

**BOILER ROOM PLAN**  
SCALE: 1:25

**DEMOLITION LEGEND**

- EXISTING DOMESTIC COLD WATER PIPING
- HWS — EXISTING HOT WATER SUPPLY PIPING
- HWR — EXISTING HOT WATER RETURN PIPING
- G — EXISTING GAS PIPING
- REMOVE EQUIPMENT
- HWS — REMOVE HOT WATER SUPPLY PIPING
- HWR — REMOVE HOT WATER RETURN PIPING
- STM — REMOVE STEAM PIPING
- C — REMOVE STEAM CONDENSATE PIPING
- G — REMOVE GAS PIPING
- REMOVE DOMESTIC COLD WATER PIPING
- ⊘ REMOVE GATE VALVE
- ⊘ REMOVE BALL VALVE
- ⊘ REMOVE BUTTERFLY VALVE
- ⊘ REMOVE CIRCUIT SETTER VALVE
- ⊘ REMOVE PIPE UP TO ABOVE
- ⊘ REMOVE PIPE DOWN TO BELOW
- PROVIDE NEW EQUIPMENT AS INDICATED

- GENERAL NOTES**
- EXISTING MECHANICAL SYSTEMS SHOWN ARE DIAGRAMMATIC AND ARE BASED ON ORIGINAL DRAWINGS. THE DRAWINGS MAY NOT REPRESENT "AS-BUILT" CONDITIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ON SITE PRIOR TO TENDER CLOSE, THE EXTENT AND CONFIGURATION OF EXISTING MECHANICAL SYSTEMS AND ALLOW FOR ADDITIONAL REMOVALS AS DETERMINED ON SITE TO MEET THE INTENT OF THE DEMOLITION INDICATED. NO EXTRAS WILL BE ALLOWED FOR FAILURE OF THE CONTRACTOR IN COMPLETING A THOROUGH REVIEW OF THE SITE PRIOR TO SUBMITTING TENDER PRICE.
  - PIPING SHOWN IN LOCATIONS ARE TO BE COORDINATED WITH ALL OTHER TRADES.
  - PROVIDE COMPLETE, FULLY TESTED AND OPERATIONAL MECHANICAL SYSTEMS TO MEET THE REQUIREMENTS DESCRIBED HEREIN AND IN COMPLETE ACCORD WITH APPLICABLE CODES AND ORDINANCES.
  - FOLLOW MANUFACTURERS RECOMMENDED INSTALLATION DETAILS AND PROCEDURES FOR EQUIPMENT, SUPPLEMENTED BY REQUIREMENTS OF CONTRACT DOCUMENTS.

- DEMOLITION NOTES**
- PIPING REMOVALS TO INCLUDE HANGERS, SUPPORTS, RISERS, VALVES AND ALL OTHER ASSOCIATED EQUIPMENT.
  - REMOVE ALL REDUNDANT PIPING BACK TO MAIN AND CAP
  - PROVIDE TEMPORARY MEASURES AS REQUIRED TO MAINTAIN MECHANICAL SERVICES WITHIN EXISTING STRUCTURE UNDER THIS CONTRACT THROUGHOUT DURATION OF CONSTRUCTION.
  - REMOVE ALL STEAM BOILERS, STEAM AND CONDENSATE PIPING, CONDENSATE RECEIVER, PUMPS, EXPANSION TANK, STEAM CONVERTER, STEAM BOILER VENTING AND OTHER TRIM ASSOCIATED WITH THE STEAM SYSTEM.
  - PATCH ALL WALL OPENINGS RESULTING FROM PIPING REMOVAL FROM EXTERIOR WALLS.

**CONTRACT DRAWINGS**  
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CONSULTANT:

SEAL:

CLIENT: CORRECTIONAL SERVICES CANADA

CLIENT REF. # : --

PROJECT: CSC STAFF COLLEGE  
BOILER REPLACEMENT

KEY PLAN:

IS	RE	DATE	DESCRIPTION
1		APR 24, 2017	ISSUED FOR TENDER

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ISSUED FOR - REVISION

IS	RE	DATE	DESCRIPTION
1		APR 24, 2017	ISSUED FOR TENDER

PROJECT NO: 171-00079-00

ORIGINAL SCALE: 1:25

DESIGNED BY: ET

DRAWN BY: ET

CHECKED BY: AW

DISCIPLINE: MECHANICAL

TITLE: DEMOLITION PLAN

SHEET NUMBER: M3.1

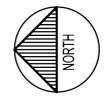
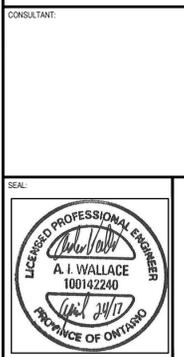
SHEET #: 1 OF 4

ISSUE: TENDER

DATE OF: APRIL 24 2017

REV # 1

M307171-00079-00 - CSC Staff College BoilerReplacement171-00079-00.MECH1.DWG, Apr 24, 2017, 10:56am BY: (etp.pha.1001)



CORRECTIONAL SERVICES CANADA

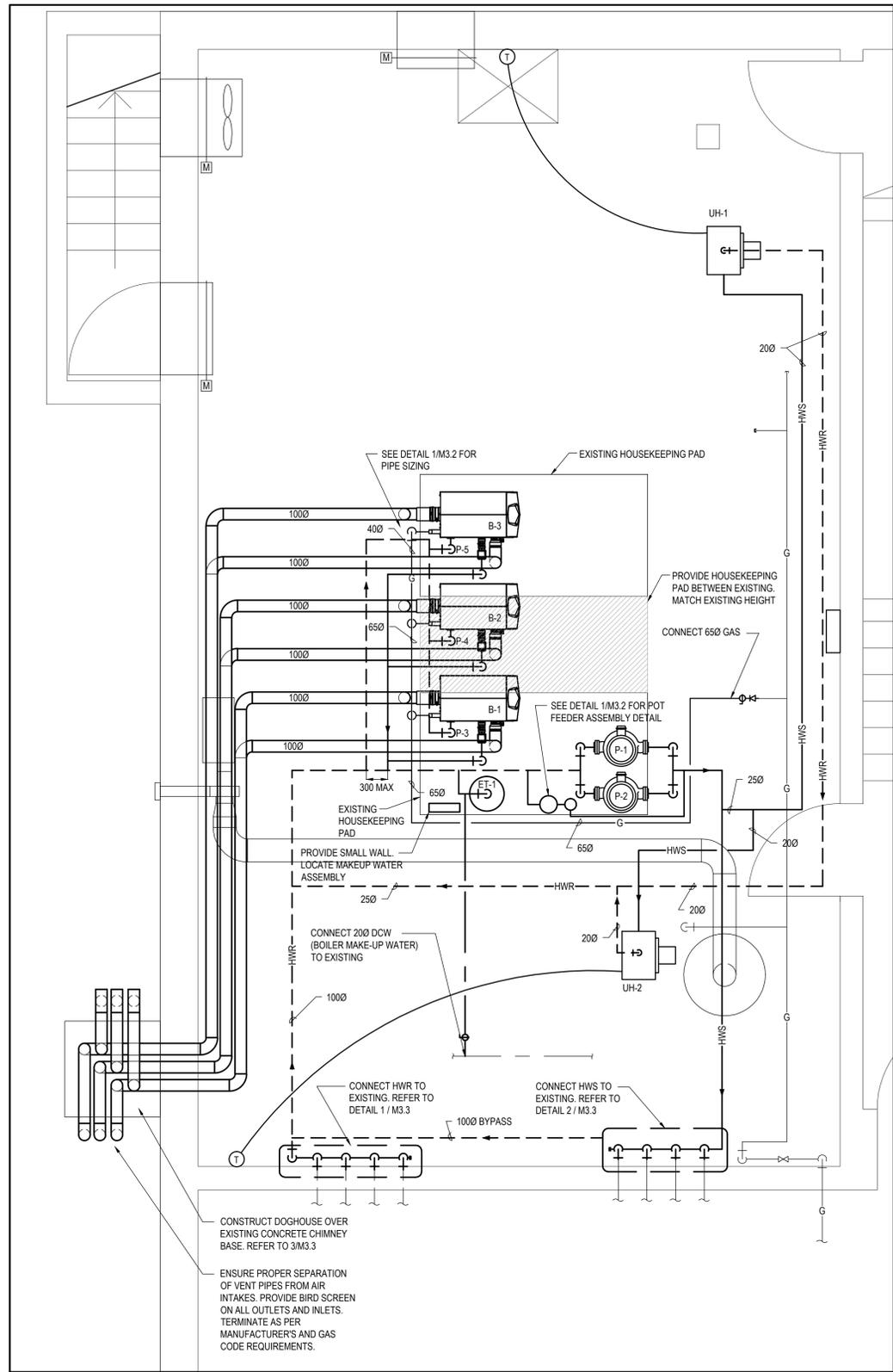
CSC STAFF COLLEGE  
BOILER REPLACEMENT

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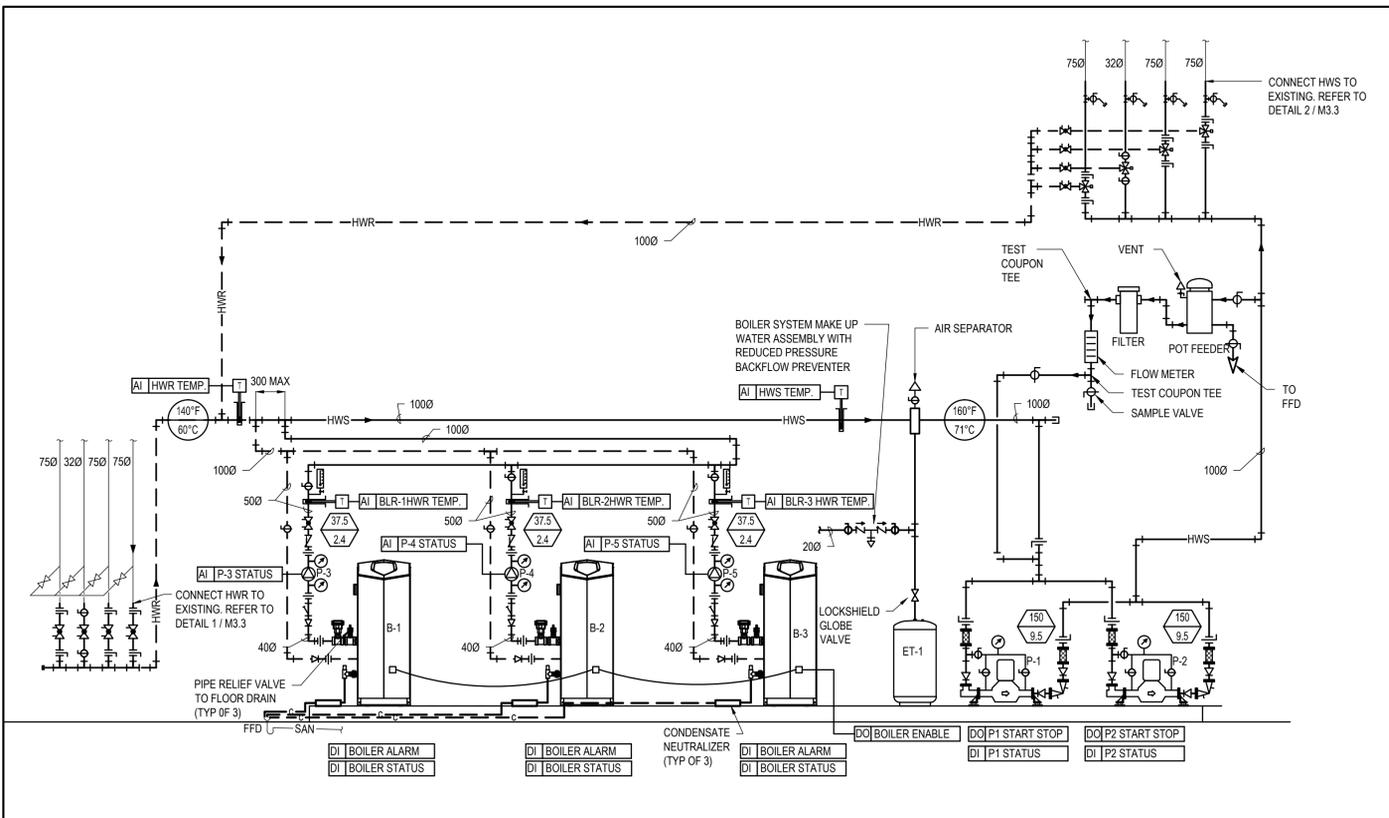
ISSUED FOR - REVISION	DATE	DESCRIPTION
1	APR 24, 2017	ISSUED FOR TENDER

PROJECT NO.	DATE
171-00079-00	APRIL 24 2017

PROJECT NO:	171-00079-00	DATE:	APRIL 24 2017
ORIGINAL SCALE:	AS SHOWN	IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.	
DESIGNED BY:	ET		
DRAWN BY:	ET		
CHECKED BY:	AW		
DISCIPLINE:	MECHANICAL		
TITLE:	BOILER ROOM PLAN SCHEMATICS AND DETAILS		
SHEET NUMBER:	M3.2		
SHEET #:	2	OF	4
ISSUE:	TENDER		REV #
DATE OF:	APRIL 24 2017		1



**BOILER ROOM PLAN**  
SCALE: 1:25



**BOILER SYSTEM SCHEMATIC**  
NOT TO SCALE

**SEQUENCE OF OPERATION - HEATING SYSTEM**

**BOILER CONTROLS:**

THE BOILER CONTROLLER SHALL BE PROVIDED BY THE BOILER MANUFACTURER AS AN INTEGRAL PACKAGE. THE FOLLOWING INPUT AND OUTPUT TERMINALS SHALL BE PROVIDED BY THE MANUFACTURER FOR CONNECTION BY THE CONTROLS CONTRACTOR: BOILER ENABLE/DISABLE, 0-10V BOILER OUTPUT CONTROL, AND GENERAL BOILER FAULT/ALARM.

BOILER PLANT CONTROL SHALL ENABLE WHEN THE DEFAULT OUTSIDE AIR TEMPERATURE IS BELOW 18°C. SYSTEM SHALL DISABLE WHEN THE OUTSIDE AIR TEMPERATURE IS 2.5°C ABOVE THE ENABLE SET POINT. THE BUILDING CIRCULATING PUMP CONTROL SHALL ENABLE WHEN THE DEFAULT OUTSIDE AIR TEMPERATURE IS BELOW ENABLE SET POINT. BOILER PLANT SHALL DISABLE WHEN THE OUTSIDE AIR TEMPERATURE IS 2.5°C ABOVE THE ENABLE SET POINT FOR A MINIMUM 24 HOUR PERIOD.

THE HOT WATER SUPPLY TEMPERATURE SHALL BE CONTROLLED BY SENDING AN ANALOG HEATING DEMAND OUTPUT TO BOILERS AS REQUIRED TO MAINTAIN A CALCULATED SECONDARY HOT WATER SUPPLY TEMPERATURE. IT ACHIEVES THIS BY RESETTING THE CASCADE CONTROL HOT WATER SUPPLY SETPOINT OF THE BOILERS. THE BOILERS CASCADE CONTROL SHALL MODULATE, SEQUENCE, AND ADJUST BOILER OPERATION TO PROVIDE MOST EFFICIENT OPERATION. THE BOILER SUPPLY WATER TEMPERATURE SHALL NOT EXCEED HIGH LIMIT SETPOINT OF 88°C (190°F).

THE SECONDARY HOT WATER TEMPERATURE SHALL BE RESET BASED ON THE OUTSIDE AIR TEMPERATURE. THE RESET SCHEDULE SHALL BE INITIALLY SETUP AS FOLLOWS: WITH AN OUTDOOR AIR TEMPERATURE OF 10°C (50°F) THE HWS SETPOINT SHALL BE 71°C (160°F). WITH AN OUTDOOR AIR TEMPERATURE OF -28.9°C (-20°F) THE HWS SETPOINT SHALL BE 80°C (176°F).

TO ESTABLISH EQUAL BOILER RUNTIME THE BOILERS SHALL BE LEAD/LAG ROTATED BASED ON MANUFACTURERS CASCADE CONTROL RECOMMENDATIONS.

THE BOILER WATER SUPPLY TEMPERATURE SHALL BE MONITORED BY THE BAS AND SHALL ALARM IF AFTER 1 HOUR THE CALCULATED SUPPLY WATER TEMPERATURE SETPOINT HAS NOT BEEN MAINTAINED. AN ALARM SHALL BE INITIATED IF THE DIFFERENTIAL BETWEEN THE SUPPLY AND RETURN WATER TEMPERATURES EXCEEDS 22°C (40°F).

**SECONDARY LOOP PUMP CONTROLS:**

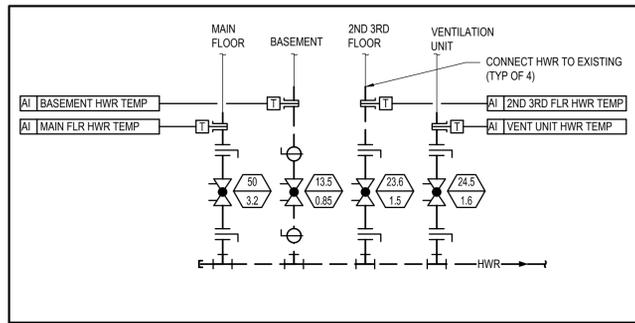
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- SEAL ALL DAMAGE ON EXTERIOR WALLS DUE TO REMOVAL OF SUPPORTS AND FASTENERS WITH HIGH PERFORMANCE, HIGH-MOVEMENT, UV-STABLE, NON-SAG POLYURETHANE SEALANT.

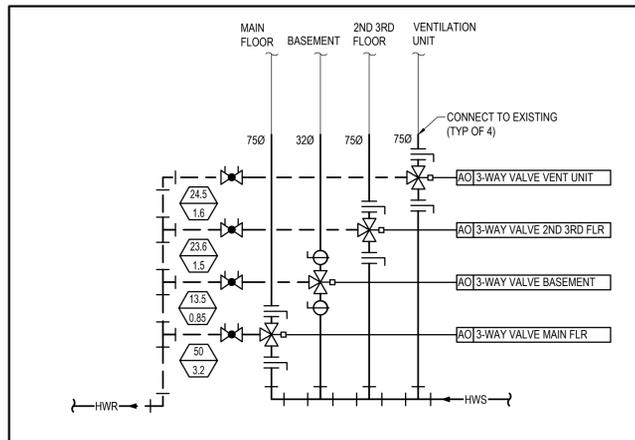
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**LEGEND**

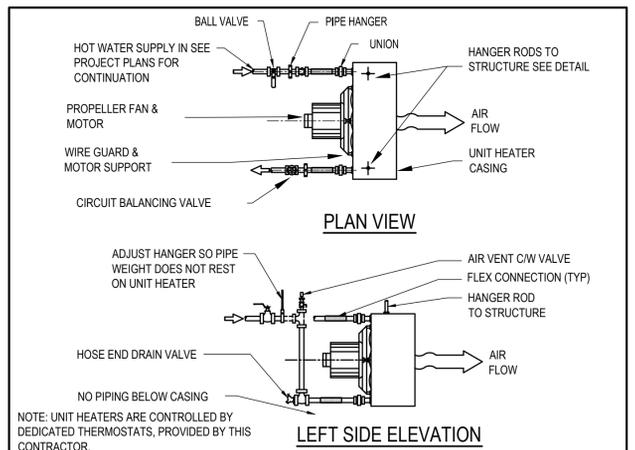
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- — BALL VALVE
- — BUTTERFLY VALVE
- — CIRCUIT SETTER VALVE
- — UNION
- — PIPE UP TO ABOVE
- — PIPE DOWN TO BELOW
- — PIPE REDUCER
- — STRAINER
- — CHECK VALVE
- — PUMP
- — PRESSURE GAUGE
- — CAPPED DRAIN VALVE
- — THERMOMETER SENSOR CW THERMOWELL
- — THERMOMETER
- DI | P1 STATUS | CONTROL POINT TAG
- — FLOW TAG
- — TEMPERATURE TAG
- P.\* — PUMP
- B.\* — BOILER
- UH.\* — UNIT HEATER
- ET.\* — EXPANSION TANK



**HOT WATER RETURN HEADER DETAIL**  
NOT TO SCALE



**HOT WATER SUPPLY HEADER DETAIL**  
NOT TO SCALE



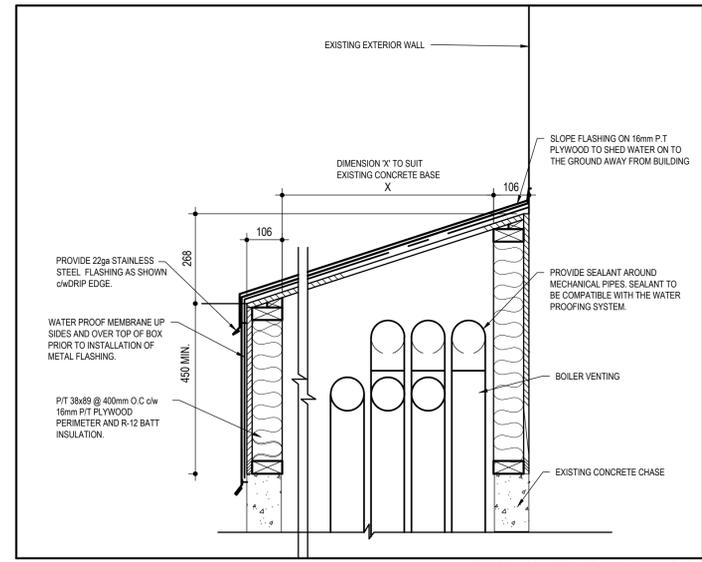
**UNIT HEATER DETAIL**  
NOT TO SCALE

PUMP SCHEDULE										
TAG	LOCATION	SERVICE	TYPE	CAPACITY (L/S)	HEAD (KPa)	MOTOR (HP)	POWER (V/PHz)	MANUFACTURER	MODEL	NOTES
P-1	BOILER ROOM	PRIMARY LOOP	IN-LINE CIRCULATOR	7.1	120	2	208/3/60	ARMSTRONG	4380-2X2X8	
P-2	BOILER ROOM	PRIMARY LOOP	IN-LINE CIRCULATOR	7.1	120	2	208/3/60	ARMSTRONG	4380-2X2X8	
P-3	BOILER ROOM	BOILER 1	IN-LINE CIRCULATOR	2.4	90	1	208/1/60	ARMSTRONG	4380-1.5X1.5X8	
P-4	BOILER ROOM	BOILER 2	IN-LINE CIRCULATOR	2.4	90	1	208/1/60	ARMSTRONG	4380-1.5X1.5X8	
P-5	BOILER ROOM	BOILER 3	IN-LINE CIRCULATOR	2.4	90	1	208/1/60	ARMSTRONG	4380-1.5X1.5X8	

UNIT HEATER SCHEDULE												
TAG	SERVICE	TYPE	HEATING COIL					E. S. P. (Pa)	POWER (V/PHz)	MOTOR FLA	MOTOR (W)	NOTES
			CAPACITY (kW)	WATER IN/OUT (°C)	WATER FLOW (L/S)	AIR IN/OUT (°C)	AIR FLOW (L/S)					
UH-1	BOILER ROOM	HORIZONTAL	5.3/7.0	71/60	0.083	18/40	127/189	0.0	120/1/60	0.6	37	C/W DEDICATED THERMOSTAT
UH-2	BOILER ROOM	HORIZONTAL	5.3/7.0	71/60	0.083	18/40	127/189	0.0	120/1/60	0.6	37	C/W DEDICATED THERMOSTAT

EXPANSION TANK SCHEDULE						
TAG	SERVICE	MODEL	ORIENTATION	TANK VOLUME (L)	ACCEPTANCE VOLUME (L)	SYSTEM CONNECTION (mm)
ET-1	HEATING SYSTEM	AMTROL EXTROL 200L	VERTICAL	98.7	51.4	120

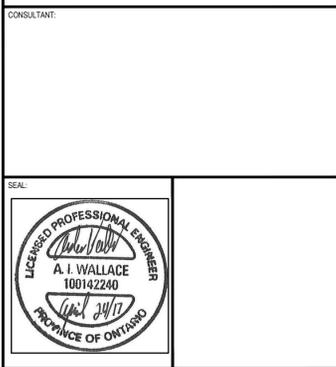
BOILER SCHEDULE	
TAG	B-1, B-2, B-3
GAS INPUT KW (MBH)	117 (399)
GAS OUTPUT KW (MBH)	110 (375)
POWER	120V/1PH/60Hz
COMBUSTION EFFICIENCY	94%
THERMAL FLUID	WATER
THERMAL FLUID CAPACITY (L)	395
DRY WEIGHT/FLOODED WEIGHT (KG)	127/140



**DOGHOUSE DETAIL**  
SCALE 1:10

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CLIENT: CORRECTIONAL SERVICES CANADA

PROJECT: CSC STAFF COLLEGE BOILER REPLACEMENT

ISSUE	DATE	DESCRIPTION
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PROJECT NO.	DATE	DESCRIPTION
171-00079-00	APRIL 24 2017	

DESIGNED BY: NTS  
DRAWN BY: ET  
CHECKED BY: AW  
DISCIPLINE: MECHANICAL

TITLE: BOILER ROOM PLAN SCHEDULES AND DETAILS  
SHEET NUMBER: M3.3  
SHEET #: 3 OF 4  
ISSUE: TENDER  
DATE OF: APRIL 24 2017  
REV # 1

