



**ROCKFORD BOARD OF EDUCATION
INVITATION FOR BID ON SUPPLIES, MATERIALS, EQUIPMENT OR SERVICES
FOR SCHOOL DISTRICT NO. 205
ROCKFORD, ILLINOIS**

IFB No. **16-39 West Middle School HVAC and Electrical Replacement**

DATE: **Friday, April 01, 2016**

RE: **ADDENDUM NO. 2**

To All Bidders:

Attached are modifications, clarifications and/or corrections for the Project Manual and are hereby made a part of the contract documents. Please attach this addendum to the Project Manual(s) in your possession. Please note the receipt of this addendum on the bid form. Bidders shall review changes to all portions of this work as changes to one portion may affect the work of another.

If you plan to hand deliver your IFB submission on the due date, please note you must check in on the 3rd floor prior to delivering your bid submission. Please allow time for this as late submission will not be accepted.

Refer all questions relative to the business aspect, Instructions to Bidders, Special Conditions, and questions concerning the technical aspect of the documents to the Purchasing Process Manager by email at tamara.pugh@rps205.com.

WEST MIDDLE SCHOOL
HVAC AND ELECTRICAL RENOVATIONS
ROCKFORD PUBLIC SCHOOLS 205
ROCKFORD, ILLINOIS

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TO: ALL BIDDERS

RE: ADDENDUM #2

Changes to Bidding Documents Dated February 29, 2016

PROJECT: WEST MIDDLE SCHOOL
HVAC AND ELECTRICAL RENOVATIONS
ROCKFORD PUBLIC SCHOOLS 205
ROCKFORD, ILLINOIS

PROJECT NO.: 25107

DATE: March 29, 2016

Please attach this Addendum to the Project Manual and Drawings for the referenced project. Take the changes to the Project Manual and Drawings into consideration in preparing your Bid.

Bidders shall make note in writing on Bid Form that this Addendum has been taken into consideration. Failure to do so may be sufficient cause to reject the Bid.

LARSON & DARBY GROUP

By Stephen M. Nelson (JWO)
Stephen M. Nelson

This Addendum consists of 1 page, plus materials itemized herein.

I. ADDITIONS OR CHANGES TO THE PROJECT MANUAL

SPECIFICATIONS SECTION 23 09 00 – INSTRUMENTATION AND CONTROL FORE HVAC

A. ADD JCI to the list of approved manufacturers in paragraph 2.2.A.

SPECIFICATIONS SECTION 23 52 39 – FIRE TUBE BOILERS

A. REPLACE section in its entirety with new attached section 23 52 39R.

II. ADDITIONS OR CHANGES TO THE DRAWINGS

A. Attached Sheet M1.1 is reissued.

END OF ADDENDUM #2

SECTION 235239 - FIRE-TUBE BOILERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes packaged, factory-fabricated and -assembled boilers, trim, and accessories for generating steam] with the following configurations and burners:
 - 1. Horizontal, Scotch Marine fire-tube boiler.
 - 2. Gas burner.

1.3 ACTION SUBMITTALS

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

1.4 INFORMATIONAL SUBMITTALS

- A. Warranty: Special warranty specified in this Section.
- B. Other Informational Submittals:
 - 1. ASME Stamp Certification and Report: Submit "A," "S," or "PP" stamp certificate of authorization, as required by authorities having jurisdiction, and document hydrostatic testing of piping external to boiler.
 - 2. Startup service reports provided by the boiler manufacturer or manufacturer's Authorized Service Representative.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For boilers, components, and accessories to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

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- B. ASME Compliance: Fabricate and label boilers to comply with ASME Boiler and Pressure Vessel Code.
- C. ASHRAE/IESNA 90.1 Compliance: Boilers shall have minimum efficiency according to "Gas and Oil Fired Boilers - Minimum Efficiency Requirements."
- D. UL Compliance: Test Boilers 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.

1.7 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace front- and rear-door refractories and heat exchangers of boilers that fail in materials or workmanship within specified warranty period.
 - 1. Horizontal, Fire-Tube: Refractory in front and rear doors, 10 years from date of startup by factory-authorized personnel.

PART 2 - PRODUCTS

2.1 HORIZONTAL, FIRE-TUBE BOILERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AESYS Technologies, LLC.
 - 2. Burnham Commercial-Model 4S.
 - 3. Cleaver-Brooks-Model CB.
 - 4. Lattner Boiler Manufacturing.
 - 5. Sellers Engineering Co.
 - 6. Superior Boiler Works, Inc.
- B. Description: Factory-fabricated, -assembled, and -tested, horizontal, Scotch Marine fire-tube boilers with heat exchanger sealed pressure tight, built on a steel base; including insulated jacket, flue-gas vent, steam discharge and water return connections, and controls.
- C. Pressure Vessel Design: Straight, steel tubes welded into steel headers. Multi-Pass Wetback or Dryback boiler design built and certified to ASME Section IV, heating boilers. Minimum heat-exchanger surface of 5 sq. ft./bhp. Include the following accessories:
 - 1. Handhole and Manhole openings for water-side inspections as required by ASME.
 - 2. Lifting lugs on top of boiler.

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3. Minimum of (1), 1.5 NPS Bottom Blowdown Connection located at shell low point for draining boiler.
4. Accessible drain and blowdown tappings, piped for both high and low, for surface and mud removal.
5. Tappings for steam supply, makeup, level controls, and chemical treatment.

D. Front and Rear Doors:

1. Hinged or Davited, sealed with heat-resistant gaskets and fastened with lugs and cap screws.
2. Designed so tube sheets and flues are fully accessible for inspection or cleaning when doors are open.
3. Include observation ports in doors at both ends of boiler for inspection of flame conditions.
4. Door refractory and insulation shall be accessible for inspection and maintenance.

E. Casing:

1. Insulation: Minimum 2-inch- thick, mineral-fiber insulation surrounding the boiler shell.
2. Flue Connection: Flange at top of boiler.
3. Jacket: Sheet metal, with screw-fastened closures and baked-enamel protective finish.
4. Mounting base to secure boiler to concrete base.
5. Control Compartment Enclosure: NEMA 250, Type 1.

2.2 FORCED-DRAFT GAS BURNERS

- A. Burner: Welded construction with multivane, stainless-steel, flame-retention diffuser for natural gas. Mount burner on hinged access door to permit access to combustion chamber.
- B. Blower: Forward-curved centrifugal fan integral to burner, directly driven by motor; with adjustable, dual-blade damper assembly and locking quadrant to set air-fuel ratio.
 1. Motors: Comply with requirements specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
 - a. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
- C. Gas Train: Control devices and modulating control sequence shall comply with requirements in UL, FM, GE-GAP and CSD-1
- D. Pilot: Intermittent-electric-spark pilot ignition with 100 percent main-valve and dual pilot-safety shutoff valves with electronic supervision of burner flame.
- E. Provide Burner with linkage-less servo-motor operated controls capable of integration and communication with BMS System. Provide any required interface cards or buses for integration and communication for DDC Start/Stop, status (Flame Supervision), Lead/Lag Status and Modulation.

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2.3 TRIM

- A. Include devices sized to comply with ANSI B31.9, "Building Services Piping."
- B. Pressure Controllers: Operating, firing rate, and high limit.
- C. Safety Relief Valve:
 - 1. Size and Capacity: As required for equipment according to ASME Boiler and Pressure Vessel Code.
 - 2. Description: Fully enclosed steel spring with adjustable pressure range and positive shutoff; factory set and sealed.
 - a. Drip-Pan Elbow: Cast iron and having threaded inlet and outlet with threads complying with ASME B1.20.1.
- D. Pressure Gage: Minimum 6-inch diameter. Gage shall have normal operating pressure about 50 percent of full range.
- E. Water Column: Minimum 12-inch glass gage with shutoff cocks.
- F. Blowdown Valves: Factory-installed bottom and surface, slow-acting blowdown valves same size as boiler blowdown nozzle.
- G. Stop Valves: Boiler inlets and outlets, except safety relief valves or preheater inlet and outlet, shall be equipped with stop valve in an accessible location as near as practical to boiler nozzle and same size or larger than nozzle. Valves larger than NPS 2 shall have rising stem.

2.4 CONTROLS

- A. Boiler operating controls and control panel shall include the following devices and features:
 - 1. Control transformer.
 - 2. Set-Point Adjust: Set points shall be adjustable.
 - 3. Operating Pressure Control: Factory wired and mounted to cycle burner.
 - 4. Low-Water Cutoff and Pump Control: Cycle feedwater pump(s) for makeup water control.
 - 5. Sequence of Operation: Electric, factory-fabricated and field-installed PID control panel to control burner firing rate to maintain a constant steam pressure. Maintain pressure set point plus or minus 10 percent.
 - a. Include automatic, alternating-firing sequence for multiple boilers to ensure maximum system efficiency throughout the load range and to provide equal runtime for boilers.
- B. Burner Operating Controls: To maintain safe operating conditions, burner safety controls limit burner operation.
 - 1. High Cutoff: Manual reset stops burner if operating conditions rise above maximum boiler design pressure.
 - 2. Low-Water Cutoff Switch: Float and electronic probe shall prevent burner operation on low water. Cutoff switch shall be manual-reset type.

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3. Audible Alarm: Factory mounted on control panel with silence switch; shall sound alarm for above conditions.
- C. Boiler plant master control panel: In addition to the boiler's individual control panels described above, the master control panel shall allow for central control for all boilers, enables remote monitoring, and modulate boilers in lead-lag or unison modulation. The panel shall have 10" color touch-screen human machine interface.
- D. Building Automation System Interface: Factory-install hardware and software to enable building automation system to monitor, control, and display boiler status and alarms.
 1. A communication interface with building automation system shall enable building automation system operator to remotely control and monitor the boiler from an operator workstation. Control features available, and monitoring points displayed, locally at boiler control panel shall be available through building automation system.

2.5 ELECTRICAL POWER

- A. Controllers, Electrical Devices, and Wiring: Electrical devices and connections are specified in electrical Sections.
- B. Single-Point Field Power Connection: Factory-installed and -wired switches, motor controllers, transformers, and other electrical devices necessary shall provide a single-point field power connection to boiler.
 1. House in NEMA 250, Type 1 enclosure.
 2. Wiring shall be numbered and color-coded to match wiring diagram.
 3. Install wiring outside of an enclosure in a metal raceway.
 4. Field power interface shall be to nonfused disconnect switch.
 5. Provide branch power circuit to each motor and to controls with a disconnect switch or circuit breaker.
 6. Provide each motor with overcurrent protection.

2.6 SOURCE QUALITY CONTROL

- A. Test and inspect factory-assembled boilers, before shipping, according to ASME Boiler and Pressure Vessel Code.
- B. 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 test.
- C. Allow Owner access to source quality-control testing of boilers. Notify Architect 14 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. Equipment Mounting:
 - 1. Install boilers on cast-in-place concrete equipment base(s). Comply with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete."
 - 2. Comply with requirements for vibration isolation devices specified in Section 230548.13 "Vibration Controls for HVAC."
- 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 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to boiler to allow service and maintenance.
- C. Connect gas piping to boiler gas-train inlet with union. Piping shall be at least full size of gas train connection. Provide a reducer if required.
- D. Connect steam and condensate piping to supply-, return-, and blowdown-boiler tappings with shutoff valve and union or flange at each connection.
- E. Install piping from safety relief valves to nearest floor drain.
- F. Install piping from safety valves to drip-pan elbow and to nearest floor drain.

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- G. 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.
- H. Connect breeching full size to boiler outlet. Comply with requirements in Section 235100 "Breechings, Chimneys, and Stacks" for venting materials.
- I. Install flue-gas recirculation duct from vent to burner. Comply with requirements in Section 235100 "Breechings, Chimneys, and Stacks" for recirculation duct materials.
- J. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
- K. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

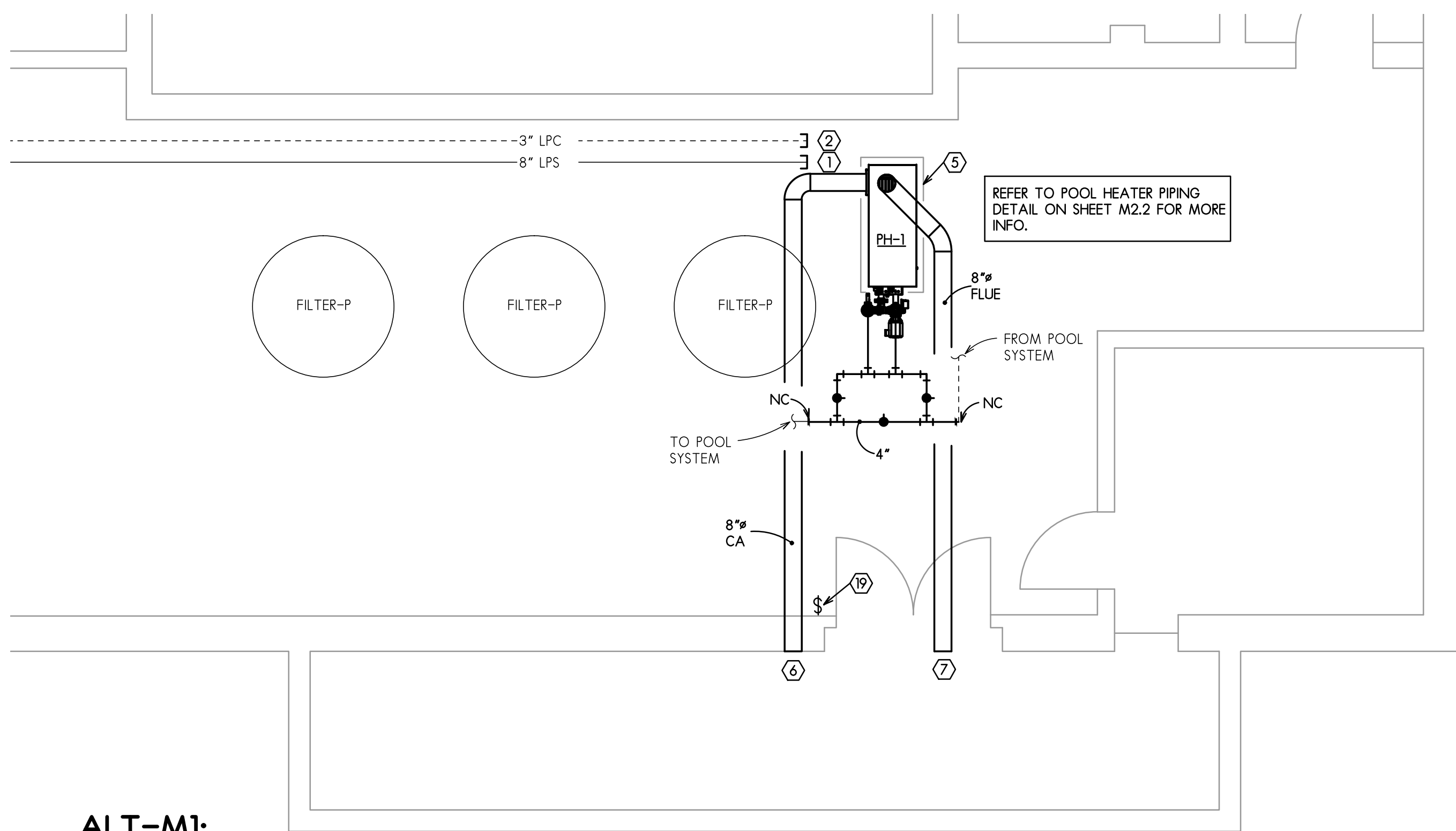
- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- B. The factory-authorized service representative shall perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Perform installation and startup checks according to manufacturer's written instructions.
 - 2. Leak Test: Hydrostatic test. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: 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. Burner Test: Adjust burner to eliminate excess oxygen, carbon dioxide, oxides of nitrogen emissions, and carbon monoxide in flue gas and to achieve combustion efficiency.
 - b. Check and adjust initial operating set points and high- and low-limit safety set points of fuel supply, water level, and steam pressure.
 - c. Set field-adjustable switches and circuit-breaker trip ranges as indicated.
- C. Remove and replace malfunctioning units and retest as specified above.
- D. Prepare test and inspection reports.
- E. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other than normal occupancy hours for this purpose.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain boilers. Video training sessions. Refer to Section 017900 "Demonstration and Training."

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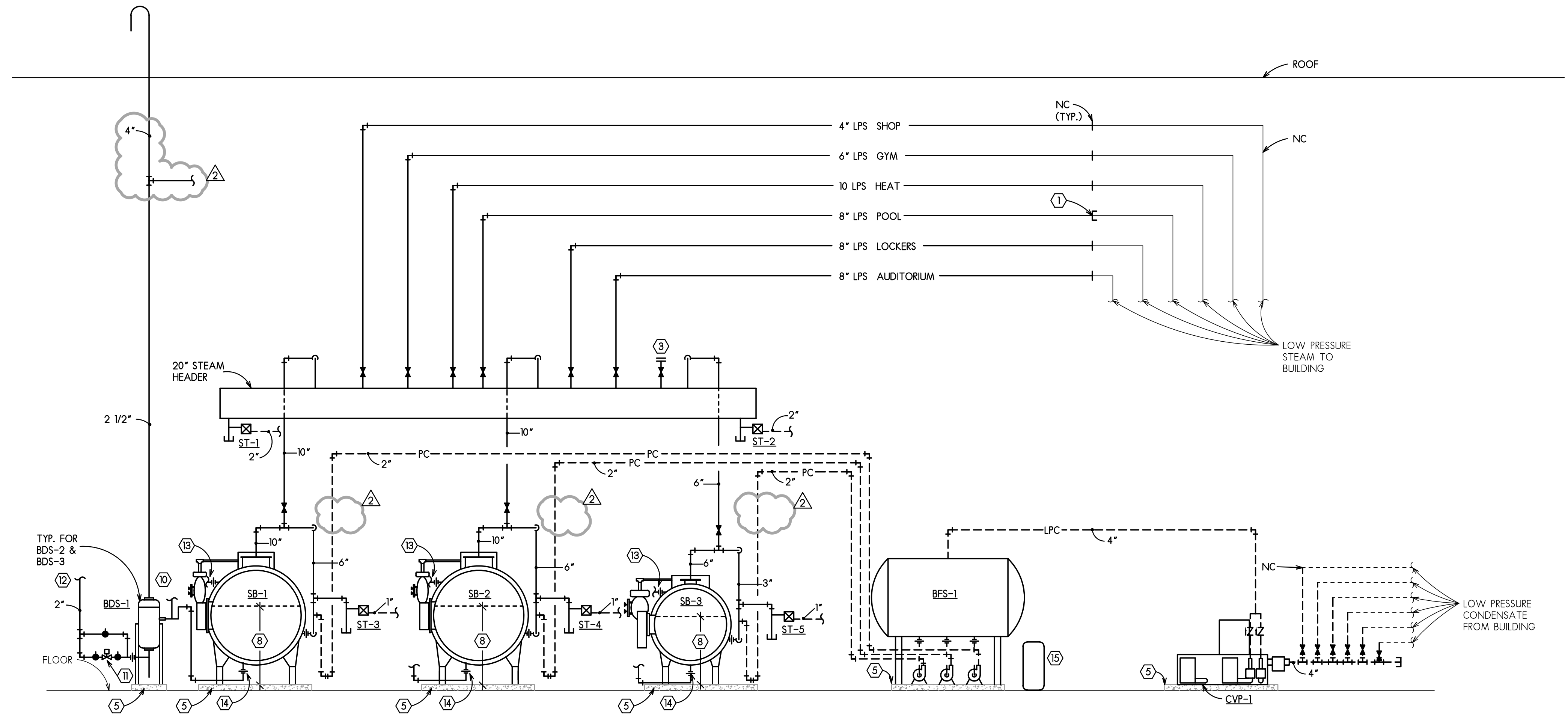
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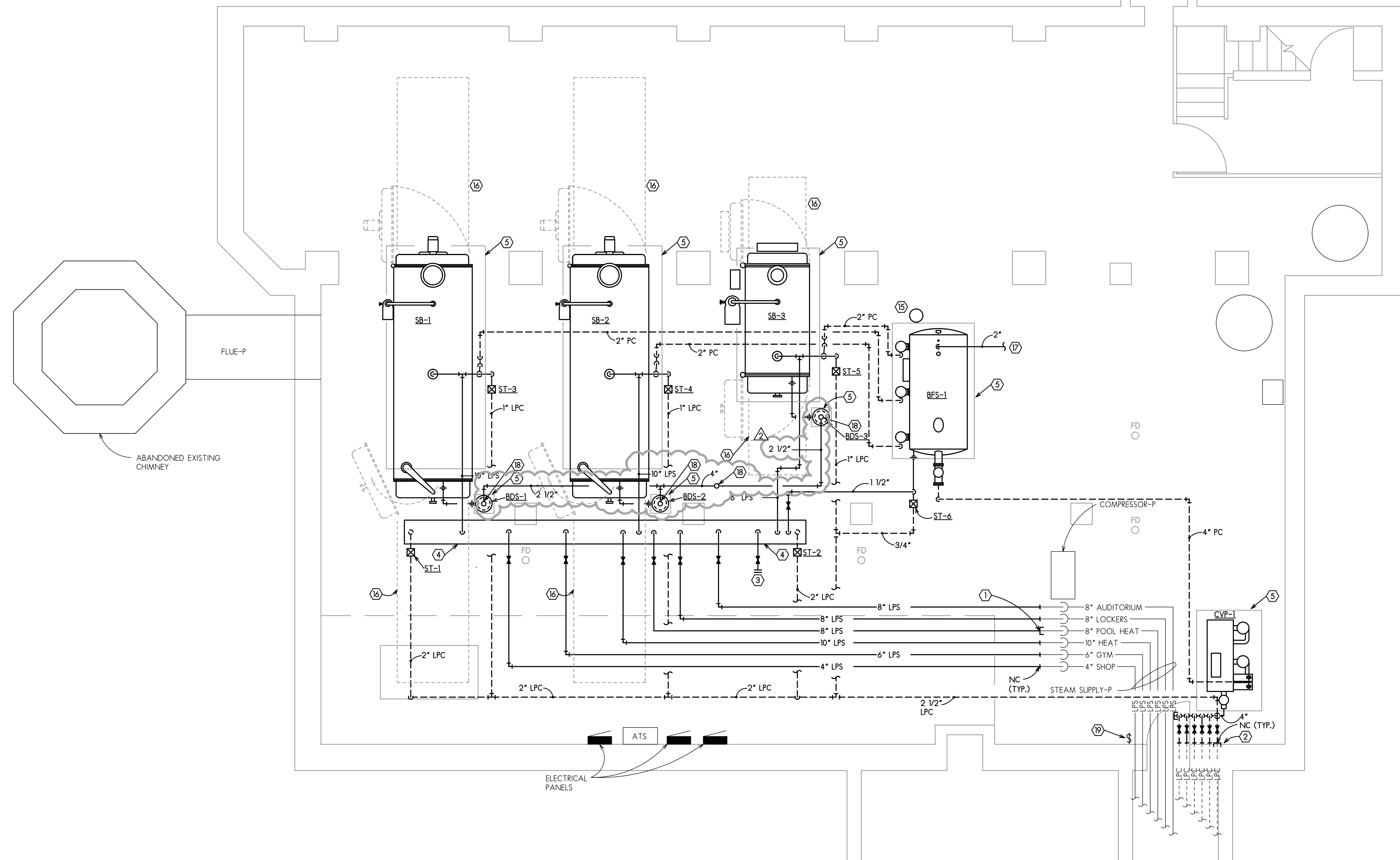
3 ALT-M1: POOL HEATER NEW WORK PLAN
SCALE: 1/4" = 1'-0"

KEYED NOTES

- ① BASE BID: CONNECT NEW 8" LPS LINE FROM HEADER TO EXISTING 8" LPS PIPE.
ALT. M1: ABANDON EXISTING STEAM SUPPLY LINE TO POOL HEAT EXCHANGER. VERIFY PIPE IS CONNECTED TO HEAT EXCHANGER IN FIELD.
- ② BASE BID: CONNECT EXISTING STEAM CONDENSATE FROM POOL SYSTEM TO NEW HEADER AS SHOWN.
ALT-M1: ABANDON EXISTING STEAM RETURN LINE FROM POOL HEAT EXCHANGER. VERIFY PIPE IS CONNECTED TO HEAT EXCHANGER IN FIELD.
- ③ 6" BLIND FLANGE AND SHUT OFF GATE VALVE FOR FUTURE CONNECTION.
- ④ 20" STEAM SUPPLY HEADER.
- ⑤ 4" THICK CONCRETE HOUSE KEEPING PAD.
- ⑥ 8" COMBUSTION AIR INTAKE TROUGH WALL WITH MFR PROVIDED WALL CAP.
- ⑦ 8" FLUE DISCHARGE THROUGH WALL WITH MFR PROVIDED WALL CAP.
- ⑧ BOILER WATER LEVEL (VERIFY WITH BOILER MFR).
- ⑨ NOT USED.
- ⑩ REFER TO BOILER BLOW DOWN SEPARATOR DETAIL ON SHEET M2.2 FOR MORE PIPING INFO.
- ⑪ TEMPERATURE REGULATOR AND SOLENOID VALVES.
- ⑫ EXTEND & CONNECT TO CW WITH RPZ.
- ⑬ TERMINATE AUTOMATIC SURFACE BLOW DOWN SYSTEM (PROVIDED BY BOILER MFR) AT BLOW DOWN SEPARATOR.
- ⑭ TERMINATE SLOW & QUICK OPEN BOTTOM BLOW DOWN PIPING AT BLOW DOWN SEPARATOR.
- ⑮ CHEMICAL FEED SYSTEM AND TANK. FIELD PIPE TO BOILER FEED TANK SYSTEM AS REQUIRED.
- ⑯ BOILER SERVICE CLEARANCE AND TUBE PULL OUT SHOWN FOR REFERENCE. FIELD LOCATE BOILERS TO ALLOW FOR SERVICE PER MFR. RECOMMENDATIONS.
- ⑰ 2" MAKE-UP WATER. EXTEND AND CONNECT TO HVAC MAKE-UP CW WITH RPZ. FIELD VERIFY.
- ⑱ 2 1/2" VENT PIPE FROM EACH BSD. COMBINE INTO 4" AS SHOWN AND RUN THROUGH ROOF WITH GOOSE NECK.
- ⑲ BOILER/HEATER EMERGENCY SHUT OFF SWITCH LOCATED & WIRED PER AHJ REQUIREMENTS.



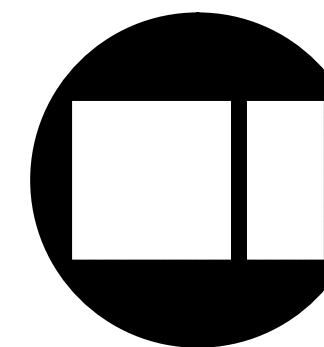
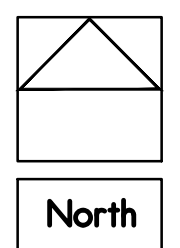
2 BOILER ROOM PIPING DIAGRAM
SCALE: N/A



1 BOILER ROOM MECHANICAL NEW WORK
SCALE: 1/4" = 1'-0"

MECHANICAL NEW WORK PLANS

SCALE: AS NOTED



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ISSUED FOR:	DATE:
PROJECT NUMBER	REVISION #
DRAWN	APPROVED
PM	RAS

DATE: 02-29-2016
PROJECT NUMBER
25107
SHEET NUMBER
M1.1