Code.
 - .2 CSA B139, Installation Code for Oil Burning Equipment.
 - .3 CSA B140.7, Oil Burning Equipment: Steam and Hot-Water Boilers.
- .6 Electrical and Electronic Manufacturer's Association of Canada (EEMAC)
- .7 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .8 Province of NL Boiler, Pressure Vessel, and Compressed Gas Regulations 119/96.

1.2 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures. Include product characteristics, performance criteria, and limitations.
 - .1 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Indicate the following:
 - .1 General arrangement showing terminal points, instrumentation test connections.
 - .2 Clearances for operation, maintenance, servicing, tube cleaning, tube replacement.
 - .3 Foundations with loadings, anchor bolt arrangements.
 - .4 Piping hook-ups.
 - .5 Equipment electrical drawings.
 - .6 Burners and controls.
 - .7 All miscellaneous equipment.
 - .8 Flame safety control system.
 - .9 Breeching and stack configuration.
 - .3 Engineering data to include:
 - .1 Boiler efficiency at 100% of design capacity.
 - .3 Quality assurance submittals: submit following in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
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- .2 Instructions: submit manufacturer's installation instructions.
- .4 Closeout Submittals:
 - .1 Submit operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.3 QUALITY ASSURANCE

- .1 Regulatory Requirements: work to be performed in compliance with applicable Provincial regulations.
- .2 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle in accordance with manufacturer's written instructions and Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
 - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse in accordance with Section 01 74 00 - Cleaning.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

1.5 MAINTENANCE

- .1 Extra materials:
 - .1 Special tools for burners, manholes, handholes and Operation and Maintenance.
 - .2 Spare parts for 1 year of operation.
 - .3 Spare gaskets.
 - .4 Spare gauge glass inserts.
 - .5 Probes and sealants for electronic indication.
 - .6 Safety valve test gauge.

2 Products

2.1 GENERAL

- .1 Packaged Pellet Boiler:
 - .1 Complete with burner and necessary accessories and controls.
 - .2 Ready for attachment to piping, electrical power, controls, flue gases exhaust.
 - .3 Designed and constructed to ANSI/ASME Boiler and Pressure vessel Code.
 - .4 CRN (Canadian Registration Number), to CSA B51.
 - .5 Boiler/burner package to bear ULC label.
 - .6 Forced draft boiler with integrated combustion air supply fan.
 - .7 Turbine section for pelletized material transfer through associated pellet duct.
 - .8 Equipped with day-hopper for pellet storage, minimum 45 kg capacity, unit to automatically regulate pellet fill level day hopper.
 - .9 Automatic pellet feed to combustion chamber via auger system.
 - .10 Auger auto-ash removal system c/w integrated ash collection hopper and full notification.
 - .11 Full water jacket surrounding boiler combustion chamber with non-combustible insulation surrounding.
 - .12 Start contacts for external pump optimal start.
 - .13 Auto-igniter device to be provided with system.

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- .2 Performance:
 - .1 In accordance with American Boiler Manufacturers Association (ABMA), testing procedures.
 - .2 Hot water: gross output as indicated. 82°C supply, 71°C return. Maximum operating pressure as indicated.
 - .3 Fuel: PFI Standard wood pellets
 - .4 Boiler efficiency: 90% minimum.
 - .5 Flue gas temperature leaving boiler:
 - .1 Not to exceed 260 degrees C.
 - .2 Above dew point conditions at minimum firing rate.
 - .3 Electrical:
 - .1 Power: 208 V, 1 phase, 60 Hz. Division 26 shall provide single 230V power source to boiler. Remainder of 230V wiring shall be performed by a licensed electrician under the financial responsibility and supervision of the controls contractor. Coordinate with Division 26.
 - .2 Controls: 120 V, 1 phase, 60 Hz, unless otherwise noted. Refer to Section 25 30 02 - EMCS: Field Control Devices.
 - .3 Electrical components: CSA approved.
 - .4 Controls: factory wired. Enclosed in Electrical and Electronic Manufacturers' Association of Canada (EEMAC) 1 steel cabinet.
 - .1 Controls Contractor shall include all provisions for circulation pumps in scope of services to be provided.
 - .2 Combination starters for circulation pumps to be furnished and installed by Electrical Contractor. All low voltage control wiring and connections to be provided by Controls Contractor.
 - .3 Integrated PLC (Programmable Logic Controller) on unit with unit-mounted GUI interface, touchscreen control.
 - .4 PLC Shall provide supervisory operation of the boiler system, including pump status, setpoint, firing rate, scheduling.
 - .5 PLC unit to provide status alarms to screen if there is a fault with boiler operation. Alarms to be provided shall be based on: Pump failure, flame failure, pellet hopper level alarms (lack of transfer - low weight), safety trips.
 - .5 Thermal insulation:
 - .1 50 mm thick mineral fibre. Seal insulation at handholes, manholes, mudholes, piping connections with insulating cement or asphaltic paint. Finish with heat resisting paint.
 - .6 Jackets: heavy gauge metal, finished with heat resisting paint.
 - .7 Mounting:
 - .1 Structural steel base, lifting lugs.
 - .8 Anchor bolts and templates:
 - .1 Supply for installation by other Divisions.
 - .9 Start-up, instruction, on-site performance tests: 3 days per boiler.
 - .10 Trial usage:
 - .1 The Departmental Representative may use boilers for test purposes prior to acceptance and commencement of warranty period.
 - .2 Supply labour, materials and instruments required for tests.
 - .11 Temporary use by contractor:
 - .1 Contractor may use boilers only after written approval from Departmental Representative.
 - .2 Monitor and record performance continuously. Keep log of maintenance activities carried out.
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- .3 Refurbish to as-new condition before final inspection and acceptance.

2.2 AUXILIARIES

- .1 Provide auxiliaries for each boiler and to meet ANSI/ASME requirements.
- .2 Hot water boilers:
 - .1 Relief valves: ANSI/ASME rated, set at 207 kPa.
 - .2 Pressure gauge: 90 mm diameter complete with shut-off cock.
 - .3 Thermometer: 115 mm diameter range 10 to 150 degrees C to Section 23 05 19.13 - Thermometers and Pressure Gauges - Piping Systems.
 - .4 UL listed and certified.
 - .5 Low water cut-off: burner shall be de-energized in the event water level falls below cut-off.
 - .6 Isolating gate valves: on supply and return connections.
 - .7 Drain valve.
 - .8 Stack thermometer: range 65 to 400 degrees C.
 - .9 One 1 set of cleaning tools.
 - .10 Auxiliary high temperature cut-out with manual reset.
 - .11 Disconnect switch outside boiler room.
 - .12 Triple aquastat relay with quick response probe.

2.3 ELECTRIC BOILER

- .1 Multi-element cast iron ASME heat exchanger.
- .2 Aquastat input control.
- .3 Single phase 208V input, with onboard circuit breakers.
- .4 Flow switch activation control.
- .5 Integrated air vent.
- .6 Integrated 207 kPa safety relief valve.

2.4 PELLET AUGER

- .1 Electric drive auger to be started from the boiler on a call for pellet filling.
- .2 To be installed in pellet storage shed to convey pellets to the vacuum connection.
- .3 Auger Section to be the full length of the storage hopper, as depicted in the architectural plans.
- .4 Power type to be compatible with the selected boiler.

2.5 VACUUM TRANSFER DUCTING FOR PELLETIZED TRANSFER

- .1 Acceptable materials of construction: Aluminum, Stainless Steel Alloys (230, 304, 316, 430).
- .2 Sections to be generally tubular geometry, size to be dictated by boiler supplier.
- .3 Transfer ducting to be designed in a single loop configuration where air supply is provided from the discharge of the boiler turbine and is supplied at high velocity to the auger connection in the pellet storage shed. Pellets and air to be returned to suction of boiler turbine.
- .4 Configuration of sections to be straight, or slightly curved, sharp directional changes are not permitted to limit pellet jamming and accumulation.
- .5 Changes in direction shall be preceded by slight "S" shaped eccentricities in the line to reduce pellet speed through deflective impingement on tubular walls. Elbow-type bends will be permitted only, and shall have a turn radius approximately equal to 4 times the tube diameter.

3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 INSTALLATION

- .1 Install in accordance with ANSI/ASME Boiler and Pressure Vessels Code Section IV, regulations of Province having jurisdiction, except where specified otherwise, and manufacturers recommendations.
- .2 Make required piping connections to inlets and outlets recommended by boiler manufacturer.
- .3 Maintain clearances as indicated or if not indicated, as recommended by manufacturer for operation, servicing and maintenance without disruption of operation of any other equipment/system.
- .4 Mount unit level.
- .5 Pipe hot water relief valves full size to nearest drain.
- .6 All boilers to be approved by the local authorities having jurisdiction. Obtain all required inspections and approvals prior to start-up and commissioning. Provide copies of affidavits, approval letters, etc. to the Departmental Representative for record purposes.
- .7 Pipe low water cut-out to drain.
- .8 Low water cut off device to be installed in such a manner that it can be tested under operational conditions.

3.3 MOUNTINGS AND ACCESSORIES

- .1 Safety valves and relief valves:
 - .1 Run separate discharge from each valve.

3.4 FIELD QUALITY CONTROL

- .1 Commissioning:
 - .1 Manufacturer to:
 - .1 Certify installation.
 - .2 Start up and commission installation.
 - .3 Carry out on-site performance verification tests.
 - .4 Demonstrate operation and maintenance.
 - .2 Provide Departmental Representative at least 24 hours notice prior to inspections, tests, and demonstrations. Submit written report of inspections and test results.
 - .3 Commission in accordance with Section 01 91 13 - General Commissioning (cx) Requirements.
 - .4 Final commissioning to occur between November and March when ambient temperature is 10°C or lower.

3.5 CLEANING

- .1 Proceed in accordance with Section 01 74 00 - Cleaning.
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION
