FAIRHILL ELEMENTARY SCHOOL
BOILERS REPLACEMENT

3001 Chichester Lane
Fairfax, VA 22031

FAIRFAX COUNTY PUBLIC SCHOOLS

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MMB-076-19

Fairfax County PUBLIC SCHOOLS
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Potomac Energy Group Inc.

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Consulting Engineers

2901 Telestar Court, Suite 400
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PROJECT LOCATION

Vicinity Map

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ISSUES / REVISIONS	
Date	Description
1/8/2018	
2/28/2018	80% CD SET
3/16/2018	90% CD SET
5/02/2018	100% CD SET
2/11/2019	BID SET

APPROVALS
Drawn By:
Designed By:
Checked By:

FAIRHILL E.S
(FAIRFAX COUNTY PUBLIC SCHOOLS)
3001CHICHESTER LANE,
FAIRFAX, VA 22031

Sheet Title:
COVER SHEET

Scale: **AS SHOWN**

Project Code: **CODE**

Sheet Number:
CS000

ELECTRICAL ENERGY CERTIFICATION FORM

Project Name: FAIRHILL ELEMENTARY SCHOOL

Street Address: 3001 CHICHESTER LANE, FAIRFAX, VA 22301

Building type or space activity: EXISTING ELECTRICAL MECHANICAL ROOM OF ELEMENTARY SCHOOL

Complete Section A or Section B based on the standard and applicability. To determine applicability, see the scoping provisions of Section 2 of ASHRAE standards or Section C401 of VECC (VECC is IECC with Virginia amendments). All provisions are mandatory unless noted as prescriptive.

SECTION A
Based on ANSI/ASHRAE/IESNA Standard 90.1 2010

LIGHTING

- ☐ **(Prescriptive)** New and replaced lighting systems comply with the lighting power density of Section 9, except as exempted in 9.1.2.
- ☐ **(Prescriptive)** New control devices as a direct replacement of existing control devices comply with the requirements of 9.4.1.2(b), (9.1.2).
- ☐ **(Prescriptive)** Installed interior lighting power includes all power used by the luminaries, including lamps, balasts, transformers, and control devices, except as exempted in 9.2.2.3, (9.1.3). Such power does not exceed allowance provided in 9.5 or 9.6, (9.2.2.3).
- ☐ **(Prescriptive)** Luminaire wattage incorporated into the installed interior lighting power is determined in accordance with 9.1.4 (a) through (e).
- ☐ Exterior lighting power allowances for all exterior building applications comply with 9.4.3.

INTERIOR LIGHTING CONTROL

- ☐ Each area enclosed by ceiling-height partitions has at least one manual control for lighting serving that area. Control devices are readily accessible and located so the occupants can see the controlled lighting. Control devices comply with 9.4.1.2 (a) (b) and (c).
- ☐ Interior lighting in buildings are equipped with an automatic control device to shut off building lighting in all spaces, except as exempted in 9.4.1.1. The automatic control device functions on:
  - ☐ A scheduled basis per 9.4.1.1 (a);
  - ☐ An occupancy sensor per 9.4.1.1 (b); or
  - ☐ A signal from another control or alarm system per 9.4.1.1 (c).

POWER/VOLTAGE DROP

- ☐ Feeder and branch circuit conductors are sized for a maximum voltage drop of 2% and 3% respectively at design load, (8.4.1.1) and (8.4.1.2).
- ☐ Equipment installed in new and existing building and, during alteration complies with (8.1.3), (8.1.4) and (8.1.5).

EXTERIOR LIGHTING CONTROL (except as exempted in 9.1)

- ☐ Lighting, all façade and landscape lightings are controlled by automatic device, (9.4.1.7).
- ☐ All lighting (including signage), other than facade and landscape, are controlled by automatic devices that reduce lighting power by at least 30%. (9.4.1.7).
- ☐ All time switches retain programming and time settings during loss of power for a period of at least 10 hours, (9.4.1.7).

ADDITIONAL CONTROL

- ☐ Control for display/accent lighting, case lighting, hotel and motel guest room lighting, task lighting, non-visual lighting, demonstration lighting and stairwell lighting are provided in accordance with 9.4.1.6.

PARKING GARAGE LIGHTING CONTROL

- ☐ Lighting for parking garage is controlled in accordance with 9.4.1.3.
- ☐ Lamps for general lighting in primary sidelighted area, in combined primary sidelighted area in an enclosed space 250 sq-ft or more, are separately controlled by multilevel photocontrol in accordance with 9.4.1.4.
- ☐ When the total daylight area under skylights plus rooftop monitors in an enclosed space exceeds 900 sq-ft, the lamps for general lighting in the daylight area is controlled by a multilevel photocontrol in accordance with 9.4.1.5.

EXIT SIGNS

- ☐ Internally illuminated exit signs do not exceed 5-watts per face, (9.4.2).

TRANSFORMER

- ☐ Low voltage dry-type distribution transformers comply with 8.1.2

RECEPTACLES

- ☐ At least 50% of all 125v, 15A and 20A receptacles including those installed in modular partition in private offices, open offices and computer classrooms are controlled by an automatic control device in accordance with 8.4.2.

COPLIANCE PATH (Prescriptive)

- ☐ Building Area Method of calculating interior lighting power allowance is in accordance with 9.5. Space-by-Space Method of calculating interior lighting power allowance is in accordance with 9.6

SECTION B
Based on Virginia Energy Conservation Code 2012

INTERIOR LIGHTING CONTROL

- ☐ Lighting within dwelling units contain 75% or more of high-efficiency lamps in the permanently installed luminaires, other than low voltage lighting, C405.1 Exception.
- ☑ Each area enclosed by ceiling-height partitions has at least one manual control for lighting serving that area. Control location complies with C405.2.1.1.
- ☑ Light reduction to at least 50% is accomplished per C405.2.1.2, except as exempted, by means of:
  - ☐ Controlling of all luminaires or lamps;
  - ☐ Dual switching of alternate rows of luminaires, alternate luminaires or alternate lamps;
  - ☐ Switching of middle lamp of luminaires independently of the outer lamps; or
  - ☐ Switching each luminaire or each lamp.
- ☐ Each area that is required to have a manual control has also additional control. The additional control functions on:
  - ☐ An automatic time switch control device, (C405.2.2.1).
  - ☐ An occupancy sensor, (C405.2.2.2).
  - ☐ A daylight zone control, (C405.2.2.3).
- ☐ Specific application controls are per C405.2.3.

ENERGY CONSUMPTION

- ☐ Buildings having individual dwelling units are provided with provisions to determine the electrical energy consumed by each tenant by separately metering individual dwelling units, (C405.7).

LIGHTING (Prescriptive)

- ☐ Total connected lighting power calculated under C405.5.1 is not greater than the interior power calculated under C405.5.2, (C405.5).
- ☑ Total connected interior lighting power is the sum of all interior lighting equipment (in watts) per C405.5.1.1 through C405.5.1.4, (C405.5.1).
- ☐ The line-voltage lighting track and plug-in busway are per C405.5.1.4.
- ☑ The interior lighting power is calculated utilizing C405.5.2 and Table C405.5.2(1) or Table C405.6.2(2).
- ☐ All exterior lighting other than low-voltage landscape lighting complies with section C405.6.1 and C405.6.2.

EXTERIOR LIGHTING CONTROL

- ☐ Lighting designated for dusk-to-down operation is controlled by an astronomical time switch or a photosensor, (C405.2.4).
- ☐ Lighting not designated for dusk-to-dawn operation is controlled by a combination of a photosensor and a time switch, or an astronomical time switch, (C405.2.4).
- ☐ All time switches retain programming and time settings during loss of power for a period of at least 10 hours, (C405.2.4).

TANDEM WIRING

- ☐ Fluorescent luminaires equipped with one, three or odd-numbered lamp configurations, that are recess-mounted within 10-feet center-to-center of each other are tandem wired, (C405.3-1).
- ☐ Fluorescent luminaires equipped with one, three or any other odd-numbered lamp configuration, that are pendant or surface-mounted within 1-foot edge-to-edge of each other are tandem wired, (C405.3 - 2).
- ☐ Internally illuminated exist signs do not exceed 5-watts per face, (C405.4).

LIGHTING FIXTURES IN OPEN PARKING GARAGE
All lighting fixtures within portions of above ground, open-side structures shall be full cut-off as defined by Article 20, Part 3 and required by Article 14, Part 9 of the Fairfax County Zoning Ordinance.

CERTIFICATION

I further hereby certify that the project referenced herein complies with all the applicable requirements of ANSI/ASHRAE/ESNA Standard 90.1, 2010 – or - 2012 VECC, and Article 20, Part 3 and Article 14, Part 9 of the Fairfax County Zoning Ordinance.

Name: FAROOQ AHMADZAI

Address: 2901 TELESTAR CT. , SUITE 400, FALLS CHURCH, VA. 22042

Occupation: ELECTRICAL ENGINEER, P.E. Date: 11/22/2017

ELECTRICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
A	AMPERE
AFF	ABOVE FINISHED FLOOR
AIC	ASYMMETRICAL INTERRUPT CURRENT
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
C/B	CIRCUIT BREAKER
D or DED	DEDICATED
DWG	DRAWING
E	EXISTING
EA	EACH
EC	EMPTY CONDUIT
EG	EQUIPMENT GROUND
ELEC	ELECTRICAL
EPO	EMERGENCY POWER OFF
FLA	FULL LOAD AMPS
FLR	FLOOR
FSS	FUSED SAFETY SWITCH
GFI	GROUND FAULT CIRCUIT INTERRUPTER
G or GND	GROUND
HP	HORSEPOWER
HVAC	HEATING VENTILATION AIR CONDITIONING
HZ	HERTZ
J/B	JUNCTION BOX
K	THOUSAND
KVA	KILOVOLT AMPERES
KW	KILOWATT
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MIN	MINIMUM
MLO	MAIN LUGS ONLY
N	NEW
NAC	NOTIFICATION APPLIANCE CIRCUIT
NEC	NATIONAL ELECTRIC CODE
N.I.C.	NOT IN CONTRACT
P	POLES
PNL	PANEL
R	RELOCATED
TYP	TYPICAL
V	VOLTS
VFD	VARIABLE FREQUENCY DRIVERS.
W	WATTS
Ø or Ph	PHASE

ELECTRICAL GENERAL NOTES

1. ALL ELECTRICAL WORK SHALL COMPLY WITH 2014 NATIONAL ELECTRICAL CODE (N.E.C.), THE LIFE SAFETY CODE, AND SHALL IN ACCORDANCE WITH ALL APPLICABLE STATE CODE REQUIREMENTS AND LOCAL AUTHORITIES.
2. ALL ELECTRICAL EQUIPMENT SHALL BE UNDERWRITERS LABORATORY (U.L.) LABELED OR LABELED BY AN APPROVED ACCREDITED AGENCY AND TESTING ORGANIZATION.
3. PRIOR TO BID, THE CONTRACTOR SHALL EXAMINE ALL PROJECT DOCUMENTS TO DEVELOP A COMPLETE UNDERSTANDING OF THE PROJECT SCOPE. FAILURE TO REVIEW ALL CONTRACT DRAWINGS AND EXISTING CONDITIONS WILL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO PERFORM ALL WORK REQUIRED. THE CONTRACTOR SHALL, UPON REVIEW OF THE DRAWINGS AND EXISTING CONDITIONS, ADVISE THE OWNER OF ANY DISCREPANCIES WHICH WILL AFFECT THE WORK REQUIRED.
4. IT IS THE INTENT OF THE CONTRACT DOCUMENTS TO INDICATE FINISHED WORK THAT IS FULLY ADJUSTED, TESTED, AND READY FOR OPERATION. WHEREVER THE WORD "PROVIDE" IS USED, IT SHALL MEAN "FURNISH AND INSTALL COMPLETE AND READY FOR USE", UNLESS OTHERWISE NOTED.
5. THE CONTRACTOR SHALL FURNISH, INSTALL, WIRE, CONNECT, AND ENERGIZE THE COMPLETE FUNCTIONAL SYSTEMS REQUIRED, INCLUDING EQUIPMENT, DEVICES, WIRING, AND ALL OTHER APPURTENANCES AND HARDWARE FOR A COMPLETE SYSTEM.
6. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ITEMS NECESSARY FOR THE COMPLETE INSTALLATION OF THE EQUIPMENT AS REQUIRED BY CODE WITHOUT ADDITIONAL COST TO THE OWNER, REGARDLESS WHETHER THE ITEMS ARE INDICATED IN THE CONTRACT DRAWINGS OR SPECIFICATIONS. SUCH ITEMS COULD BE, BUT ARE NOT LIMITED TO, SUPPORTS, WIRING, START–UP AND SERVICE, ETC.
7. THE CONTRACTOR SHALL PROVIDE AND INSTALL A FIRST CLASS SYSTEM AND SHALL COMPLETELY COORDINATE WITH ALL OTHER TRADES.
8. ALL CONFLICTS WHICH MAY PREVENT THE COMPLETION OF WORK SHALL BE BROUGHT TO THE ATTENTION OF FCPS PROJECT MANAGER. THE CONTRACTOR SHALL NOT PROCEED WITH RELATED WORK UNTIL THE CONFLICT IS RESOLVED.
9. THE CONTRACTOR SHALL INSTALL ALL ELECTRICAL EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
10. ALL EQUIPMENT, DEVICES, AND RELATED APPURTENANCES SHALL BE THE LATEST PRODUCT OF THE SPECIFIED MANUFACTURERS UNLESS OTHERWISE NOTED.
11. THE CONTRACT DRAWINGS ARE DIAGRAMMATIC AND DO NOT INDICATE ALL COMPONENTS AND ACCESSORIES REQUIRED FOR THE COMPLETE INSTALLATION. THE CONTRACTOR SHALL PROVIDE SUCH ITEMS TO COMPLETE THE ENTIRE SYSTEM AND PLACE IN PROPER OPERATION IN ACCORDANCE WITH APPLICABLE CODES, INDUSTRY STANDARDS, AND EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
12. THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND ARRANGE FOR ALL INSPECTIONS BY LOCAL AUTHORITIES HAVING JURISDICTION. SUBMIT COPIES TO O AND M MANUALS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ALL ADDITIONAL CONDUIT, DEVICES, AND FITTINGS AS REQUIRED TO ASSURE THE ELECTRICAL DISTRIBUTION SYSTEMS ARE INSTALLED PROPERLY AND IN ACCORDANCE WITH CODE.
14. THE CONTRACTOR SHALL INSTALL ALL ELECTRICAL SYSTEMS SO AS TO NOT INTERFERE WITH THE PLUMBING, STRUCTURAL, MECHANICAL, AND ARCHITECTURAL SYSTEMS. THE CONTRACTOR SHALL COORDINATE THE PROJECT REQUIREMENTS.
15. ALL ELECTRICAL SYSTEMS, DEVICES, AND RELATED ITEMS SHALL BE TESTED AT THE COMPLETION OF THE PROJECT. THE CONTRACTOR SHALL REPLACE ANY AND ALL DEFECTIVE DEVICES, ITEMS, OR SYSTEMS AT COMPLETION OF THE PROJECT BEFORE FINAL COMPLETION.
16. EXACT LOCATION AND MOUNTING HEIGHTS OF JUNCTION BOXES, OUTLETS, STUB–UPS, ETC. SHALL BE DETERMINED FROM CONTRACT DOCUMENTS, EQUIPMENT, DETAILS, SPECIFICATIONS WHERE APPLICABLE, AND MANUFACTURER'S ROUGH–IN DRAWINGS.
17. ALL GROUNDING SHALL BE DONE AS PER N.E.C. REQUIREMENTS. THE CONTRACTOR SHALL USE GREEN GROUND WIRE FOR GROUNDING.
18. ALL BRANCH CIRCUIT WIRING ON THE DRAWINGS THAT IS UNMARKED INDICATES TWO CURRENT CARRYING CONDUCTORS AND A GROUNDING CONDUCTOR.
19. THE ACTUAL NUMBER OF WIRES FOR EACH CIRCUIT ARE NOT INDICATED ON THE DRAWINGS UNLESS NECESSARY FOR CLARIFICATION. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL WIRES NECESSARY FOR THE PROPER FUNCTION OF THE SYSTEM WHETHER INDICATED ON THE DRAWINGS OR NOT.
20. PROVIDE NFPA APPROVED FIRE STOPPING AT ALL PIPING AND CONDUIT PENETRATIONS OF FIRE RATED FLOORS, WALLS, AND COMPONENTS.
21. THE CONTRACTOR SHALL GUARANTEE ALL WORKMANSHIP, MATERIALS, EQUIPMENT, AND RELATED ITEMS FOR A PERIOD AFTER ACCEPTANCE OF THE PROJECT BY THE OWNER AND REPLACE ANY DEFECTIVE MATERIALS, EQUIPMENT, AND RELATED ITEMS WITHIN THE GUARANTEE PERIOD. THE PERIOD SHALL BE TWENTY FOUR MONTHS FROM THE COMPLETION OF THE PROJECT UNLESS SPECIFIED OTHERWISE IN THE CONTRACT DOCUMENTS.
22. REFER TO THE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

ELECTRICAL SYMBOLS & ABBREVIATIONS

SYMBOL	DESCRIPTION
	FLUORESCENT OR LED LIGHTING FIXTURE.
	LIGHTING FIXTURE ON EMERGENCY CIRCUIT
	DISTRIBUTION TYPE PANELBOARD, PANEL DESIGNATION AS NOTED ON PLANS
	BRANCH CIRCUIT HOMERUN TO PANELBOARD, NUMBER OF CROSSMARKS INDICATE NUMBER OF PHASE CONDUCTORS. UNLESS OTHERWISE NOTED, CONNECT CIRCUIT TO A SINGLE POLE, 20 AMP BRANCH CIRCUIT BREAKER IN PANELBOARD INDICATED. EQUIPMENT GROUND WIRE IS INDICATED WITH DOT. PROVIDE GROUND WIRE IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
#10N	BRANCH CIRCUIT WIRING CONCEALED IN CEILING OR WALLS – CROSS MARKS AND NUMERALS INDICATE NUMBER AND SIZE OF CONDUCTORS RESPECTIVELY, 2 No. 12 AWG IN 1/2" CONDUIT NOT NOTED, CROSS MARK WITH #10N INDICATES NEUTRAL CONDUCTOR ONLY SHALL BE No. 10 AWG. 1/2" AND 3/4" TRADE SIZE CONDUITS NOT NOTED ON PLANS, EQUIPMENT GROUND WIRE IS NOT INDICATED, PROVIDE GROUND WIRE IN ACCORDANCE WITH PROJECT SPECIFICATIONS
2	REFERENCED PLAN NOTE DESIGNATION
1 / E001	PLAN OR DETAIL NUMBER DRAWING WHERE PLAN OR DETAIL APPEARS
	MOTOR OUTLET.
$M	MANUAL MOTOR CONTROLLER SINGLE POLE 20A, MOUNT 48" A.F.F. OR AS NOTED
$	SINGLE POLE FLUSH TUMBLER SWITCH. MOUNTING HEIGHT – 4'–0" ABOVE FINISHED FLOOR OR AS NOTED
A	LIGHTING FIXTURE DESIGNATION LETTER AND/OR INDICATES TYPE
J J	JUNCTION BOX ABOVE CEILING OR WALL MOUNTED
	SAFETY SWITCH (F.S.S. – FUSIBLE, N.F.S.S.–NON–FUSIBLE)
	DUPLEX RECEPTACLE, 2P, 3W, 20A, 125V, NEMA 5–20R, FLUSH MOUNTED 18" ABOVE FINISHED FLOOR, UNLESS OTHERWISE NOTED ON DRAWINGS
F	EXISTING FIRE ALARM MANUAL PULL STATION FLUSH MOUNTED 4'–0" ABOVE FLOOR, UNLESS OTHERWISE NOTED.
F	EXISTING FIRE ALARM AUDIO–VISUAL TYPE SIGNALING DEVICE FLUSH CEILING MOUNTED, DEVICE SHALL BE 75 CANDELA UNLESS OTHERWISE NOTED WITH SUBSCRIPT ON FLOOR PLAN.

COMcheck Software Version 4.0.4.1

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2015 IECC
Project Title: FAIRHILL E.S.
Project Type: New Construction

Construction Site:
FAIRFAX COUNTY PUBLIC SCHOOLS
3001 Chichester Lane
Fairfax, VA 2203;

Owner/Agent:

Designer/Contractor:

Additional Efficiency Package

Unspecified

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B X C)
1-Common Space Types:Electrical/Mechanical	730	0.95	694
		Total Allowed Watts =	694

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
1-Common Space Types:Electrical/Mechanical				
LED 1: LED Panel 55W:	1	6	55	330
		Total Proposed Watts =		330

Interior Lighting PASSES: Design 52% better than code

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2015 IECC requirements in COMcheck Version 4.0.4.1 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

FAROOQ AHMADZAI
ELECTRICAL ENGINEER, P.E.
Name - Title

Signature

11/22/2017
Date

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FAIRHILL E.S
(FAIRFAX COUNTY PUBLIC SCHOOLS)
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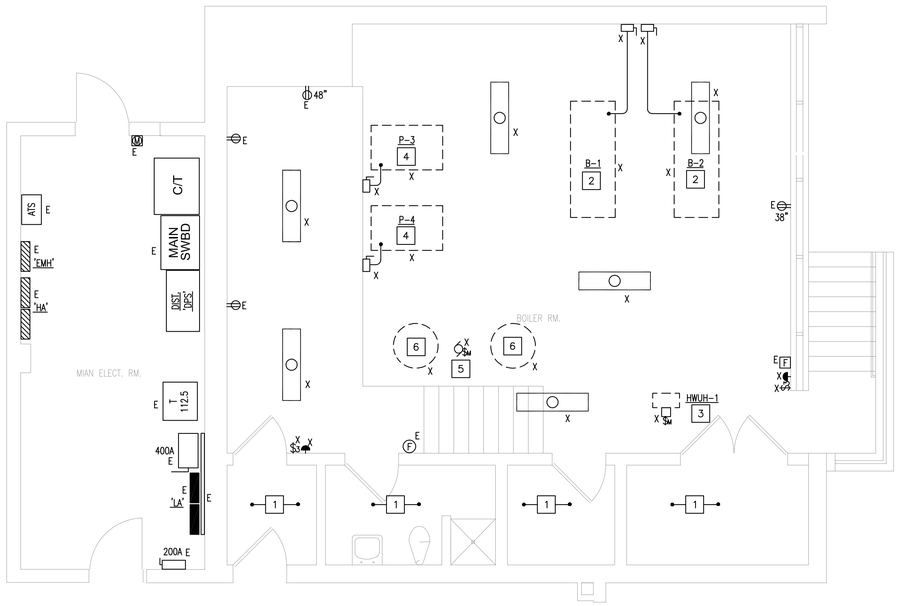
FAIRFAX, VA 22031

Sheet Title:
COVER SHEET - ELECTRICAL

Scale: AS SHOWN

Project Code: CODE

Sheet Number:
E001



REFERENCED PLAN NOTES

Applicable to this drawing only

1. EXISTING TO REMAIN, NOT IN CONTRACT.
2. REMOVE EXISTING BOILERS (B-1 &B-2) AND ASSOCIATED WITH ALL CIRCUITS BACK TO PANEL.
3. REMOVE HOT WATER UNIT HEATER (HWUH-1) AND ASSOCIATED WITH ALL CIRCUITS BACK TO PANEL.
4. REMOVE PUMPS (P-3 & P-4) AND ASSOCIATED WITH ALL CIRCUITS BACK TO PANEL.
5. REMOVE EXISTING HOT WATER CIRCULATING PUMP. EXISTING CIRCUIT TO REMAIN.
6. REMOVE EXISTING GAS WATER HEATER. EXISTING 120V, 1ø CONTROL CIRCUIT TO REMAIN.

SUBSCRIPTS

Applicable to this drawing only

E	EXISTING TO REMAIN.
X	EXISTING TO BE REMOVED.

DEMOLITION GENERAL NOTES

1. ALL EXISTING FIXTURES, EQUIPMENT AND ASSOCIATED WIRING AND CONDUIT TO BE REMOVED, LOCATED IN THE SCOPE, SHALL BE REMOVED BACK TO THE NEAREST ACTIVE SOURCE TO REMAIN ENERGIZED.
2. WHETHER SPECIFICALLY INDICATED OR NOT, THE CONTRACTOR SHALL REMOVE ALL EXISTING WIRING AND EQUIPMENT THAT IS NO LONGER REQUIRED TO REMAIN AS A PART OF AN ACTIVE SYSTEM.
3. FOR ALL EQUIPMENT REMOVED INCLUDING LIGHTS, RECEPTACLES, AND WIRING DEVICES, THE CONTRACTOR SHALL REMOVE ALL CIRCUITING BACK TO THE ELECTRICAL PANEL OR TO THE NEAREST JUNCTION BOX TO REMAIN ENERGIZED. CIRCUITS NO LONGER REQUIRED TO REMAIN AS PART OF AN ACTIVE SYSTEM SHALL BE REMOVED BACK TO THE PANEL. INACTIVE OUTLETS SHALL BE PROVIDED WITH BLANK COVERS UNLESS OTHERWISE NOTED.
4. NOT USED.
5. ALL EXISTING CIRCUITS NO LONGER USED SHALL BE LABELED AS A SPARE CIRCUIT IN THE RESPECTIVE PANEL. IDENTIFY PANEL NUMBERS AND BREAKER NUMBERS.
6. ALL EXISTING ELECTRICAL EQUIPMENT REMOVED DURING CONSTRUCTION SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE STORED, REMOVED FROM THE JOB SITE, OR DISPOSED OF AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
7. WHERE EXISTING EQUIPMENT IS RELOCATED, EXTREME CARE SHALL BE TAKEN TO PREVENT DAMAGE DURING THE REMOVAL AND REINSTALLATION. WHERE DAMAGE OCCURS, THE EQUIPMENT SHALL BE REPLACED OR REPAIRED TO THE SATISFACTION OF THE OWNER, AT NO ADDITIONAL COST TO THE OWNER.
8. UNLESS NOTED OTHERWISE, ALL EXISTING ELECTRICAL SYSTEMS TO REMAIN ACTIVE THAT ARE DISTURBED UNDER THIS CONTRACT SHALL BE RESTORED TO THE ORIGINAL OPERATING CONDITION.
9. WHERE EXISTING ELECTRICAL SYSTEMS INTERFERE WITH THE INSTALLATION OF NEW SYSTEMS AND THE EXISTING IS TO REMAIN ACTIVE, THE INSTALLATION SHALL BE DISCONNECTED, RELOCATED, AND RECONNECTED AS REQUIRED TO MAINTAIN THE SYSTEM. CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE AND ENGINEER IMMEDIATELY.
10. FEEDERS AND BRANCH CIRCUITS EXTENDING THROUGH THE CONTRACT SPACE TO SERVE OTHER AREAS NOT IN THE CONTRACT SHALL REMAIN ACTIVE. IT IS THE CONTRACTOR RESPONSIBILITY TO MAINTAIN THIS CIRCUIT CONTINUITY.
11. ALL EXISTING EQUIPMENT TO REMAIN OR THAT IS RELOCATED SHALL BE INSPECTED FOR DAMAGE, CLEANED, REPAIRED OR REPLACED AT NO ADDITIONAL COST AND INSTALLED AS SHOWN ON THE ELECTRICAL DRAWINGS.
12. REFER TO THE GENERAL NOTES, & ELECTRICAL NOTES, FOR ADDITIONAL REQUIREMENTS.

01 / E101 BOILER ROOM PLAN - EQUIP. REMOVAL

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

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FAIRHILL E.S
(FAIRFAX COUNTY PUBLIC SCHOOLS)
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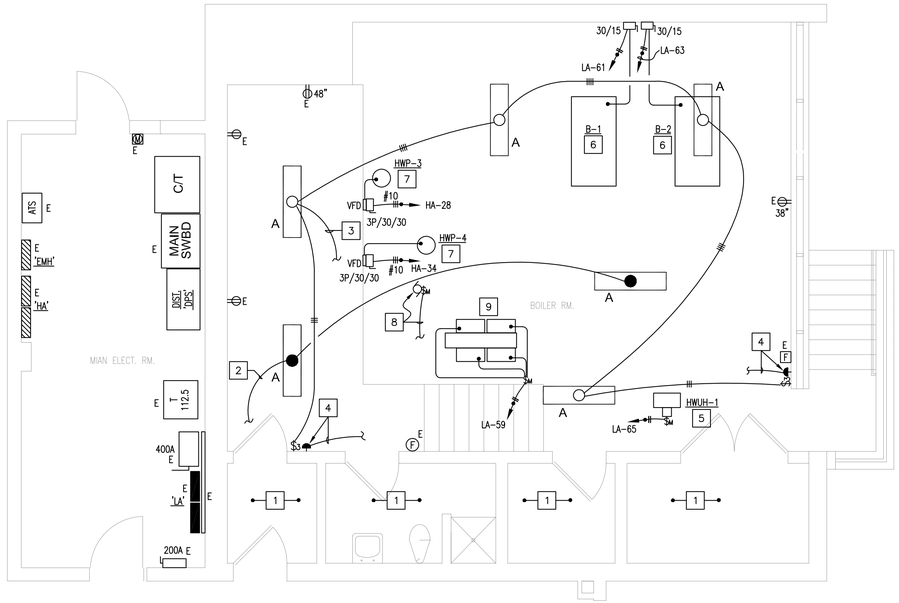
FAIRFAX, VA 22031

Sheet Title:
BOILER ROOM PLAN - EQUIPMENT REMOVAL

Scale: **AS SHOWN**

Project Code: **CODE**

Sheet Number:
E101



01
E201

BOILER ROOM PLAN - NEW WORK

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

REFERENCED PLAN NOTES

Applicable to this drawing only

1. EXISTING TO REMAIN, NOT IN CONTRACT.
2. CONNECT TO EXISTING 277V EMERGENCY LIGHTING CIRCUIT PREVIOUSLY SERVING IN THIS ROOM.
3. CONNECT TO EXISTING 277V LIGHTING CIRCUIT PREVIOUSLY SERVING IN THIS ROOM.
4. EPO (EMERGENCY POWER OFF) PUSH BUTTON TYPE SWITCH FOR BOILERS SHUT DOWN CONNECT TO BOILER CONTROL PANEL.
5. HOT WATER UNIT HEATER (HWUH-1), 120V, 1ø.
6. BOILERS (B-1 & B-2), 15A, 120V, 1ø (EACH), WITH BUILT-IN CONTROLLER PANEL.
7. HOT WATER PUMPS (HWP-1 & HWP-2), 10HP, 480V, 3ø (EACH). PROVIDE WITH VFD.
8. NEW CIRCULATING PUMP, 120V, 1ø. EXTEND EXISTING CIRCUIT TO THIS NEW LOCATION.
9. NEW RINNAI GAS WATER HEATER, 20A, 120V, 1ø.
10. NOT USED.

SUBSCRIPTS

Applicable to this drawing only

E EXISTING TO REMAIN.

THE FOLLOWING ITEMS MUST BE COMPLETED BY THE CONTRACTOR BEFORE ANY WORK COULD BE PERFORMED AT THE SCHOOL.

1. PROVIDE TRADE PERMITS TO THE OWNER.
2. SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE PRINCIPAL AND OWNER.
3. SUBMIT WRITTEN PROPOSAL FROM THE CONTROL SUB-CONTRACTOR WITH THE SCOPE OF WORK. CONTROL CONTRACTOR CAN NOT START THEIR WORK UNTIL MR. SERGHEI MALCOV HAS BEEN NOTIFIED.

LIGHTING FIXTURE SCHEDULE

FIXTURE TYPE	MANUFACTURER	CATALOG NUMBER	LAMPS				MOUNTING	REMARKS
			No.	WATTS	VOLTS	TYPE		
A	METALUX LIGHTING	4VT2-LD4-6-DR-UNV-L835-CD1-WL-U	–	56	UNIVERSAL	LED	PENDANT	2'x4' VAPORTITE LED, WET LOCATION.

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Seal:

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ISSUES / REVISIONS	
Date	Description
1/8/2018	
2/28/2018	80% CD SET
3/16/2018	90% CD SET
5/02/2018	100% CD SET
2/11/2019	BID SET

APPROVALS
Drawn By:
Designed By:
Checked By:

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Sheet Title:
BOILER ROOM
PLAN - NEW WORK

Scale: **AS SHOWN**

Project Code: **CODE**

Sheet Number:
E201

EXISTING

PANEL SCHEDULE

PANEL DESIGNATION: **HA** | VOLTAGE: **277/480** | PHASE: **3** | WIRES: **4** | MAINS: **225A MLO** | MOUNTING: **SURFACE**
A.I.C. RATING: **EXISTING TO REMAIN** | REMARKS: **SECTION 1**

BRANCH CIRCUIT LOAD DESCRIPTION	LOAD KVA	CIRCUIT BREAKER POLE	CIRCUIT BREAKER TRIP	PHASE No.	PHASE A B C	CIRCUIT BREAKER No.	CIRCUIT BREAKER TRIP	CIRCUIT BREAKER POLE	LOAD KVA	BRANCH CIRCUIT LOAD DESCRIPTION
LIGHTS (E) RM A102	2.6	1	20	1		2	20	1	2.2	LIGHTS (E) RM A111A
LIGHTS (E) RM A101	2.4	1	20	3		4	20	1	2.3	LIGHTS (E) RM A111
LIGHTS (E) RM A109	2.7	1	20	5		6	20	1	2.0	LIGHTS (E) RM A110
LIGHTS (E) OFFICE+LIBRARY	2.8	1	20	7		8	20	1	2.6	LIGHTS (E) LIBRARY
LIGHTS (E) KITCHEN	3.0	1	20	9		10	20	1	2.6	LIGHTS (E) LIBRARY
LIGHTS (E) HALL	2.2	1	20	11		12	20	1	2.8	LIGHTS (E) CAFETERIA
LIGHTS (E) HALL FRONT CANOPY	2.5	1	20	13		14	20	1	2.8	LIGHTS (E) CAFETERIA
LIGHTS (E) CLINIC	2.0	1	20	15		16	40	3	15.0	PUMP #1 (E)
LIGHTS (E) MAIN OFFICE	2.6	1	20	17		18				
MAU-1 (E)	6.0	3	20	19		20				
				21		22	40	3	15.0	PUMP #2 (E)
				23		24				
MAU-5 &6 (E)	6.0	3	20	25		26				
				27		28	30	3	11.6	NEW HWP-3
				29		30				
SPARE	–	3	20	31		32				
				33		34	30	3	–	NEW HWP-4 (STAND-BY)
				35		36				
COMPRESSOR (E)	8.0	3	20	37		38				
				39		40	20	1	–	SPARE
				41		42	20	1	–	SPARE

EXISTING

PANEL SCHEDULE

PANEL DESIGNATION: **HA** | VOLTAGE: **277/480** | PHASE: **3** | WIRES: **4** | MAINS: **225A MLO** | MOUNTING: **SURFACE**
A.I.C. RATING: **EXISTING TO REMAIN** | REMARKS: **SECTION 2**

BRANCH CIRCUIT LOAD DESCRIPTION	LOAD KVA	CIRCUIT BREAKER POLE	CIRCUIT BREAKER TRIP	PHASE No.	PHASE A B C	CIRCUIT BREAKER No.	CIRCUIT BREAKER TRIP	CIRCUIT BREAKER POLE	LOAD KVA	BRANCH CIRCUIT LOAD DESCRIPTION
LIGHTS (E) BOILER RM.	1.0	1	20	43		44	20	3	–	SPARE
LIGHTS (E) PARKING LOT	2.6	1	20	45		46				
	–	2	20	47		48				
				49		50	20	1	2.0	EXISTING CKT.
SIGN (E)	1.0	1	20	51		52	20	1	2.2	EXISTING CKT.
SPACE	–	1	–	53		54	–	1	–	SPACE
SPACE	–	1	–	55		56	–	1	–	SPACE
SPACE	–	1	–	57		58	–	1	–	SPACE
SPACE	–	1	–	59		60	–	1	–	SPACE
SPACE	–	1	–	61		62	–	1	–	SPACE
SPACE	–	1	–	63		64	–	1	–	SPACE
SPACE	–	1	–	65		66	–	1	–	SPACE
SPACE	–	1	–	67		68	–	1	–	SPACE
SPACE	–	1	–	69		70	–	1	–	SPACE
SPACE	–	1	–	71		72	–	1	–	SPACE
SPACE	–	1	–	73		74	–	1	–	SPACE
SPACE	–	1	–	75		76	–	1	–	SPACE
SPACE	–	1	–	77		78	–	1	–	SPACE
SPACE	–	1	–	79		80	–	1	–	SPACE
SPACE	–	1	–	81		82	–	1	–	SPACE
SPACE	–	1	–	83		84	–	1	–	SPACE

TOTAL CONNECTED LOAD = 110.5 KVA
LIGHTING LOAD (125% OF LOAD) = 48.9 KVA x (1.25) = 61.1 KVA
EQUIPMENT LOAD (100% OF LOAD) = 61.6 KVA
TOTAL DEMAND LOAD = 61.1 KVA + 61.6 KVA
= 122.7 KVA = 148A.

EXISTING

PANEL SCHEDULE

PANEL DESIGNATION: **LA** | VOLTAGE: **120/208** | PHASE: **3** | WIRES: **4** | MAINS: **200A MCB** | MOUNTING: **SURFACE**
A.I.C. RATING: **EXISTING TO REMAIN** | REMARKS: **SECTION 1**

BRANCH CIRCUIT LOAD DESCRIPTION	LOAD KVA	CIRCUIT BREAKER POLE	CIRCUIT BREAKER TRIP	PHASE No.	PHASE A B C	CIRCUIT BREAKER No.	CIRCUIT BREAKER TRIP	CIRCUIT BREAKER POLE	LOAD KVA	BRANCH CIRCUIT LOAD DESCRIPTION
RECEPTACLES (E) RM A-3	0.54	1	20	1		2	20	1	0.54	RECEPTACLES (E) RM A-4
RECEPTACLES (E) RM A-3	0.54	1	20	3		4	20	1	0.54	RECEPTACLES (E) RM A-4
RECEPTACLES (E) RM A-3	0.36	1	20	5		6	20	1	0.54	RECEPTACLES (E) RM A-4
RECEPTACLES (E) RM A-5	0.72	1	20	7		8	20	1	0.36	RECEPTACLES (E) RM A-6
RECEPTACLES (E) RM A-5	0.72	1	20	9		10	20	1	0.72	RECEPTACLES (E) RM A-6
RECEPTACLES (E) RM A-5	0.54	1	20	11		12	20	1	0.54	RECEPTACLES (E) RM A-6
PLUGMOLD (E) AV WORK RM	0.72	1	20	13		14	20	1	0.9	RECEPTACLES (E) RM A-1,2
PLUGMOLD (E) AV WORK RM	0.72	1	20	15		16	20	1	0.54	RECEPTACLES (E) RM A-1,2
RECEPTACLES (E) LIBRARY	0.72	1	20	17		18	20	1	0.54	RECEPTACLES (E) RM A-1,2
RECEPTACLES (E) LIBRARY	0.72	1	20	19		20	20	1	0.18	RECEPTACLES (E) LIBRARY COLUMN
RECEPTACLES (E) LIBRARY	0.72	1	20	21		22	20	1	0.18	RECEPTACLES (E) LIBRARY COLUMN
RECEPTACLES (E) LIBRARY	0.72	1	20	23		24	20	1	0.54	RECEPTACLES (E) HALL/STORAGE
PLUGMOLD (E) LIBRARY OFFICE	0.72	1	20	25		26	20	1	0.6	EWC (E)
PLUGMOLD (E) LIBRARY OFFICE	0.72	1	20	27		28	20	1	0.8	RECEPTACLES (E) AV RM
TIME CLOCK (E)	–	1	20	29		30	20	1	0.6	EWC (E)
RECEPTACLES (E) LIBRARY OFFICE	0.72	1	20	31		32	20	1	0.54	RECEPTACLES (E) CLINIC
RECEPTACLES (E) LIBRARY OFFICE	0.72	1	20	33		34	20	1	0.54	RECEPTACLES (E) CLINIC, OFFICE
RECEPTACLES (E) CUS. OFFICE	0.54	1	20	35		36	20	1	0.54	RECEPTACLES (E) HALL
RECEPTACLES (E) FRONT HALL	0.54	1	20	37		38	20	1	0.36	RECEPTACLES (E) HALL & ROOF
CABINET UNIT HEATER (E)	1.0	1	20	39		40	20	2	2.0	A/C (E) COMPUTER RM
UNIT VENT (E) RMS A-3,4,5,6	0.8	1	20	41		42				

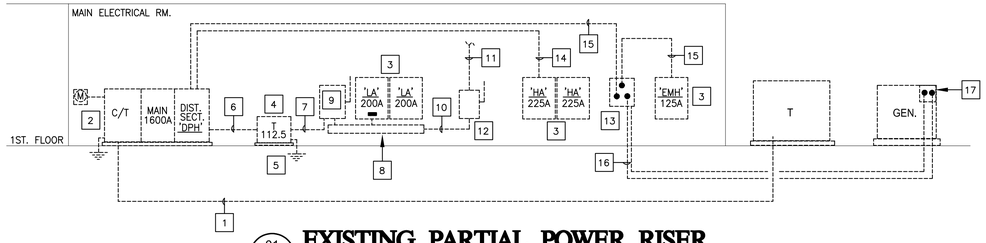
EXISTING

PANEL SCHEDULE

PANEL DESIGNATION: **LA** | VOLTAGE: **120/208** | PHASE: **3** | WIRES: **4** | MAINS: **200A MLO** | MOUNTING: **SURFACE**
A.I.C. RATING: **EXISTING TO REMAIN** | REMARKS: **SECTION 2**

BRANCH CIRCUIT LOAD DESCRIPTION	LOAD KVA	CIRCUIT BREAKER POLE	CIRCUIT BREAKER TRIP	PHASE No.	PHASE A B C	CIRCUIT BREAKER No.	CIRCUIT BREAKER TRIP	CIRCUIT BREAKER POLE	LOAD KVA	BRANCH CIRCUIT LOAD DESCRIPTION
UNIT VENT (E) SIDE HALL	0.6	1	20	43		44	20	1	0.4	LIGHTS (E) VIDEO RM
UNIT VENT (E) LOBBY	0.6	1	20	45		46	20	1	0.6	EWC (E)
LIGHTS (E) LIBRARY	1.0	1	20	47		48	20	1	0.54	RECEPTACLES (E) LIBRARY
RECEPTACLES (E) MAIN OFFICE	0.54	1	20	49		50	20	1	0.54	RECEPTACLES (E) LIBRARY
RECEPTACLES (E) MAIN OFFICE	0.54	1	20	51		52	20	1	1.2	COPIER (E)
PRV-3 (E)	0.6	1	20	53		54	20	1	0.8	LIGHTS HOOD (E) KITCHEN
PRV-4 (E)	0.6	1	20	55		56	20	1	0.54	RECEPTACLES (E) BOILER RM
RECEPTACLES (E) BOILER RM	0.54	1	20	57		58	20	1	0.54	RECEPTACLES (E) BOILER RM
NEW RINNAI WATER HEATERS	0.5	1	20	59		60	20	1	0.54	RECEPTACLES (E) BOILER RM
NEW BOILER B-1	0.1	1	20	61		62	20	1	0.36	RECEPTACLES (E) COMPUTER RM
NEW BOILER B-2	0.1	1	20	63		64	20	1	0.2	LEAK DETECTOR (E)
NEW HWH-1	0.2	1	20	65		66	20	1	1.0	LIGHTS (E) LOBBY DECOR
RECEPTACLES (E) LIBRARY	0.72	1	20	67		68	20	1	0.4	CIRCULATING PUMP
EXHAUST HOOD (E) KITCHEN	0.7	1	20	69		70	20	1	0.6	PRV-1,2,5,6 (E)
AIR DRYER PLUG (E)	0.18	1	20	71		72	20	1	0.54	RECEPTACLES (E) RM A-1
RECEPTACLES (E) HUB, DATA	1.6	1	20	73		74	20	1	0.54	RECEPTACLES (E) RM A-1
RECEPTACLES (E) LIBRARY	0.72	1	20	75		76	20	1	0.54	RECEPTACLES (E) RM A-1
SPARE	–	1	20	77		78	20	1	0.18	RECEPTACLES (E) ELEC. RM
BATTERY CHARGER (E)	0.1	1	20	79		80	30	3	–	SURGE PROTECTION (E)
RECEPTACLES (E)	0.36	1	20	81		82				
SPACE	–	1	–	83		84				

TOTAL CONNECTED LOAD = 45.2 KVA
LIGHTING LOAD (125% OF LOAD) = 3.2 KVA x (1.25) = 4.0 KVA
EQUIPMENT LOAD (100% OF LOAD) = 12.6 KVA
RECEPT. LOAD (FIRST 10.0 KVA AT 100% OF LOAD) = 10.0 KVA
(THE REMAINING AT 50% LOAD) = 9.7 KVA
TOTAL DEMAND RECEPT. LOAD = 10.0 KVA + 9.7 KVA = 19.7 KVA
TOTAL DEMAND LOAD = 4.0 KVA + 12.6 KVA + 19.7 KVA
= 36.3 KVA = 101A.



01 / E301 **EXISTING PARTIAL POWER RISER**
Not To Scale

EXISTING PARTIAL POWER RISER NOTES

1. EXISTING INCOMING SERVICE TO REMAIN.
2. EXISTING 1600A, 3ø, 4W, 277/480V, MAIN SWITCHBOARD TO REMAIN.
3. EXISTING PANEL TO REMAIN.
4. EXISTING 112.5 KVA DRY TYPE TRANSFORMER 3ø, 480V TO 120/208Y, 3ø, 4W TO REMAIN.
5. EXISTING TRANSFORMER GROUND TO REMAIN.
6. EXISTING 3 #1 + GROUND IN 1 1/4" CONDUIT TO REMAIN.
7. EXISTING 4 #400 KCM + 1 #1/0 G IN 3" FLEXIBLE CONDUIT TO REMAIN.
8. EXISTING WIRE TROUGH TO REMAIN.
9. EXISTING 3P, 400A FUSED DISCONNECT SWITCH TO REMAIN.
10. EXISTING 4 #1/0 + 1 #6 G IN 2" CONDUIT TO REMAIN.
11. EXISTING 4 #1/0 + 1 #6 G IN 2" CONDUIT TO EXISTING PANEL 'LK' TO REMAIN.
12. EXISTING 3P, 200A, FUSED DISCONNECT SWITCH TO REMAIN.
13. EXISTING AUTOMATIC TRANSFER SWITCH TO REMAIN.
14. EXISTING 4 #4/0 + 1 #6 G IN 2 1/2" CONDUIT TO REMAIN.
15. EXISTING 4 #8 + 1 #10 G IN 1" CONDUIT TO REMAIN.
16. EXISTING 3 #8 + 1 #10 G IN 1" CONDUIT TO REMAIN.
17. EXISTING CONTROL PANEL TO REMAIN

CONDUIT & WIRE SIZE SCHEDULE
UNLESS OTHERWISE SHOWN

CIRCUIT BREAKER TRIP	GROUND WIRE SIZE	1 or 2 POLE CONDUIT	1 or 2 POLE WIRE (Copper)	3 POLE CONDUIT	3 POLE WIRE (Copper)
15A	1 #12	3/4"	3 #12	3/4"	4 #12
20A	1 #12	3/4"	3 #12	3/4"	4 #12
30A	1 #10	3/4"	3 #10	3/4"	4 #10
40A	1 #10	3/4"	3 #8	1"	4 #8
50A	1 #10	3/4"	3 #6	1"	4 #6
60A	1 #8	1"	3 #4	1"	4 #4
70A	1 #8	1"	3 #4	1-1/4"	4 #4
80A	1 #8	1-1/4"	3 #3	1-1/4"	4 #3
90A	1 #8	1-1/4"	3 #2	1-1/4"	4 #2
100A	1 #8	1-1/4"	3 #1	1-1/4"	4 #1

NOTE: ALL SIZES ARE BASED ON CONDUIT LENGTH OF 100 FEET FOR 120 VOLT BRANCH CIRCUITS. IF LENGTH EXCEEDS 100 FEET (FOR 120 VOLT CIRCUITS) THEN USE THE NEXT HIGHER WIRE SIZE.

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APPROVALS
Drawn By:
Designed By:
Checked By:

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Sheet Title: DETAILS - ELECTRICAL

Scale: **AS SHOWN**

Project Code: **CODE**

Sheet Number: **E301**

GENERAL NOTES:

1. CONTRACTOR(S) SHALL COORDINATE EXISTING MECHANICAL, PLUMBING, ELECTRICAL, STRUCTURAL & ARCHITECTURAL WORK. MECHANICAL & PLUMBING PIPING AS WELL AS ELECTRICAL CONDUIT LOCATIONS. THE ACTUAL POSITION OF THE PIPING SHALL BE COORDINATED.
2. NO CONTRACTOR OR SUBCONTRACTOR SHALL BEGIN ANY WORK UNTIL HE HAS REVIEWED THE SPECIFICATIONS IN CONJUNCTION WITH THE DRAWINGS. THE SPECIFICATIONS CONTAIN INFORMATION NOT SHOWN ON THE DRAWINGS. EACH CONTRACTOR OR SUBCONTRACTOR SHALL HAVE IN HIS POSSESSION AT THE TIME OF WORK AT LEAST THOSE SECTIONS OF THE SPECIFICATIONS AND ALL CONSTRUCTION STANDARDS (ASME, ASHRAE, SMACNA, ETC.) THAT PERTAIN TO HIS WORK.
3. EQUIPMENT SHALL BE INSTALLED IN SUCH A MANNER WHERE IT IS SERVICEABLE AND REMOVABLE WITHOUT MOVING EXISTING MECHANICAL INFRASTRUCTURE. WHERE EQUIPMENT REQUIRES ACCESS FOR SERVICING, PROVIDE ACCESS PANELS IN CEILING OR ADJACENT WALLS FOR REQUIRED ACCESS, OR AT CONTRACTOR'S OPTION HE MAY SHIFT THE UNIT LOCATION TO PROVIDE THE REQUIRED ACCESS AT NO ADDITIONAL COST TO THE OWNER. SHOW EXACT EQUIPMENT LOCATION WITH REQUIRED ACCESS ON COORDINATION DRAWING SUBMISSION.
4. CONTRACTOR MUST REVIEW THE CONTRACT DOCUMENTS IN THEIR ENTIRETY AND HAVE A COMPLETE SET OF DESIGN DOCUMENTS AT SITE.
5. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS.
6. ALL DOMESTIC HOT AND COLD WATER PIPES SHALL BE COPPER PIPING.
7. ALL THREE PHASE EQUIPMENT SHALL BE PROVIDED WITH ICM-455 PHASE MONITOR WITH ELECTRONIC DISPLAY.
8. ALL DIELECTRIC CONNECTIONS SHALL BE OF NIPPLE TYPE ONLY (DO NOT USE DIELECTRIC UNIONS).
9. BALL VALVES SHALL BE USED THROUGHOUT THE NEW WORK AND MAIN BOILER ROOM. WHERE A BALL VALVE IS SHOWN FOR 5" PIPING, A 6" VALVE SHALL BE PROVIDED.
10. ALL NEW VALVES SHALL BE PROVIDED WITH VALVE EXTENSION TO PREVENT DAMAGING PIPING INSULATION.
11. PROVIDE AUTO AIR VENTS AT HIGH POINTS AS REQUIRED WITH SHUT-OFF VALVES AND HOSE END CAPS
12. ALL NEW PIPING SHALL BE INSULATED. (REFER TO SPECIFICATION).
13. THE DEMOLITION DRAWINGS HAVE BEEN PREPARED WITH THE USE OF EXISTING DRAWINGS AND FIELD SURVEYS TO IDENTIFY EXISTING CONDITIONS. THE CONTRACTOR MUST TAKE INTO ACCOUNT AND PROVIDE ALLOWANCES IN HIS BIDS THAT THERE WILL BE INSTANCES WHERE EXACT LOCATION, ADDITIONAL PIPING, AND/OR DEVICES MAY BE FOUND THAT ARE NOT SHOWN ON THE DEMOLITION DRAWINGS THAT REQUIRE REMOVAL. THESE SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL CONDUCT A THROUGH WALK-THROUGH OF THE FACILITY PRIOR TO BIDDING TO ASCERTAIN EXISTING CONDITIONS AND SCOPE OF THE DEMOLITION WORK.
14. ALL NEW CONTROLS WORK SHALL BE PERFORMED BY AUTOMATIC TEMPERATURE CONTROL (ATC) CONTRACTOR SUB-CONTRACTED BY THE GENERAL CONTRACTOR AT THE GENERAL CONTRACTOR EXPENSES.

ABBREVIATION

ADS-	AIR DIRT SEPARATOR
A.F.F.	ABOVE FINISH FLOOR
AS-	AIR SEPARATOR
ATC	AUTOMATIC TEMPERATURE CONTROL
B-	BOILER
DOM.	DOMESTIC
DN.	DOWN
ET-	EXPANSION TANK
HWP-	HOT WATER PUMP
HW	HOT WATER
GPH	GALLON PER HOUR
GPM	GALLON PER MINUTE
HWUH-	HOT WATER UNIT HEATER
LWT	LEAVING WATER TEMPERATURE
LBS	POUNDS
O.A.I	OUTSIDE AIR INTAKE
P-	PUMP
PD	PRESSURE DROP
PSI	POUND PER SQUARE INCH
TD	TEMPERATURE DROP
(E)	EXISTING
(N)	NEW
WG	WATER GAUGE
WPD	WATER PRESSURE DROP

SYMBOL LIST

	EXISTING WORK TO BE REMOVED
	EXISTING WORK TO REMAIN
	BALANCING VALVE
	SHUT-OFF VALVE
	CHECK VALVE
	MANUAL ISOLATION VALVE
T	THERMOMETER
P	PRESSURE GAUGE
	NEW PIPING
	PIPE ELBOW UP/DN.
	UNION
	EXISTING 3-WAY AUTOMATIC MIXING CONTROL VALVE
	PRESSURE REGULATING VALVE
CW	DOMESTIC COLD WATER PIPE
HWS	EXISTING HOT WATER SUPPLY PIPE
HWR	EXISTING HOT WATER RETURN PIPE
HWS	NEW HOT WATER SUPPLY PIPE
HWR	NEW HOT WATER RETURN PIPE
	END OF DEMOLITION WORK
	POINT OF CONNECTION NEW TO EXISTING WORK

The Contractor shall attach an engraved weatherproof warranty tag to each boiler. Identification tag shall be black with engraved 1/2" white letters. Tag is to be screwed or riveted to each new unit at or near manufacturers rating plate. Double-faced tape is not acceptable.

UNIT # (unit number)

INSTALLED BY: (contracting company's name)

2 YR LABOR WARRRANTY EXPIRES: (month / day / year)

PHONE: (Service providers phone number)

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Seal:

Consultants:

ISSUES / REVISIONS	
Date	Description
1/8/2018	
2/28/2018	80% CD SET
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5/02/2018	100% CD SET
2/11/2019	BID SET

APPROVALS
Drawn By:
Designed By:
Checked By:

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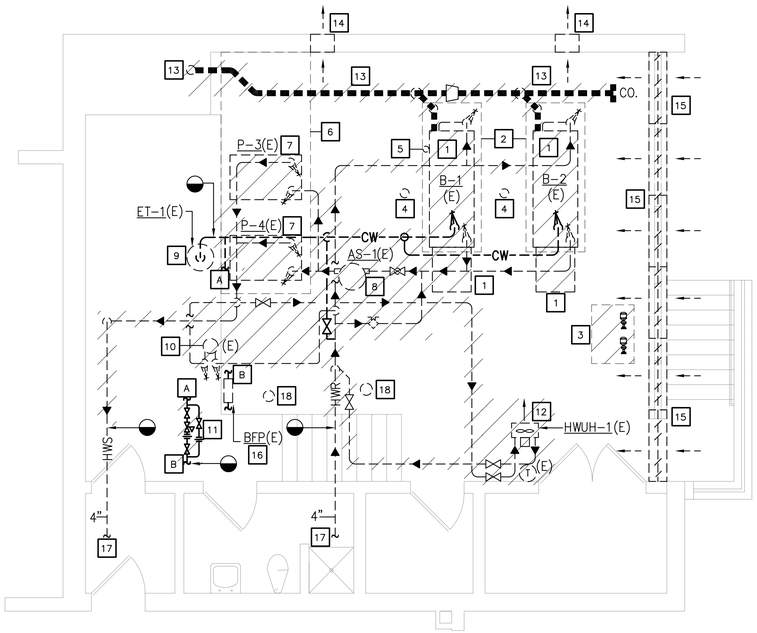
FAIRFAX, VA 22031

Sheet Title:
GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS - MECHANICAL

Scale: AS SHOWN

Project Code: CODE

Sheet Number:
M001



REFERENCED PLAN NOTES

Applicable to this drawing only

1. EXISTING DUAL BURNERS GAS & FUEL OIL BOILERS TO BE REMOVED WITH ALL RELATED GAS, FUEL OIL, HOT WATER SUPPLY, RETURN, MAKE-UP WATER, FLUES & ETC. (PRIOR TO BOILERS REMOVAL ALL ELECTRICAL POWER CONNECTIONS, GAS, FUEL OIL PIPES AND FLUE PIPES SHALL BE DISCONNECTED FOR SAFETY).
2. EXISTING CONCRETE PADS UNDER EXISTING BOILERS TO REMAIN AND TO BE CLEANED PRIOR TO NEW PAINT.
3. EXISTING FUEL OIL PUMPS PACKAGE WITH ALL RELATED PIPING SHALL BE REMOVED WITHIN THE EXISTING BOILER ROOM. ALL EXISTING FUEL OIL PIPING SHALL BE DRAINED PRIOR TO REMOVAL INCLUDING ELECTRICAL CONNECTIONS. CAP ALL EXISTING FUEL OIL PIPES AT FLOOR AND WALL PENETRATIONS. SEAL PIPING CAPS WATER AND AIR TIGHT.
4. EXISTING OPEN-SITE DRAINS TO REMAIN (TYPICAL OF 2).
5. EXISTING FLOOR DRAIN THRU. EXISTING CONCRETE PAD TO REMAIN.
6. EXISTING CONTINUOUS CONCRETE PAD UNDER EXISTING PUMPS TO REMAIN.
7. EXISTING BASE MOUNTED END SUCTION HOT WATER PUMPS TO BE REMOVED WITH ALL RELATED VALVES, PIPING AND ETC. (DISCONNECT ELECTRICALLY PRIOR TO REMOVAL).
8. EXISTING AIR SEPARATOR TO BE REMOVED WITH RELATED PIPING, SUPPORTS AND ETC.
9. EXISTING VERTICAL FLOOR MOUNTED HOT WATER EXPANSION TANK TO REMAIN WITH RELATED PARTIAL PIPING AS SHOWN, SUPPORT AND ETC.
10. EXISTING HOT WATER TREATMENT TANK TO BE REMOVED WITH ALL RELATED PIPES, VALVES AND ETC.
11. EXISTING COLD WATER MAKE-UP PRESSURE REGULATING VALVE TO BE REMOVED WITH ALL RELATED BY-PASS, VALVES AND ETC.
12. EXISTING HOT WATER UNIT HEATER TO BE REMOVED WITH ALL RELATED PIPING, VALVE, CONTROL, ELECTRICAL CONNECTION AND ETC.
13. EXISTING BOILERS FLUES UP THRU EXISTING CHIMNEY TO BE REMOVED ENTIRELY.
14. EXISTING 16X8 WALL GRILLES TO REMAIN (TYPICAL OF 2).
15. EXISTING COMBUSTION AIR INTAKE LOUVERS ABOVE WINDOWS TO REMAIN.
16. EXISTING COLD WATER BACK FLOW PREVENTER TO REMAIN.
17. EXISTING HWS & HWR PIPING SERVING EXISTING BUILDING HEATING EQUIPMENT TO REMAIN.
18. EXISTING DOMESTIC HOT WATER HEATERS FLUES VENTING ROOF OPENINGS TO REMAIN AND TO BE RE-USED. CONTRACTOR TO ENLARGE THE EXISTING ROOF OPENINGS AS NEEDED TO ACCOMMODATE THE NEW DESIGN OPENING REQUIREMENT. REFER TO NEW WORK DRAWING M201 FOR MORE INFORMATION ON THE NEW DESIGN USE OF EXISTING ROOF OPENINGS.

01 / M101 **BOILER ROOM PLAN - EQUIP. REMOVAL**

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

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Sheet Title:
BOILER ROOM PLAN - EQUIPMENT REMOVAL

Scale: **AS SHOWN**

Project Code: **CODE**

Sheet Number:
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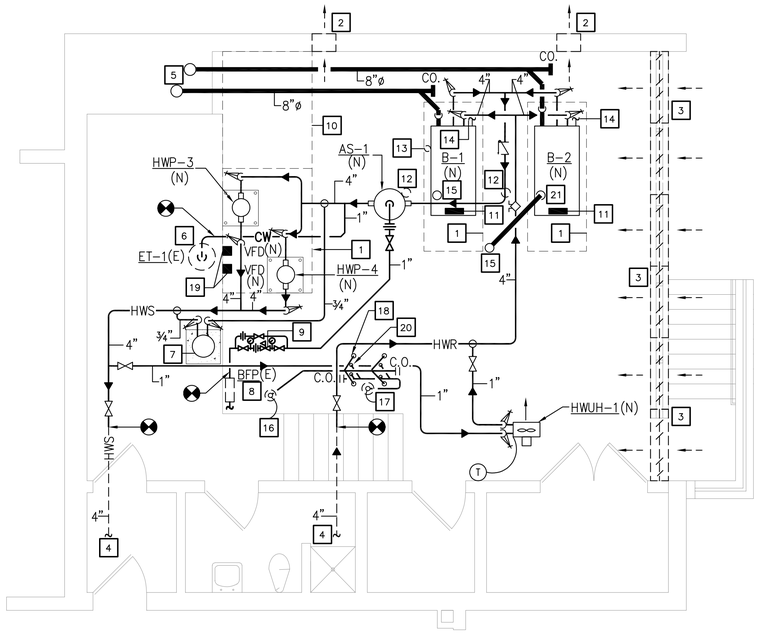

01 BOILER ROOM PLAN - NEW WORK

M201 Scale: 1/4" = 1'-0"

CONTROL/DDC POINT CHANGES BY FCPS

(A) DISCONNECT AND RECONNECT EXISTING CONTROL POINTS:
BOILER 1 STATUS, ALARM
BOILER 2 STATUS, ALARM
MIXING VALVE – DISCONNECT AND REMOVE CONTROL WIRE TO THE CONTROL PANEL
PUMP 3 START/STOP, STATUS
PUMP 4 START/STOP, STATUS
REMOVE "HOT WATER RESET VALVE" POINT AND USE IT FOR BOILER 1 START/STOP. PROVIDE NEW CONTROL WIRES AND CONDUIT
REMOVE "DOMESTIC HOT WATER PUMP ENABLE/DISABLE" POINT AND USE IT FOR BOILER 2 START/STOP. PROVIDE NEW CONTROL WIRES AND CONDUIT
CONNECT BOILERS START/STOP AND PUMPS START/STOP AT THE EQUIPMENT TO NORMALLY CLOSED TERMINALS OF THE EQUIPMENT CONTROL RELAYS
FCPS WILL MAKE WIRE TERMINATION AT BAS CONTROLLER WHEN NOTIFIED

(B) CONTRACTOR SHALL RETAIN ONE OF THE FOLLOWING CONTROL CONTRACTORS FOR DISCONNECT, RECONNECT AND WIRING:
CKS BUILDING SERVICES INC. – CHRIS STEVENS (703.975.4990)
METROPOLITAN CONTROLS – PAUL CABADA (443.532.5014)

(C) FCPS WILL REVISE PROGRAMMING

(D) CONTROL CONTRACTOR MUST CALL THE FOLLOWING PERSON AT THE FAIRFAX COUNTY PUBLIC SCHOOLS BEFORE ANY EXISTING CONTROL WIRES AND RELAYS ARE REMOVED: SERGHEI MALCOV @(703) 764-4373

(E) CONTROL CONTRACTOR SHALL REMOVE EXISTING CONTROL WIRES FROM THE EQUIPMENT WITHOUT CUTTING THEM AND LABEL EVERY CONTROL WIRE. RECONNECT THEM ON THE NEW EQUIPMENT. UPON COMPLETION, THE CONTROL CONTRACTOR SHALL VERIFY WITH FCPS TO MAKE SURE THAT ALL THE CONTROL POINTS WORK. CONTROL CONTRACTOR SHALL REPROGRAM THE SEQUENCE AND PROVIDE FCPS WITH A BACKUP COPY OF THE FINAL PROGRAM AND THE SEQUENCE.

(F) REPLACE ALL RELAYS AND CURRENT SENSORS WITH LIKE COMPONENTS. LABEL EACH POINT INSIDE EQUIPMENT (LABEL RELAY SOCKETS, NOT RELAYS, AS TO DEVICE CONTROLLED/FUNCTION). EXTEND CONTROL WIRES AS NECESSARY.

(G) NO WIRE NUT SPLICES OR TERMINATIONS WILL BE ACCEPTED. WIRES SHALL BE LANDED ON FIELD, INSTALLED OR FACTORY INSTALLED TERMINAL BOARDS.

REFERENCED PLAN NOTES

Applicable to this drawing only

1. EXISTING RE-PAINTED CONCRETE PADS TO BE RE-USED FOR NEW BOILERS AND NEW PUMPS.
2. EXISTING 16X8 WALL GRILLES TO REMAIN (TYPICAL OF 2).
3. EXISTING COMBUSTION AIR INTAKE LOUVERS ABOVE WINDOWS TO REMAIN.
4. EXISTING HWS & HWR PIPING SERVING EXISTING BUILDING HEATING EQUIPMENT TO REMAIN.
5. NEW 2 (TWO) EACH – 8" DIAMETER BOILERS FLUES UP THRU EXISTING CHIMNEY & SHALL BE TERMINATED 36" ABOVE TOP OF CHIMNEY WITH WEATHER PROOF CAPS.
6. EXISTING VERTICAL FLOOR MOUNTED HOT WATER EXPANSION TANK TO REMAIN WITH NEW PIPING CONNECTION AS SHOWN.
7. NEW WATER TREATMENT TANK MOUNTED ON TOP OF NEW 4" CONCRETE PAD.
8. EXISTING COLD WATER BACK FLOW PREVENTER TO REMAIN.
9. NEW COLD WATER MAKE-UP WATER PRESSURE REGULATING VALVE (BOILER FEED) MOUNTED 54" ABOVE BOILER ROOM FLOOR.
10. EXISTING CONTINUOUS CONCRETE PAD TO REMAIN.
11. NEW BOILERS CONTROLLER PANELS TO BE INTERPHASED WITH NEW OUTDOOR TEMPERATURE RESET SENSORS.
12. EXISTING OPEN-SITE DRAINS TO REMAIN (TYPICAL OF 2).
13. EXISTING FLOOR DRAIN THRU. EXISTING CONCRETE PAD TO REMAIN.
14. NEW PVC DRAIN PIPING TO BE CONNECTED TO CONDENSATE DRAIN NEUTRALIZER SYSTEM & SHALL BE PIPED TO DISCHARGE OVER EXISTING FLOOR DRAIN.
15. NEW 6"ø COMBUSTION AIR INTAKE PVC PIPING UP THRU ROOF, TERMINATE WITH WEATHER PROOF TERMINATION KIT.
16. NEW 6" IN DIAMETER CVENT POLYPROPYLENE PIPE UP THRU EXISTING ROOF OPENING, TERMINATE WITH FACTORY PROVIDED WEATHER-PROOF ROOF CAP AND DN. TO CONNECT TO COMMON VENT HEADER. REFER TO PLUMBING DRAWING P201 FOR TANKLESS RACK SYSTEM (TRS) LOCATION.
17. NEW 6" IN DIAMETER COMBUSTION PIPE UP THRU EXISTING ROOF OPENING, TERMINATE WITH FACTORY PROVIDED WEATHER-PROOF ROOF CAP AND DN. TO CONNECT TO COMMON COMBUSTION AIR HEADER. REFER TO PLUMBING DRAWING P201 FOR TANKLESS RACK SYSTEM (TRS) LOCATION.
18. NEW POLYPROPYLENE VENT PIPE DN. TO CONNECT TO NEW TANKLESS WATER HEATERS VENT COLLAR (TYPICAL OF 4). COMMON VENT VERTICAL TERMINATION ASSEMBLY SHALL BE BY RINNAI.
19. NEW VARIABLE FREQUENCY DRIVES (VFD) FOR BALANCING ONLY.
20. NEW COMBUSTION AIR PIPE DN. TO CONNECT TO NEW TANKLESS WATER HEATERS AIR INTAKE COLLAR (TYPICAL OF 4). COMMON VENT VERTICAL TERMINATION ASSEMBLY SHALL BE BY RINNAI.
21. NEW 6"ø COMBUSTION AIR INTAKE PVC PIPING DN. TO BOILER AIR INTAKE COLLAR.

GENERAL NOTES

A. ALL NEW ISOLATION VALVES SHALL BE BALL VALVE TYPE WITH-IN BOILER ROOM ON HOT WATER SYSTEM AND PIPING.

B. ALL NEW ISOLATION VALVES ON NEW INSULATED PIPING SHALL BE PROVIDED WITH HANDLE STEM EXTENSIONS TO PREVENT DAMAGING INSULATION.

C. ALL HIGH MOUNTED VALVES SHALL BE LINKED CHAIN OPERATED.

THE FOLLOWING ITEMS MUST BE COMPLETED BY THE CONTRACTOR BEFORE ANY WORK COULD BE PERFORMED AT THE SCHOOL.

1. PROVIDE TRADE PERMITS TO THE OWNER.
2. SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE PRINCIPAL AND OWNER.
3. SUBMIT WRITTEN PROPOSAL FROM THE CONTROL SUB-CONTRACTOR WITH THE SCOPE OF WORK. CONTROL CONTRACTOR CAN NOT START THEIR WORK UNTIL MR. SERGHEI MALCOV HAS BEEN NOTIFIED @ (703) 764-4373.

ANY ROOFING WORK SHALL BE DONE BY THE FOLLOWING ROOFER:
COLBERT ROOFING
CHRIS COLBERT
703.550.9171

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BOILER ROOM PLAN - NEW WORK

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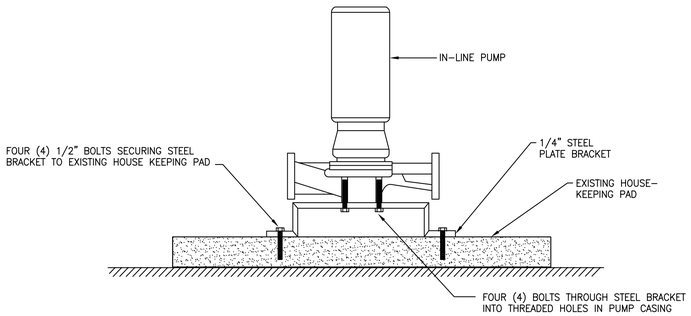
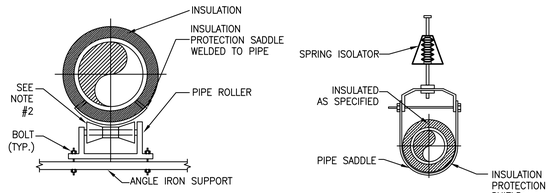


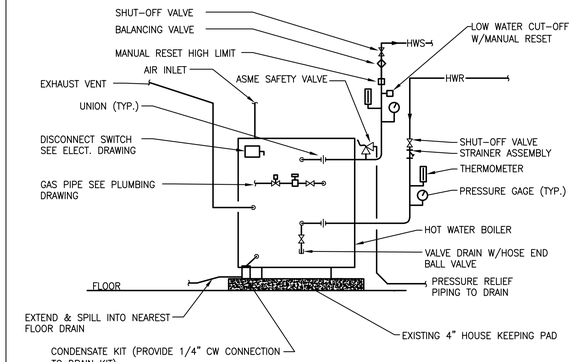
NOTE:
1- ALL NEW VALVES SHALL BE BALL TYPE VALVES (GATE, GLOBE AND BUTTERFLY TYPE VALVES SHALL NOT BE ACCEPTABLE)

07 M301 IN-LINE PUMP INSTALLATION DETAIL
NOT TO SCALE

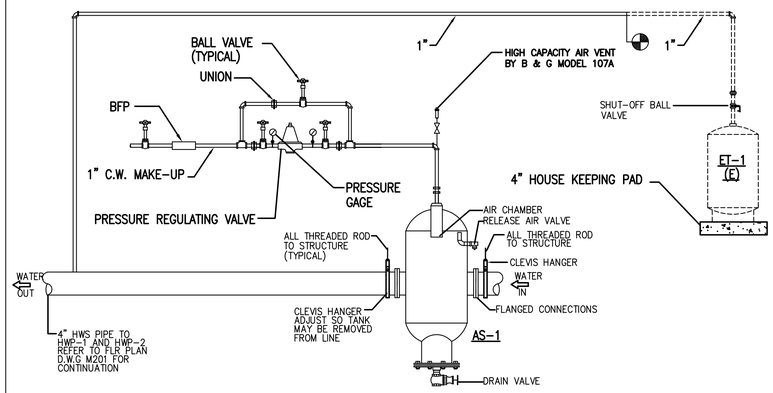


NOTES:
1. FOR TYPE OF HANGER AND INSULATION REQUIREMENTS REFER TO SPECIFICATIONS.
2. PIPING AS INDICATED IN SPECIFICATIONS SHALL BE INSTALLED ON ROLLER HANGERS.

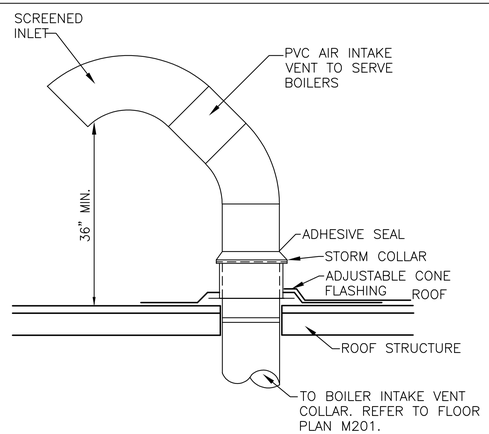
04 M301 PIPE HANGER AND ROLLER DETAIL
NOT TO SCALE



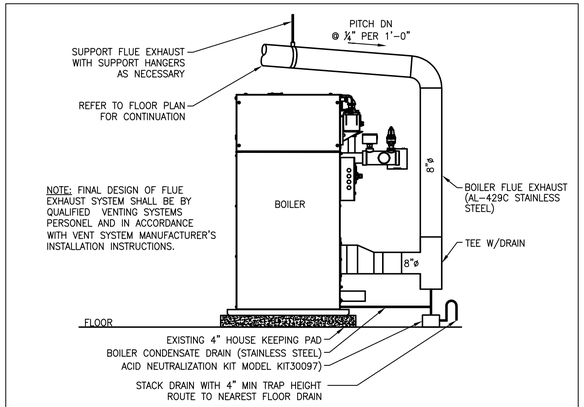
01 M301 BOILER PIPING DETAIL
NOT TO SCALE



08 M301 CLOSE EXPANSION TANK DETAIL
NOT TO SCALE



09 M301 BOILER INTAKE VENT DETAIL
NOT TO SCALE



05 M301 CONDENSING BOILER FLUE EXHAUST
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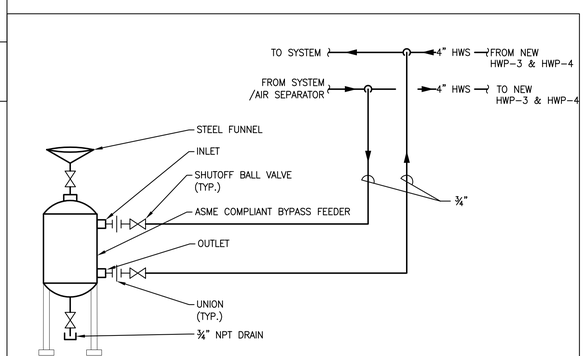
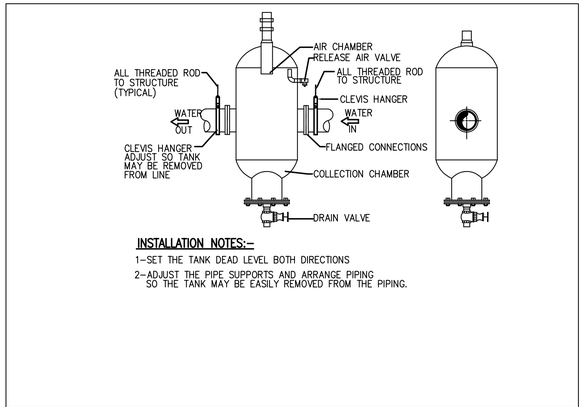
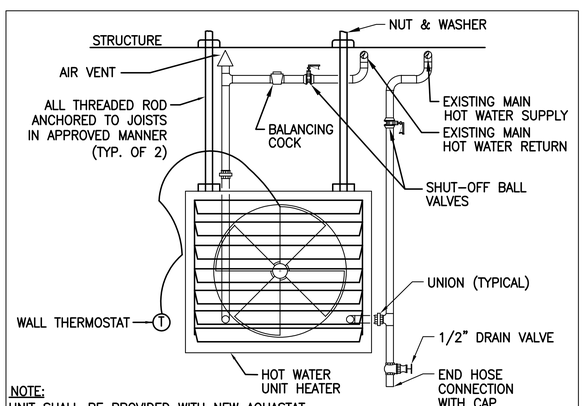


06 M301 CHEMICAL BYPASS FEEDER DETAIL
NOT TO SCALE



INSTALLATION NOTES:-
1-SET THE TANK DEAD LEVEL BOTH DIRECTIONS
2-ADJUST THE PIPE SUPPORTS AND ARRANGE PIPING SO THE TANK MAY BE EASILY REMOVED FROM THE PIPING.

02 M301 AIR SEPARATOR DETAIL
NOT TO SCALE



NOTE:
UNIT SHALL BE PROVIDED WITH NEW AQUASTAT.

03 M301 HORIZONTAL HOT WATER UNIT HEATER
NOT TO SCALE

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Sheet Title:
DETAILS - MECHANICAL

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Project Code: CODE

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M301

BOILER SCHEDULE

DESIGNATION	TYPE	GAS INPUT (MBH)	GROSS OUTPUT (MBH)	EWT (°F)	LWT (°F)	BOILER WATER CONTENT GALLONS	MAX WPD (FT)	RELIEF VALVE SETTING (PSI)	WORKING PRESSURE (PSI)	VENT SIZE (INCHES)	VOLTS/ PHASE	AMPS	DIMENSIONS (INCHES) (LxWxH)	OPERATING WEIGHT	BASIS OF DESIGN MANUFACTURER/MODEL#
B-1 & B-2	CATEGORY VI	1250	1203	100°-160°	120°-180°	87	0.9	75	60	8" DIA.	120/1	15	57.75x30x78	1,975 LBS	LOCHINVAR/FBNI-1251
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SCHEDULE NOTES:
1. BOILERS SHALL BE PROVIDED WITH NEUTRALIZER KIT & PIPED PRIOR TO DISCHARGE OVER FLOOR DRAIN.
2. BOILER WIDTH WITH INSULATION & COVER IS 30".
3. BOILERS COMBUSTION AIR & EXHAUST PIPES SHALL BE 6"ø & 8"ø PVC AND STAINLESS STEEL RESPECTIVELY.
4. PROVIDE BOILERS WITH MODULATING SEQUENCING CONTROL, OUTDOOR & SUPPLY SENSORS.
5. BOILERS SHALL BE PROVIDED WITH FLUE VENT DAMPERS. ELECTRICAL REQUIREMENTS SHALL BE @ 120V/1PH/60HZ (2.5W POWER CONSUMPTION).
6. OTHER ACCEPTABLE BOILERS MANUFACTURERS SHALL BE AERCO AND VIESSMANN.

HOT WATER UNIT HEATER SCHEDULE

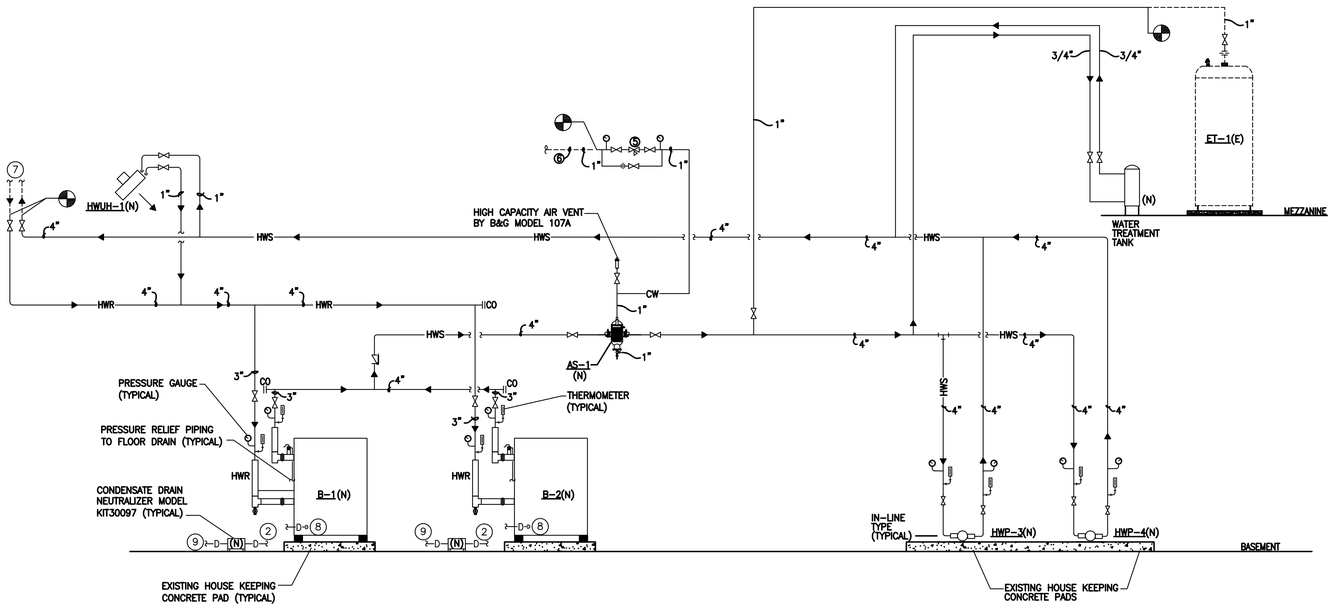
DESIGNATION	SERVICE	REHEAT COIL								VOLTS/ PHASE	FAN MOTOR (HP)	OPERATING WEIGHT (LBS)	DIMENSIONS (LxWxH IN)	BASIS OF DESIGN MANUFACTUER/MODEL#
		CFM	TOTAL MBH	GPM	WPD (FT)	EAT (°F)	LAT (°F)	EWT/LWT (°F)	N/A					
HWUH-1	BOILER ROOM	1,050	52.28	6.1	0.24	60	100	180/160	N/A	115/1	1/20	100	21x12x25	STERLING/HS-84
-	-	-	-	-	-	-	-	-		-	-	-	-	-
TOTAL			52.28	6.1										

SCHEDULE NOTES:
1. PROVIDE ALL UNITS WITH INTEGRAL THERMOSTAT, DISCCONNECT SWITCH.
2. PROVIDE ALL UNIT HEATERS WITH MOUNTING BRACKETS.
3. OTHER ACCEPTABLE MANUFACTURERS SHALL BE TRANE AND Q'MARK.

PUMP SCHEDULE

DESIGNATION	SERVICE	FLOW (GPM)	HEAD (FEET)	(VFD) HP	PUMP TYPE	MAX WATER TEMP(°F)	VOLTS/ PHASE	MAX RPM	VSD	WEIGHT	MANUFACTURER AND MODEL
HWP-3 & HWP-4	HOT WATER	280	100	15	IN-LINE	180	480/3	1750	YES	-	BELL&GOSSETT/E-80-4X4X11B
-	-	-	-	-	-	-	-	-	-	-	-

SCHEDULE NOTES:
2. PUMPS SHALL BE PROVIDED WITH NEW VARIABLE FREQUENCY DRIVE (VFD) FOR WATER BALANCING ONLY.
3. OTHER ACCEPTABLE MANUFACTURERS SHALL BE GRUNDFOS AND ARMSTRONG.



HOT WATER SCHEMATIC PIPING DIAGRAM - NEW WORK

NOT TO SCALE

NOTES

1. MECHANICAL CONTRACTOR TO INSTALL 6 EACH 1/2" WELDOLETS ON HOT WATER PIPING FOR FUTURE ENERGY MANAGEMENT SYSTEM IN BOILER ROOM. THE FINAL LOCATIONS SHALL BE DETERMINED DURING CONSTRUCTION.
2. CONDENSATE DRAIN PIPE FROM BOILER.
3. ALL DRAIN VALVES SHALL HAVE HOSE END CAPS.
4. BOILERS SHALL BE PROVIDED WITH OUTDOOR AUTO TEMPERATURE RESET SENSOR.
5. NEW PRESSURE REGULATING VALVE. (PRV)
6. EXISTING 1" CW PIPING FROM EXISTING BACK FLOW PREVENTOR.
7. EXISTING HWS & HWR PIPES TO AND FROM BUILDING EXISTING HEATING EQUIPMENT.
8. PIPE AND SIZE CONDENSATE DRAIN PIPINGS PER BOILERS' MANUFACTURER'S RECOMMENDATION.
9. EXTENDED TO DISCHARGE OVER THE NEAREST FLOOR DRAIN.

CHEMICAL POT FEEDER SCHEDULE

DESIGNATION	SERVICE	VOLUME (GALLONS)	MAX PRESSURE (PSI)	DIMENSIONS (INCHES)	MANUFACTURER AND MODEL/WEIGHT(LBS)
CHEM-1	HOT WATER LOOP	2.0	300	6"ø x31"H	NEPTUNE VTF-2HP/45 LBS.
-	-	-	-	-	-

SCHEDULE NOTES:
1. PROVIDE WITH FULL BOTTOM DRAIN AND BOLT ON LEGS.
2. BASIS OF DESIGN BY NEPTUNE OR APPROVED EQUAL.

AIR SEPARATOR SCHEDULE

DESIGNATION	SERVICE	MAXIMUM FLOW (GPM)	INLET PIPE SIZE	MAXIMUM WATER P.D. (FT)	MANUFACTURER/MODEL/WEIGHT
AS-1	HOT WATER	280	4" FLANGED	5.0	BELL AND GOSSETT/MODEL RL-4F/450 LBS
-	-	-	-	-	-

SCHEDULE NOTES:
1. OTHER ACCEPTABLE MANUFACTURERS SHALL BE TACO & SPIROTHERM.

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EQUIPMENT SCHEDULES - MECHANICAL

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PLUMBING ABBREVIATIONS

ABBREVIATION	DESCRIPTION
ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ARCH	ARCHITECTURAL
B	BOILER
BEL	BELOW
BTU	BRITISH THERMAL UNIT
CD	CONDENSATE DRAIN
CLG	CEILING
CO	CLEAN–OUT
CONN	CONNECTION
CONT	CONTINUATION
CP	CIRCULATION PUMP
CW	COLD WATER
DEG	DEGREES
DFU	DRAINAGE FIXTURE UNITS
DIA	DIAMETER
DN	DOWN
DWG	DRAWING
(E)	EXISTING
ELECT	ELECTRICAL
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
F	FAHRENHEIT
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FLR	FLOOR
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GTWH	GAS TANKLESS WATER HEATER
HB	HOSE BIBB
HP	HORSEPOWER
HW	HOT WATER
KW	KILOWATT
MAX	MAXIMUM
L	LAVATORY
MBH	1000 BRITISH THERMAL UNITS PER HOUR
MECH	MECHANICAL
MIN	MINIMUM
MS	MOP SINK
NIC	NOT IN CONTRACT
OSD	OPEN SITE DRAIN
PH	PHASE
PS	PANTRY SINK
RD	ROOF DRAIN
REF	REFRIGERATOR
RPZ	REDUCED PRESSURE ZONE
RTU	ROOFTOP UNIT
SAN	SANITARY
TD	TRENCH DRAIN
TEMP	TEMPERATURE
TMV	THERMOSTATIC MIXING VALVE
TPV	TRAP PRIMER VALVE
TYP	TYPICAL
UR	URINAL
V	VOLTAGE
VP	VENT PIPE
VS	VENT STACK
VTR	VENT THROUGH ROOF
WC	WATER CLOSET
WCO	WALL CLEAN–OUT
WH	WALL HYDRANT (FREEZE PROOF, VACUUM BREAKER)
W/	WITH

PLUMBING AND FIRE PROTECTION SYMBOLS

SYMBOL	DESCRIPTION
	EXISTING PIPE TO BE REMOVED
	EXISTING SOIL or WASTE (SANITARY) PIPE
S	EXISTING STORM WATER PIPING
	EXISTING VENT PIPE
	EXISTING COLD WATER PIPING
	EXISTING HOT WATER PIPING
	EXISTING HOT WATER RECIRCULATING PIPING
G	EXISTING NATURAL GAS PIPING
F	EXISTING FIRE SERVICE PIPING
	SOIL or WASTE (SANITARY) PIPE
S	STORM WATER PIPING
	VENT PIPE
	COLD WATER PIPING
	HOT WATER PIPING
	HOT WATER RECIRCULATING PIPING
G	NATURAL GAS PIPING
F	FIRE SERVICE PIPING
TPL	TRAP PRIMER LINE
	PIPE TURNING UP
	PIPE TURNING DOWN
	GATE VALVE
	VALVE IN VERTICAL POSTION
	CHECK VALVE
TS	OPEN STEM & YOKE VALVE W/ TAMPER SWITCH
WH HB	WALL HYDRANT or HOSE BIBB
	FLOW SWITCH
	FIRE DEPARTMENT CONNECTION WITH AUTOMATIC BALL DRIP VALVE
	CLEANOUT
	WALL CLEANOUT
	LIMIT OF DEMOLITION
	POINT OF CONNECTION – NEW TO EXISTING
WC–1	PLUMBING FIXTURE DESIGNATION
	FLOOR DRAIN
D1 P-1	PLAN OR DETAIL NUMBER DRAWING WHERE PLAN OR DETAIL APPEARS
RPZ	REDUCED PRESURE ZONE

PLUMBING GAS NOTES

1 ALL GAS PIPING SHALL BE INSTALLED IN ACCORDANCE WITH NFPA #54 AND ALL LOCAL AUTHORITY AND UTILITY COMPANY REQUIREMENTS. GAS VALVES AND CONNECTIONS TO THE EQUIPMENT SHALL BE IN AN ACCESSIBLE LOCATION. GAS SHUT–OFF VALVES SHALL BE LOCATED OUTSIDE OF UNIT HOUSINGS.

2 GAS LINES ARE TO BE LEAK TESTED BY CONTRACTOR TO DETERMINE THAT THERE ARE NO LEAKS PRIOR TO EQUIPMENT START–UP.

3 ALL GAS VALVES AND CONNECTIONS TO EQUIPMENT MUST BE ACCESSIBLE. GAS SHUT–OFF VALVES SHALL BE LOCATED OUTSIDE OF HOUSING ON ALL ITEMS OF EQUIPMENT.

4 CONTRACTOR SHALL COORDINATE GAS SERVICE, GAS METER, SIZES AND LOCATIONS WITH GAS COMPANY.

5 CONTRACTOR SHALL INSTALL INDIVIDUAL VENTS TO ATMOSPHERE FOR ALL PRESSURE REGULATORS IN ACCORDANCE WITH SECTION 410.3 OF THE 2012 EDITION OF THE INTERNATIONAL FUEL GAS CODE.

6 CONTRACTOR SHALL INSTALL TEE FITTINGS FOR TESTING OF ALL PRESSURE REGULATORS IN ACCORDANCE WITH SECTION 410.2.5 AND 410.2.6 OF THE 2012 EDITION OF THE INTERNATIONAL FUEL GAS CODE.

7 CONTRACTOR SHALL PROVIDE APPROVED VENT–LIMITING DEVICE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTION. SECTION 410.3 "EXCEPTION" OF THE 2012 EDITION OF THE INTERNATIONAL FUEL GAS CODE.

8 PROVIDE AN A.G.A. APPROVED OR U.L. LISTED GAS VALVE REGULATOR AND A UNION AT EACH PIECE OF GAS FUELED EQUIPMENT AND AS INDICATED ON THE DRAWINGS. ALL EQUIPMENT SHALL BE COMPLETE WITH GAS COCKS, UNIONS, DRIP LEGS, SOLENOID VALVES, AND PRESSURE REGULATORS. VALVES SHALL BE INSTALLED AT AN ACCESSIBLE LOCATION. GAS VALVES 2" AND SMALLER SHALL BE A.G.A. OR U.L. APPROVED. VALVES 2–1/2" AND LAGER SHALL BE CERTIFIED BY THE MANUFACTURER TO BE SUITABLE FOR NATURAL GAS SERVICE.

9 THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE GAS COMPANY OF THE WORK TO BE PERFORMED AND SHALL CONFIRM THE REQUIREMENTS TO ADJUST, MODIFY, OR REPLACE EXISTING GAS METERS AND REGULATORS. THE CONTRACTOR IS RESPONSIBLE FOR ALL PURGING AS REQUIRED.

10 ALL GAS PIPING SHALL BE SCHEDULE 40 BLACK STEEL PIPE.

PLUMBING DEMOLITION NOTES

1 THE EXACT SIZES AND LOCATIONS OF ALL EXISTING PIPING SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO DEMOLITION OF ANY EXISTING WORK. THE DEMOLITION WORK SHALL BE COORDINATED WITH THE NEW WORK TO ASSURE PROPER LIMITS OF DEMOLITION.

2 WHETHER SPECIFICALLY INDICATED OR NOT, THE CONTRACTOR SHALL REMOVE ALL EXISTING EQUIPMENT AND ASSOCIATED PIPING THAT IS NO LONGER REQUIRED TO REMAIN AS A PART OF AN ACTIVE SYSTEM.

3 CONTRACTOR SHALL DISPOSE OF ALL DEMOLISHED EQUIPMENT AND PIPING UNLESS SPECIFICALLY NOTED OTHERWISE.

4 WHERE EXISTING EQUIPMENT IS RELOCATED, EXTREME CARE SHALL BE TAKEN TO PREVENT DAMAGE DURING THE REMOVAL AND REINSTALLATION. WHERE DAMAGE OCCURS, THE EQUIPMENT SHALL BE REPLACED OR REPAIRED TO THE SATISFACTION OF THE OWNER, AT NO ADDITIONAL COST TO THE OWNER.

5 THE CONTRACTOR SHALL COORDINATE ANY PIPING WHICH MUST REMAIN AS PART OF AN ACTIVE SYSTEM AND IS IN CONFLICT WITH THE NEW LAYOUT. CONFLICT SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE AND ENGINEER IMMEDIATELY PRIOR TO BID.

6 COORDINATE SERVICE OUTAGES WITH THE OWNER 48 HOURS PRIOR TO DISRUPTION. ALL EXISTING EQUIPMENT TO REMAIN OR THAT IS RELOCATED SHALL BE INSPECTED FOR DAMAGE, CLEANED, REPAIRED OR REPLACED AT NO ADDITIONAL COST AND INSTALLED AS SHOWN ON THE PLUMBING DRAWINGS.

7 IN THE AREA OF RENOVATIONS, EXISTING TO REMAIN PIPING THAT IS NOT INSULATED SHALL BE INSULATED TO THE SAME SPECIFICATION OF THE INSULATION SPECIFIED FOR THIS PROJECT.

8 REFER TO THE GENERAL NOTES, PLUMBING NOTES, AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

PLUMBING GENERAL NOTES

1 ALL WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE VIRGINIA STATE CODE REQUIREMENTS AND LOCAL AUTHORITIES.

2 PRIOR TO BID, THE CONTRACTOR SHALL EXAMINE ALL PROJECT DOCUMENTS TO DEVELOP A COMPLETE UNDERSTANDING OF THE PROJECT SCOPE. FAILURE TO REVIEW ALL CONTRACT DRAWINGS AND EXISTING CONDITIONS WILL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO PERFORM ALL WORK REQUIRED. THE CONTRACTOR SHALL, UPON REVIEW OF THE DRAWINGS AND EXISTING CONDITIONS, ADVISE THE OWNER OF ANY DISCREPANCIES WHICH WILL AFFECT THE WORK REQUIRED.

3 IT IS THE INTENT OF THE CONTRACT DOCUMENTS TO INDICATE FINISHED WORK THAT IS FULLY ADJUSTED, TESTED, AND READY FOR OPERATION. WHEREVER THE WORD "PROVIDE" IS USED, IT SHALL MEAN "FURNISH AND INSTALL COMPLETE AND READY FOR USE", UNLESS OTHERWISE NOTED.

4 THE CONTRACTOR SHALL FURNISH AND INSTALL THE COMPLETE AND FUNCTIONAL SYSTEMS REQUIRED, INCLUDING EQUIPMENT, PIPING, VALVES, AND ALL OTHER APPURTENANCES AND HARDWARE FOR A COMPLETE SYSTEM.

5 THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ITEMS NECESSARY FOR THE COMPLETE INSTALLATION OF THE EQUIPMENT AS REQUIRED BY CODE WITHOUT ADDITIONAL COST TO THE OWNER, REGARDLESS WHETHER THE ITEMS ARE INDICATED IN THE CONTRACT DRAWINGS OR SPECIFICATIONS. SUCH ITEMS COULD BE, BUT ARE NOT LIMITED TO, SUPPORTS, INSULATION, WIRING, START–UP AND SERVICE, ETC.

6 THE CONTRACTOR SHALL FURNISH AND INSTALL A FIRST CLASS SYSTEM AND SHALL COMPLETELY COORDINATE WITH ALL OTHER TRADES.

7 ALL CONFLICTS WHICH MAY PREVENT THE COMPLETION OF WORK SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL NOT PROCEED WITH RELATED WORK UNTIL THE CONFLICT IS RESOLVED.

8 THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

9 THE CONTRACT DRAWINGS ARE DIAGRAMMATIC AND DO NOT INDICATE ALL COMPONENTS AND ACCESSORIES REQUIRED FOR THE COMPLETE INSTALLATION. THE CONTRACTOR SHALL PROVIDE SUCH ITEMS TO COMPLETE THE ENTIRE SYSTEM AND PLACE IN PROPER OPERATION IN ACCORDANCE WITH APPLICABLE CODES, INDUSTRY STANDARDS, AND EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.

10 LOCATIONS OF EQUIPMENT, PIPING, VALVES, ETC. ARE INDICATED DIAGRAMMATICALLY ON THE DRAWINGS. THE CONTRACTOR SHALL OBTAIN EXACT LOCATIONS AND ESTABLISH EXACT DIMENSIONS ON THE JOB SITE AFTER STUDYING THE CONDITIONS.

11 THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND ARRANGE FOR ALL INSPECTIONS BY LOCAL AUTHORITIES HAVING JURISDICTION.

12 THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ALL ADDITIONAL FITTINGS AND REROUTING OF PIPING AS REQUIRED TO ASSURE THE PIPING SYSTEMS ARE INSTALLED PROPERLY AND IN ACCORDANCE WITH CODE.

13 THE CONTRACTOR SHALL INSTALL ALL SYSTEMS SO AS TO NOT INTERFERE WITH THE MECHANICAL, STRUCTURAL, ELECTRICAL, AND ARCHITECTURAL SYSTEMS. THE CONTRACTOR SHALL COORDINATE THIS PROJECT REQUIREMENT.

14 ALL NEW SYSTEMS SHALL BE TESTED BY THE CONTRACTOR UPON COMPLETION OF THE PROJECT. ALL PIPING SYSTEMS SHALL BE COMPLETELY LEAK AND PRESSURE TESTED PRIOR TO EQUIPMENT START–UP. IT SHALL BE ESTABLISHED THAT ALL EQUIPMENT IS CAPABLE OF OPERATING AT THE DESIGN CAPACITY TO THE SATISFACTION OF THE OWNER.

15 THE CONTRACTOR SHALL PROVIDE ACCESS DOORS IN WALLS AND CEILINGS AS REQUIRED TO MAINTAIN ACCESS TO VALVES.

16 PROVIDE NFPA APPROVED FIRE STOPPING AT ALL PIPING PENETRATIONS OF FIRE RATED FLOORS, WALLS, AND COMPONENTS.

17 THE CONTRACTOR SHALL GUARANTEE ALL WORKMANSHIP, MATERIALS, EQUIPMENT, AND RELATED ITEMS FOR A PERIOD AFTER COMPLETION OF THE PROJECT AND REPLACE ANY DEFECTIVE MATERIALS, EQUIPMENT, AND RELATED ITEMS WITHIN THE GUARANTEE PERIOD. THE PERIOD SHALL BE TWELVE MONTHS FROM THE COMPLETION OF THE PROJECT UNLESS SPECIFIED OTHERWISE IN THE SPECIFICATIONS OR CONTRACT DOCUMENTS.

18 ALL CONTRACT DOCUMENTS INCLUDING ARCHITECTURAL, STRUCTURAL, ELECTRICAL, MECHANICAL, AND PLUMBING ARE COMPLEMENTARY AND MUST BE USED IN COMBINATION BY THE CONTRACTOR TO OBTAIN COMPLETE CONSTRUCTION INFORMATION AND PROVIDE A COMPLETE OPERABLE SYSTEM.

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Sheet Title:
COVER SHEET - PLUMBING

Scale: **AS SHOWN**

Project Code: **CODE**

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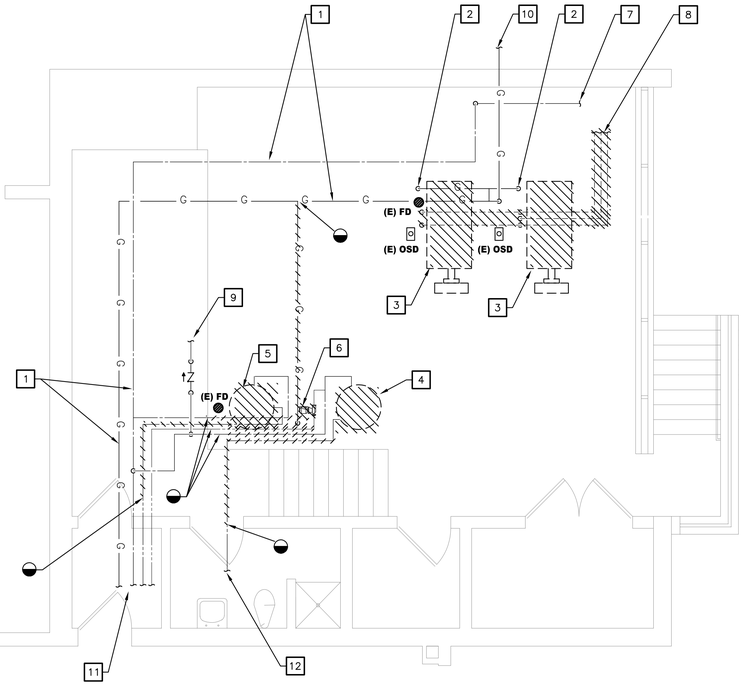
P001



01 / P101 **BOILER ROOM PLAN - EQUIP. REMOVAL**

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

REFERENCED PLAN NOTES

Applicable to this drawing only

1. PIPE BELOW FLOOR ABOVE.
2. PIPE DOWN.
3. REMOVE EXISTING BOILER. SEE MECH PLANS.
4. REMOVE EXISTING GAS WATER HEATERS.
5. SALVAGE EXISTING GAS WATER HEATER AND RETURN TO OWNER ASSET #96585.
6. REMOVE EXISTING HOT WATER CIRCULATION PUMP.
7. EXISTING INCOMING DOMESTIC COLD WATER SERVING MAIN BUILDING TO REMAIN.
8. REMOVE EXISTING GAS VENT PIPES TO ROOF PENETRATION.
9. EXISTING MAKE-UP DOMESTIC COLD WATER TO BOILERS TO REMAIN.
10. EXISTING INCOMING GAS PIPE FROM GAS METER (7000 CFH) TO REMAIN.
11. EXISTING DOMESTIC CW/HW/HWR/ PIPES SERVING THE BUILDING TO REMAIN.
12. EXISTING DOMESTIC HW PIPE SERVING THE KITCHEN TO REMAIN.

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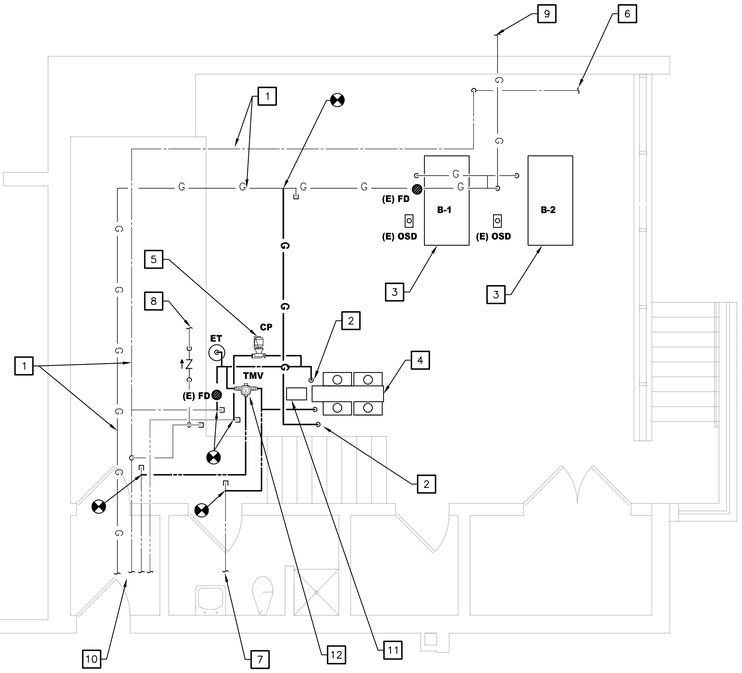
Sheet Title:
BOILER ROOM PLAN - EQUIPMENT REMOVAL

Scale: **AS SHOWN**

Project Code: **CODE**

Sheet Number:
P101



01 P201 **BOILER ROOM PLAN - NEW WORK**

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

REFERENCED PLAN NOTES

Applicable to this drawing only

1. PIPE BELOW FLOOR ABOVE.
2. PIPE DOWN.
3. NEW BOILER. SEE MECH PLANS.
4. NEW GAS TANKLESS RACK SYSTEM (TRS).
5. HOT WATER CIRCULATION PUMP (CP).
6. EXISTING INCOMING DOMESTIC COLD WATER SERVING MAIN BUILDING TO REMAIN.
7. EXISTING DOMESTIC HW PIPE SERVING THE KITCHEN TO REMAIN.
8. EXISTING MAKE-UP WATER TO BOILERS TO REMAIN.
9. EXISTING INCOMING GAS PIPE FROM GAS METER (7000 CFH) TO REMAIN.
10. EXISTING DOMESTIC CW/HW/HWR/ PIPES SERVING THE BUILDING TO REMAIN.
11. CONDENSATE NEUTRALIZER TANK (RINNAI 103000067)
12. NEW THERMOSTATIC MIXING VALVE.

PRESSURE REGULATING VALVES SHALL BE VENTLESS AS MANUFACTURED BY SENSUS OR MAXITROL. GAS REGULATING VALVES SHALL BE EQUIPPED WITH VENT LIMITING ORIFICE OR DEVICE (VENT LIMITER) IN COMPLIANCE WITH ANSI Z21.80/CSA 6.6.

THE FOLLOWING ITEMS MUST BE COMPLETED BY THE CONTRACTOR BEFORE ANY WORK COULD BE PERFORMED AT THE SCHOOL.

1. PROVIDE TRADE PERMITS TO THE OWNER.
2. SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE PRINCIPAL AND OWNER.
3. SUBMIT WRITTEN PROPOSAL FROM THE CONTROL SUB-CONTRACTOR WITH THE SCOPE OF WORK. CONTROL CONTRACTOR CAN NOT START THEIR WORK UNTIL MR. SERGHEI MALCOV HAS BEEN NOTIFIED.

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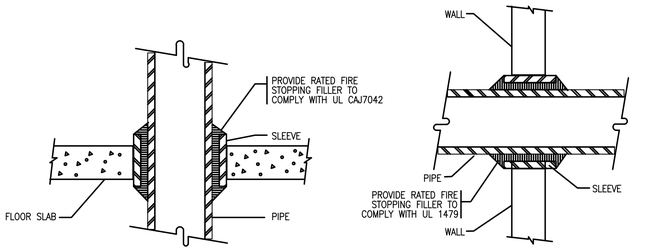
Sheet Title:
BOILER ROOM
PLAN - NEW WORK

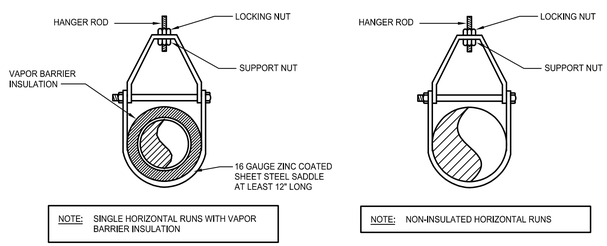
Scale: **AS SHOWN**

Project Code: **CODE**

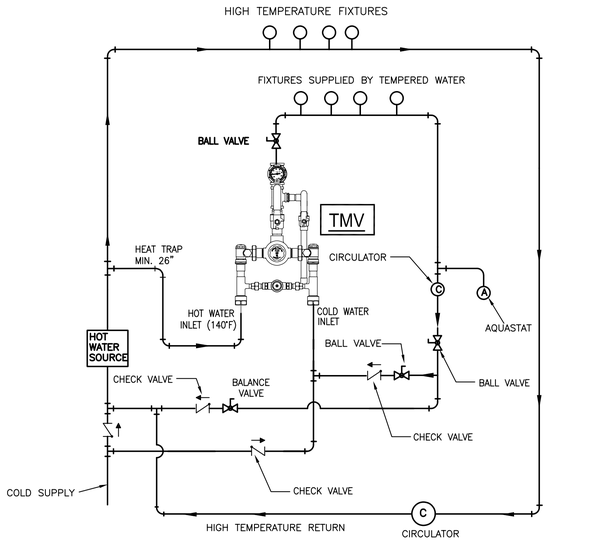
Sheet Number:
P201



01 P301 **TYPICAL FLOOR/WALL PENETRATION DETAIL**
Scale: NONE



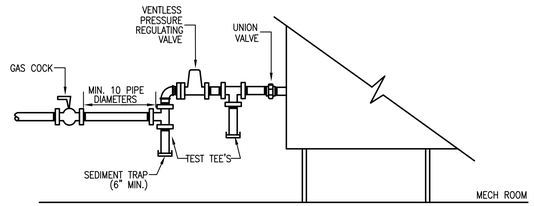
02 P301 **CLEVIS HANGER DETAIL**
Scale: NONE



LEONARD XL-670-LF-DT
HIGH LOW THERMOSTATIC WATER MIXING VALVE (ECO-MIX)
ASSE 1070 CERTIFIED

NOTE:
-MIXING VALVE SHALL HAVE A FACTORY STARTUP BY RAY BOURNE, 240-882-5140 OR 301.877.2300

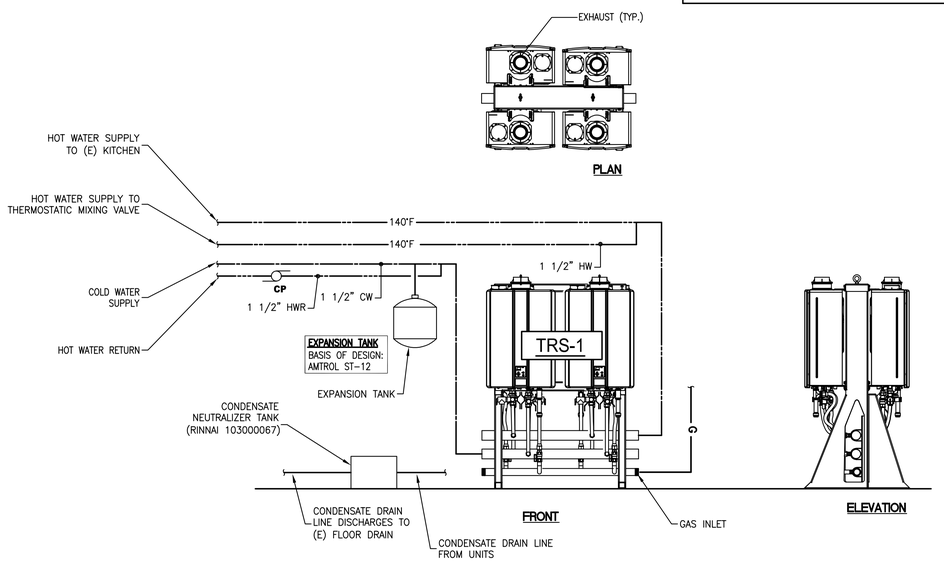
03 P301 **THERMOSTATIC MIXING VALVE DETAIL**
Scale: NONE



04 P301 **GAS PIPE CONNECTION DETAIL**
Scale: NONE

NATURAL GAS CONNECTION SCHEDULE

ITEM NUMBER	QTY	EQUIPMENT	INPUT MBH (1000 BTUH) EXISTING	INPUT MBH (1000 BTUH) REMOVED	INPUT MBH (1000 BTUH) EACH	INPUT MBH (1000 BTUH) NEW	REMARKS
NEW EQUIPMENT							
B-1	2	BOILER-1/BOILER-2	–	–	1250	2500	BOILER ROOM
TRS-1	1	TANKLESS RACK SYSTEM (4 UNITS)	–	–	199	796	BOILER ROOM
EXISTING EQUIPMENTS							
		(E)STEAMER	220	–		–	KITCHEN
		2-(E)OVEN 80MBH EACH	160	–		–	KITCHEN
		2-(E)OVEN 80MBH EACH	160	–		–	KITCHEN
		(E)GENERATOR	600	–		–	BOILER ROOM
		(E)BOILER-1	1527	1527		–	BOILER ROOM
		(E)BOILER-2	1527	1527		–	BOILER ROOM
		(E)GAS WATER HEATER	200	200		–	BOILER ROOM
		(E)GAS WATER HEATER	125	125		–	BOILER ROOM
		(E)RTU-1	400	–		–	ROOF
		(E)RTU-2	150	–		–	ROOF
		(E)RTU-3	120	–		–	ROOF
		(E)RTU-4	250	–		–	ROOF
		(E)RTU-5	250	–		–	ROOF
		(E)RTU-6	250	–		–	ROOF
		(E)RTU-7	250	–		–	ROOF
		(E)RTU-8	120	–		–	ROOF
		(E)RTU-9	80	–		–	ROOF
		(E)RTU-10	80	–		–	ROOF
TOTAL EXISTING EQUIPMENTS GAS LOAD DEMAND --- ➡			6469	–		–	
TOTAL EQUIPMENTS GAS LOAD REMOVED --- ➡ ➡ ➡				3379			
TOTAL NEW EQUIPMENTS GAS LOAD ADDED --- ➡ ➡ ➡ ➡						3296	
TOTAL NEW GAS LOAD DEMAND------ ➡ ➡ ➡ 3090 + 3296 = 6386							
EXISTING GAS METER LOAD CAPACITY------ ➡ ➡ ➡ ➡ ➡ 7000							LESS THAN 2 PSI PRESSURE DROP: 0.3 IN WC



05 P301 **GAS TANKLESS RACK SYSTEM DETAIL**
Scale: NONE

INSULATION FOR ALL DOMESTIC HOT WATER PIPE WITH A MINIMUM THERMAL RESISTANCE (R-VALVE) OF R-3 SHALL BE APPLIED. (IECC 403.4.2)

NOTE: THE DESIGN INCLUDES A FOUR (4) UNITS FREE-STANDING RACK SYSTEM.

NOTE: CONTRACTOR SHALL REQUIRE TO REGISTER WITH RINNAI 30 DAYS WITHIN PURCHASE OF NEW WATER HEATERS TO OBTAIN 2 YEARS LABOR WARRANTY FROM RINNAI.

GAS TANKLESS RACK SYSTEM

Item Number:	TRS-1
Manufacturer:	RINNAI
Tankless Rack System (TRS) model:	TRS04CUIN
Number of tankless water heaters:	4
Model Number:	CU199iN
Gas Data:	199 MBH GAS INPUT (EACH)
Electrical Characteristics:	120v, 60hz

CIRCULATION PUMP

Item Number:	CP
Manufacturer:	BELL & GOSSET
Model Number:	NBF-9U/LW
Flow Rate:	2 GPM @ 8 FEET OF HEAD
Electrical Data:	120 VOLT, 1 PHASE, 41 W, 0.40 AMP.

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Sheet Title:
DETAILS AND SCHEDULES - PLUMBING

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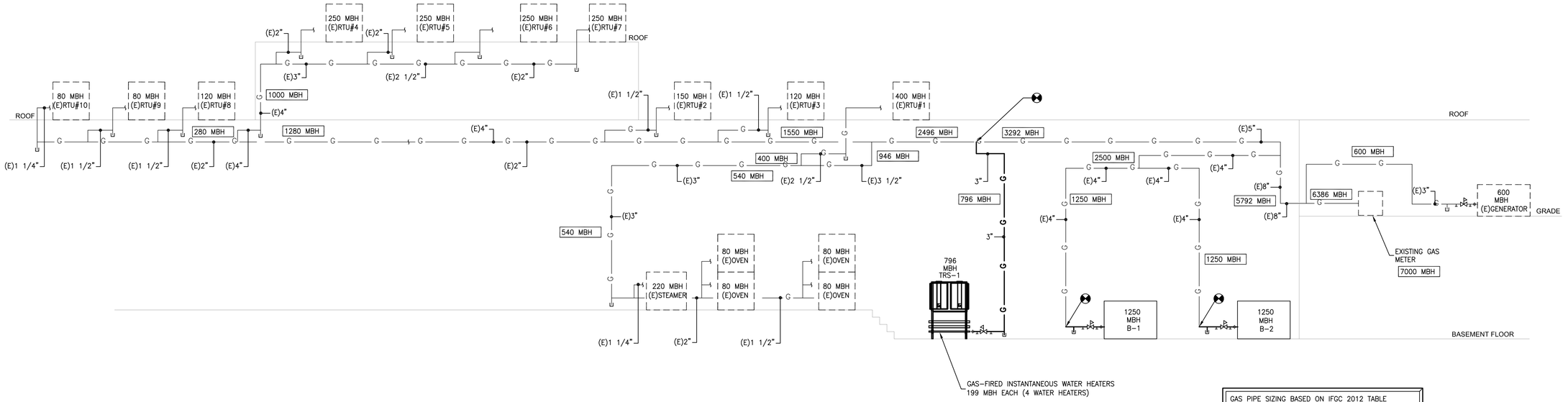
P301

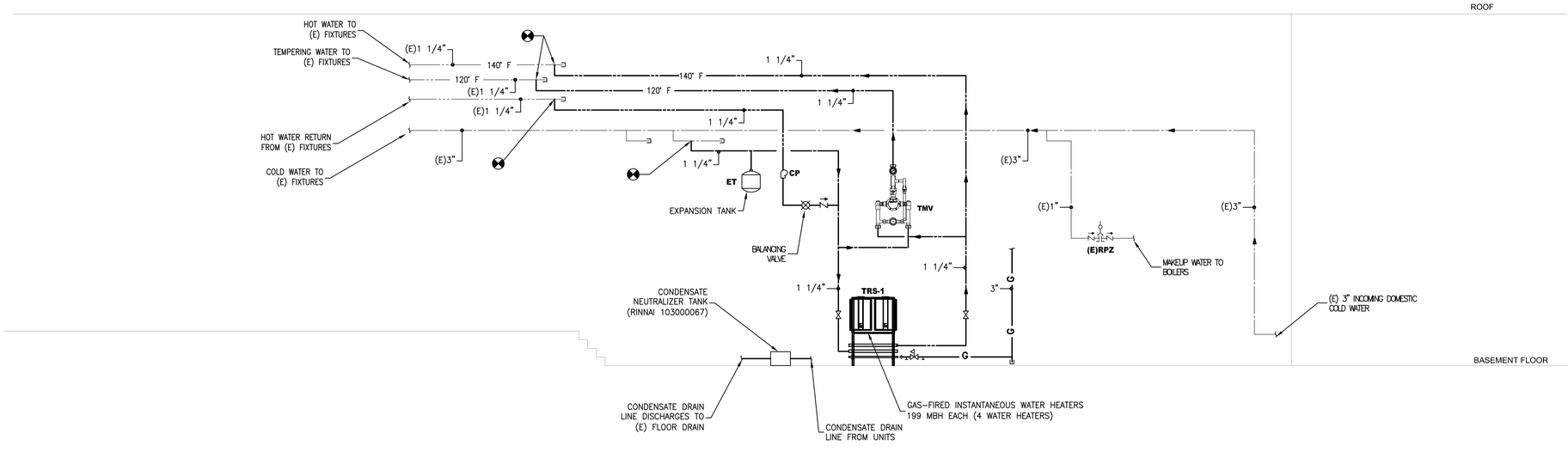


01 P401 GAS RISER DIAGRAM - PLUMBING

Scale: None

GAS PIPE SIZING BASED ON IFGC 2012 TABLE 402.4(1) SCHEDULE 40 METALLIC INLET PRESSURE: LESS THAN 2 PSI PRESSURE DROP: 0.3 IN WC
SPECIFIC GRAVITY: 0.6
DEVELOPED LENGTH OF LONGEST PIPE RUN: 575 FT.
TOTAL CONNECTED NEW GAS LOAD: 6386 MBH

PRESSURE REGULATING VALVES SHALL BE VENTLESS AS MANUFACTURED BY SENSUS OR MAXITROL. GAS REGULATING VALVES SHALL BE EQUIPPED WITH VENT LIMITING ORIFICE OR DEVICE (VENT LIMITER) IN COMPLIANCE WITH ANSI Z21.80/CSA 6.6.



02 P401 DOMESTIC WATER RISER DIAGRAM

Scale: NONE

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RISER DIAGRAMS-PLUMBING

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