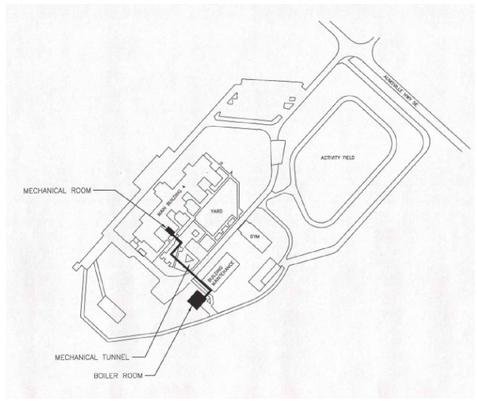
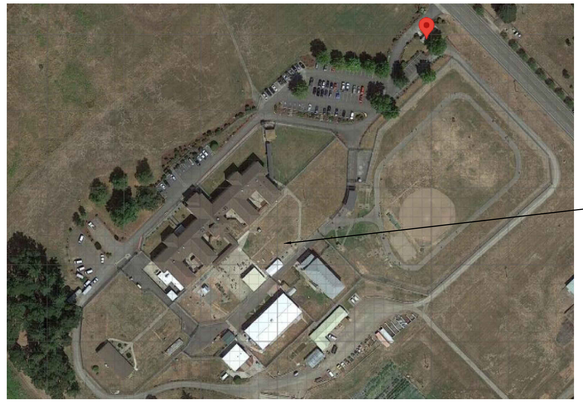
OREGON DEPARTMENT OF CORRECTIONS
SANTIAM CORRECTIONAL INSTITUTION
4005 AUMSVILLE HWY
STEAM BOILER REPLACEMENT





SCI
4005 AUMSVILLE HWY
SALEM, OR 97317

Drawing Index:

M0.1	Cover Sheet/Scope of Work
M2.1	Mechanical Plan - Boiler Room - Demo
M2.2	Mechanical Plan - Boiler Room - New
M5.1	Reference Pictures
M6.0	Equipment Schedules/Cut Sheets
M6.1	Mechanical Details
Reference	2008-2009 Energy Performance Contract.pdf (as-built mech & plumb reference drawings)

PROJECT SCOPE OF WORK:

DEMO:
- REMOVE EXISTING BOILERS AND REPLACE WITH NEW.

MECHANICAL:
- REPLACE AND REMOVE EXISTING BOILERS WITH UNITS OF EQUAL OR GREATER CAPACITY. MODIFY EXISTING GAS AND DIESEL FUEL PIPING AND PROVIDE NEW PIPING TO ACCOMMODATE NEW BOILERS.
- BASIS OF DESIGN IS TO REPLACE EXISTING BOILERS WITH BURNHAM 3P BOILERS. OTHER MANUFACTURERS WITH EQUAL PRODUCTS AND COMPARABLE LEAD TIMES ARE ACCEPTABLE WITH PRIOR PRODUCT APPROVAL.
- CONTRACTOR RESPONSIBLE FOR SITE WORK/CONCRETE PAD AND INSTALLATION NEEDED FOR NEW BOILERS.
- CONTRACTOR RESPONSIBLE FOR TESTING OF BOILERS.
- REPLACE ALL VALVES, SENSORS AND COMPONENTS AS REQUIRED TO ENSURE A COMPLETE AND OPERATIONAL SYSTEM.
- PROVIDE UNIT LABELS ON ALL NEW BOILERS.
- CONTRACTOR RESPONSIBLE FOR UNIT SEISMIC ANCHOR CALCULATIONS.

CONTROLS:
- DISCONNECT AND REPLACE ALL CONTROL POINTS
- PROVIDE NEW SENSORS FOR CONTROL POINTS

ELECTRICAL:
- DISCONNECT AND RECONNECT NEW UNITS.
- PROVIDE DISCONNECTS.

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MARK R. DENTER
EXPIRES: 31DEC23

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SANTIAM CORRECTIONAL INSTITUTION - BOILER REPLACEMENT
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MECHANICAL COVER SHEET

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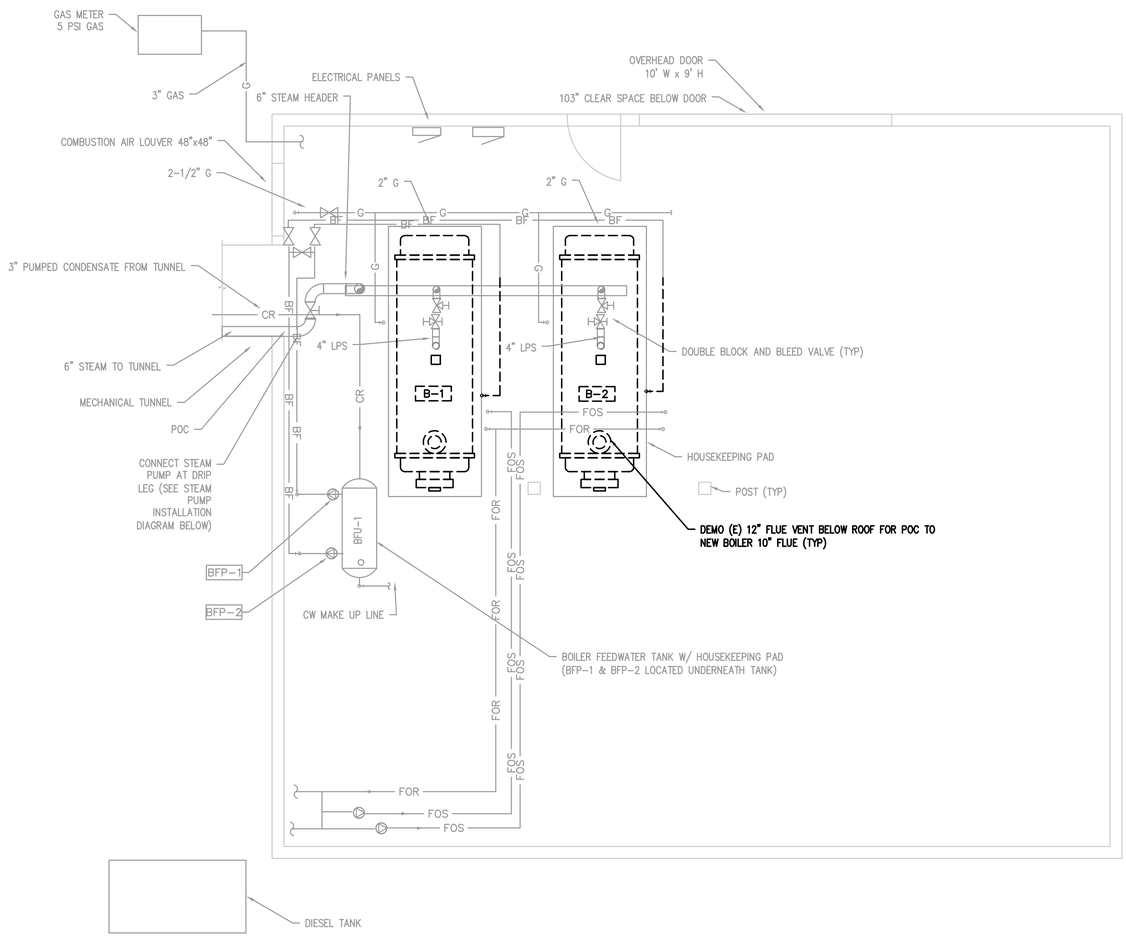
SHEET
M0.1

SHEET NOTES:

1. DISCONNECT (E) PIPING, DUCTWORK, AND EQUIPMENT AS REQUIRED TO REPLACE STEAM BOILERS.

KEYED NOTES: (1)

1. TBD.



1 / M2.1 MECHANICAL FLOOR PLAN – BOILER ROOM – DEMO

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

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FLOOR PLANS

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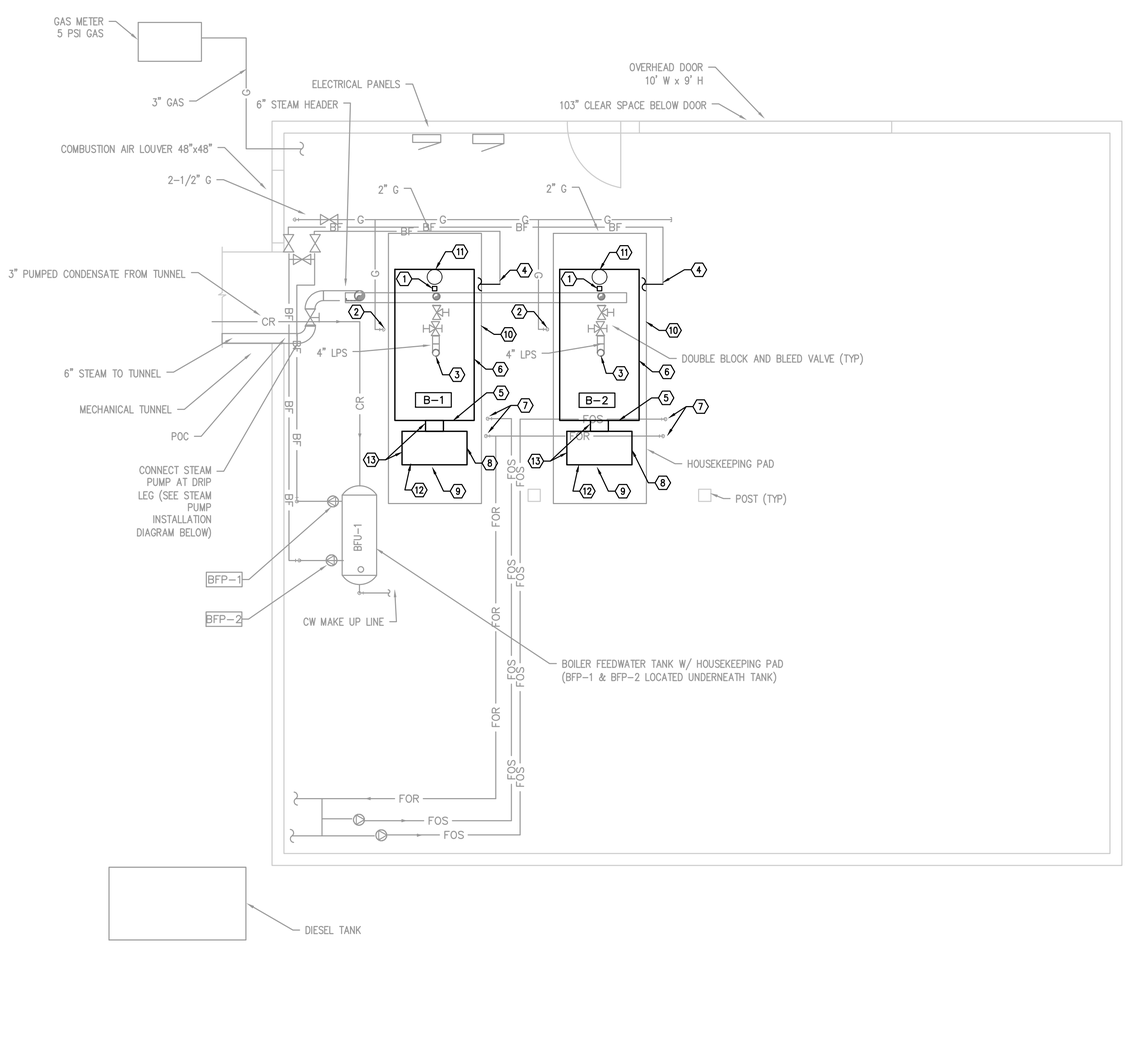

1 M2.2 MECHANICAL FLOOR PLAN – BOILER ROOM – NEW
SCALE: 1/4"=1'-0"

SHEET NOTES:

1. RECONNECT (E) PIPING, DUCTWORK, AND EQUIPMENT AS REQUIRED TO REPLACE STEAM BOILERS AND MAINTAIN BOILER SYSTEM OPERATIONS.
2. RECONNECT OR REPLACE (E) VALVES, APPURTENANCES, AND ACCESSORIES AS REQUIRED TO MAINTAIN BOILER SYSTEM OPERATIONS.
3. VENT ALL SAFETY VALVES UP THRU ROOF.
4. VENT ALL PRESSURE REGULATORS UP THRU ROOF AND AWAY FROM INTAKES AND APPLIANCES.

KEYED NOTES: (#)

1. 2" SAFETY RELIEF VALVE POINT OF CONNECTION. SET PRV FOR 15 PSIG. VENT THRU ROOF.
2. GAS FUEL POINT OF CONNECTION. PROVIDE VALVES AND ACCESSORIES AS NEEDED TO MEET BOILER GAS CONNECTION PRESSURE REQUIREMENTS.
3. STEAM OUTPUT/HEADER POINT OF CONNECTION.
4. FEED WATER POINT OF CONNECTION. VERIFY (E) BFP-1 AND (E) BFP-2 MEET 31 GPM MINIMUM AS WELL AS 209 GPM MAXIMUM FLOW REQUIREMENTS FOR EACH BOILER. REPLACE PUMPS AS REQUIRED TO MEET MINIMUM AND MAXIMUM BOILER FLOW REQUIREMENTS.
5. BLOWDOWN/DRAIN POINT OF CONNECTION BELOW. RECONNECT TO (E) BLOWDOWN SEPARATOR TO DRAIN.
6. BLOWOFF/DRAIN POINT OF CONNECTION. RECONNECT TO (E) BLOWDOWN SEPARATOR TO DRAIN.
7. DIESEL FUEL SUPPLY AND RETURN LINE POINT OF CONNECTION. PROVIDE VALVES AND ACCESSORIES AS NEEDED TO MEET BOILER DIESEL CONNECTION PRESSURE REQUIREMENTS.
8. ELECTRICAL POINT OF CONNECTION.
9. BOILER MASTER CONTROL PANEL POINT OF CONNECTION. SEE WIRING DIAGRAMS 2/M6.1 AND 3/M6.1.
10. DRAIN POINT OF CONNECTION.
11. BOILER FLUE POINT OF CONNECTION. VENTING SHALL BE UL LISTED, MANUFACTURER APPROVED, SELKIRK PS OR EQUAL.
12. BURNER POINT OF CONNECTION. INSTALL PER MANUFACTURER INSTRUCTIONS.
13. FLUE GAS RECIRCULATION POINTS OF CONNECTION. INSTALL PER MANUFACTURER INSTRUCTIONS.

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SHEET
M2.2

PHOTO 1 – SITE

PHOTO 2 – BOILER ROOM

PHOTO 3 – BOILER ROOM

PHOTO 4 – BOILER ROOM

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REFERENCE PHOTOGRAPHS

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SHEET
M5.1

BOILER		
MARK	B	B
NUMBER	1	2
TYPE	LOW PRESSURE STEAM	LOW PRESSURE STEAM
ARRANGEMENT	3-PASS FIRE TUBE	3-PASS FIRE TUBE
DUAL FUEL	NAT. GAS / DIESEL	NAT. GAS / DIESEL
SHELL DIAMETER (IN)	48	48
GROSS OUTPUT (MBH)	2064	2064
NET STEAM RATING (MBH)	1603	1603
NET STEAM RATING (SQ.FT)	6677	6677
NET WATER RATING (MBH)	1747	1747
HEATING SURFACE F.S. (FT^2)	300	300
HEATING SURFACE W.S. (FT^2)	335	335
FIRING RATE GAS INPUT (MBH)	2511	2511
FIRING RATE DIESEL INPUT (GPH)	17.4	17.4
FURNACE VOLUME (FT^3)	9.3	9.3
MAX ALLOW. WORK. PRESSURE/MAWP (PSIG)	15	15
WATER CONTENT / STEAM (LBS)	2747	2747
WATER CONTENT / WATER (GALLONS)	329	329
WATER PRESSURE DROP (PSI)	1	1
DRY WEIGHT (LBS)	4840	4840
ENTERING WATER TEMP. (DEG. F.)	190	190
LEAVING STEAM TEMP. (DEG. F.)	239	239
GAS/DIESEL EFFICIENCY @ 100% FIRE	83.5/86.5	83.5/86.5
MIN. FLOW RATE (LB/HR)	426	426
MAX. FLOW RATE (LB/HR)	2128	2128
NOMINAL FLUE DIA. (IN.)	10	10
VOLTAGE/PH/A	230/3	230/3
MCA/MOCP		
GROSS OUTPUT HORSEPOWER (HP)	61.7	61.7
OPERATING WEIGHT (LBS)	7587	7587
BASIS OF DESIGN: BURNHAM 3 SERIES	3L-60-GO-LB	3L-60-GO-LB
NOTES:	1,2,3	1,2,3

NOTES:
1. PROVIDE WITH WEISHAUPT HIGH EFFICIENCY DUAL FUEL GAS AND #2 DIESEL FUEL BURNERS.
2. PROVIDE MECHANICAL SALES UL LISTED MASTER PANEL TO CONTROL TWO LOW PRESSURE STEAM BOILERS. PANEL WILL HAVE CAPABILITY TO MONITOR THE BOILERS, PROVIDE LEAD/LAG OPERATION, AND PROVIDE A REMOTE CONNECTION FOR MODBUS TCP/IP BMS COMMUNICATION WITH BACNET/IP OR ETHERNET/IP COMMUNICATION INTERFACE. CONTROL PANEL TO HAVE 10" HMI TOUCH SCREEN CONTROLLER FOR EASE OF OPERATOR INTERFACE. MASTER PANEL TO HAVE SIEMENS LMV SERIAL KIT AND CONNECTIVITY TO EACH BURNER. PANEL TO COME WITH FOUR (4) ANALOG INPUTS. A MAIN STEAM HEADER PRESSURE TRANSMITTER SHALL BE SUPPLIED FOR FIELD INSTALLATION.
3. RECONNECT NEW BOILERS AND BURNERS TO EXISTING DELTA CONTROL PANEL AND SETTINGS.

BURNHAM®
Commercial Boilers

LEGEND CONNECTIONS
A = 6" FLANGED SUPPLY (150#)
B = 3" RETURN
C = 3" x 4" HANDHOLE
D = 1" WATER COLUMN
E = 3/4" AQUASTAT/LFHA
F = 1-1/2" BOTTOM BLOWDOWN
G = 1-1/2" SURFACE BLOWOFF
H = 1-1/2" AUXILIARY CONNECTION
J = 2" SAFETY VALVE
K = 10" NOMINAL FLUE DIAMETER

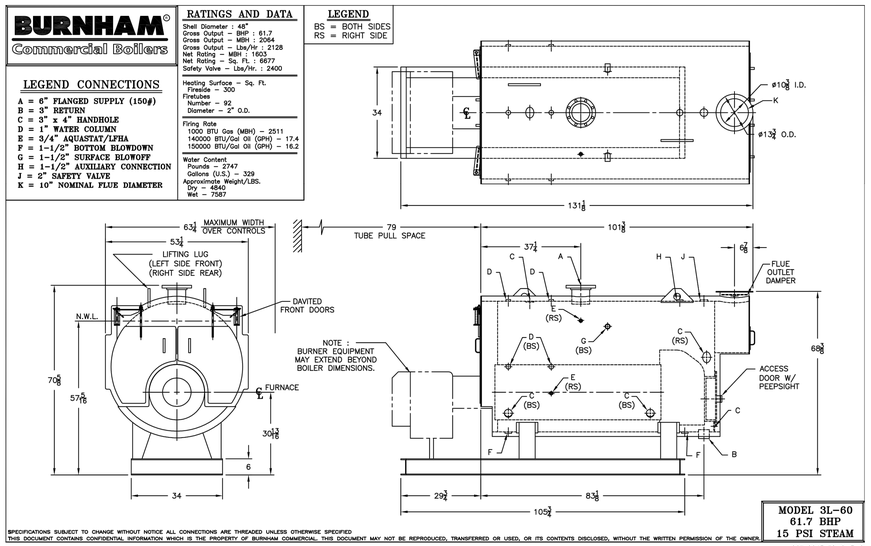
RATINGS AND DATA
Shell Diameter : 48"
Gross Output – BHP : 61.7
Gross Output – MBH : 2064
Gross Output – Lbs/Hr : 2128
Net Rating – MBH : 1603
Net Rating – Sq. Ft. : 6677
Safety Valve – Lbs/Hr. : 2400

Heating Surface – Sq. Ft.
Tresise = 300
Firetubes
Number = 92
Diameter = 2" O.D.

Firing Rate
1000 BTU Gas (MBH) – 2511
140000 BTU/Gal Oil (GPH) – 17.4
150000 BTU/Gal Oil (GPH) – 16.2

Water Content
Pounds – 2747
Gallons (U.S.) – 329
Approximate Weight/LBS.
Dry – 4840
Wet – 7587

LEGEND
BS = BOTH SIDES
RS = RIGHT SIDE



MODEL 3L-60
61.7 BHP
15 PSI STEAM

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE ALL CONNECTIONS ARE THREADED UNLESS OTHERWISE SPECIFIED
THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF BURNHAM COMMERCIAL. THIS DOCUMENT MAY NOT BE REPRODUCED, TRANSFERRED OR USED, OR ITS CONTENTS DISCLOSED, WITHOUT THE WRITTEN PERMISSION OF THE OWNER.
OCT 2015 TS-2-5-2

SERIES 3 FORCED DRAFT PACKAGED SCOTCH TYPE BOILERS SUGGESTED SPECIFICATION

Note: To use as a project specification:

A. Insert in the blank spaces provided, the applicable model number, capacity, fuel, and electrical data.

B. Delete the items in parentheses, or the items marked *, which are not applicable to the project requirements.

C. Insert, where applicable, optional non-standard features desired.

SPECIFICATION

Boilers:

Furnish and install TWO forced draft three-pass firetube type full wet back Scotch type factory packaged boilers for (combination NATURAL gas and No. 2 oil) complete with fuel burning equipment, safety and operating controls, and appurtenances as hereinafter specified. The boiler unit(s) shall be fully assembled and wired at the manufacturer's factory, requiring only connection to power, fuel supply and system piping to be ready for operation.

1. Boiler unit(s) shall be Burnham model number 3L-60 as manufactured by Burnham Corporation designed for (15 psi steam) with safety valve(s) set to relieve at 15 psi) and shall have a gross output of 2128 LBS/HR or 61.7 boiler horsepower. Boiler heating surface measured on the fireside shall be not less than five square feet per boiler horsepower. Furnace heat release rate shall not exceed 150,000 BTUH per cubic feet.

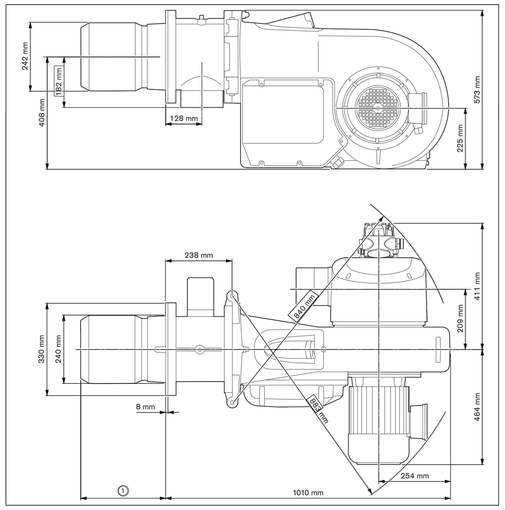
2. Boiler(s) shall be of the three-pass full wet-back firetube design, with two passes of fire tubes. Use of cast refractory baffling to provide the second or third pass shall not be permitted. All tubes shall be set with roller expander at each end, and shall be flared. Pressure vessel(s) shall be constructed, tested and marked in accordance with Section IV, Low Pressure Heating Boilers, or Section I, High Pressure Boilers of the ASME Code, as applicable for the working pressure herein before specified, and shall be registered with the National Board of Boiler and Pressure Vessel Inspectors.

3. Boiler(s) shall be mounted on a heavy structural steel base with extension beyond boiler front for protection of burner. The burner shall be mounted at the front of the boiler, with all mechanical equipment mounted on the boiler base, except those items necessarily remote mounted due to size or operational function.

4. Boiler(s) shall be provided with top vent connection at rear of boiler with full size access opening to rear tube sheet, hinged gas tight front flue cleanout doors with refractory lining keyed in place and providing access to front tube sheet without disconnecting any fuel lines or electrical wiring, sixteen inch diameter rear furnace access door with Pyrex observation port, factory installed enameled steel jacket with two inch fiberglass insulation, lifting lugs, and connections for controls, supply and return piping, and bottom blowdown.

3.4.7 Dimensions

Burner



1 295 … 325 mm without combustion head extension
395 … 425 mm with combustion head extension (100 mm)
495 … 525 mm with combustion head extension (200 mm)
595 … 625 mm with combustion head extension (300 mm)

–weishaupt–

SPECIFICATION – *(THIS SPECIFICATION CANNOT BE ALTERED WITHOUT THE WRITTEN CONSENT OF WEISHAUPT CORPORATION)*

FUEL BURNING SYSTEM

A. Manufacturers

1. Basis of design Weishaupt Model WM-GL20/2-A, ZM-T-4LN
2. Other manufacturers will not be accepted as part of the base bid. Alternate manufacturer may be priced as an alternate bid. Clearly list the deduct or add price for alternative burner on the proposal if any

B. Burner Performance:

1. Provide burner with gross output of 2,064,000 MBH/hr. when fired with natural gas or 21 US/Gal/hr on #2 fuel oil. Any deficiencies in the burner output will not be accepted.
2. Combustion system shall provide 9 to 10% CO2 and no CO with natural gas firing and 12 to 13% CO2 with no smoke when oil firing.
3. Burner shall be fully modulating on gas and modulating 3-stage on oil
4. The Oxygen (O2) level for both fuels shall be a maximum of 3% at high fire and 4.5% at low fire without the need for Oxygen Trim control. The burner system shall include Flue Gas Recirculation as a means of reducing NOx. The system shall include a FGR damper system mounted directly on the burner housing. The FGR pipe size shall be 6" diameter or larger if required. The system shall produce less than 15 ppm on gas corrected to 3% O2.
5. Burner control system and fuel system shall conform to applicable codes and with requirements of LOCAL JURISDICTION.
6. Fuel changeover shall be accomplished with a gas/oil selector switch without any mechanical changes required when switching from one fuel to another.

C. Burner System:

1. Burner control system and fuel system shall conform to applicable codes and with requirements of : LOCAL JURISDICTION.
2. Burner shall be listed by ETL (comply to UL795 and UL296) and shall bear the appropriate ETL. Label. *(Burner shall be designed and constructed as an integrated combustion system package and shall be factory fire tested.)*

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EQUIPMENT SCHEDULES/CUT SHEETS

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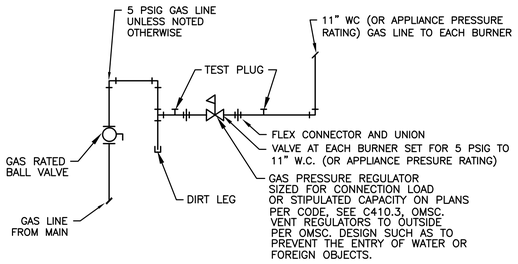
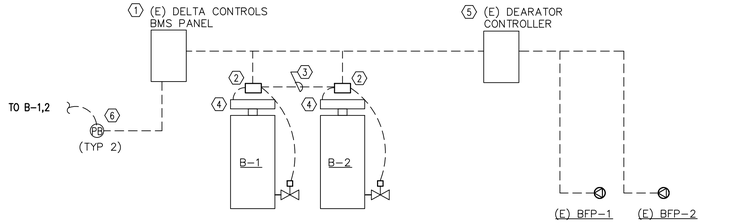
SHEET
M6.0



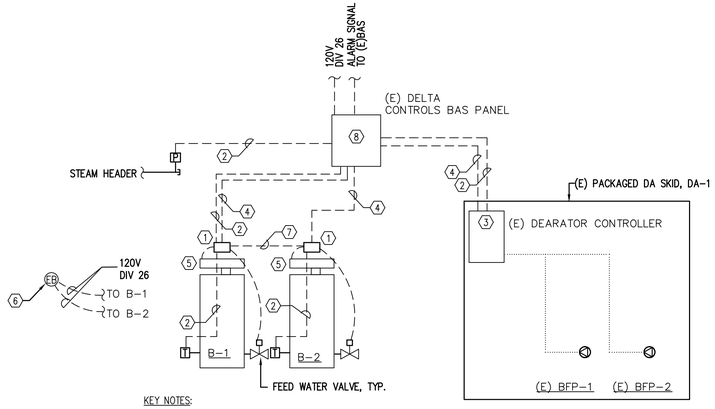
1 M6.1 GAS REGULATOR TO EACH BURNER 5 PSI TO 11" W.C.
SCALE: NONE



KEY NOTES:

1. (E) DELTA CONTROLS BMS PANEL.
2. MASTER CONTROL PANEL WITH BOILER HOA SWITCHES, RELAYS, CONTROLLER, AND ALARM HORN. CONTRACTOR TO CONFIRM LOCATION.
3. SHIELDED CABLE INTER-TIE BETWEEN BOILERS.
4. BURNER CONTROLLER.
5. (E) DEARATOR CONTROLLER ON SKID.
6. EMERGENCY STOP BUTTON TYPICAL OF 2 (ONE AT EACH DOOR).

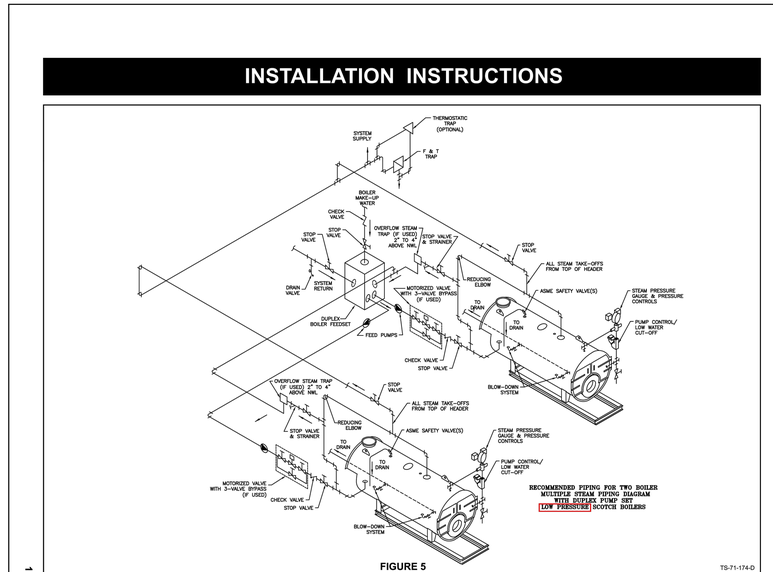
2 M6.1 BOILER CONTROL WIRING DIAGRAM
SCALE: NONE



KEY NOTES:

1. MASTER BOILER CONTROL PANEL WITH BOILER HOA SWITCHES, RELAYS, CONTROLLER, AND ALARM HORN. MOUNT MASTER CONTROL PANELS ON UNISTRUT BY B-1 AND B-2.
2. SHIELDED CABLE.
3. DEARATOR CONTROLLER ON SKID.
4. STRANDED WIRES FROM (E) DELTA CONTROLS BAS PANEL TO MASTER BOILER CONTROL PANELS.
5. BURNER CONTROLLER.
6. EMERGENCY STOP BUTTON, TYPICAL OF 2 (ONE AT EACH DOOR).
7. SHEILDED CABLE INTERTIE BETWEEN BOILERS.
8. (E) DELTA CONTROLS BAS PANEL.

3 M6.1 BOILER CONTROL WIRING DIAGRAM
SCALE: NONE



4 M6.1 BOILER INSTALLATION DIAGRAM
SCALE: NONE

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