RDK Engineers
200 Brickstone Square
Andover, MA 01810-1488
December 7, 2016

BOILER REPLACEMENT
HADLEY ELEMENTARY SCHOOL
SWAMPSCOTT, MASSACHUSETTS

ADDENDUM NO. 2

Addendum Number 2
December 7, 2016

NOTICE TO BIDDERS:

This addendum is issued prior to receipt of bids and does hereby become part of the contract Documents, and in case of conflict, it shall supersede original plans and specifications. All bidders shall indicate acknowledgement of this addendum on the bid form. Failure to do so may result in disqualification in accordance with MGL Chapter 149.

ITEM 1: CONTRACT INFORMATION & BIDDING REQUIREMENTS:

1.1 Section 00 11 16 Invitation to Bid, Receipt of Bids,1st Paragraph: Please change Raymond Design Associates to RDK Engineers.

Section 00 11 16 Invitation to Bid, Receipt of Bids, 2nd Paragraph: Please delete the paragraph in its entirety and replace with the following:

The project consists of the replacement of fourteen (14) existing cast iron steam boilers, boiler feed system and piping.

1.2 Section 00 41 00 General Bid Form, Part A: Please change Raymond Design Associates to RDK Engineers.

1.3 Sample Agreement: Please change Tom Younger to Gino Cresta.
Sample Agreement: Please add Evan Katz, School Business Administrator along side Dave Castellarin.

ITEM 2: SPECIFICATIONS:

2.1 Section 01000 General Requirements, 01016 Utilities, Paragraph 1.01, Last Sentence:

Please change the Engineer to read RDK Engineers.

Section 10111 General Requirements, 01011 Contract includes (List of Drawings):

Under Plumbing: Delete reference to Drawing No. P2.01 Plumbing Boiler Room New Work Plan – Phase 2.

Section 01000 General Requirements, 01022 Personal Security Requirements, Paragraph 1.01:

Please change South Shore Vocation Technical School to Hadley Elementary School.

2.2 Section 220000 Plumbing

A. Part 1, General

1. Paragraph 1.08, Page 9, Paragraph E3: Please add the following:
   b. Gas Booster.

B. Part 2, Products,

1. Paragraph 2.01, Page 25, Table, Pipe Class A19, Please delete the 2nd column, 2" and Smaller.

2. Paragraph 2.06T.1, Warranty, Page 33, please delete the paragraph in it's entirety and replace with the following:

3. Manufacturer shall warranty to replace or properly repair equipment and materials in which defects develop within a period of twelve (12) months from date of start-up.

2.3 Please add the following paragraph to Section 220000 Plumbing Part 2:

2.07 INSULATION

A. General: The pipe covering specified herein for piping systems shall be provided in strict accordance with the manufacturer's printed instructions, the best practice of the trade and to the full intent of this specification.

1) The sealers, tapes, adhesives and mastics used in conjunction with the installation of the pipe covering specified herein shall possess the maximum possible fire safe qualities available and shall be of a type approved by Factory Mutual, Factory Insurance Association or National Fire Protection Association.

2) Valves, fittings, flanges and accessories shall have the same thickness of pipe covering applied as the adjacent pipe. Pipe covering for these items shall be factory PVC molded type.

3) Longitudinal seams and butt joint shall be sealed with a fire retardant, vapor barrier adhesive.

4) Insulation at hangers shall be protected with sheet metal saddles.

B. Interior Cold Water, Hot Water, and Hot Water Return System Piping

1) All interior cold water, tempered water, tempered water return, hot water and hot water return piping shall be insulated with a preformed fiberglass insulation which meets the property requirements of ASTM C547, "Standard Specification for Mineral Fiber Pipe Insulation". Pipe insulation shall have a white, factory applied, fire retardant, reinforced vapor barrier jacket.

2) Insulation shall be continuous through sleeves and have a thickness of 1-inch. Insulation thickness is based on conductivity "K"factor range of 0.22 - 0.28 BTU-in/hr-ft^2-^{o}F. @ 100 ^{o}F mean

temperature rating. For minimum thickness of alternative insulation types outside the stated conductivity range, see test method for steady state heat transfer properties of horizontal pipe insulations, ASTM C 335-95 and the State Energy Code.

3) Ends of insulation at termination points shall be sealed to the pipe with a pre-molded PVC type fitting. Pipe fittings and valves shall be provided with pre-molded PVC covers with fiberglass inserts.

4) Pipe insulation within 6'-0" of finished floor, in exposed installations, shall be provided with 20 mil. PVC continuous covers in addition to the vapor barrier jacket. Fittings and seams shall be solvent welded.

5) Insulation shall be manufactured by Owens-Corning Fiberglas Corp., Knauf Fiberglass, Certainteed or equal.

2.4 Section 230000 - HVAC

A. Part 1 – General

1. Page 5, Paragraph 1.02B., Related Work: Please delete B6 and B7 in their entirety.

2. Page12, Paragraph D, Product Data: Please delete D16 and D17 in their entirety.

3. Please add the following to Paragraph D:

   a. 29. Steam Unit Heater
   b. 30. Controls – Alternate #1

4. Page 16, Paragraph 110F.9, please delete in its entirety and add the following:

   a. 9. Condensate transfer unit

5. Page 16, Paragraph 1.10F, please add the following:

   a. 11. Steam Unit Heater

B. Part 2 – Products

1. Page 40, Paragraph 2.08.B.2a, Please change VMP-40 to VMP-30.

2. Page 46, Paragraph 2.08.D.2; Please change 30A Nonfused Disconnect Switch, 3 Pole, 240V AC, Heavy Duty to read the following:

   30A Nonfused Disconnect Switch 1 Pole, 120V AC, Heavy Duty

3. Page 46, Paragraph 2.08D.5: Please change to read the following:

   Combination Magnetic Starter, Having Overload Relays, With Circuit Breakers And Cover Mounted Reset Button For Each Pump.

4. Page 47, Boiler Feed Units, Paragraph 2.10.A.1, 2 and 3, please change to read the following:

    1. Rust Resistant steel condensate receiver.
    2. Three (3) boiler feed pumps with electric motor drive.
    3. Three (3) pump actuation flow switches.

5. Page 47, Paragraph 210.D.
    a. 1st sentence, please change stainless steel to /rust resistant.
    b. Please delete 3rd sentence in its entirety.

6. Page 47, Paragraph 2.10.G: Please change to read the following:

    a. First sentence, Unit to be furnished with a NEMA 1 factory fabricated control panel.

7. Page 47, Paragraph 2.10.G2: Please change to read the following:

    a. Nonfused Disconnect Switch, 3 pole, 240 V AC, Heavy Duty

8. Page 48, Paragraph 210.H.1
    a. Please add the following: Boiler #3 selector switch shall provide positions for OFF-CONT-PUMP 3.

9. Page 48, Paragraph 210.D;
    Please add the following:
    J. Float operated make-up water valve with an air gap fitting.

10. Page 50, Paragraph 2.12 Ductwork: Please delete in its entirety.

11. Page 53, Paragraph 2.13 Louvers: Please delete in its entirety.

12. Page 56, Insulation - Paragraph 2.15.L, Ductwork Insulation – General, please delete in its entirety.

13. Page 57, Metal Chimneys and Flues, Paragraph 2.16 – Please delete in its entirety and replacement with the following:

2.5 Please add the following paragraphs to Section 230000 Part 2:

2.16 METAL CHIMNEYS AND FLUES

A Per 248 CMR 5.00 and 7.00, provide the services of a licensed plumber or gasfitter to be responsible for, supervise, and/or install flue venting system(s) for all gas-fired equipment based on the equipment capacity. The licensed plumber or gasfitter shall obtain a gas fitting permit in compliance with 248 CMR 3.00 as required by the Massachusetts Fuel Gas and Plumbing Code.

B Boilers (without draft hoods, under 85% efficiency unless otherwise noted on drawings).

1. Furnish and install, as shown on the drawings, a positive pressure, dual wall, insulated breeching/stack system.
2. Breeching to be round, double wall, all metal, gas and liquid-tight factory built component system, tested and listed by UL 103 for use with building heating equipment, burning gas, solid or liquid fuels as described in NFPA-85A, B, D and NFPA-211.
3. Breeching inner shell (gas carrying pipe) to be 0.035" 304 stainless steel for liquid fuel or 316 stainless steel for solid fuels and heavy oil. Outer shell to be minimum 0.026" aluminized (indoors only) or 304 stainless steel outdoors). Both inner and outer shell construction to be all welded (tacked joints are unacceptable) and all vertical seams to be full strength 100% penetration square groove weld in accordance with AISC and/or AWS specifications and codes. Inner and outer walls to be connected by "J" clips, which shall allow for unobstructed thermal expansion of inner and outer walls.
4. Insulating barrier to consist of two (2) inches of six (6) pounds per cubic foot density insulation secured to the inner shell with steel straps.
5. Inner shell to be sealed by use of 304 stainless steel bands and high-temperature sealant. The outer shell to be joined together with sealant and one piece 304 stainless steel draw bands. Joint sealant to be supplied by the manufacturer for the anticipated temperature range.
6. System to be complete with elbows, tees, laterals, tapered increasers/reducers, thimbles, support plates, expansion sections, flange adapters, boiler kits, and all necessary hangers, guying and supports. Final system design/layout to be by breeching manufacturer. Submit shop drawings.
7. System to be warranted against defects in materials and workmanship for a period of ten (10)) years from date of original installation.
8. System shall be as manufactured by Schebler, Selkirk Metalbestos, Ampco, Metal-Fab, or approved equal providing they meet the specified requirements.

C. Gas-Fired only Water Heaters (with draft hoods, up to 84%efficiency):

1. Furnish and install, as shown on the drawings, type-B gas vent systems for the gas-fired only equipment with draft hoods.
2. The factory-built chimney shall be laboratory tested and listed by Underwriters' Laboratories, Inc., as "Building Heating Appliance Chimney" (ref. UL std. 103) for use with building heating equipment, burning gas or fuel oil as described in NFPA 211, Chapter 2.
3. The double-wall metal vent piping shall have an outer jacket of galvanized steel (indoors only, for outdoors stainless steel shall be used) and an inner liner of type 430 stainless steel. The outer jacket and inner liner shall be separated by a 1/2" air space, except as required for

construction of the pipe, which shall be in accordance with the terms of the products UL listing.

4. All runs of vent piping shall be supported, guided and compensated for expansion at intervals as specified in the product installation instructions and as by the manufacturer.
5. Vent piping size, system configuration and parts must be selected to operate only under a neutral or negative pressure induced or gravity draft during all operating modes of the attached appliances.
6. Furnish and install all barometric flue dampers where required for proper operation. Dampers shall be compatible for use in system specified as fired by natural gas and shall be furnished with thermal spill switches, wired to shut down all burners in the event of a flue blockage or downdraft condition.
7. Vent piping system shall be complete with all required elbows, tees, laterals, tapered increasers/reducers, adapters, adjustable lengths, expansion sections, appliance connectors, thimbles and all necessary hangers and supports. Final system design/layout shall be by vent piping system manufacturer. Submit shop drawings for approval.
8. System shall be as manufactured by Schebler, Selkirk Metalbestos, Ampco, Metal-Fab, or approved equal providing they meet the specified requirements.

D. Single Wall Vents (Chimney Liner)

1. Single wall metal vents.
2. All steel single wall stack:

   a. Manufacturers: Subject to compliance with requirements, provide all steel, positive pressure single wall vents of the following type:
      1) Clearver Brooks Exhaust Solutions, Model CBI.
      2) Or equal.

3. The factory built breeching system shall be made in accordance with NFPA 211. This stack system shall be designed and installed to be gas tight. It shall be UL 1777. This breeching system shall be designed to compensate for all flue gas induced thermal expansions. Clearances to combustible materials shall be per installation instructions and shall have been determined for a continuous operation at temperatures up to 1000° F.
4. The joint assembly shall be a mal/female slip-type jointing with flange to flange and V-band assembly. An internal sleeve serves for readily alignment as well as long term joint seal protection from condensate, water and flue gas temperature. Non-slip type joints are not acceptable.
5. The single wall stack is made of an inner gas carrying pipe of 20 gauge type 304 stainless steel. The materials and construction of the modular sections and accessories shall be as specified by the terms of the product's UL listing.

6. The breeching and stack shall be warranted against functional failure due to defects in material and manufacturer's workmanship for a period of 10 years from the date of delivery.
7. Drawings showing the actual layout and drawn to scale shall be provided by the manufacturer. The system shall be installed as designed by the manufacturer and in accordance with the terms of the manufacturer's 10 year warranty and in conjunction with sound engineering practice.

2.17 AUTOMATIC TEMPERATURE CONTROLS

A. Automatic Temperature Controls shall be as specified herein.

B. Summary – Section includes:

1. Multi-stage steam boiler cycling and set point sequencing control.
2. Automatic Control Damper.

C. Related Sections:

1. Conforms to applicable building code requirements of all authorities having jurisdiction.

D. Manufactuers:

1. Heat-Timer Corporation
2. Or approved equal.

E. References

1. International Organization for Standardization (ISO)
2. Manufacturer shall be ISO 9001:2008 Quality Management Systems Certified.
3. Underwriters Laboratories, Inc. (UL):
4. The control shall be tested per standard 916 "Energy Management Equipment".
5. The City of New York, Department of Environmental Protection (DEP).
6. The control shall be approved for installation in New York City by DEP.

F. Quality Assurance

1. Manufacturer's Quality System:
   a. Registered to ISO 9001:2008 Quality Standard, including in-house engineering for product design activities.
   b. The control must be UL tested and certified per standard 916 "Energy Management Equipment".

G. Control Operation

1. Description: The control shall operate on 120 VAC, with a

maximum power of 30 VA. The control shall be pre-engineered and programmed exclusively for the cycling, sequencing, and lead rotation of multiple steam boilers based on a PID logic. It shall incorporate the following integrated functions: Steam Outdoor Reset, Steam Set Point, Outdoor temperature cutoff(s), day/night heat level programming, and Boost (optimum start/stop).

2. Stages: The control shall have eight normally open relay contacts that can be used to start and stop each stage. The control shall have the capability to operate multiple single-stage, two-stage, three-stage, or four- stage steam boilers. It shall be capable of controlling a total of eight stages without the use of additional control extensions. It shall be capable of controlling up to 24 total stages using a maximum of two external compatible extension controls.
3. Sequence of Operation:
   a. Cycle Operating Concept: By monitoring the outside temperature, the control shall be able to anticipate the heating needs of the building. Each Cycle period (usually 60 minutes long but adjustable between 10 minutes and 240 minutes, depending on the building response) is divided into a Cycle-ON segment and a Cycle-OFF segment. The length of the Cycle-ON segment will vary with the outdoor temperature and the Heat Adjustment selection. The colder it is outside, the longer the ON part of the cycle shall be, and the shorter the OFF part of the cycle shall be. The Heat Adjustment selection provides multiple ratios of Cycle-ON to Cycle-OFF that varies based on the building heat dissipation rate.
   b. Adding and Subtracting Stages: After the purge elapses and during the establishing heat and Cycle-On periods, the control shall use a number of adjustable settings to customize the sequencing to the specific application and equipment being controlled. These settings shall include reaction time, minimum runtime, last stage hold, and standby delay. If additional output is required, the control shall wait a full reaction time before energizing any additional stages. If the control PID requires output reduction, the control shall turn-off a stage after making sure that the stage has run for a full minimum runtime before de-energizing it.
4. Features**:**
   a. Heat Adjustment: The control shall provide two (2) independent heat adjustments, one for Normal (Day) mode and one for Save (Night) mode. The heat adjustment shall allow for the selection of various “cycling” curves that regulate the heating system in accordance with the outside temperature.
   b. Schedules: A digital, 7 day electronic time clock shall be incorporated to switch between the Normal (Day) and Save (Night) modes of operation. The clock shall be capable of 4 separate Normal (Day) / Save (Night) schedules per day and each day can be programmed

independently. The normal/save schedule shall be stored in E-Prom indefinitely. Copy and erase functions shall be provided to facilitate programming.

c. Manual Shift: A menu selection option shall be provided to immediately switch from the Normal (Day) to Save (Night), Save to Normal mode, or Save to Extended Day with an adjustable delay. If a shift to Save (Night) or to Normal (Day) is selected the control shall remain as such until the next setting on the schedule. In Extended Day mode, a shift to Normal (Day) the control shall automatically revert back to the Save (Night) mode after an adjustable time delay that ranges from 60 to 240 minutes.

d. Boost (Optimum Start/Stop): The control shall incorporate 3 separate field selectable “boost” functions. During the “boost” period the steam source will not be cycled. The digital display will indicate a boost is occurring and the type of boost. The choices shall be:

e. Manual boost shall offer a fixed warm-up period of 0-120 minutes.

   1) Vari-Boost shall offer an automatic variable warm-up period that varies in length based on the outside temperature.

   2) Vari-Boost with Early Shutdown shall provide an automatically variable warm-up with an automatically variable early switch to the Setback Save mode based on the outside temperature.

f. Season: A summer/winter menu selection shall be provided for summer shutdown. In the summer mode the control panel will not activate the steam source.

g. Set Point: The control shall provide an integral sensor set point adjustment for steam heating or process applications.

h. Reaction Time and Minimum Runtime: The control shall have the capability of adjusting the rate at which stages are added or subtracted using the Reaction Time and Minimum Runtime settings.

i. Last Stage Hold: The control shall have a last stage hold feature that shall keep the last boiler’s lowest stage on for an additional, field adjustable, PSI above the set point before de-energizing it to reduce short cycling of the lead boiler.

j. Purge Time: The control shall have an adjustable purge delay. This setting shall determine the delay time required for a boiler to start to produce output

k. Rotation: The control shall be capable of rotating the boilers either based on an adjustable time period (between 1 hour and 999 hours), First-On/First-Off, or manually.

l. Parallel or Normal Sequencing: The control shall have an option for parallel sequencing where the control shall

start the lower firing stages on all boilers before energizing the higher firing stages. Also, it shall have a normal sequencing mode where it shall bring on the lowest stage of a unit followed by the next higher stage on the same unit. Then when all stages on that unit are energized, it shall do the same to the next unit inline.

m. Memory: The control shall store all configuration and settings on EE-Prom. In case of power failure the control should be able to retrieve all of its latest settings.

n. Display: The control shall have a four line by twenty-character alphanumeric display capable of displaying both numbers and characters. The display shall be visible with no ambient light. All control operation information shall be available for display. During times of inactivity, or 5 minutes after the last user entry, the display shall enter default mode. In this mode the control shall display the outdoor temperature, system pressure, and each stage status.

o. Setback Schedule or Remote Setback: The control shall have a setback setting were it will reduce the pressure of the system either based on the programmed schedule or using an external setback signal.

5. Inputs:

a. Outdoor Temperature: This shall be the value read from the outdoor sensor placed on the north side of the building at least 10 Ft. above the ground.

b. System Pressure: This shall be the value read from the system pressure transducer placed on the main header to measure the steam pressure.

c. External Shutdown: The control shall be capable of accepting a dry-contact shutdown input. This shall prevent any stage from being activated when the contact is closed.

d. Prove Input: The control shall be capable of accepting a dry-contact system prove input to check on system components before energizing any boiler stage. This shall prevent any stage from being activated until the contact is closed.

6. Outputs:

a. Eight Stage relay outputs

b. System relay output

7. Data Points:

a. Day-Heat Adjustment/Night-Heat Adjustment: The control shall have two individually changeable heat-adjustments, one for the day and the second for the night. The heat-adjustment setting shall change the ratio of the Cycle-ON to Cycle-OFF at any given outdoor temperature.

b. Day Outdoor Cutoff/Night Outdoor Cutoff: The control shall provide two (2) integral outdoor sensor set points,

one for Normal (Day) operation and one for Save (Night) operation. They shall be independently adjustable, in 1° increments. Their settings shall be digitally displayed. The range of settings is 20° to 100°. The settings shall be stored in E-Prom for an indefinite time period.

c. Heating Cycle Length: The cycle length shall be adjustable between 10 to 240 minutes. The control shall digitally display the elapsed time of the cycle as well as the current segment of the current cycle.

d. System Set Point: The control shall provide an adjustable system pressure set point. The sensor's set point and current pressure shall be digitally displayed.

H. Communication Options **(Alternate #1)**

1. Internet Communication**:** The control shall be capable of communicating to the Internet using a high-speed Internet connection to communicate to the manufacturer or manufacturer representative web servers to send or receive its information.

   a. Remote **users** of the control shall have the capability of changing control parameters remotely using a web browser when provided with security log in information to the manufacturer's web site. In case of Internet communication malfunction, the control shall be capable of operating independently.

   b. Security: The control shall offer two levels of security, a web security and a control security. The web security shall have a minimum of two levels, a READ ONLY user and a FULL RIGHTS user. Multiple users shall be capable of accessing the control through the web system at the same time. During that access period, only a single user shall be capable of changing the control settings. The control security shall have a password security that allows only authorized users to make control changes.

   c. Control and Sensor Data Logging/History: The control shall be capable of sending all of its data as well its sensor data to a remote server for storage. The data shall be accessible through the Internet using a web browser.

   d. Alarms**:** The control shall have alarm setting and delivery capabilities. The control and Internet system shall be capable of sending multiple alarm deliveries for each occurrence to cell phones as a text message or to multiple email addresses.

2. BACnet IP Communication: The control shall be BACnet IP capable. It shall provide the user with BACnet IP communication Interface to an Energy Management System (EMS) or Building Management System (BMS) on the same BACnet network. The control shall be designed to be BACnet Application Specific Controller (B-ASC). The control shall manage the boilers through direct wiring to the equipment and not through the BACnet network.

3. BACnet MSTP Communication: The control shall be

BACnet IP capable. However, will communicate to the BACnet network through a BACnet IP to BACnet MSTP router that is supplied by the control manufacturer at additional cost. It shall provide the user with BACnet MSTP communication Interface to an Energy Management System (EMS) or Building Management System (BMS) on the same BACnet network. The control shall be designed to be BACnet Application Specific Controller (B-ASC). The control shall manage the boilers through direct wiring to the equipment and not through the BACnet network.

I. Control Dampers and Actuators

1. Automatic dampers, furnished by the Contractor shall be low leakage and include all required linkages, supports, actuators, switches, etc. Dampers are to be installed by the HVAC Contractor. All blank-off plates and conversions necessary to install smaller than duct size dampers are the responsibility of the Contractor. Control dampers shall be designed for operation in a temperature range of -25^{o}F and 180^{o}F. Smoke dampers shall be UL 555S rated.
2. Damper blade width shall not exceed six inches unless otherwise noted on drawings. Blade and frame seals shall be replaceable extruded silicone, EDPM, or PVC coated polyester (for low velocity dampers only) on blade edges, TPE or stainless steel compression at jambs. Seals and linkages shall provide tight closing, ultra low leakage dampers.
3. Dampers installed on fan discharges shall be oriented such the blades are perpendicular to the fan shaft, this will minimize pressure drop due to uneven airflow from the fan. Unless otherwise noted, provide opposed blade dampers for modulating applications and parallel blade for two-position control. Dampers, providing they meet the requirements of these specifications, shall be as manufactured by Ruskin, Arrow, TAMCO (T. A. Morrison), American Warming and Ventilating (AWV), Vent Products, Greenheck, or Johnson Controls. Note that not all manufacturers may make all types of dampers. Model numbers shown are used to indicate the minimum acceptable quality for each type of damper.
4. Dampers used within 4 feet of outdoor wall louvers, all penthouse/gooseneck intakes or reliefs, and in aluminum duct systems, shall be aluminum. Other dampers used in galvanized steel duct systems shall be either galvanized steel, or aluminum. Dampers for use in stainless steel duct systems shall be either stainless steel or baked herisite coated aluminum (with no steel or galvanized steel parts).
5. Provide insulated aluminum dampers for all outdoor air louvers (such as mechanical and generator room ventilation, space relief's, etc.) and on the generator exhaust louvers. Insulated dampers shall be equal to Arrow model AFDTI-25LT, Tamco Series 9000BF, Greenheck model ICD-45, AWV model CR58, or Johnson VD-1252 with thermally broken frame and with blades foam insulated and thermally broken to provide a minimum overall R-value of 1.2.

Maximum leakage shall not exceed Class 1A (3.0 cfm/sf at 1" w.g. static pressure differential) for all sizes.

6. Low pressure and smoke control dampers (on up to 2" pressure class ductwork) shall be flat blade or airfoil type designed for a minimum of 2.5" differential pressure (all sizes) and up to 2,000 fpm face velocity. These are designated as low pressure dampers. Maximum size of modules for large dampers shall be 4' x 4' (size could be pressure limited) with an AMCA certified leakage rate not exceeding 3.0 (4.0 for smoke dampers) cfm/sf at 1" w.g. static pressure differential for all sizes. Where larger dampers are needed (either dimension), incorporate mullion supports (same material as damper frame) designed to prevent failure or deformation of the damper assembly up to a differential pressure of 4" w.g. Maximum pressure drop of a fully open 2' x 2' damper at 1,500 fpm shall not exceed 0.08".

7. Aluminum Dampers:
   a. Low Pressure Dampers: Frames and single thickness or airfoil blades shall be constructed of not less than 0.080" thick extruded aluminum, type 6063-T5 with minimum 4" deep frame. Linkage hardware shall be installed in frame side and be constructed of aluminum and corrosion resistant, zinc & nickel-plated steel (stainless steel for use in stainless steel duct systems). Coordinate with manufacturers for inclusion of thrust collars and other special requirements where vertical blades are required (such as fan discharges). Aluminum low pressure control dampers shall be equal to Greenheck model VCD-40 or 43 or Ruskin Type CD50. Aluminum low pressure smoke dampers shall be equal to Greenheck model SMD-401M or Ruskin type SD50M.
8. Damper actuators shall be electronic direct coupled over the shaft, enabling it to be mounted directly to the damper shaft with a "V" shaped toothed cradle (to minimize slippage) without the need for connecting linkage. Actuators shall have electronic overload circuitry to prevent damage. Actuators shall have position indicator. For power-failure/safety applications, an internal mechanical, spring return mechanism shall be built into the actuator housing. Spring shall be capable of easy field change from normally open to normally closed. Actuators shall have an external manual gear release (above 60 in-lb torque, provide manual crank) to allow manual positioning of the damper when the actuator is not powered. Modulating actuators shall accept a 0 to 10 VDC or 0 to 20 mA control input and provide a 2 to 10 VDC or 4 to 20 mA operating range. All actuators on dampers larger than 2 square feet shall provide a position feedback signal (such as 2 to 10 VDC) indicating damper position, wired to the BAS and indicated on the graphics.
9. Actuators for dampers mounted in up to 2" pressure class shall be sized for a minimum 2,500 fpm velocity and 2"

differential pressure with a minimum 15% safety factor. Actuator for dampers mounted in higher pressure class ductwork shall be sized for 4,000 fpm velocity and a differential pressure equal to the duct design pressure with a minimum 15% safety factor. Show actuator sizing calculations on submittals. Actuators shall be as manufactured by Belimo, Johnson, Siemens, or approved equal. Actuators for smoke dampers shall meet UL 555S requirements.

14. Page 60, Identification – Paragraph 3.02.A.1:

    a. 1st sentence, please delete and Specification Section 250000.

15. Page 61, Paragraph 3.02B: Please delete paragraph in its entirety.

16. Page 72, Paragraph 3.15A: Please delete the first part of 1st sentence; In addition to supports and hangers as mentioned in the MISCELLANEOUS METALS section, and start that sentence with Provide.

17. Page 72, Paragraph 3.15B: Please delete the following:

    a. 1st sentence, General
    b. 2nd sentence, HVAC Sub
    c. 3rd sentence, HVAC Sub

18. Page 73, Operating and Maintenance Instructions Paragraph 3.19A, please delete the following:

    a. 2nd sentence, Sub

19. Page 74, Paragraph 3.19B, please delete the following:

    a. 1st sentence, Sub

20. Page 74, Training, Paragraph 3.20B, please delete the following:

    a. 1st sentence, Sub
    b. 2nd sentence, Sub

    Page 74, Training, Paragraph 3.20D, please delete the following:

    a. and additional 40 hours for ATC.

ITEM 2: DRAWINGS:

2.1 Clarification narrative for Drawings PD2.00 and PD2.01:
Plumbing Construction and Phasing;

The intent of these drawings is to illustrate the proposed phasing of this project consisting of Phase 1 demolition and new work and Phase 2 demolition and new work.

<u>Phase 1 - Demolition</u>

Provide temporary 4" gas line from downstream of the existing gas meter and pressure regulating station to the temporary boiler as located on the drawings. This gas piping shall be mounted on the exterior of the building and 72" above grade. Piping shall be tested and inspected prior to connection to the temporary boiler then removed when the temporary boiler is removed. All damage to the building from the installation of the temporary gas piping shall be repaired to match existing.

Provide gas piping disconnection of seven (7) boilers as indicated on the drawings to be demolished first. Provide gas piping (4") removal within boiler room as indicated on the drawings.

Provide floor drain and blowdown tank discharge power cleaning to restore operation.

Phase 1 – New Work
Provide gas booster and make all required gas piping connections. Provide gas piping connections to the new boilers (3). Test and inspect all new gas piping for energizing.
Phase 2 – Demolition
Provide gas piping demolition to the remaining seven (7) existing boilers. Provide temporary disconnection of non-potable cold water to the blowdown tank and boiler feed unit.
Phase 2 – New Work
Connect non-potable cold water to the new blowdown tank and boiler feed unit.

2.2 Clarification narrative for Drawings H0.00, HD2.01, HD2.02, H2.01, H2.02, H2.03, and H2.04: HVAC Construction and Phasing;

The intent of these drawings is to illustrate the proposed phasing of this project consisting of Phase 1 demolition and new work and Phase 2 demolition and new work.

Phase 1 - Demolition

Provide temporary, trailer-mounted, 60 BHP gas-fired boiler with a protective 6'-0" chain link fence as shown on the drawings. Provide a temporary, insulated 4" LPS and 1" BF piping from the boiler room to the temporary boiler with temporary power (see Electrical) and controls (pressure control from existing pressure controller and boiler feed signal to existing boiler feed unit). Temporary boiler shall be connected, tested, and available for use prior to the start of any demolition and shall remain available until the Phase 1 New Work (new boilers and gas booster along with all required piping, controls, etc.) are ready for operation. At the completion of Phase 1 work the temporary boiler may be removed.

Demolish seven (7) existing boilers and associated piping, controls, and breeching as shown on the drawings. Maintain operation of the other existing seven (7) boilers.

Phase 1 – New Work
Provide the three (3) new boilers, piping, breeching, and controls as shown on the drawings.
Phase 2 – Demolition
Demolish the remaining existing seven (7) boilers and associated piping, controls, and breeching as shown on the drawings. Demolish the existing condensate transfer unit, boiler feed unit, and blowdown tank as shown on the drawings. Coordinate all work to maintain heating within the school and minimize downtime.
Phase 2 – New Work

Provide the new condensate transfer unit, triplex boiler feed unit, blowdown tank, controls, chimney liner (complete breeching installation), unit heater, concrete pads/extensions, piping (complete), insulation, and combustion air dampers. Provide testing, inspections, and start-up of all equipment.

Add the following sketches to the indicated drawings:

1. SKH-1: Boiler Room Unit Heater to drawing H2.02.
2. SKH-2: Boiler Room Breeching to drawing H2.03.
3. SKH-3: Boiler Feed & Unit Heater Schedules to drawing H8.00
4. SKE-1: Boiler Room Demolition and New Work Part Plans to drawing ED2.00 and E2.00.
5. SKE-2: Electrical Schedule to drawing E9.00.

Replace the existing drawings noted below with following new drawings:

1. P2.00 – Plumbing Boiler Room New Work Phase 1 with P2.00 – Plumbing Boiler Room New Work Phase 1 Revision 1 dated 12/7/16.
2. H0.01 – HVAC Boiler Room Equipment Plan & Temp Boiler with H0.01 – HVAC Boiler Room Equipment & Temp Boiler Revision 1 dated 12/7/16.
3. H6.00 – HVAC Controls with H6.00 – HVAC Schematic Revision 1 dated 12/7/16.

ITEM 3: QUESTIONS FROM CONTRACTORS:

3.1 Plans show a note at the existing 50 or 75 gal water heater for new 6 flue (type Bi) but the spec has the boiler & water heater flue together as positive pressure insulated flue, Do they want type B gas vent per plans or positive flue per spec?

RDK RESPONSE: Use of type B vent to serve the existing water heater to remain has been clarified on the drawings and specifications revisions. Refer to Items 1 and 2.

3.2. Several drawings show the existing common breaching as 30" and several show it at 20'. Which is correct?

RDK RESPONSE: Portions of the existing breeching are 30" round which is clouded on the Drawings. Refer to Item 2.

3.3. The specified boiler has a 12' flue outlet per Fulton data. Plans show 6 from boilers.

RDK RESPONSE: The breeching branches to each boiler shall be 12" round. See Item 2 for clarification.

3.4 Plans shows a 22x22 square liner. Can we provide a 20 single wall liner like we do on all other projects?

RDK Response: The drawings have been clarified to provide a 20" round single wall liner for the boilers terminating 36" above the existing chimney with a storm cap and flashing between the breeching and the chimney opening. The single wall liner shall transition to the specified double wall breeching where exposed to the outdoors. This is typical for the water heater B vent as well. See Items 1 and 2.

3.5 Stack height is not indicated on the plans

RDK RESPONSE: The drawings have been clarified to show the height of the existing chimney (approximately 50'-0"). See Item 2.

3.6 Could the complete new breeching and liner system be installed under phase I with a 20x18 tee to tie in the 7 remaining boilers? The tee could be capped and used as a clean out after the second bank of boilers are removed. This would eliminate most of the connecting of dis-similar products which can damage the flanges.

RDK RESPONSE: The successful contractor may submit revised work sequencing for approval provided a benefit is realized by the Owner.

3.7. If we have to work on weekends or after hours will we have to carry the cost for access to the building? If so how much?

RDK RESPONSE: The district will pick up any custodial overtime required for weekend access.

However, all weekend access needs to be requested in advance and is subject to district review and approval

3.8. Who is the existing control sub for this building?

RDK RESPONSE: This is a pneumatic system. There is no existing control sub for this building.

3.9 Do we have to line the existing chimney? If so what material and what size is the inside?

RDK RESPONSE: Yes, See Item 3 & 4.

3.10. Spec calls for all new louvers, none are shown on drawings?

RDK RESPONSE: The existing louvers are to be revised. See Items 1 and 2.

3.11. Need list of contractors that attended walk-thru.

RDK RESPONSE: The list of the meeting attendees are as follows:

Enterprise Equipment

P.J. Kennedy

LimBach Company

3.12 Why does drawing H2.01 Show Temporary Boiler as “Alternate”?

RDK RESPONSE: The temporary boiler shall be included within the base bid of this contract.

3.13 Alternate 012300-1 Paragraph 1.2.1 just lists “Bac-Net Internet Interface + Access to Boiler Controls”, I assume this applies to new boilers only correct?

RDK RESPONSE: Correct

3.14 I see no ATC spec, am I missing anything?

RDK RESPONSE: Specification 230000 2.17 Automated Temperature Controls has been added.

3.15 What is Contract Performance Time (Not Listed in Section 01 10 00)

RDK RESPONSE: Refer to Section 01 31 00, Schedule of Work.

3.16 Any Recommended “Boiler Equals”?

RDK RESPONSE: The boiler listed (Fulton) with the contract documents represents the minimum standards for the new boilers. “Equal” boilers may ben submitted for approval provided they meet the minimum standards.

3.17 The plans H2.03 & H2.04 make reference to a new blow down tank . I did not see anything scheduled on the plans H8.00. Capacity? Manufacturer?

RDK Response: The blowdown tank shall be replaced with a Penn Model A with a 1” inlet, 2” drain, and a 2 ½” vent sized for operation at 15 psi maximum. Separator shall be 14” in diameter, welded 5/16” carbon steel and ASME rated. Separator shall be constructed for floor mounting and have an automatic aftercooler.

3.18 The schedule on P0.00 make reference to a new hot water heater. The plans H2.02 & H2.04 show ETR Hot water heater. Existing to remain?

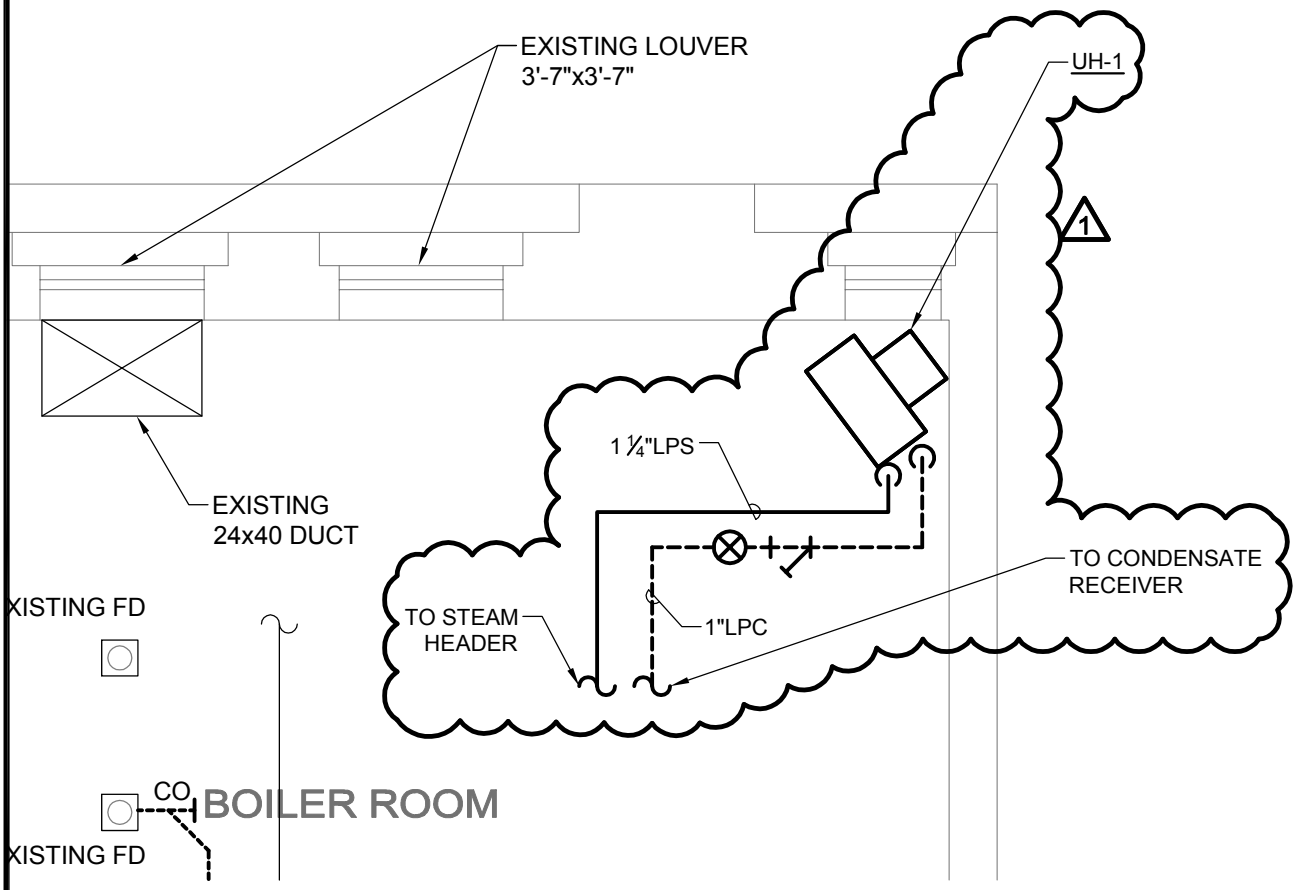
RDK Response: The existing water heater is to remain. The water heater breeching shall be removed and replaced as shown on the drawings, see Item 2.

3.19 Specification page 00 11 16-2 second paragraph "the project consists of.....small addition ...mini pile foundation" Boilerplate from different job?

RDK Response: Specification section 001116 has been corrected, see Item 1.

3.20 Specification page 00 11 16-2 Is base bid budget $$ valid?

RDK Response: The construction budget remains unchanged.



HVAC
BOILER ROOM UNIT HEATER

SCALE: 1/4"=1'-0"

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PROJECT

NUMBER 20160564 REVISION 1

REFERENCE DRAWING H2.02

SWAMPSCOTT HADLEY
SCHOOL BOILER

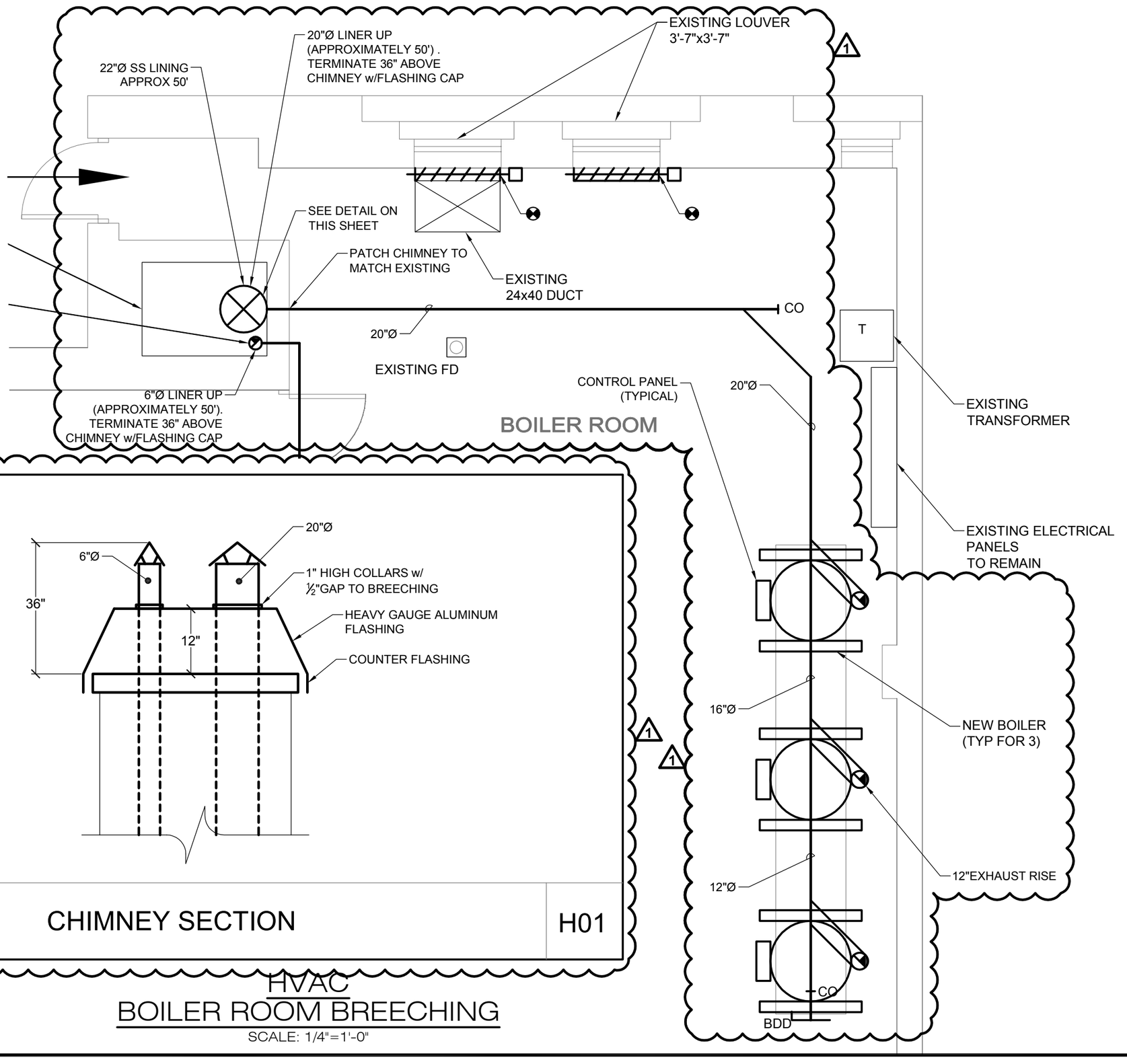
DRAWING

DRAWN BY CSL CHECKED BY WW

DATE 12/7/16 SCALE 1/4" = 1'

BOILER ROOM UNIT
HEATER

SKH-01



RDK

CHIMNEY SECTION

H01

HVAC
BOILER ROOM BREECHING

SCALE: 1/4"=1'-0"

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REVISION
1

SWAMPSCOTT
HADLEY SCHOOL
BOILER

DRAWING

DRAWN BY
CSL
CHECKED BY
WW
SCALE
1/4" = 1'
REFERENCE DRAWING
H2.03

BOILER ROOM
BREECHING

SKH-02

BOILER FEED TANK AND PUMP SCHEDULE

TAG	SERVICE	LOCATION	PUMPS											TANK			
			CASING TYPE	FLUID		GPM	DISCHARGE PRESSURE (PSI)	WORKING PRESS. (PSIG)	MOTOR					CAP (GAL)	MAT.	MANUFACTURER AND MODEL NUMBER (AS STANDARD)	REMARKS
				TYPE	TEMP (°F)				RPM	BHP	HP	V	PH				
BFU-1	BOILER FEED	BOILER ROOM	INLINE	STM. COND.	210	9	20		1750	-	1	208	3	110	STEEL	SKIDMORE, DUPLEX	1, 2

1

NOTES:

1 REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DRAWINGS FOR ADDITIONAL INFORMATION.
2 PROVIDE TRIPLEX LEAD/STANDBY PUMPS, INTEGRAL CONTROL PANEL AND MOTOR STARTERS.

1

UNIT HEATER SCHEDULE (HOT WATER)

(GPM)

TAG	LOCATION	TYPE	OUTPUT MBH	AIR			MOTOR						WATER				MANUFACTURER AND MODEL NUMBER (AS STANDARD)	REMARKS
				CFM	EAT (°F)	LAT (°F)	RPM	BHP	HP	ELECTRIC SERVICE			GPM	EWT (°F)	LWT (°F)	P.D. (FT.)		
										HZ	V	PH						
UH-1	BOILER ROOM		63	1120						60	115	1					RITTLING RH-63-H-01-AA	

NOTES:

1 REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DRAWINGS FOR ADDITIONAL INFORMATION.

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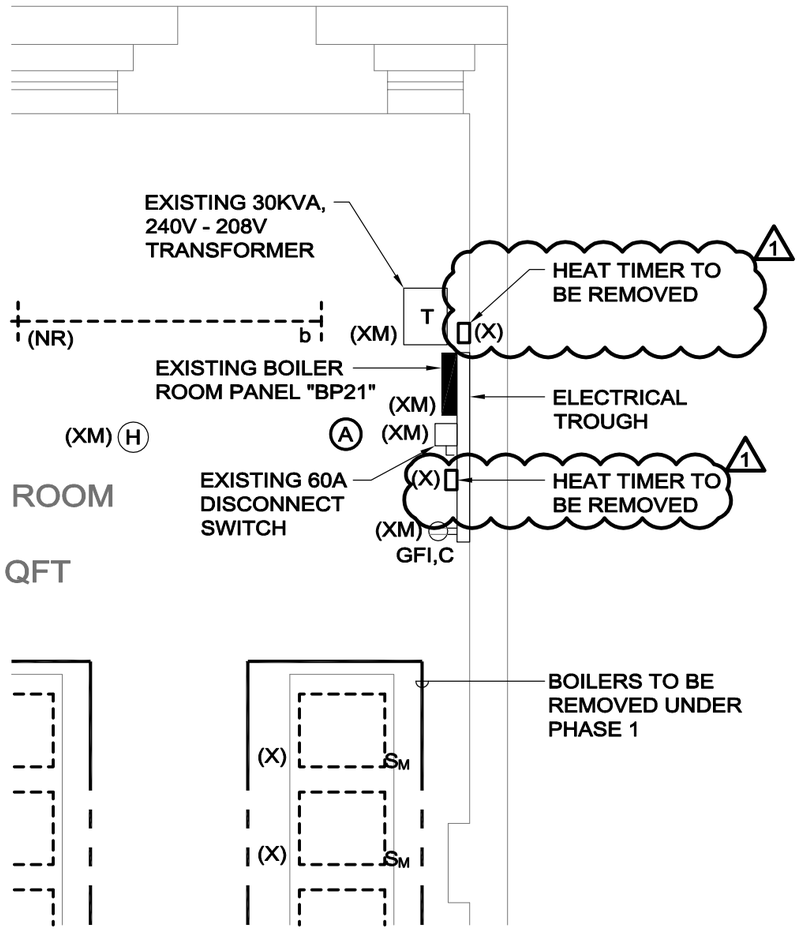
SWAMPSCOTT
HADLEY SCHOOL
BOILER

DRAWING

DRAWN BY
CSL
CHECKED BY
WW
SCALE
N/A
REFERENCE DRAWING
H8.00

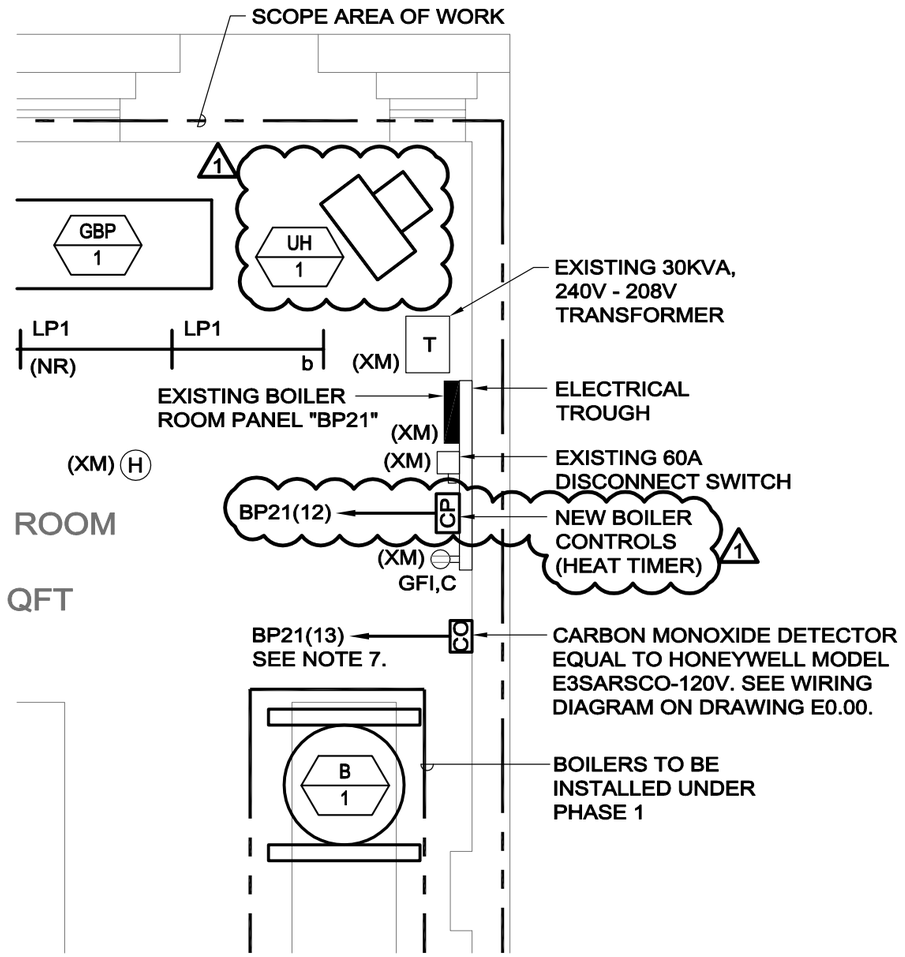
BOILER FEED & UNIT HEATER SCHEDULES

SKH-03



ELECTRICAL - BOILER ROOM
DEMOLITION PART PLAN

SCALE: 1/4"=1'-0"



ELECTRICAL - BOILER ROOM
NEW WORK PART PLAN

SCALE: 1/4"=1'-0"

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DATE
12/07/16
REVISION
1

SWAMPSCOTT
HADLEY SCHOOL
BOILER

DRAWING

DRAWN BY
MW
CHECKED BY
GEM
SCALE
AS NOTED
REFERENCE DRAWING
ED2.00 & E2.00

ELECTRICAL
BOILER ROOM
DEMOLITION & NEW
WORK PART PLANS

SKE-01

MECHANICAL EQUIPMENT SCHEDULE

LOAD TAG	STARTER LOCATION	LOAD HP	LOAD FLA	LOAD KVA	LOAD VOLT	LOAD PH	STARTER NEMA SIZE	STARTER TYPE	OVERCURRENT CB	OVERCURRENT RK1 FUSE	OVERCURRENT MCP	PB	HOA	INDICATING LIGHTS R	INDICATING LIGHTS G	INDICATING LIGHTS A	AUXILIARY CPT	AUXILIARY CONTACTS NO	AUXILIARY CONTACTS NC	POWER SOURCE PANEL	POWER SOURCE C/B	CONNECTION FLEX	CONNECTION JB	CONNECTION REC	DISC AS	DISC AF	DISC NEMA	BRANCH CIRCUIT	REMARKS
B-1		-	9.8	1.2	120	1	-	NOTE 8	-	-	-	-	-	-	-	-	-	-	-	BP21(8)	20A/1P	X	-	-	MMS	-	1	2#12 & #12G - 3/4"C	NOTE 12
B-2		-	9.8	1.2	120	1	-	NOTE 8	-	-	-	-	-	-	-	-	-	-	-	BP21(8)	20A/1P	X	-	-	MMS	-	1	2#12 & #12G - 3/4"C	NOTE 12
B-3		-	9.8	1.2	120	1	-	NOTE 8	-	-	-	-	-	-	-	-	-	-	-	BP21(20)	20A/1P	X	-	-	MMS	-	1	2#12 & #12G - 3/4"C	NOTE 13
GBP-1		1/2	2.4	0.9	208	3	-	NOTE 8	-	-	-	-	-	-	-	-	-	-	-	BP21(15,17,19)	15A/3P	X	-	-	60	-	1	4#12 & #12G - 3/4"C	NOTE 13
UH-1		-	4.4	0.5	120	1	-	-	-	-	-	-	-	-	-	-	-	-	-	BP21-11	15A/1P	X	-	-	MMS	-	1	2#12 & #12G - 3/4"C	

1

NOTES

1. NOTES 2-6 APPLY TO ALL APPLICABLE LOADS.
2. PROVIDE THERMAL OVERLOAD UNITS FOR ALL STARTERS SIZED TO MATCH LOAD NAMEPLATE AND NEC REQUIREMENTS .
3. BRANCH CIRCUIT WIRING METHODS SHALL BE AS NOTED ON THE DRAWINGS AND/OR SPECIFICATIONS FOR THE APPLICABLE LOCATION. THE FINAL THREE FEET (MAXIMUM) SHALL BE FLEXIBLE METAL OR LIQUIDTIGHT FLEXIBLE METAL CONDUIT.
4. COPPER BRANCH CIRCUIT CONDUCTOR SIZING BASED UPON NEC TABLE 310.15(B)(16). MAKE ADJUSTMENTS TO CONDUCTORS FOR TEMPERATURE OR VOLTAGE DROP THAT EXCEED NEC AND SPECIFICATION CRITERIA.
5. RACEWAY SIZES ARE BASED UPON GRSC AND LFMC WITH THWN CONDUCTORS.
6. VFD SHALL BE CONTROLLED VIA REMOTE 4-20mA OR 0-5V SIGNAL PROVIDED BY THE HVAC ATC CONTRACTOR.
7. REQUIRED DISCONNECT IS PROVIDED INTEGRAL/PREWIRED TO MECHANICAL EQUIPMENT.
8. REQUIRED STARTER IS PROVIDED INTEGRAL/PREWIRED TO MECHANICAL EQUIPMENT.
9. DISCONNECT FOR 2S1W AND 2S2W MOTORS SHALL BE SIX POLE.
10. PROVIDE NEUTRAL FROM SOURCE TO STARTER ONLY FOR 120V CONTROL POWER OF 208V 3PH UNITS.
11. FUSES FOR DISCONNECT SWITCHES SHALL BE CLASS RK5
12. UTILIZE EXISTING SPARE CIRCUIT BREAKER TO SERVICE THE NEW LOADS AS ILLUSTRATED. PROVIDE LUGS SIZED TO ACCOMMODATE CONDUCTOR SIZES SPECIFIED. MODIFY CIRCUIT DIRECTORY TO REFLECT THE CHANGE.

KEY:

FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
2S1W	TWO SPEED SINGLE WINDING
2S2W	TWO SPEED TWO WINDING
RVAT	REDUCED VOLTAGE AUTOTRANSFORMER
RVPW	REDUCED VOLTAGE PART WINDING
RVYDOT	REDUCED VOLTAGE WYE DELTA OPEN TRANSITION
RVYDCT	REDUCED VOLTAGE WYE DELTA CLOSED TRANSITION
MMS	MANUAL MOTOR STARTER
CB	CIRCUIT BREAKER
MCP	MOTOR CIRCUIT PROTECTOR
PB	START AND STOP PUSH BUTTON
HOA	HAND-OFF-AUTOMATIC SELECTOR SWITCH
CPT	CONTROL POWER TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE W/O BYPASS

PHASE 1 - REVISED PANELBOARD SCHEDULE

PANEL: BP21 VOLTS: 208Y/120 MOUNT: SURFACE GROUND BUS: Y
MAIN: MCB AMPS: 50 AIC: 10,000 ISOLATED GROUND BUS: N
PH/WIRE: 3/4 LOC.: Boiler Rm 200% NEUTRAL: N

CIR.	AMPS/ POLES	DESCRIPTION OF LOAD	LOAD kVA	LOAD BY PHASE, kVA A	B	C	LOAD kVA	DESCRIPTION OF LOAD	AMPS/ POLES	CIR.
1				0.80			0.80			2
3	50A/3P	MAIN			0.80		0.80	TEMPORARY BOILER	20A/3P	4
5						0.80	0.80			6
7	20A/1P	TRANS	0.40	1.65			1.25	BOILER B-1 & B-2	20A/1P	8
9	20A/1P	BOILER LEFT	1.00		1.18		0.18	GFI RECEPTACLE	20A/1P	10
11	15A/1P	MPC-Q	0.20			0.40	0.20	BOILER CONTROLS	20A/1P	12
13	20A/1P	CO DETECTION	0.40	1.40			1.00	COPIER 1ST FLOOR	20A/1P	14
15			0.30		1.30		1.00	COPIER 1ST FLOOR	20A/1P	16
17	15A/3P	GAS BOOSTER	0.30			1.30	1.00	COPIER 1ST FLOOR	20A/1P	18
19			0.30	0.92			0.62	BOILER B-3	20A/1P	20
		CONNECTED kVA BY PHASE -		4.77	3.28	2.50		TOTAL CONNECTED kVA-	10.55	
								DEMAND FACTOR	1.00	
								TOTAL DEMAND kVA-	10.55	
								TOTAL DEMAND AMPERES-	29.30	

1

PHASE 2 REVISED PANELBOARD SCHEDULE

PANEL: BP21 VOLTS: 208Y/120 MOUNT: SURFACE GROUND BUS: Y
MAIN: MCB AMPS: 50 AIC: 10,000 ISOLATED GROUND BUS: N
PH/WIRE: 3/4 LOC.: Boiler Rm 200% NEUTRAL: N

CIR.	AMPS/ POLES	DESCRIPTION OF LOAD	LOAD kVA	LOAD BY PHASE, kVA A	B	C	LOAD kVA	DESCRIPTION OF LOAD	AMPS/ POLES	CIR.
1				0.00			0.00			2
3	50A/3P	MAIN			0.00		0.00	SPARE	20A/3P	4
5						0.00	0.00			6
7	20A/1P	TRANS	0.40	1.65			1.25	BOILER B-1 & B-2	20A/1P	8
9	20A/1P	SPARE	0.00		0.18		0.18	GFI RECEPTACLE	20A/1P	10
11	15A/1P	UNIT HEATER UH-1	0.16			0.36	0.20	BOILER CONTROLS	20A/1P	12
13	20A/1P	CO DETECTION	0.40	1.40			1.00	COPIER 1ST FLOOR	20A/1P	14
15			0.30		1.30		1.00	COPIER 1ST FLOOR	20A/1P	16
17	15A/3P	GAS BOOSTER	0.30			1.30	1.00	COPIER 1ST FLOOR	20A/1P	18
19			0.30	0.92			0.62	BOILER B-3	20A/1P	20
		CONNECTED kVA BY PHASE -		3.97	1.48	1.66		TOTAL CONNECTED kVA-	7.11	
								DEMAND FACTOR	1.00	
								TOTAL DEMAND kVA-	7.11	
								TOTAL DEMAND AMPERES-	19.75	

1

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PROJECT

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DATE
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REVISION
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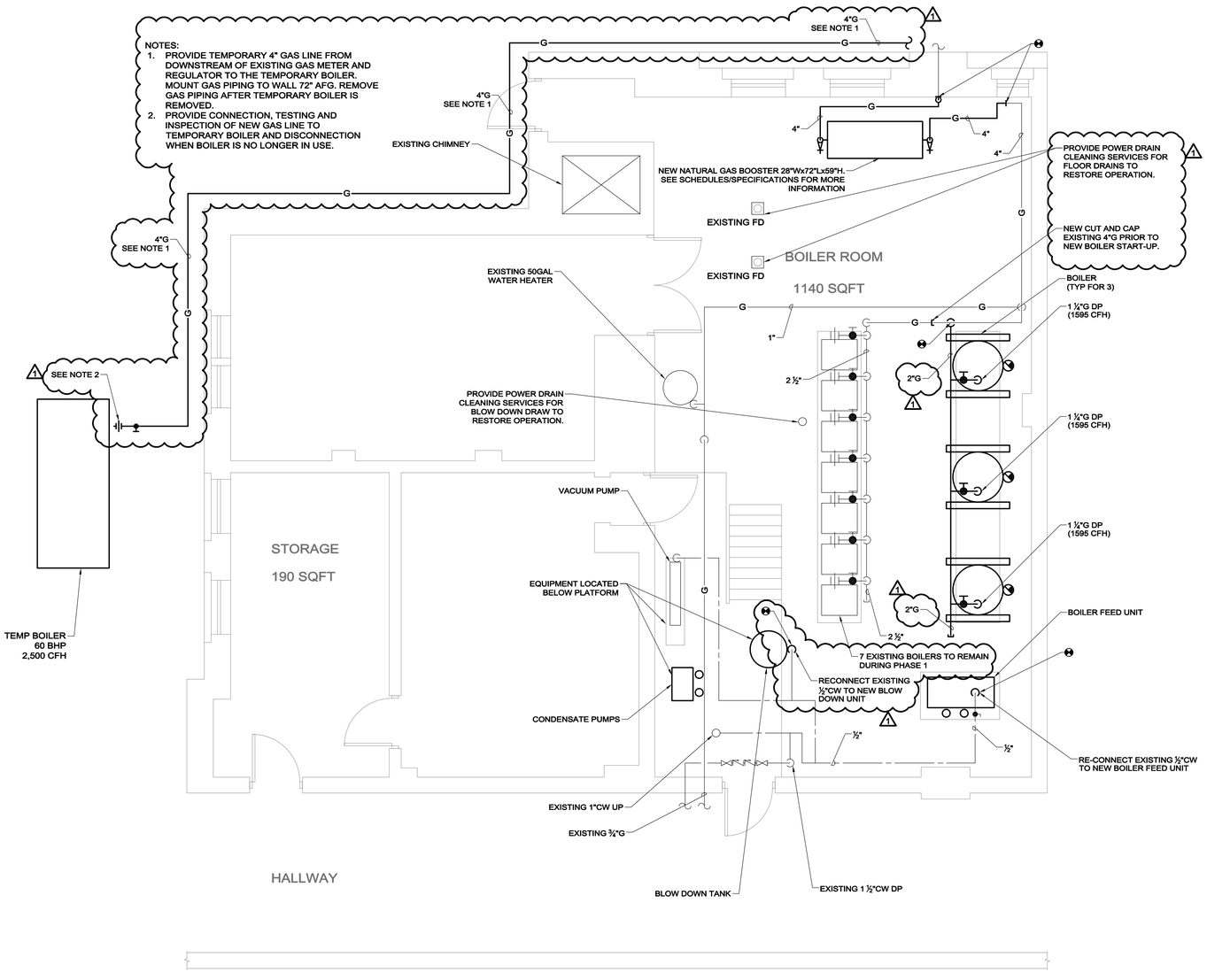
SWAMPSCOTT
HADLEY SCHOOL
BOILER

DRAWING

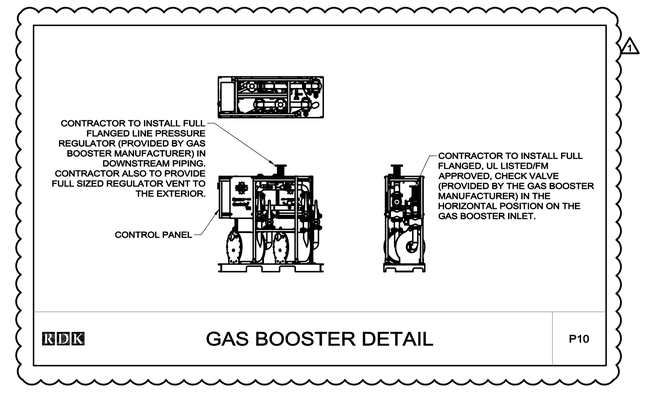
DRAWN BY
MW
CHECKED BY
GEM
SCALE
NONE
REFERENCE DRAWING
E9.00

ELECTRICAL
SCHEDULES

SKE-02



PLUMBING
BOILER ROOM NEW WORK PLAN - PHASE 1
SCALE: 1/4"=1'-0"



BID DOCUMENTS
11-23-16

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REVISIONS

	DATE	CHK	DESCRIPTION
1	12/7/16	1	ADDENDUM #2

SEAL

PROJECT
NUMBER 20160564
DATE 11/23/2016
HADLEY ELEMENTARY
SWAMPSCOTT, MA
BOILER REPLACEMENT

DRAWING
DRAWN BY CSL
CHECKED BY DW
SCALE 1/8" = 1'-0"
PLUMBING
BOILER ROOM
NEW WORK PLAN
PHASE 1

P2.00

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REVISIONS

	DATE	CHK	DESCRIPTION
1	12/7/16	1	ADDENDUM #2

SEAL

PROJECT

NUMBER
20160564

DATE
11/23/2016

HADLEY ELEMENTARY
SWAMPSCOTT, MA
BOILER REPLACEMENT

DRAWING

DRAWN BY
CSL

CHECKED BY
DW

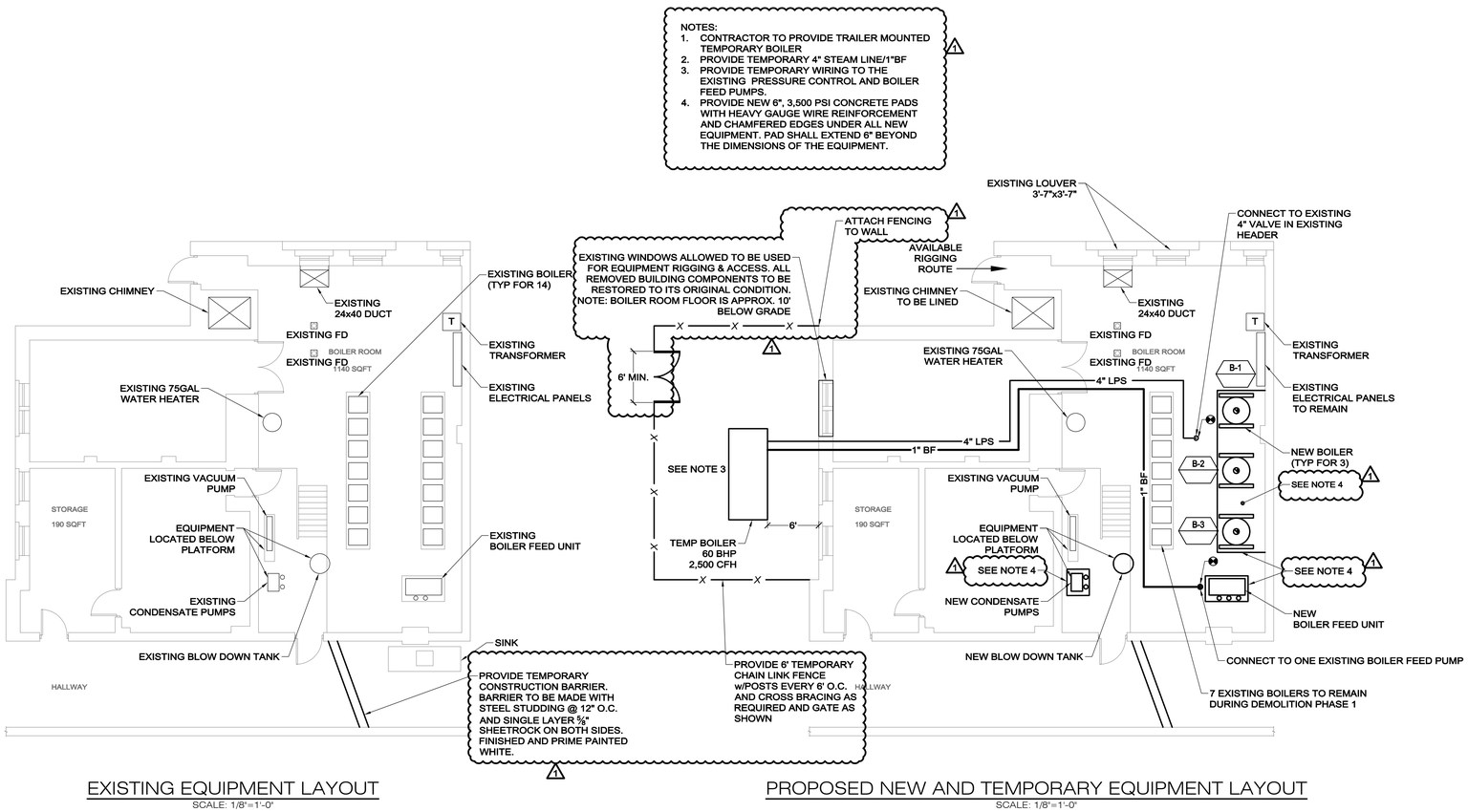
SCALE
1/8" = 1'-0"

HVAC
BOILER ROOM
EQUIPMENT PLAN
& TEMP BOILER

BID DOCUMENTS
11-23-16

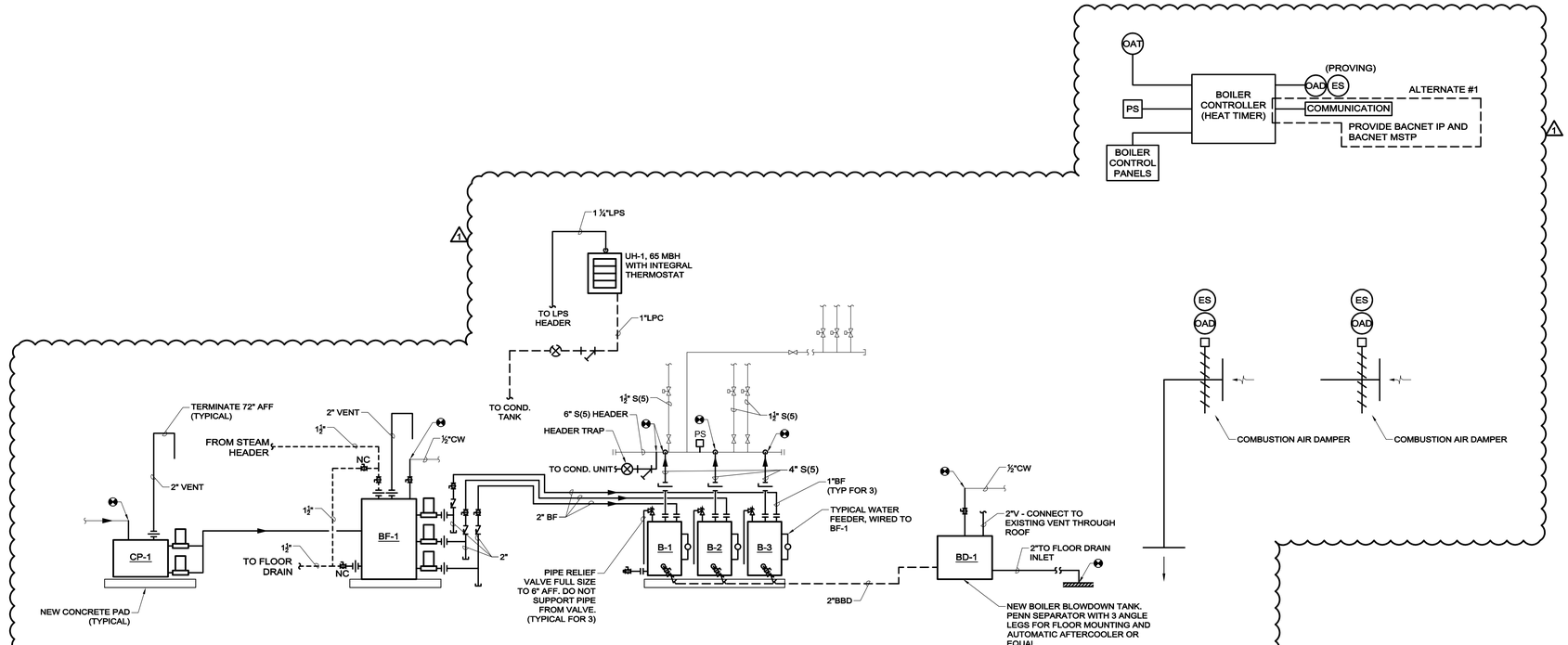
1/8" = 1' - 0"
0 8' 16'

H0.01



EXISTING EQUIPMENT LAYOUT
SCALE: 1/8"=1'-0"

PROPOSED NEW AND TEMPORARY EQUIPMENT LAYOUT
SCALE: 1/8"=1'-0"



STEAM HEATING CONTROLS:

GENERAL:

1. THE BOILERS SHALL BE CONTROLLED BASED USING INTEGRAL AND EXTERNAL CONTROLS. ALL SETPOINTS SHALL BE ADJUSTABLE.
2. NEW BOILER FEED PUMPS SHALL BE STARTED AND STOPPED VIA MANUFACTURERS PACKAGED CONTROLS UPON SIGNAL FROM THE BOILER CONTROLS. WIRE AND TEST MANUFACTURER'S CONTROLS.
3. ALL TEMPERATURES LISTED ARE IN FAHRENHEIT.
4. ALL ACTUATORS SHALL BE ELECTRONIC.
5. PROVIDE ALL TRANSFORMERS AND CONTROL WIRING FROM 120 VOLT POWER SOURCE TO VALVE ACTUATORS, SENSORS, ETC. REFER TO DIVISION 16000 FOR 120 VOLT POWER SOURCE.

BOILER CONTROLS:

1. THE BOILER SHALL BE ENABLED WHENEVER THE OUTDOOR AIR TEMPERATURE DROPS BELOW 60°F (ADJ) (45°F (ADJ) DURING UNOCCUPIED HOURS) AS DETERMINED BY THE OUTDOOR AIR TEMPERATURE SENSOR.
2. THE BOILERS SHALL BE DISABLED WHENEVER THE OUTDOOR AIR TEMPERATURE RISES TO 60°F (ADJ) OR ABOVE.

1

3. THE BURNER ASSOCIATED WITH B-1, B-2 AND B-3 SHALL SHUT-OFF IN THE EVENT OF:
   A. HIGH STEAM PRESSURE
   B. LOW WATER CUTOFF (AUTOMATIC RESET)
   C. LOW WATER CUTOFF (MANUAL RESET)
   D. REMOTE CUTOFF SWITCH(ES)
   E. FLAME FAILURE
5. UPON A DROP IN STEAM PRESSURE BELOW 3 PSIG, THE COMBUSTION AIR DAMPERS SHALL OPEN. ONCE THE DAMPERS ARE PROVED OPEN, THE LEAD BOILER SHALL ENERGIZE FOLLOWED BY THE LAG BOILER AS REQUIRED. IF THE LEAD BOILER DOES NOT START THEN THE LAG BOILER SHALL BECOME THE LEAD BOILER AND THE LEG 2 BOILER SHALL BECOME THE LAG BOILER.
6. UPON A RISE IN STEAM PRESSURE TO 5 PSIG, THE LAG THEN LEAD BOILER SHALL SHUT OFF AND THE COMBUSTION AIR DAMPER SHALL CLOSE.
7. THE LEAD BOILER ASSIGNMENT SHALL BE ROTATED WEEKLY.

BOILER FEED UNIT/FEED PUMP CONTROL:

1. THE BOILER FEED PUMPS SHALL BE OPERATED IN A LEAD/ STANDBY CONFIGURATION.
2. THE LEAD PUMP ASSIGNMENT SHALL BE ROTATED WEEKLY.
3. UPON A FAILURE OF THE LEAD PUMP, THE STANDBY PUMP SHALL AUTOMATICALLY START.
4. AS THE WATER LEVEL IN THE BOILER RECEDES, THE WATER COLUMN PUMP CONTROLLER SWITCH SHALL CLOSE, STARTING THE RESPECTIVE BOILER FEED PUMP. AS THE LEVEL IS RESTORED, THE SWITCH WILL OPEN AND STOP THE PUMP.
5. IF THE WATER LEVEL IN A BOILER FEED UNIT DROPS BELOW THE LEVEL OF THE FLOAT SWITCH, CITY WATER SHALL BE SUPPLIED TO THE BOILER FEED UNIT THROUGH THE BOILER FEED UNIT MAKE-UP FEED CONTROLLER UNTIL THE WATER LEVEL IN THE BOILER FEED UNIT IS RESTORED.

BID DOCUMENTS
11-23-16

H6.00

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REVISIONS

	DATE	CHK	DESCRIPTION
1	12/7/16	1	ADDENDUM #2

SEAL

PROJECT

NUMBER
20160564

DATE
11/23/2016

HADLEY ELEMENTARY
SWAMPSCOTT, MA
BOILER REPLACEMENT

DRAWING

DRAWN BY
CSL

CHECKED BY
JF

SCALE
NONE

HVAC CONTROLS