PROJECT MANUAL
CONSTRUCTION BID DOCUMENTS

April 22, 2026

Rochester Housing Authority
Hudson Ridge Tower, 401 Seneca Manor Drive, Rochester NY 14621
AERCO Boiler Replacement

PROJECT DESCRIPTION:

With this project we will be replacing (3) AERCO Benchmark 2.0 Heating Boilers at Hudson Ridge Tower. Hudson Ridge is a 16-story high rise apartment building located at 401 Seneca Manor Drive, Rochester NY 14621. In 2005, (4) Aerco Benchmark 2.0 boilers were installed to provide hydronic heat for the building. In 2021, one of those boilers was replaced with a compatible Aerco 2.0 boiler. Currently, there are (3) remaining Aerco Benchmark 2.0 boilers that we seek to replace with this project. All asbestos and hazardous materials have been previously removed from the boiler room.

This project will require the demo and replacement of (3) high efficiency condensing boilers, each with a 2 million btu/hr. input. The replacement boilers will be installed in the # 1,2 & 3 locations on the pad and using the pre-existing supply and return connections from the previous boiler. The new boilers installed shall be an Aerco Benchmark 2.0 model or equal. An equal would closely match the Benchmark 2.0 in all dimensions and specifications. The replacement boiler selection will be such that all the pipe connections on the new boiler will be in an exact or similar pattern as the Benchmark 2.0 and will therefore be able to be installed with standard pipe fittings, with no significant changes to the existing supply and return heat piping. An equal will allow for the control compatibility and control integration with the #4 boiler.

The location of the Hudson Ridge boiler room is in a first-floor mechanical room which is easily accessed at ground level from the back of the building. The boilers may be wheeled in through the shipping room doors at the back of the building. The boiler may need to be tipped at a diagonal when passing through two interior doors. Once in the mechanical room, there is one (8") step down to the boiler pad.

The Contractor performing this work will provide a turn-key solution to the boiler replacement and install all aspects of a full and complete boiler system replacement.

The contractor will purchase and install the replacement boilers and all associated piping, wiring, water level controls, safety devices, flues, operating controls etc. The installation plan will only be described conceptually in this bid scope, and it is the responsibility of the selected Contractor to provide a basic schematic design plan prior to award of the purchase order.

The Contractor will be required to have a Heating Boiler Professional (or Manufacturer Rep) as part of their team. This Heating Boiler Professional (HBP) will provide leadership and assistance with the installation plan and quality control throughout the project. The HBP will provide guidance and assistance for quality control and start-up of the boilers. The HBP will assure the proper assembly and control of the flue exhaust and modulating draft functions. The HBP will set up the runtime operation and setpoints of the new boiler system and provide a basic operations training of the new boiler to the RHA HVAC staff.

The contract length will be 150 days to allow for lead times, admin work, controls, start up, inspections, etc. Due to lead times and approval times, we are not certain if the project can be complete before the next heating season. Because there are 4 boilers at the site, it is possible to work on some boilers while other boilers are in operation. It is the intent of this project that the field installation be completed within 75 days of the confirmed boiler delivery date. The contractor must provide boilers that can be procured and installed without long delays. A scheduling plan showing your ability to meet the project timelines will be reviewed as part of the post-bid qualification process.

A 2-year workmanship and service warranty will be included with this project. A boiler operation training component will be supplied to the Owner and staff upon completion of the work.

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SECTION 1 - CONTRACT REQUIREMENTS:

SUBMITTALS

The Contractor shall submit, in a timely manner, submittals for all specified equipment for approval by the Owner or Owners Rep. Under no circumstances shall the Contractor install any materials until the Owner or Owners Rep has made final approval on the submittals.

SHOP DRAWINGS

Shop drawings shall be submitted to the Owner or Owners Rep for approval and shall consist of:

- General assembly drawing of the boiler including product description, model number, dimensions, clearances, weights, service sizes, schematic flow diagram of gas valve trains, etc.
- Piping plan showing connections for supply, return, bypass, drains etc.
- Flue Exhaust System.

SCHEDULING

- The Contractor will be responsible to complete all the boiler replacement contract obligations in 150 days from the date of the contract signing. The contractor is expected to order the boilers immediately upon receipt of the PO and install all the boilers within 75 days of their arrival to Rochester.
- The Contractor will be expected to start mobilization shortly after the contract signing and during the lead time for the new equipment. The contractor will perform any preliminary work possible, while waiting for the new boilers to arrive.

- Upon award of the Contract, the Contractor shall prepare an estimated Progress Schedule and submit it for the Owner or Owner's Rep for approval. It shall indicate the dates for starting and completion of the various stages of the construction. This project is not fill-in work. Once the project starts, we expect the contractor to commit a workforce to the project and complete the project in a timely manner.

WORKMANSHIP and BOILER PERFORMANCE WARRANTY

- The Contractor shall remedy any defects due to faulty materials or workmanship for a period of two (2) years from the date of completion. The optimum boiler performance and operation will also be warranted for a period of two (2) years. If there is a drift or failure of the boiler performance during the 2-year warranty period, the Contractor will respond within a reasonable period of time (36 hrs or less) at no additional costs to the Owner to correct the problem.

MANUFACTURERS WARRANTY

- At the time of placing the equipment order, the Contractor is encouraged to negotiate the strongest equipment warranties possible. The Contractor shall provide RHA with a written warranty statement from the manufacturers of all equipment installed. The warranty terms will be clearly defined and include the manufacturer contact information and the contact of the most local manufacturer representatives.

OPERATING & MAINTENANCE MANUALS

- The Contractor is required to deliver 3 copies of an Owner's operating and maintenance manual in organized binders upon completion of the work. This includes full documentation of the primary equipment operating instructions and service information along with the manufacturer warranties.
- Contents must include Contractor name and address, supplier name and address, parts lists, diagrams, spare parts, operating instructions, maintenance instructions, wiring diagrams, control diagrams, test and balance reports, etc.
- The Owner's manual will include as-built plan of the boiler installation including a wiring diagram of the primary circuitry and controls associated with the boiler.
- The manual will include a cut-away view of boiler and burner, schematics including fuel trains, general instructions for maintenance and inspections, complete spare parts lists and troubleshooting procedures.

SECTION 1 - CONTRACT REQUIREMENTS (END)

SECTION 2 - GENERAL REQUIREMENTS

MATERIALS AND EQUIPMENT

- The Contractor shall provide and pay for all materials, labor, tools, equipment, light, power, transportation, and other facilities necessary for the execution and completion of the work, unless specifically stated otherwise.

- Where equipment, materials, articles or workmanship are referred to in the Specifications as "or equal", the Owner or Owner's Rep shall decide the question of equality.

PROTECTION OF WORK AND PROPERTY

- The Contractor shall be responsible for all damages to persons or property that occur in connection with the performance of their work and shall be responsible for the proper care and protection of all materials delivered and work performed until completion and final acceptance, whether or not the same has been covered by partial payments made by the Owner.

- The Contractor shall take all necessary precautions for the safety of employees on the work site, and shall comply with all applicable provisions of Federal, State, and City Safety Laws and Codes, to prevent accidents or injury to persons on, about, or adjacent to the premises where the work is being performed.

- The Contractor shall erect and properly maintain at all times, as required by the conditions and the progress of the work, all necessary safeguards for the protection of the workmen and the public and shall post danger signs warning against the hazards created by construction operations and conditions.

- The Contractor shall alert the Owner of any unforeseen problems that have occurred with the installation, utilities, quantities, right-of-way, etc.

ACCESS TO WORK AND INSPECTION

- The Owner shall have, at all times, access to the work wherever it is in preparation or progress and the Contractor shall provide proper facilities for such access so that the Owner may perform their functions under the Contract Documents.

- All material and workmanship shall be subject to inspection, examination, or test by the Owner or the Owners Rep at any and all times during the project.

CHANGES IN THE WORK

- Because the terms of this contract are to provide a “turn-key solution” to the boiler replacement, we do not expect to encounter any significant change orders. Any and all work which the Contractor feels will involve extra cost to this project must receive written authorization prior to proceeding with the work. (stop work) No work considered to be an extra is to be performed prior to the receipt of a signed change order from RHA. (exceptions may be made in emergencies endangering life or property)

USE OF PREMISES

- The Contractor shall confine his apparatus, the storage of materials and the operations of his workmen to limits indicated by directions of the Owner and shall not unreasonably encumber the premises with his materials.

CLEANING UP

- The Contractor shall, at all times, keep the premises free from accumulation of waste materials, surplus materials, debris, or rubbish caused by his employees or work, and at the completion of the work, he shall remove all his rubbish, waste material, surplus material, tools, and scaffolding from and about the construction site and shall leave his work "broom clean".

QUALITY ASSURANCE

- The equipment shall, as a minimum, be in strict compliance with the requirements of this specification and shall be the manufacturer's standard commercial product unless specified otherwise. Additional equipment features, details, accessories, etc. which are not specifically identified but which are a part of the manufacturer's standard commercial product, shall be included in the equipment being furnished.

- The equipment shall be of the type, design, and size that the manufacturer currently offered for sale and appears in the manufacturer's current catalogue. The equipment shall be new and fabricated from new materials and shall be free from defects in materials and workmanship.

- A Heating Boiler Professional (or Manufacturer Rep) will be included as part of the contactors team for purposes of providing leadership and assistance with the installation plan and quality control throughout the project.

- The Heating Boiler Professional shall be responsible for performance of inspections, start up and testing of the boiler and accessory equipment and materials. A detailed written record of the start-up performance, including burner setting data entire load range shall be furnished to the Owner. Any equipment defects discovered by the tests shall be rectified.

ENVIRONMENTAL SAFETY

- It is the responsibility of the Owner to abate any regulated materials that may prevent the complete installation of the boiler project. If any regulated materials are found to be in the way of the construction, work will stop until the work site is determined to be safe and secure from hazards. *(this is an unlikely scenario)*
- During demolition, it is the responsibly of the contactor to provide adequate (negative) ventilation into the workspace to prevent any noxious fumes from entering the occupied areas of the building

SECTION 2 - GENERAL REQUIREMENTS (END)

SECTION 3 - SCOPE OF WORK

This is a "turn-key" construction project. The work to be performed consists of providing all labor, equipment, materials, etc. to furnish and install (3) AERCO boiler replacements as described in the specifications herein. The Contractor is required to be familiar with all the heating boiler industry's codes and standard practices. The Contractor is required to deliver a complete and fully functioning, high efficiency heating boiler system regardless of the accuracy of the detail described in this bid spec. The construction and assembly plan described in this bid scope is conceptual, and it is the responsibility of the contactor to partner with a Heating Boiler Professional to assure the construction and delivery of the new heating boiler system to the highest of industry standards.

IMPORTANT NOTES →

- The existing wall mounted AERCO controller will be abandoned and no longer used. The control panel that come integrated as part of the new boilers will be used as the primary controller for these boilers.
- The contractor will supply and install a condensate drain neutralizer on each boiler. The condensate neutralizers will be a commercial style that are properly sized for the boilers.

BOILER ROOM PREP

- Contactor will coordinate any demolition or boiler room prep that may be needed with the Owner to assure a high level of safety during the process

BOILER PLACEMENT AND CONNECTION PLAN

- The location of the new boilers are such that it will maintain the same footprint and location as the older boilers. The (supply and return) pipe fittings on the new boilers must line up with the prior supply and return of the new boilers. The new boilers will have a similar footprint and a similar configuration of the pipe fittings as the previous boilers. The selection of the new boiler will be critical to the success of this project (supply, return, drains, gas train etc.)
- This project is a "turn-key" solution, and the Contractor will be responsible to provide all new piping materials for the gas train, drains, exhaust system, and to provide all labor related the reconfiguration and assembly of said piping. The selection, configuration and assembly of all piping will be to the most recent NYS and ASME codes and regulations.

BOILER INSTALLATION

The manufacturers installation instructions will be used as the primary guidance for the new boiler installation. Because this will be a retrofit project, it will be critical to carefully plan and prepare for the new boilers compatibility prior to ordering the equipment and starting the work. The Heating Boiler Professional will be expected to be on site at start of the contract to review the pre-planning with the Contractors.

Steps of the boiler installation will include:

- Boiler selection and compatibility
- Rigging the new boilers into the equipment room.
- Piping of supply, return, drain, gas and exhaust connections
- Installation of all required valves isolation and maintenance valves; water, drains, gas etc.
- Construction of the gas trains
- Installation of gas burners
- Installation of LWCO & safety devices
- Installation and wiring of the safety controls
- Wiring of the boiler controls
- Integration of the boiler start and stop functions with RHA's building automation system.

GAS PIPING

- The pilot gas train shall include shutoff cock, pilot pressure regulator, and pilot solenoid valves.
- The main gas train components shall include components for natural gas. Included shall be main gas shutoff cock; low gas and high gas pressure switches with manual reset; main gas pressure regulator; auxiliary gas valve; block gas valve with proof-of-closure switch; downstream cock as leakage test cock; and metering gas flow control valve and manifold gas pressure gauge with gauge cock. The gas train shall be sized for a supply pressure to manufacturer specifications. Vents from

the main and pilot gas pressure regulators, and the high and low gas pressure switches, shall be connected into vent lines and piped to the outdoors terminating with insect caps in an area where vented gas cannot be drawn into the building.

VENTING OF THE BOILER FLUE GASES

- The selection of proper venting materials, the venting design, venting connections and venting controls will be critical to the functional operation of the new boiler.
- A double wall stainless steel (DWSS) venting system must be used to prevent condensation of the flue gas and maintain the stack heat required for the flue gas to rise out of the building.
- If required, the DWSS vent system will include a premium quality barometric damper that will integrate with the DWSS.
- A flue gas sensor will be installed in the venting system to assure optimum combustion performance and signal an alarm upon failure to maintain the limits of the combustion parameters.
- Inner pipe joints shall be sealed by use of factory supplied “V” bands and sealant according to manufacturer’s installation instructions.
- When installed according to the manufacturer's installation instructions, the piping and its supporting system shall resist side loads (whether system is horizontal or vertical) at least 1.5 times the weight per foot of the piping. Supports shall support (as verified by manufacturer testing) 12’ of pipe with a safety factor of at least four (4).

INSULATION OF BOILER SYSTEM COMPONENTS

- The heating boiler will undergo a hydrostatic water pressure test to 45psi according to the manufacturer’s instructions prior to insulating the boiler.
- All pipes carrying water will be tested for leaks (with water) prior to the installation of the insulation. Air testing for this purpose will not be accepted.
- All boiler room water pipes will be insulated with 1” non-combustible fiberglass according to NYS and ASME standards (see codes and standards attached)

GENERAL INSTALLATION REQUIREMENTS

- Install equipment and accessories in accordance with manufacturer’s instructions.
- Identify valves in piping with tags.
- Identify piping with plastic pipe markers. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.
- Insulate all hot water piping.
- Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- Provide plug valves in natural gas systems to each gas fired piece of equipment for shut-off service.
- **Install new ball or butterfly valves for main heating system shut-off and to isolate equipment.**
- Install valves with stems upright or horizontal, not inverted.
- Pipe relief valve discharge to floor drains.
- Pipe vents from gas pressure regulator valves to outdoors and terminate in weatherproof hood.

SECTION 3 - SCOPE OF WORK (END)

SECTION 4 - EQUIPMENT & PRODUCT SPECIFICATIONS

AERCO 2.0 MMBTU Benchmark Boiler with Edge [ii] Control

*** Quantity (3)**

*** Single Fuel (natural gas)**

*** Order without an O2 trim package**

CONDENSING BOILERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract apply to this section, including General and Supplementary Conditions and Division 01 Specification Sections.

1.2 SUMMARY

A. This section includes packaged, factory-fabricated and assembled, gas-fired, fire-tube condensing boilers, trim and accessories for generating hot water.

1.3 SUBMITTALS

A. Product Data: Include performance data, operating characteristics, furnished specialties and accessories.

1. Prior to flue vent installation, engineered calculations and drawings must be submitted to Architect/Engineer to thoroughly demonstrate that size and configuration conform to recommended size, length and footprint for each submitted boiler.

B. Efficiency Curves: At a minimum, submit efficiency curves for 100%, 50% and 7% input firing rates at incoming water temperatures ranging from 80°F to 160°F.

C. Pressure Drop Curve. Submit pressure drop curve for the following flow ranges per designated capacities below

1500 - 2000 MBH: 25 - 350 GPM

D. Shop Drawings: For boilers, boiler trim and accessories include:

1. Plans, elevations, sections, details and attachments to other work
2. Wiring Diagrams for power, signal and control wiring

E. Source Quality Control Test Reports: Reports shall be included in submittals.

F. Field Quality Control Test Reports: Reports shall be included in submittals.

G. Operation and Maintenance Data: Data to be included in boiler emergency, operation, and maintenance manuals.

H. Warranty: Standard warranty specified in this section

I. Other Informational Submittals:

1. ASME Stamp Certification and Report: Submit "H" stamp certificate of authorization, as required by authorities having jurisdiction, and document hydrostatic testing of piping external to boiler.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: The manufacturer must have been regularly engaged in the manufacture of condensing hydronic boilers for not less than thirty (30) years. The manufacturer must be headquartered in North America and manufacture pressure vessels in an ASME-certified facility wholly owned by the manufacturer. The specifying engineer, contractor and end customer must have the option to visit the factory to witness test fire and other relevant procedures.

B. Electrical Components, Devices and Accessories: Boilers must be listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. AHRI Performance Compliance: Condensing boilers must be rated in accordance with applicable federal testing methods and is capable of achieving the energy efficiency and performance ratings within prescribed tolerances.

D. ASME Compliance: Condensing boilers must be constructed in accordance with ASME Boiler and Pressure Vessel Code, Section IV “Heating Boilers”.

E. ASHRAE/IESNA 90.1 Compliance: Boilers shall have minimum efficiency according to "Gas and Oil Fired Boilers - Minimum Efficiency Requirements."

F. DOE Compliance: Minimum efficiency shall comply with 10 CFR 430, Subpart B, Appendix N, "Uniform Test Method for Measuring the Energy Consumption of Furnaces and Boilers."

G. UL Compliance: Boilers must be tested for compliance with UL 795, "Commercial-Industrial Gas Heating Equipment." Boilers shall be listed and labeled by a testing agency acceptable to authorities having jurisdiction.

H. NOx Emission Standards: When installed and operated in accordance with manufacturer’s instructions, the following condensing boiler models shall comply with the NOx emission standards outlined in South Coast Air Quality Management District (SCAQMD), Rules 1146, 1146.1, or 1146.2; and the Texas Commission on Environmental Quality (TCEQ), Title 30, Chapter 117, and Rule 117.465 or the NOx emissions referenced below:

- BMK750-2000, BMK4000-6000: 9 ppm NOx corrected to 3% oxygen at all firing rates when firing on natural gas

1.5 COORDINATION

A. Coordinate size and location of concrete bases. Anchor unit to concrete base. Concrete, reinforcement and formwork requirements are specified in Division 03.

1.6 WARRANTY

A. Standard Warranty: Boilers shall include manufacturer's standard form in which manufacturer agrees to repair or replace components of boilers that fail in materials or workmanship within specified warranty period.

1. Warranty Period for Fire-Tube Condensing Boilers

    a. The pressure vessel/heat exchanger shall carry a 10-year from shipment, non-prorated, limited warranty against any failure due to condensate corrosion, thermal stress, mechanical defects or workmanship.

    b. The pressure vessel is warranted against failure due to thermal shock for the lifetime of the boiler provided the boiler is installed, controlled, operated and maintained in accordance with the operation and maintenance manual.

    c. The burner shall be conditionally guaranteed against any failure for (5) five years from shipment.

    d. Manufacturer labeled control panels are conditionally warranted against failure for (2) two years from shipment.

    e. All other components, with the exception of the igniter, flame detector and O_2 sensor, are conditionally guaranteed against any failure for (18) months from shipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. This specification is based on the Benchmark Series boilers that are fitted with Edge [ii] control as manufactured by AERCO International Inc. Equivalent units and manufacturers must meet all performance criteria, and will be considered upon prior approval.

B. Basis-of-Design Product: Subject to compliance with requirements, provide AERCO International, Benchmark Series Boiler with Edge [ii] control:

1. BMK 2000, (2,000,000 BTU/hr input)
2. Approved Equals:
    a. AERCO Benchmark boilers w/Edge [i] Controls
    b. AERCO MFC Series
    c. Request for substitutions will be considered in accordance with provisions of Section 235216 - Condensing Boilers, in writing no less than 30 days prior to bid date.
    d. Note: Water tube boilers are not permitted without written approval. Request and written approval must be submitted and obtained 14 days prior to bid date.

2.2 CONSTRUCTION

A. Description: Boiler shall be natural gas, (only) and a fully condensing fire tube design. It shall be designed to operate in variable primary or primary secondary piping configuration. Power burner shall have full modulation, discharge into a positive or negative pressure vent and the minimum firing rate shall not exceed the following per model:

- BMK2000: 100,000 BTU/hr input

Boilers that have an input greater than what is specified above at minimum fire will not be considered. Boiler efficiency shall increase with decreasing load (output), while maintaining setpoint. Boiler shall be factory-fabricated, factory-assembled and factory-tested, fire-tube condensing boiler with heat exchanger sealed pressure-tight, built on a steel base, including insulated jacket, flue-gas vent connections, combustion-air intake connections, water supply, dual inlet returns condensate drain connections, and controls.

B. Heat Exchanger: The heat exchanger shall be constructed of 439 stainless steel fire tubes and tubesheets, with a one-pass combustion gas flow design. The fire tubes shall be 1/2" or 5/8" OD, with no less than 0.049" wall thickness. The upper and lower stainless steel tubesheet shall be no less than 0.25" thick. The pressure vessel/heat exchanger shall be welded construction. The heat exchanger shall be ASME stamped for a working pressure not less than 150 psig. Access to the tubesheets and heat exchanger shall be available by burner and exhaust manifold removal. Minimum access opening shall be no less than 8-inch diameter.

C. Pressure Vessel: The pressure vessel shall have a maximum water volume per each model as listed below:

- BMK2000: 40 gallons (151.4 liters)

The boiler water pressure drop shall not exceed the following per model size:

- BMK1500 and 2000: 3 psig @ 170 gpm

The boiler water connections shall be flanged 150-pound, ANSI rated.

- BMK1500 - 3000: 4 inch flange

The pressure vessel shall be constructed of ASME SA53 carbon steel, with a 0.25 inch thick wall and 0.50 inch thick upper head. Inspection openings in the pressure vessel shall be in accordance with ASME Section IV pressure vessel code. The boiler shall be designed so that the thermal efficiency increases as the boiler firing rate decreases.

A. Modulating Air/Fuel Valve and Burner: The boiler burner shall be capable of the following firing turndown ratios without loss of combustion efficiency or staging of gas valves. The turndown ratios shall be as follows and are based on BTU size:

- BMK2000: 20:1

The burner shall not operate above 7.5% oxygen level or 55% excess air. The burner shall produce less than 13 ppm of NOx, under standard calibration, corrected to 3% excess oxygen when firing on natural gas. The burner shall be metal-fiber mesh covering a stainless steel body with spark or proven pilot ignition and flame rectification. All burner material exposed to the combustion zone shall be of stainless steel construction. There shall be no moving parts within the burner itself. A modulating air/fuel valve shall meter the air and fuel input. The

modulating motor must be linked to both the gas valve body and air valve body with a single linkage. The linkage shall not require any field adjustment. A variable speed cast aluminum pre-mix blower shall be used to ensure the optimum mixing of air and fuel between the air/fuel valve and the burner.

B. Fuel: The boiler shall use natural gas as the gas train option:

1. Natural gas: The unit gas train shall be specifically designed and calibrated for a single predetermined fuel. The gas train shall be a ventless gas train.

C. Minimum boiler efficiencies shall be as follows at a 20ºF delta-T:

EWT	100% Fire	50% Fire	7% Fire
160 °F	86.5%	87%	87%
140 °F	87%	87.5%	87.5%
120 °F	88.5%	89%	90%
100 °F	93.2%	94.5%	95.2%
80 °F	95.6%	96.8%	98.2%

D. Exhaust Manifold: The exhaust manifold shall be of corrosion resistant cast aluminum or 316 stainless steel with the following diameter flue connections:

1. BMK2000-3000: 8 inch

The exhaust manifold shall have a collecting reservoir and a gravity drain for the elimination of condensation.

I. Blower: The boiler shall include a variable-speed, DC centrifugal fan to operate during the burner firing sequence and pre-purge the combustion chamber.

1. Motors: Blower motors shall comply with requirements specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
   a. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require a motor to operate in the service factor range above 1.0.

J. Ignition: Ignition shall be via spark or proven pilot ignition with 100 percent main-valve shutoff and electronic flame supervision.

K. Combustion Air: The boiler shall be designed such that the combustion air is drawn from the inside of the boiler enclosure, decoupling it from the combustion air supply and preheating the air to increase efficiency.

L. Combustion Air Filter: The boiler shall be equipped with an automotive high flow air filter to ensure efficient combustion and unhindered burner components operation.

M. Enclosure: The plastic and sheet metal enclosure shall be fully removable, allowing for easy access during servicing.

N. O_2 sensor located in the Combustion Chamber: The boiler shall be equipped with an Oxygen sensor. The sensor shall be located in the boiler combustion chamber. Boilers

without Oxygen sensor or boilers with an Oxygen sensor in the exhaust shall not be acceptable due to measurement estimation and performance accuracy.

2.3 CONTROLS

A. The boiler shall have an integrated boiler control that is capable of operating the boiler and associated accessories including but not limited to: its pumps, valves and dampers.
   1. The control shall have a 5 inch color touch screen display as well as six function buttons that are separate from the display. User shall have the ability to navigate the menus via touchscreen or navigation buttons. Controls not equipped with navigation button options shall not be permitted.
   2. The control shall be equipped with a multi-color linear LED light to indicate the level of firing and/or air/fuel valve position.
   3. The control shall display two temperatures using two dedicated three-digit seven-segment displays.
   4. The control shall offer an Enable/Disable toggle switch as well as two buttons for Testing and Resetting the Low Water Cutoff.

B. The Manager designated boiler control shall be capable of the following functions without the need for additional external controls:
   1. Sequence up to 4 boilers,
   2. Control boiler variable speed or single speed pumps and/or modulating motorized valves,
   3. Operate or modulate a variable or single speed system pump or rotate two system pumps,
   4. Control and communicate with up to 6 SmartPlate domestic water heaters and their domestic hot water pump,
   5. The control shall connect to other plant boiler controls using RS485 and communicate using Modbus protocol.

C. The control system shall be segregated into three components: “Edge [ii]” Control Panel, Power Panel and Input/Output Connection Box. The entire system shall be Underwriters Laboratories recognized.

D. The control panel shall consist of seven individual circuit boards using surface-mount technology in a single enclosure. Each board shall be individually field replaceable. These circuit boards shall include:
   1. A microcontroller board with integrated 5 inch touchscreen color display providing the user interface.
   2. A 7-segment display board. This board includes two 3-digit 7-segment displays. These displays shall be used to view a variety of temperature sensor values and operating and startup function status.
   3. An Interface board connects the microcontroller board to internal components using ribbon cables.
   4. An electric low-water cutoff board connects to the test and manual reset functions on the microcontroller board.
   5. A power supply board is designed to provide the different DC voltages to the rest of the boards. It also acts as voltage regulator and reduce power noise.
   6. An ignition and combustion board. This board controls the air/fuel valve and Safety Shutoff Valve, flame status and ignition transformer

7. A connector board used to connect all external electrical connection.

E. Combination plant: The managing boiler control shall be capable of setting and managing a combination plant that consist of up to two groups of boilers, their swing boilers and swing valves. The control shall be capable of performing all the listed features without the need for any additional controls. The use of additional controls to achieve any of these functionalities shall be prohibited to simplify installation and plant management. The combination plant control shall have the following capabilities:
   1. The control shall be capable of operating one group of boilers for heating and another group of boilers for domestic hot water using plate heat exchangers or indirect tanks.
   2. The control shall be capable of managing the lead boiler in each of the two groups independent of the other group.

F. System Pump lead/lag rotation: The control shall be capable of operating two system pumps. It shall rotate the lead pump based on user time setting. The use of an external pump lead-lag control shall not be permitted unless function is performed by building management system.

G. Variable Speed Pump: The control shall be capable of modulating a variable speed pump. It shall modulate the pump based on the boiler firing rate, the boiler plant firing rate, or based on the return header temperature differential from supply water temperature on a primary secondary piping application.

H. Minimum number of boiler plant open valves: The control shall manage the minimum number of boiler motorized valves to reduce variable speed pump flow and energy used. The control shall offer a setting to control the number of valves open during low load and standby operation. Manufacturers without this feature shall offer additional pump controller and a smaller single speed pump to run during the low load and standby periods.

I. Control settings transfer using USB: The control shall simplify and significantly lessen startup and boiler setting time by being able to use a USB flash drive to copy settings from one boiler to another boiler. Installers shall use successfully preconfigured boiler settings in their portfolio to newly installed boilers.

J. Combustion calibration: The control shall offer at least 5 calibration points. The use of less than 5 calibration points is not permitted to improve overall system efficiency under all firing rates. Each combustion calibration point shall operate with 5 to 7% O_2 levels to improve operating efficiency. Deviating away from these values shall not be acceptable.

K. Assisted Combustion Calibration: The control shall offer an assisted combustion calibration feature to help reduce setup time and improve setup accuracy. The assisted combustion calibration shall adjust the O_2 level at each calibration point to help keep O_2 level within allowable efficiency. The control shall log, date and time stamp the calibrated point combustion values of O_2 and allow the user to log NOx, CO and flame strength. The control shall check these values against manufacturer allowable combustion values and color identify values out of manufacturer acceptable ranges. As an additional capability, the control shall also have the ability to perform manual combustion calibration. Not having Assisted Combustion Calibration function shall be prohibited.

L. Valve Balancing: To help simplify installation and as part of a boiler plant, the control shall be capable of controlling an electronic modulating motorized valve for each of the boilers using the manager boiler control. It shall have a built-in logic to provide a maximum flow using an adjustable valve opening percentage point for each boiler. The control shall be

capable of closing any valve that has an off boiler. If all boilers are off, the control shall keep at minimum one valve open to protect pumps.

M. Building Automation: The control shall be able to communicate to Building Management Systems using BACnet and Modbus without the use of external gateways. The control shall be able to communicate over each of the two protocols using IP as well as RS485. The use of external gateways is not acceptable. The control shall be able to communicate to the building management system using:
   1. BACnet MS/TP and BACnet IP/Ethernet. When communicating over BACnet IP, the control shall offer an additional layer of IP security by mapping all control BACnet IP communication to the BACnet server's IP and MAC addresses. Not having this level of security shall deem the IP communication insecure and shall not be acceptable.
   2. Modbus RTU and Modbus IP.

N. Unit and Plant Status: The control shall provide a quick view of the unit status and plant status.
   1. The unit status screen shall provide temperature setpoint, all water inlet and outlet and supply air and exhaust temperature sensors' values. It shall also provide unit current and target firing rates. Additional screens shall display unit run hours, cycle count and average cycles per hour.
   2. The plant status screens shall provide plant temperature setpoint, plant water supply and return temperatures, outdoor temperature and domestic hot water setpoint and current temperatures. Additionally, a status screen shall show the boiler status of each plant unit, plant firing rate.
   3. Unit and Plant event history: The manager control shall display the last 500 historical events per plant or 200 historical events for single unit installations.

O. Software update: The control shall be capable of field software updates without a need for hardware component(s) replacement. This shall be performed either using software on a USB flash drive or via Internet connection. The software update mechanism shall be performed by a trained technician. The software update menus shall be secured using a password level. After the software update, the control shall retain all of its prior field settings.

P. Copy settings from one boiler to the other: To significantly reduce installation time by reducing long repetitive work, the control shall have the capability of saving its settings to a USB flash drive. In addition, the control shall have the ability of copying new settings from a flash drive.

Q. Programmable Inputs and Outputs: The control shall be equipped with multiple relay and analog outputs and dry contact and analog inputs. Each shall be field programmable to meet installation needs. The following I/O options shall be available:
   1. Relay outputs: There shall be two output relays that are programmable. The following relay functions shall be selectable:
      a. Swing Valve 2
      b. System Pump
      c. Summer Pump
      d. Multi-temperature pump
      e. Pump2
      f. Louver
   2. Inputs and interlocks: The following control functions shall be available:
      a. Flow input
      b. Damper end switch input
      c. Louver end switch input

3. Analog output: There shall be three analog outputs that are programmable. The control shall have configurable analog outputs that can be used as one of the following options:
    a. Boiler pump
    b. Domestic hot water variable speed pump
    c. Valve
    d. Fire rate
4. Analog input: There shall be three analog inputs that are programmable. The control shall have configurable analog inputs that can be used as one of the following options:
    a. Remote setpoint
    b. Smart Plate valve position
    c. Domestic ho t water variable speed pump flow

R. Backup boiler: The control shall be able to operate a lower efficiency back up boiler during peak periods when main plant boilers are at or close to peak load.

S. The controls shall annunciate boiler and sensor status and include extensive self-diagnostic capabilities.

T. The control panel shall incorporate:

1. Setpoint High Limit: Setpoint high limit allows for a selectable maximum boiler outlet temperature and acts as temperature limiting governor. Setpoint limit is based on a PID function that automatically limits firing rate to maintain outlet temperature within a 0 to 10 degree selectable band from the desired maximum boiler outlet temperature.
2. Setpoint Low Limit: Allow for a selectable minimum operating temperature.
3. Failsafe Mode: Failsafe mode allows the boiler to switch its mode to operate from an internal setpoint if its external control signal is lost, rather than shut off. This is a selectable mode, enabling the control can to shut off the unit upon loss of external signal, if so desired.

U. The boiler control system shall incorporate the following additional features for enhanced external system interface:

1. System start temperature feature
2. Pump delay timer
3. Auxiliary start delay timer
4. Auxiliary temperature sensor
5. Analog output feature to enable simple monitoring of temperature setpoint, outlet temperature or fire rate
6. Remote interlock circuit
7. Delayed interlock circuit
8. Easy Setup by providing simplified menu quick settings to expedite plant and boiler setup
9. Delta-T Limiter
10. Freeze protection
11. Fault relay for remote fault alarm
12. Warm-weather shutdown
13. The control shall offer multi-level user security access using different passwords. For additional security, the passwords shall expire if control display was not touched for an extended period 30 minutes.

V. Each boiler shall include an electric, single-seated combination safety shutoff valve/regulator with proof of closure switch in its gas train. Each boiler shall incorporate dual over-temperature protection with manual reset, in accordance with ASME Section IV and CSD-1.

W. Each boiler shall have integrated Boiler Sequencing Technology (BST), capable of multi-unit sequencing with lead-lag functionality and parallel operation. The system will incorporate the following capabilities:

1. Efficiently sequence 2-to-16 units on the same system to meet load requirement.
2. Integrated control and wiring for seamless installation of optional modulating motorized valve. When valves are utilized, the system shall operate one motorized valve per unit as an element of load sequencing. Valves shall close with decreased load as units turn off, with all valves open under no-load conditions.
3. Automatically rotate lead/lag amongst the units on the chain and monitor run hours per unit and balance load in an effort to equalize run hours among active units.
4. Option to manually designate lead and last boiler
5. Designated manager control, used to display and adjust key system parameters.
6. Automatic bump-less transfer of master function to next unit on the chain in case of designated master unit failure; master/slave status shall be shown on the individual unit displays.

2.4 ELECTRICAL POWER

A. Controllers, Electrical Devices and Wiring: Electrical devices and connections are specified in Division 26 sections.

B. Single-Point Field Power Connection: Factory-installed and factory-wired switches, motor controllers, transformers and other electrical devices shall provide a single-point field power connection to the boiler.

C. Electrical Characteristics:

Electrical Specifications	BMK750-2000
Voltage	120 V
Phase	1
Frequency	60 Hz
Full Load Current	13-16 Amps

2.5 VENTING

A. The minimum exhaust vent duct size for each boiler is 8 inch (BMK2000 - 3000) diameter.

B. Combustion-Air Intake: Boilers shall be capable of drawing combustion air from the outdoors via a metal or PVC duct connected between the boiler and the outdoors.

C. The minimum ducted combustion air duct size for each boiler is, 8 inch (BMK2000 - 3000), diameter.

D. Common vent and common combustion air must be an available option for boiler installation. To improve system efficiency, multi-boiler system shall utilize sequencing logic with common venting as well as individual boiler venting configuration. Manufacturers not

allowing parallel modulation for common shall not be acceptable. Consult manufacturer for common vent and combustion air sizing.

E. Follow guidelines specified in manufacturer's venting guide.

2.6 SOURCE QUALITY CONTROL

A. Burner and Hydrostatic Test: Factory adjust burner to eliminate excess oxygen, carbon dioxide, oxides of nitrogen emissions and carbon monoxide in flue gas, and to achieve combustion efficiency. Perform hydrostatic testing.

B. Test and inspect factory-assembled boilers, before shipping, according to ASME Boiler and Pressure Vessel Code.

1. If boilers are not factory assembled and fire-tested, the local vendor is responsible for all field assembly and testing.

C. Allow Owner access to source quality-control testing of boilers. Notify Architect fourteen days in advance of testing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Before boiler installation examine roughing-in for concrete equipment bases, anchor-bolt sizes and locations and piping and electrical connections to verify actual locations, sizes and other conditions affecting boiler performance, maintenance and operations.

1. Final boiler locations indicated on Drawings are approximate. Determine exact locations before roughing-in for piping and electrical connections.

B. Examine mechanical spaces for suitable conditions where boilers will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 BOILER INSTALLATION

A. Install boilers level on concrete bases. Concrete base is specified in Division 23 Section "Common Work Results for HVAC," and concrete materials and installation requirements are specified in Division 03.

B. Install gas-fired boilers according to NFPA 54.

C. Assemble and install boiler trim.

D. Install electrical devices furnished with boiler but not specified to be factory mounted.

E. Install control wiring to field-mounted electrical devices.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other Division 23 sections. Drawings indicate general arrangement of piping, fittings and specialties.

B. Install piping adjacent to boiler to permit service and maintenance.

C. Install piping from equipment drain connection to nearest floor drain. Piping shall be at least full size of connection. Provide an isolation valve if required.

D. Connect gas piping to boiler gas-train inlet with unions. Piping shall be at least full size of gas train connection. Provide a reducer if required.

E. Connect hot-water piping to supply and return boiler tapings with shutoff valve and union or flange at each connection.

F. Install piping from safety relief valves to nearest floor drain.

G. Boiler Venting

1. Kit: Complete system, ASTM A959, Type 29-4C stainless steel or polypropylene (PPs), pipe, vent terminal, thimble, indoor plate, vent adapter, condensate trap and dilution tank, and sealant. Vent system shall meet category IV venting requirements.
2. B. Combustion-Air Intake: Complete system, stainless steel, pipe, vent terminal with screen, inlet air coupling, and sealant.
3. Connect venting full size to boiler connections. [Comply with requirements in Division 23 Section "Breechings, Chimneys and Stacks."]

H. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

I. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections

1. Perform installation and startup checks according to manufacturer's written instructions.
2. Perform hydrostatic test. Repair leaks and retest until no leaks exist.
3. Start units to confirm proper motor rotation and unit operation. Adjust air-fuel ratio and combustion.

4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
    a. Check and adjust initial operating setpoints and high- and low-limit safety setpoints of fuel supply, water level and water temperature.
    b. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

C. Remove and replace malfunctioning units and retest as specified above.

D. Occupancy Adjustments: When requested within 2 months of date of Substantial Completion, provide on-site assistance adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other than normal occupancy hours for this purpose.

E. Performance Tests:

The boiler manufacturer is expected to provide partial load thermal efficiency curves. These thermal efficiency curves must include at least three separate curves at various BTU input levels. If these curves are not available, it is the responsibility of the boiler manufacturer to complete the following performance tests:

1. Engage a factory-authorized service representative to inspect component assemblies and equipment installations, including connections, and to conduct performance testing.
2. Boilers shall comply with performance requirements indicated, as determined by field performance tests. Adjust, modify, or replace equipment to comply.
3. Perform field performance tests to determine capacity and efficiency of boilers.
    a. Test for full capacity.
    b. Test for boiler efficiency at [low fire, 20, 40, 60, 80, 100, 80, 60, 40 and 20] percent of full capacity. Determine efficiency at each test point.
4. Repeat tests until results comply with requirements indicated.
5. Provide analysis equipment required to determine performance.
6. Provide temporary equipment and system modifications necessary to dissipate the heat produced during tests if building systems are not adequate.
7. Notify Architect in advance of test dates.
8. Document test results in a report and submit to Owner.

END OF SECTION

SECTION 5 - COORDINATION REQUIREMENTS

MOBILIZATION & COORDINATION'S AT SITE

- This work shall include, but not be limited to: assembling and setting up for the Project, temporary signs, barriers, notification of Owner, agencies, and others affected by this work, coordination with utility companies, as required, temporary facilities required by local or State law and regulation. The cost of required insurance and bonds, submission of shop drawings, permits and other expenses required for the start of work will be included in this item. This item shall include the cost to mobilize and demobilize to the location of the Project.
- The location of the boiler room is in a first floor mechanical room that is easily accessed at ground level from the back of the building. The boiler may be wheeled in through the shipping room doors at the back of the building. The boiler may need to be tipped at a diagonal when passing through two interior doors. Once in the mechanical room, there is one (8") step down to the boiler pad.
- We will not allow the Contractor to move the equipment into the boiler room without first presenting a staging and safety plan.

CONTRACTOR USE OF PREMISES

- The Contractor shall limit their use of the premises to the work areas indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.
- Keep driveways and entrances serving the premises clear and available to the Owner, Engineer, and emergency vehicles at all times. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- Contractor will be able to use portions of the project site for staging/parking areas during construction. Area to be used are to be approved by and coordinated with Owner.

COORDINATION AND PROJECT CONDITIONS

- Coordinate scheduling, submittals, and Work of various sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.
- Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Install utilities parallel with structure and as inconspicuous as possible in exposed spaces. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

ROGRESS MEETINGS

- Owner's Project Manager will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings. Meetings will be on a bi-weekly basis.
- Attendance Required: Job superintendent. Subcontractors, Suppliers, Consultants, as appropriate to agenda topics for each meeting.

- Agenda
  - Review minutes of previous meetings.
  - Review of Work progress, field observations, problems, and decisions.
  - Identification of problems that impede, or will impede, planned progress.
  - Review of submittals schedule and status of submittals.
  - Review of off-site fabrication and delivery schedules.
  - Maintenance of progress schedule, corrective measures to regain projected schedules.
  - Planned progress during succeeding work period.
  - Effect of proposed changes on progress schedule and coordination.
  - Maintenance of quality and work standards, other business relating to Work.
  - Owner's Project Manager will record minutes and distribute copies within two days after meeting to participants, and those affected by decisions made.

PREINSTALLATION MEETING

- When required in individual specification sections, convene preinstallation meeting at Project site prior to commencing work of specific section. Require attendance of parties directly affecting, or affected by, Work of specific section. Notify Owner's Project Manager at least 3 days in advance of meeting date.
- Prepare agenda and preside at meeting:
  - Review minutes of previous meetings.
  - Review conditions of installation, preparation and installation procedures.
  - Review coordination with related work.
- Owner's Project Manager will record minutes and distribute copies within two days after meeting to participants, and those affected by decisions made.

SECTION 5 - COORDINATION REQUIREMENTS (END)

SECTION 6 - ADMINISTRATIVE REQUIREMENTS

PRE-PROJECT WALK THROUGH

- It is important to register and pick up the BID PACKAGE prior to the walk through. We must establish a list of interested Contractors as soon as possible after the announcement of this project. We will tour the site and review the project with interested Contractors prior to the bid opening.

- The bid spec does not illustrate defined field measurements. It will be important to verify actual field conditions and measurements prior to your bid. We will not be holding multiple walk-through's so please make sure someone from your team attends the walk through on the announced day.

QUESTIONS MUST BE SUBMITTED IN WRITING

- Any questions generated during the walk through or upon reading the scope of work must be answered the same to all interested parties. Therefore, any questions you have regarding this

project will be answered in a pre-bid addendum to all registered Contractors. If you have a question before or during the walk through, please follow the instruction on the bid notice invitation sheet.

PRE-QUALIFICATION MEETING

- This will be a turn-key project with the Contractor being responsible to complete the full scope of work. Through a pre-qualification process; the Contractor selected will need to show that they have the staffing and skills to perform all the obligations of the project and in the timelines required. The "apparent low bidder" will be asked to provide (3) references and the primary equipment submittals prior to the final PO award and notice to proceed.

HUD PAPERWORK REQUIREMENTS

- This project will be funded through a HUD Capital Project Grant. Therefore, all the contract documents (schedules, payments, change orders) associated with this project will be HUD generated forms. The Contractor who is awarded this work will need to include a strong office component to understand and administer the paperwork requirements of the project.
- **Please build this office time and associated costs into your bid proposal.**

SCHEDULING AND STAFFING PLAN

- Prior to the final selection of the (low bid) Contractor, we will meet with that Contractor to review his/her ability to meet the staffing, skill-set, and timelines for this project.

- Upon signing the construction contract, the Contractor must submit an advance work plan (calendar schedule) to show how he/she can accomplish the work in the 150 days. This plan will graphically illustrate weekly goals and staffing. The count for contract days and construction days is based on calendar days and will include weekends and holidays; a 7 day week.

CONTRACTORS SCHEDULE OF VALUES

- The Contractor will be required to submit a thoughtful schedule of values with their bidding documents. (See HUD form 51000-Schedule of Amounts for Contract Payments). This HUD form 51000 will play a key role to help you price up the project, staging the work, and billing for the progress payments. It will be the responsibility of the Contractor to have this document completed with accuracy prior to bidding on the work. Then going forward, a copy of your completed HUD form 51000 must be available at all meetings; pre-construction, during construction, and as part of the billing and payment process.

PERMITS

- The Contractor is obligated to obtain any necessary City of Rochester permits that will cover the project. If a permit is required, it must be obtained in the first week of the contract. A copy of the permit will be posted at the site. Contractor is responsible to administer any permit inspections required. An (RHA administered) NYS boiler inspection will be required for this project. Contractor will use RHA's inspector and coordinate the boiler inspection with RHA.

CONTRACTOR PAYROLL, SIGN IN SHEETS, CHANGE ORDERS

- The Contractor will be required to have the employees sign a "sign-in sheet" each day on the job. Contractor will retain a copy of the sign-in record and provide a copy to RHA. The sign in sheet will be a key document for the processing of the payroll. This project will have Davis Bacon wage rates assigned and the Contractor will need to show they are paying the employees the said wage rate by submitting a weekly Certified Payroll form to RHA. One certified payroll form will need to be filed to

RHA for each week on the job. The payroll must be submitted to RHA each week concurrently (real time) throughout the job.

- Because this is a turn-key project, we do not expect the need for many change orders. It will be critical that the Contractor order materials and mobilize upon receipt of the PO. If we do encounter a need for a change of plan, or a change order, all work (associated with the change) must stop until the change order is fully approved by RHA. It is the responsibility of the Contractor to understand the HUD change order process. The Contractor must swiftly initiate the completed change order request to RHA, not vice versa

SECTION 7 - CODES, CERTIFICATIONS, REFERENCES

CODES

NYS Department of Labor - Division of Safety & Health Code Rules

- **PART 4 - CONSTRUCTION, INSTALLATION OF LOW-PRESSURE BOILERS**
  (Statutory authority: Labor Law, §§27-a, 28, 29, 200, 204)

- Subpart 4-1 General Provisions
- Subpart 4-2 Certified Boiler Inspectors
- Subpart 4-3 Authorized Insurance Companies
- Subpart 4-4 Inspection of Boilers
- Subpart 4-5 Specific Requirements for Low Pressure Heating System Boilers
- Subpart 4-6 Installations, Repairs and Replacement of Low-Pressure Heating Boilers
- Subpart 4-7 Heat Generating Apparatus--General Provisions
- Subpart 4-8 Heat Generating Apparatus--Special Provisions
- Subpart 4-9 Flame Safeguard Controls for Gas-Fired Boilers
- Subpart 4-13 Special Requirements for Low Pressure Steel Plate Boilers
- Subpart 4-14 Special Requirements for Cast-Iron Boilers
- Subpart 4-15 Hydrostatic Tests

APPLICABLE REFERENCES

- Product Data: Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories for each model indicated.
- Shop Drawings: Detail equipment assemblies and indicate dimensions, required clearances, and method of field assembly, components, and location and size of each field connection.
- Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring.
- Source Quality Control Tests and Inspection Reports: Indicate and interpret test results for compliance with performance requirements before shipping.
- Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
- Maintenance Data: Include parts list, maintenance guide, and wiring diagrams for each boiler.
- ASME Section I or IV (Power boilers or Heating Boilers)
- NSI Z21.13 (Gas Fired Low Pressure Boilers)
- NFPA 54 (ANSI Z221.3) National Fuel Gas Code

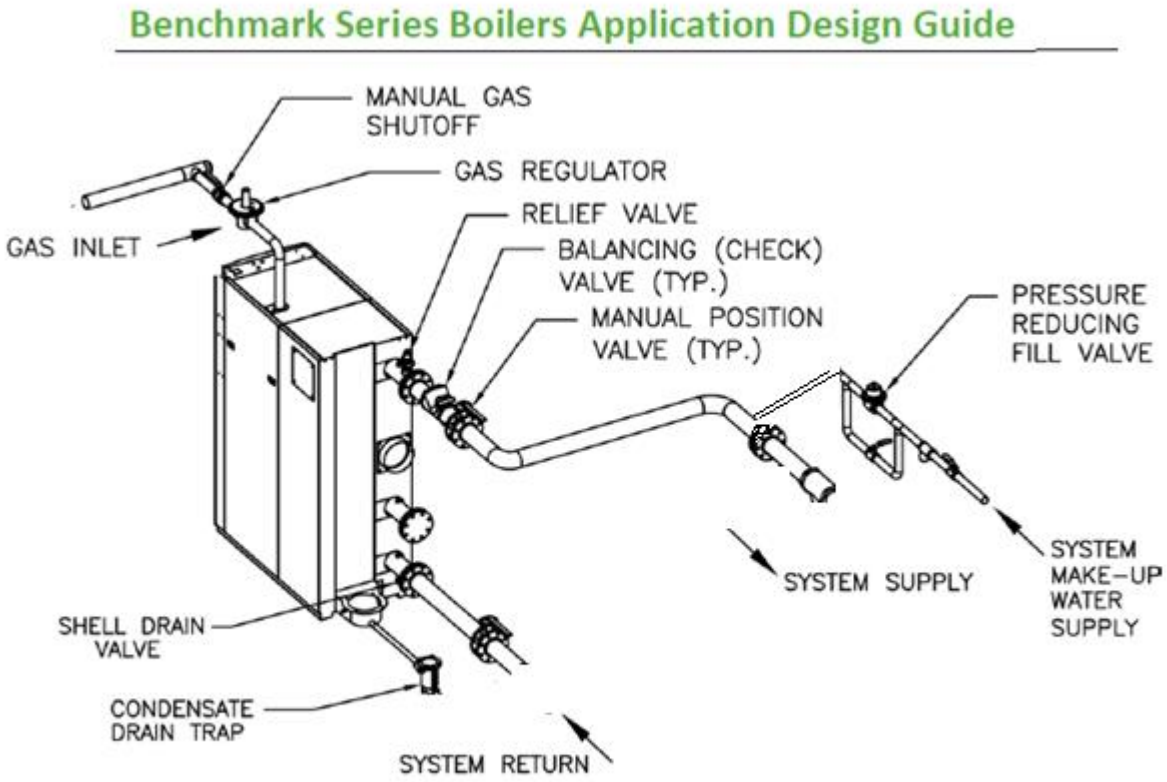
- Factory Mutual
- ASME CSD-1 (Controls and Safety Devices)
- UBC (Uniform Building Code)
- MC (Uniform Mechanical Code)
- NEC (National Electrical Code)
- UL (Underwriters Laboratories)
- NFPA 85

CERTIFICATIONS

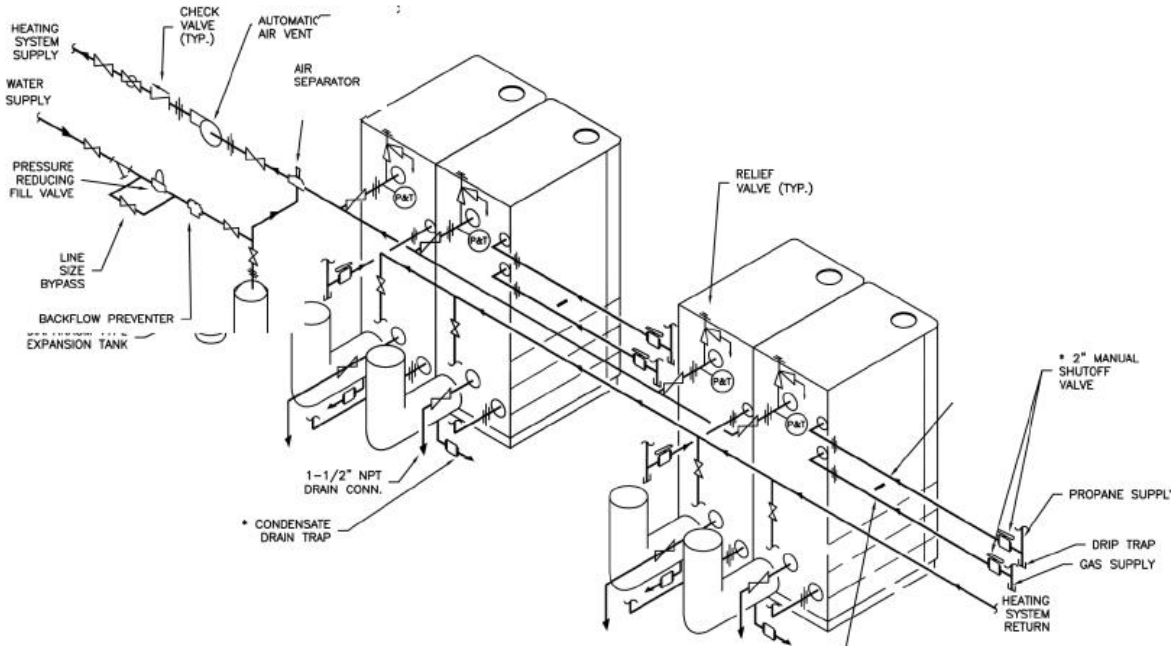
- Manufacturer's Certification: The boiler manufacturer shall certify the following:
- The products and systems furnished are in strict compliance with the specifications.
- The boiler, burner and other associated mechanical and electrical equipment have all been properly coordinated and integrated to provide a complete and operable boiler.
- ASME certification.
- UL and CSD-1 certification.
- The equipment furnished has been installed in accordance with the manufacturer's installation instructions.
- The specified factory tests have been satisfactorily performed.
- The specified field tests have been satisfactorily performed.
- Contractor's Certification: The Contractor shall certify the following:
- The products and systems installed are in strict compliance with the specifications.
- The specified field tests have been satisfactorily performed.
- Boiler Inspectors' Certification: All boiler inspections during hydrostatic testing shall be performed by an authorized boiler inspector who is certified by the National Board of Boiler and Pressure Vessel Inspectors and shall be submitted in writing prior to final acceptance by the engineer.
- Test Reports: Factory and field test reports as described above and as specified hereinafter, shall be submitted prior to final acceptance by the engineer.
- Operation and Maintenance Manuals: Manufacturer's printed operation and maintenance manuals shall be submitted prior to final acceptance by the engineer. Operation and maintenance manuals shall contain shop drawings, product data, operating instructions, cleaning procedures, replacement parts list, maintenance and repair data, complete parts list, etc.

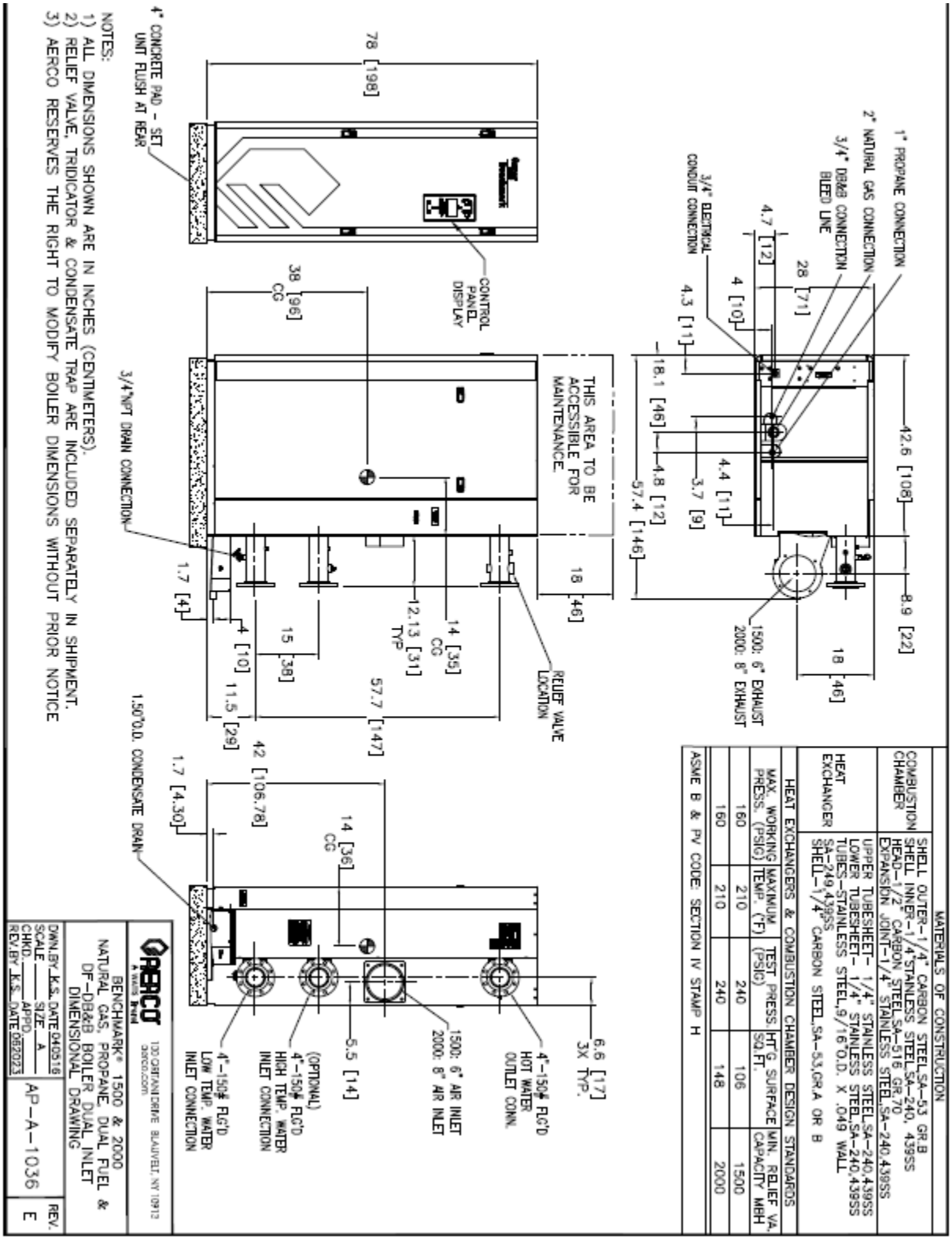
SECTION 7: CODES, CERTIFICATIONS, REFERENCES (END)

SECTION 8 - DRAWINGS AND ILLUSTRATIONS



Single Boiler Piping Schematic (BMK3000/2500 shown)





SECTION 8 - DRAWINGS AND ILLUSTRATIONS (END)