DRAWING INDEX

BOILER REPLACEMENT AT HIGHLAND JR. HIGH SCHOOL

OGDEN SCHOOL DISTRICT

325 GRAMERCY AVENUE
OGDEN, UTAH

DAVID L. JENSEN & ASSOCIATES

MECHANICAL ENGINEERS

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GENERAL NOTES:

1. CONTRACTOR SHALL USE DAVIS BACON WAGES DUE TO FEDERAL FUNDING SOURCE.

PROJECT INFORMATION

REVISION:

MARK	DATE	DESCRIPTION

DLJ PROJECT NUMBER: 21113

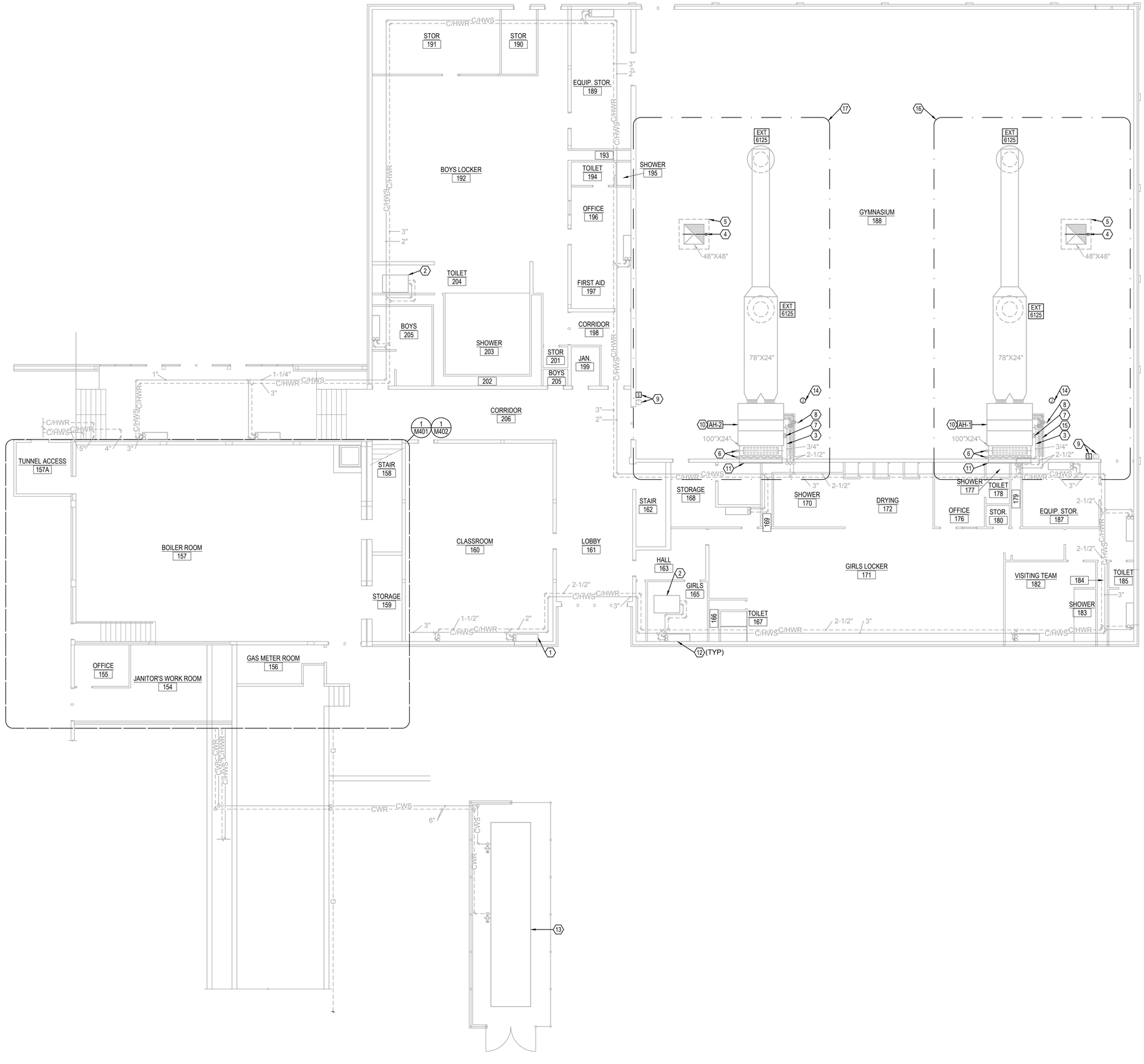
ISSUE TYPE:

CONSTRUCTION DOCUMENTS

ISSUE DATE:

MARCH 23, 2022

G101



1 **MECHANICAL PLAN**
SCALE: 1/8"=1'-0"

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KEYED NOTES FOR

1. EXISTING UNIT VENTILATOR TO REMAIN.
2. EXISTING FAN COIL UNIT TO REMAIN.
3. EXISTING DRAIN PIPE TO REMAIN.
4. REMOVE BACKDRAFT DAMPER AND ADD NEW RELIEF CONTROL DAMPER (APPROX. 48"X48", FIELD VERIFY). SEE DETAIL FOR INSTALLATION.
5. EXISTING RELIEF HOOD ON ROOF.
6. REPLACE EXISTING PNEUMATIC RETURN AND OUTSIDE AIR CONTROL DAMPER ACTUATORS WITH NEW DDC CONTROL DAMPER ACTUATORS.
7. REMOVE FACE AND BYPASS DAMPER ACTUATOR AND LOCK DAMPER SUCH THAT ALL FLOW GOES THROUGH COIL.
8. REMOVE HYDRONIC DEVICES ON COIL AND RE-PIPE COIL AS PER DETAIL.
9. REMOVE PNEUMATIC THERMOSTAT AND REPLACE WITH DDC SENSOR.
10. REMOVE ALL PNEUMATIC CONTROLS FROM AIR HANDLING UNIT AND REPLACE WITH DDC CONTROLS AS PER DETAIL.
11. OUTSIDE AIR LOUVER ABOVE LOCKER ROOM AREA.
12. EXISTING WALL MOUNTED FAN COIL TO REMAIN.
13. EXISTING AIR COOLED CHILLER.
14. DIVISION 26 TO PROVIDE 120 VOLTS IN J-BOX AT THIS LOCATION FOR HVAC CONTROLS.
15. PROVIDE DIFFERENTIAL PRESSURE SENSOR IN C/HWS AND C/HWR PIPE AT THIS LOCATION AS PART OF BASE BID.
16. BID AS ADD ALTERNATE #1.
17. BID AS ADD ALTERNATE #2.

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SHEET TITLE

MECHANICAL PLAN

SHEET NUMBER

MH101

HVAC GENERAL NOTES

1. CONTRACTOR SHALL FURNISH AND INSTALL ALL ITEMS WHICH ARE OBVIOUSLY AND REASONABLY NECESSARY TO COMPLETE THE INSTALLATION.
2. BIDDERS SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS SURROUNDING THE PROJECT PRIOR TO BIDDING.
3. THE CONTRACTOR IS REFERRED TO ELECTRICAL PLANS AND SPECIFICATIONS. SUCH PLANS AND SPECIFICATIONS ARE CONTRACT DOCUMENTS.
4. DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW APPROXIMATE LOCATIONS.
5. ALL MECHANICAL HVAC WORK SHALL BE PREFORMED IN STRICT ACCORDANCE WITH THE LATEST EDITION OF THE PREVAILING STATE MECHANICAL/PLUMBING AND BUILDING CODES AS WELL AS ALL REGULATIONS THAT MAY APPLY. IN CASE OF CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND A GOVERNING CODE OR ORDINANCE THE MORE STRINGENT SHAL
6. MAINTAIN A 10'-0" BETWEEN OUTSIDE AIR INTAKES AND PLUMBING/EXHAUST VENTS.
7. WHERE RATED ASSEMBLIES ARE PENETRATED BY DUCTS, PIPES OR OTHER ITEMS, THE "F" AND "T" RATING SHALL BE MAINTAINED WITH REQUIRED UL LISTED ASSEMBLIES OR SEALANTS AS REQUIRED BY THE APPLICABLE CODE OR AUTHORITY HAVING JURISDICTION.

MECHANICAL ABBREVIATIONS

AD	ACCESS DOOR	DEG	DEGREE FAHRENHEIT	HPS	HIGH PRESSURE STEAM	PD	PRESSURE DROP
AFF	ABOVE FINISHED FLOOR	DEMO	DEMOLITION	HR	HOUR	PERF	PERFORATE(D)
AHU	AIR HANDLING UNIT	DET	DETAIL	HTG	HEATING	PH	PHASE
AI	ANALOG INPUT	DH	DUCT HEATER	HVAC	HEATING, VENTILATING & AIR CONDITIONING	PLUM	PLUMBING
ALT	ALTERNATE	DI	DIGITAL INPUT			PPM	PARTS PER MILLION
AMB	ANBIENT	DIA	DIAMETER	HW	HOT WATER	PRV	PRESSURE REDUCING VALVE
AMP	AMPERE	DIM	DIMENSION	HWR	HOT WATER HEATING	PSI	POUNDS PER SQUARE INCH
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	DIV	DIVISION		RETURN	RA	RETURN AIR
		DMPR	DAMPER	HWS	HOT WATER HEATING SUPPLY	RAD	RADIATED
AO	ANALOG OUTPUT	DO	DIGITAL OUTPUT			RCP	RECIRCULATION PUMP
APD	AIR PRESSURE DROP	DRN	DRAIN	HZ	HERTZ	REF	ROOFTOP EXHAUST FAN
APPROX	APPROXIMATE	DS	DOWNSPOUT	IN	INCHES	REQD	REQUIRED
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	EA	EXHAUST AIR	INWC	INCHES OF WATER COLUMN	REV	REVISION
		EF	EXHAUST FAN	INWG	INCHES OF WATER GAUGE	RH	RELATIVE HUMIDITY
ASL	ABOVE SEA LEVEL	EFF	EFFICENCY	IU	INDOOR UNIT	RL	REFRIGERANT LIQUID
AVG	AVERAGE	EQ	EQUAL	KW	KILOWATT	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
B	BOILER	EQUIP	EQUIPMENT	LAT	LEAVING AIR TEMPERATURE		
BOD	BOTTOM OF DUCT	ERV	ENERGY RECOVERY VENTILATION	LB	POUND	RPM	REVOLUTIONS PER MINUTE
BOP	BOTTOM OF PIPE			LPC	LOW PRESSURE CONDENSATE	RS	REFRIGERANT SUCTION
BTU	BRITISH THERMAL UNIT	ESP	EXTERNAL STATIC PRESSURE			SA	SUPPLY AIR
BTU	BTU PER HOUR	ET	EXPANSION TANK	LPS	LOW PRESSURE STEAM	SCHED	SCHEDULE
C	COMMON	EWT	ENTERING WATER TEMPERATURE	LWT	LEAVING WATER TEMPERATURE	SEN	SENSIBLE
C	CONVECTOR					SL	SEA LEVEL
CA	COMBUSTION AIR	EXH	EXHAUST	MAU	MAKEUP AIR UNIT	SPEC	SPECIFICATION
CAP	CAPACITY	EXT	EXISTING	MAX	MAXIMUM	SSHP	SPLIT SYSTEM HEAT PUMP
CC	COOLING COIL	F	FAHRENHEIT	MBH	THOUSAND BRITISH THERMAL UNITS/HOUR	STD	STANDARD
CEF	CEILING MTD EXHAUST FAN	F	FURNACE			TEMP	TEMPERATURE
CFM	CUBIC FEET PER MINUTE	FCU	FAN COIL UNIT	MECH	MECHANICAL	TSP	TOTAL STATIC PRESSURE
CHWR	CHILLED WATER RETURN	FLR	FLOOR	MECH RM	MECHANICAL ROOM	TSTAT	THERMOSTAT
CHWS	CHILLED WATER SUPPLY	FLEX	FLEXIBLE	MFR	MANUFACTURER	TW	TEMPERED WATER
CO2	CARBON DIOXIDE	FO	FLAT OVAL	MIN	MINIMUM	TYP	TYPICAL
COMB	COMBUSTION	FPM	FEET PER MINUTE	MISC	MISCELLANEOUS	UH	UNIT HEATER
CONTR	CONTRACTOR	FPVAV	FAN POWERED VAV	MTD	MOUNTED	V	VOLT
CU	CONDENSING UNIT	FT	FEET	NC	NOISE CRITERIA	VAV	VARIABLE AIR VOLUME
CU FT	CUBIC FEET	GALV	GALVANIZED	NC	NORMALLY CLOSED	VD	VOLUME DAMPER
CU YD	CUBIC YARDS	GPM	GALLONS PER MINUTE	NIC	NOT IN CONTRACT	VERT	VERTICAL
CUH	CABINET UNIT HEATER	GHR	GLYCOL HEATING RETURN	NOM	NOMINAL	VFD	VARIABLE FREQUENCY DRIVE
CV	CONSTANT VOLUME	GHS	GLYCOL HEATING SUPPLY	NTS	NOT TO SCALE	VOL	VOLUME DAMPER
CW	COLD WATER	H	FUME HOOD	OA	OUTSIDE AIR	W/	WITH
CWR	CONDENSOR WATER RETURN	HORIZ	HORIZANTAL	OBD	OPPOSED BLADE DAMPER	W/O	WITHOUT
CWS	CONDENSOR WATER SUPPLY	HP	HIGH PRESSURE	OU	OUTDOOR UNIT	WB	WET BULB
DB	DRY BULB	HP	HORSEPOWER	P	PUMP	WPD	WATER PRESSURE DROP
DD	DUAL DUCT BOX	HP	HEAT PUMP	PCF	POUNDS PER CUBIC FEET		

MECHANICAL LEGEND

NOTE: NEW ITEMS SHOWN DARK, EXISTING ITEMS SHOWN LIGHT. ALL ITEMS MAY NOT APPEAR ON DRAWINGS.

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	AUTOMATIC 2-WAY VALVE		UNION		BRANCH DUCT TAKE-OFF WITH MANUAL DAMPER
	AUTOMATIC 3-WAY VALVE		VENTURI		DUCT FLEXIBLE CONNECTION
	AUTOMATIC BALL FLOAT VENT	WFS	WATER FLOW SWITCH		TURNING VANES
	BALL VALVE	CWS	CONDENSER WATER SUPPLY		DUCT TEE CONNECTION
	CAPPED END W/BALL VALVE	CWR	CONDENSER WATER RETURN		DUCT TRANSITION
	CHECK VALVE	C/HWS	COMBINATION CHILLED/ HOT WATER SUPPLY		SQUARE TO ROUND DUCT TRANSITION
	COMBINATION BALANCING VALVE/ SHUTOFF	C/HWR	COMBINATION CHILLED/HOT WATER RETURN		AUTOMATIC DAMPER
	DEVICE IN DROP	HWS	HOT WATER HTG. SUPPLY		VOLUME DAMPER
	DIRECTION OF SLOPE	HWR	HOT WATER HTG. RETURN	BD	BACK-DRAFT DAMPER
	FLANGED BUTTERFLY VALVE	V	VENT PIPE		DUCT ACCESS DOOR
	FLANGED ECCENTRIC REDUCER	LPS	LOW PRESSURE STEAM PIPING		RETURN AIR, RISE AND DROP
	FLANGED UNION	LPC	LOW PRESSURE CONDENSATE PIPING		SUPPLY AIR, RISE AND DROP
	FLEXIBLE CONNECTION	GHS	GLYCOL HEATING SUPPLY PIPING		EXHAUST AIR, RISE AND DROP
	FLOW DIRECTION	GHR	GLYCOL HEATING RETURN PIPING		OUTSIDE AIR, RISE AND DROP
FM	FLOW METER	RL	REFRIGERANT PIPING - LIQUID		RELIEF AIR, RISE AND DROP
	GATE VALVE	RS	REFRIGERANT PIPING - SUCTION		COMBUSTION AIR, RISE AND DROP
	GLOBE VALVE		REFRIGERANT SHUT-OFF VALVE		ROUND DUCT, RISE AND DROP
	IMMERSION WELL		EXPANSION VALVE		FLAT OVAL DUCT, RISE AND DROP
	INLINE PUMP		MOISTURE INDICATING SIGHT GLASS	FO	FLAT OVAL DUCT
	MANUAL VENT WITH BALL VALVE		FLEXIBLE CONNECTION	FD	FIRE DAMPER
	P & T PLUG IN IMMERSION WELL		FILTER DRIER	FSD	FIRE SMOKE DAMPER
	PIPE DROP		PIPE SUPPORT		FLEXIBLE DUCT
	PIPE INLINE DROP		EXTERIOR PIPE SUPPORT	X-#	AIR DEVICE
	PIPE INLINE RISE		EXTERIOR PIPE SUPPORT	X-# / #	AIR DEVICE CFM
	PIPE RISER		DIRECTION OF SLOPE DOWN	#	KEYED NOTE
	PNEUMATIC 2-WAY VALVE	S	SUCTION LINE	X	EQUIPMENT CALLOUT
	PRESSURE GUAGE	L	LIQUID LINE	X / S#	DETAIL NUMBER SHEET DETAIL APPEARS
	PRESSURE GAGE W/BALL VALVE		TRAP. ONE PIECE FACTORY FABRICATED	# / S#	LARGE SCALE NUMBER SHEET LARGE SCALE APPEARS
	RELIEF VALVE	T	THERMOSTAT		AIR FLOW DIRECTION
	SCREWED CONCENTRIC REDUCER	S	SENSOR	TOP / BOT	SECTION LETTER SHEET NUMBER
	STEAM TRAP	CO2	CO2 SENSOR	ROOM / NO	ROOM NAME ROOM NUMBER
	STRAINER	J	J-BOX		ACCESS DOOR
	THERMOMETER	4	REVISION DELTA		
	THREADED HOSE CONNECTION		NEW CONNECTION		

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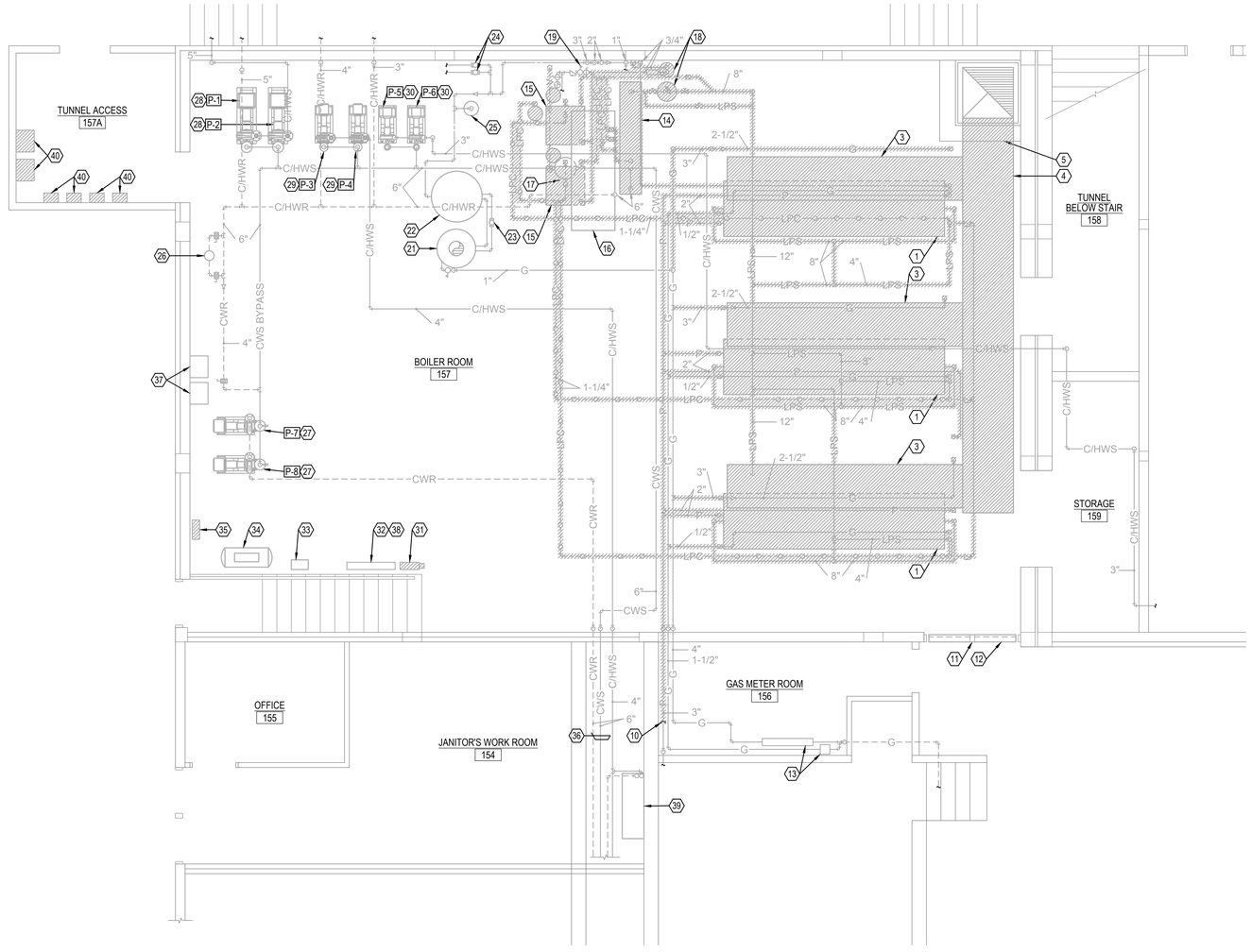
MECHANICAL LEGEND AND GENERAL NOTES

SHEET NUMBER

M001



1 BOILER ROOM DEMOLITION PLAN

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

KEYED NOTES FOR SHEET M401

1. REMOVE STEAM BOILER RATED AT 5,500,000 BTUH IMPUT; 4,400,000 BTUH OUTPUT.
2. REMOVE HATCHED STEAM PIPING.
3. REMOVE 36"X36" HORIZONTAL FLUE WITH SIX DROPS TO BOILER HOOD AT 14" DIAMETER EACH.
4. REMOVE 42"X42" COLLECTOR FLUE ALL THE WAY TO CHIMNEY.
5. PATCH 42"X42" HOLE IN CHIMNEY WITH 14 GAUGE STEEL PLATE.
6. REMOVE HATCHED STEAM CONDENSATE PIPING.
7. REMOVE BOILER MAKE-UP WATER PIPE.
8. REMOVE NATURAL GAS PIPE.
9. REMOVE PROPANE PIPE.
10. CAP EXISTING PROPANE PIPE.
11. REMOVE DOOR MULLION AND SAVE FOR REINSTALLATION. DOOR OPENING WITH DOORS AND MULLION REMOVED IS APPROX. 6'-8" X 6"-8".
12. CAP OFF EXISTING INSIDE OF 72" WIDE X 36" TALL COMBUSTION AIR LOUVER ABOVE DOOR.
13. EXISTING NATURAL GAS METER.
14. REMOVE STEAM TO HOT WATER SHELL AND TUBE HEAT EXCHANGER.
15. REMOVE CONDENSATE RETURN UNIT WITH PUMP(S).
16. EXISTING HOT WATER EXPANSION TANK.
17. EXISTING HOT WATER AIR ELIMINATOR.
18. REMOVE WATER SOFTENER ON MAKE-UP WATER.
19. EXISTING HEATING HOT WATER PRESSURE REGULATOR STATION.
20. EXISTING REDUCED PRESSURE BACKFLOW PREVENTER.
21. EXISTING DOMESTIC HOT WATER HEATER RATED AT 199,900 BTUH INPUT.
22. EXISTING DOMESTIC HOT WATER STORAGE TANK.
23. EXISTING DOMESTIC HOT WATER STORAGE TANK PUMP.
24. EXISTING DOMESTIC HOT WATER RECIRCULATING PUMP.
25. EXISTING DOMESTIC HOT WATER EXPANSION TANK.
26. EXISTING DIRT SEPARATOR ON CHILLED WATER RETURN PIPE.
27. EXISTING CHILLED LOOP PRIMARY PUMP.
28. EXISTING NORTH HALL CLASSROOM LOOP PUMP.
29. EXISTING NORTH BUILDING LOOP PUMP (OFFICE, AUDITORIUM, BAND, ART).
30. EXISTING GYM LOOP PUMP.
31. REMOVE OLD ALERTON MECHANICAL PLANT CONTROLS.
32. OLD CONTROL PANEL TO REMAIN CURRENTLY USED AS JUNCTION BOX.
33. EXISTING CONTROL AIR DRYER.
34. EXISTING CONTROL AIR COMPRESSOR.
35. REMOVE BARBER COLEMAN MICRO 8000 ENERGY MANAGEMENT SYSTEM.
36. EXISTING PIPING TO AIR COOLED CHILLER.
37. EXISTING ELECTRICAL PUMP DISCONNECT.
38. REMOVE ALL UNUSED CONTROLS AND WIRING FROM THIS PANEL.
39. EXISTING WALL MOUNTED FAN COIL UNIT TO REMAIN.
40. REMOVE PUMP STARTER/DISCONNECT FOR P-1 THRU P-6. SEE DIVISION 26.

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BOILER ROOM DEMOLITION PLAN

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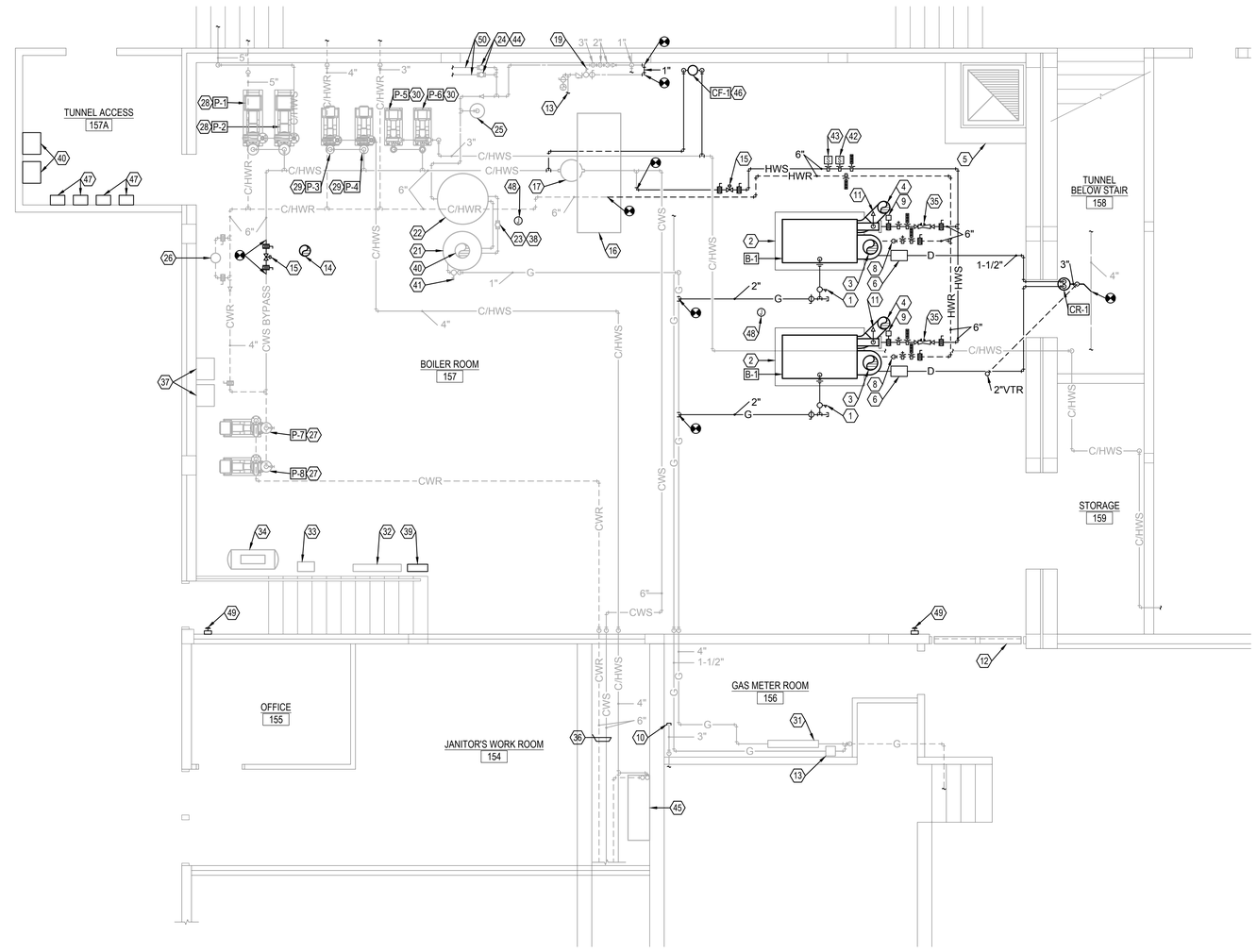
M401



1 BOILER ROOM REMODEL PLAN

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

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KEYED NOTES FOR SHEET M402

1. GAS ISOLATION VALVE, 6" DIRT LEG IN VERTICAL GAS PRESSURE REGULATOR AND UNION OF FLANGE CONNECTION AT BOILER.
2. NEW 4" THICK CONCRETE HOUSEKEEPING PAD TO EXTEND 6" BEYOND BOILER ON ALL SIDES.
3. 12" DIAMETER BOILER FLUE EXHAUST UP THROUGH ROOF TERMINATE 3'-0" ABOVE COMBUSTION AIR AND 3'-0" ABOVE ANY OTHER ITEM WITHIN 10'-0" HORIZONTAL. GUY WIRE TO STRUCTURE.
4. 10" DIAMETER COMBUSTION AIR DUCT THROUGH ROOF. TERMINATE 3'-0" ABOVE ROOF STRUCTURE. GUY WIRE TO STRUCTURE.
5. PATCH EXISTING 42"X42" HOLE IN CHIMNEY WITH 14 GAUGE STEEL PLATE.
6. ACID NEUTRALIZATION TANK BY BOILER MANUFACTURER.
7. TERMINATE BOILER CONDENSATE DRAIN INTO FUNNEL CONDENSATE RECEIVER. CONNECT RECEIVER TO EXISTING 4 INCH WASTE PIPE.
8. INSTALL BALL VALVE AND HOSE THREAD WITH CAP ON DRAIN OF BOILER BELOW RETURN PIPE CONNECTION.
9. CONTROL ISOLATION VALVE PROVIDED FROM BOILER MANUFACTURER.
10. CAP EXISTING PROPANE PIPE.
11. RELIEF VALVE AND PIPE TO WITHIN 6 INCHES OF FLOOR.
12. CAP OFF EXISTING INSIDE OF 72" WIDE X 36" TALL COMBUSTION AIR LOUVER ABOVE DOOR.
13. EXISTING NATURAL GAS METER.
14. NEW 9"Ø COMBUSTION AIR DUCT FOR WATER HEATER TO TERMINATE 3'-0" ABOVE ROOF WITH ROOF CAP AND WITHIN 12" OF UNDERSIDE OF ROOF IN BOILER ROOM. COMBUSTION AIR TO BE1 10'-0" HORIZONTALLY FROM FLUE ON ROOF.
15. NEW 6" DIA. CONTROL VALVE WITH MANUAL ISOLATION VALVES AND FLANGES ON EACH SIDE.
16. EXISTING HOT WATER EXPANSION TANK.
17. EXISTING HOT WATER AIR ELIMINATOR.
18. EXISTING MAKE-UP WATER TO HYDRONIC SYSTEM TO REMAIN.
19. EXISTING HEATING HOT WATER PRESSURE REGULATOR STATION.
20. EXISTING REDUCED PRESSURE BACKFLOW PREVENTER.
21. EXISTING DOMESTIC HOT WATER HEATER RATED AT 199,900 BTUH INPUT.
22. EXISTING DOMESTIC HOT WATER STORAGE TANK. ADD TANK TEMP. SENSOR.
23. EXISTING DOMESTIC HOT WATER STORAGE TANK PUMP.
24. EXISTING DOMESTIC HOT WATER RECIRCULATING PUMP.
25. EXISTING DOMESTIC HOT WATER EXPANSION TANK.
26. EXISTING DIRT SEPARATOR ON CHILLED WATER RETURN PIPE.
27. EXISTING CHILLED LOOP PRIMARY PUMP.
28. EXISTING NORTH HALL CLASSROOM LOOP PUMP. VFD TO BE ADDED DIVISION 26.
29. EXISTING NORTH BUILDING LOOP PUMP (OFFICE, AUDITORIUM, BAND, ART). VFD TO BE ADDED BY DIVISION 26.
30. EXISTING GYM LOOP PUMP. VFD TO BE ADDED BY DIVISION 26.
31. VERIFY PRESSURE OF MAIN GAS REGULATOR AT METER BEFORE SUBMITTING NEW GAS METERS AT BOILERS. GAS PRESSURE BELIEVED TO BE 1 LB.
32. OLD CONTROL PANEL TO REMAIN, CURRENTLY USED AS JUNCTION BOX.
33. EXISTING CONTROL AIR DRYER.
34. EXISTING CONTROL AIR COMPRESSOR.
35. REDUCED ON BOTH SIDES TO 4 INCH DIA. VENTURI VALVE.
36. EXISTING PIPING TO AIR COOLED CHILLER.
37. EXISTING ELECTRICAL PUMP DISCONNECT. SEE DIV. 26.
38. CONNECT BACS TO ENABLE/DISABLE EXISTING DOMESTIC HOT WATER TANK PUMP.
39. NEW BACS CONTROLS PANEL(S) LOCATION.
40. EXISTING WATER HEATER FLUE.
41. EXISTING PRESSURE REGULATOR.
42. TEMPERATURE SENSOR FOR BOILER CONTROLLER.
43. TEMPERATURE SENSOR FOR BACS.
44. CONNECT BACS TO ENABLE/DISABLE EXISTING DOMESTIC HOT WATER RECIRCULATION PUMP.
45. EXISTING WALL MOUNTED FAN COIL UNIT TO REMAIN.
46. SEE DETAIL FOR PIPE CONNECTIONS.
47. NEW VFD FOR PUMPS P-1 THRU P-6. SEE DIVISION 26.
48. DIVISION 26 TO PROVIDE J-BOX WITH 120 VOLTS TO BE USED FOR HVAC CONTROLS.
49. NEW BOILER KILL SWITCH.
50. ADD DOMESTIC HOT WATER RECIRCULATION LOOP TEMPERATURE SENSOR TO EXISTING PIPE (2 EACH).

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BOILER ROOM REMODEL PLAN

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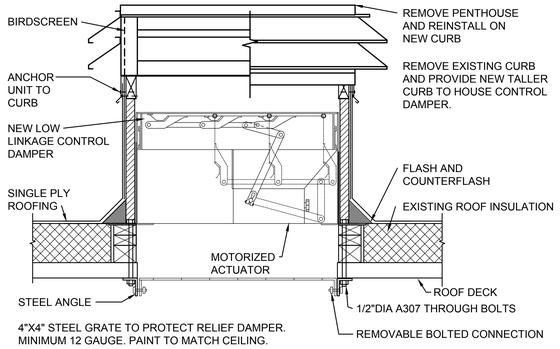
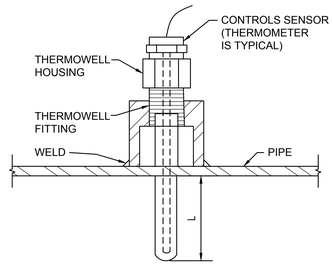
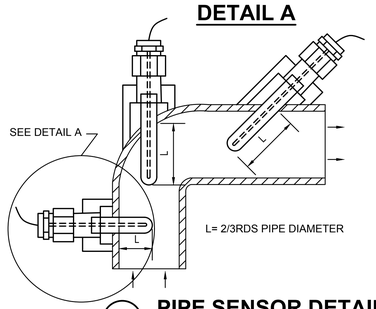


8 PENTHOUSE DETAIL WITH RELIEF DAMPER

SCALE: N.T.S.

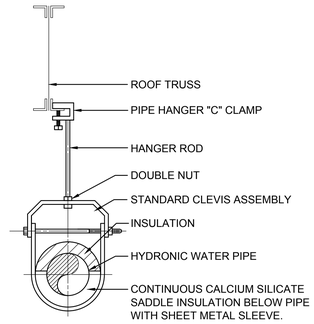


DETAIL A



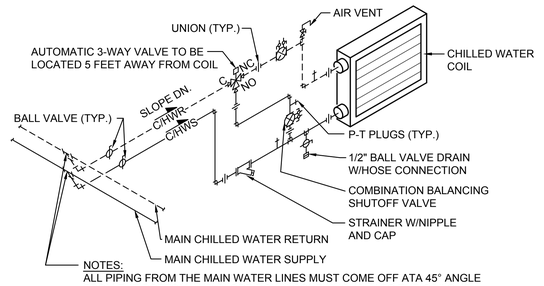
5 PIPE SENSOR DETAIL

SCALE: N.T.S.



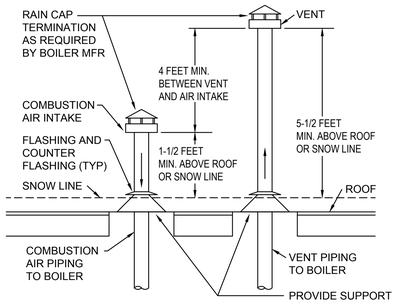
6 PIPE HANGER DETAIL

SCALE: N.T.S.



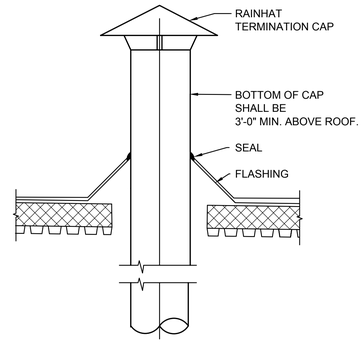
7 SINGLE CHILLED/HOT WATER COIL DETAIL

SCALE: N.T.S. (3-WAY AUTO VALVE)



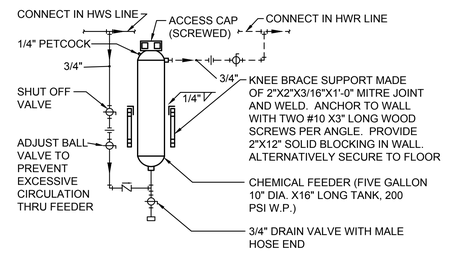
1 BOILER VENT/COMBUSTION AIR PIPING TERMINATION AT ROOF

SCALE: N.T.S.



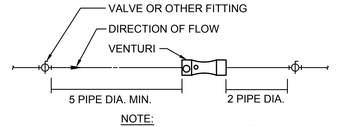
2 COMBUSTION AIR INLET RAINHAT THRU ROOF DETAIL

SCALE: N.T.S.



3 CHEMICAL TREATMENT DETAIL

SCALE: N.T.S.



NOTE:
INSTALL VENTURI W/ METER CONNECTIONS PROJECTING HORIZONTALLY

4 VENTURI INSTALLATION DETAIL

SCALE: N.T.S.

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CONSULTANTS

STAMP

REGISTERED PROFESSIONAL ENGINEER No. 181307 HAL L. ABERCROMBIE STATE OF UTAH

BOILER REPLACEMENT AT HIGHLAND JR. HIGH SCHOOL

OGDEN SCHOOL DISTRICT
325 GRAMERCY AVENUE
OGDEN, UTAH

MARK	DATE	DESCRIPTION
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ISSUE TYPE:	CONSTRUCTION DOCUMENTS
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PROJECT NO:	21113
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DRAWN BY:	TGA
CHECKED BY:	HLA

SHEET TITLE

MECHANICAL DETAILS

SHEET NUMBER

M501

EXISTING PUMP SCHEDULE

NOTES:
(1) PUMP IS EXISTING, DATA PROVIDED FOR BALANCING,
(2) SEE DIVISION 26 FOR NEW VFD TO BE ADDED TO THIS PUMP
(3) BOTH PUMPS RUN FOR FULL CAPACITY OF CHILLER (730 GPM)

MARK	DUTY	CHILLED WATER DESIGN					HEATING WATER DESIGN		MINIMUM FLOW		ELECTRICAL				MANUFACTURER	MODEL	SIZE	REMARKS
		DESIGN FLOW, GPM	HEAD FT.	MIN. EFF., %	BHP	RPM	MAX. DESIGN FLOW GPM	MAX. DESIGN FLOW RPM	GPM	RPM	VOLTS	HZ	PHASE	HP				
P-1	CHILLED WATER / HEATING WATER SUPPLY	390	135	72	17.9	1800	209	949	98	443	208	60	3	20	B & G	1510	3G 12.250	(1, 2)
P-2	CHILLED WATER / HEATING WATER SUPPLY	390	135	72	17.9	1800	209	949	98	443	208	60	3	20	B & G	1510	3G 12.250	(1, 2)
P-3	CHILLED WATER / HEATING WATER SUPPLY	215	90	74	9.9	1800	115	941	54	440	208	60	3	10	B & G	1510	2-1/2 BB 9.5 BF	(1, 2)
P-4	CHILLED WATER / HEATING WATER SUPPLY	215	90	74	9.9	1800	115	941	54	440	208	60	3	10	B & G	1510	2-1/2 BB 9.5 BF	(1, 2)
P-5	CHILLED WATER / HEATING WATER SUPPLY	125	95	63	6.1	1800	67	941	31.3	440	208	60	3	7.5	B & G	1510	1-1/2 BC 8.375 BF	(1, 2)
P-6	CHILLED WATER / HEATING WATER SUPPLY	125	95	63	6.1	1800	67	941	31.3	440	208	60	3	7.5	B & G	1510	1-1/2 BC 8.375 BF	(1, 2)
P-7	CHILLED WATER PRIMARY LOOP	365	60	70	8.4	1800	N/A	N/A	N/A	N/A	208	60	3	10	B & G	1510	3 BC 8.375 BF	(1, 3)
P-8	CHILLED WATER PRIMARY LOOP	365	60	70	8.4	1800	N/A	N/A	N/A	N/A	208	60	3	10	B & G	1510	3 BC 8.375 BF	(1, 3)

AIR HANDLING UNIT SCHEDULE

NOTES:
(1) AIR HANDLING UNIT IS EXISTING. EXISTING CONTROLS SHALL BE REMOVED AND NEW CONTROLS INSTALLED AS PER DRAWINGS. CONTRACTOR SHALL BALANCE UNIT AFTER CONTROL UPGRADE.
(2) UNIT ONLY HAS ONE HYDRONIC COIL THAT IS USED FOR COOLING IN SUMMER AND HEATING IN WINTER. CONTROLS CONTRACTOR SHALL WORK WITH BALANCING CONTRACTOR TO SET DAMPER POSITION FOR MIN. OUTSIDE AIR
(3) AH-1 SHALL BE BID ALTERNATE #1
(4) AH-2 SHALL BE BID ALTERNATE #2

MARK	SUPPLY FAN		COOLING COIL CAPACITY									HEATING COIL CAPACITY							ELECTRICAL				MIN.	NOTES
	AIRFLOW, CFM	ESP, IN W.G.	TOTAL BTU/HR	SENSIBLE BTU/HR	EAT, F DB	EAT, F WB	LAT, F DB	LAT, F WB	EWT	LWT	GPM	WPD, FT	TOTAL BTU/HR	EAT, F DB	LAT, F DB	EWT	LWT	GPM	WPD, FT	VOLTS	HERTZ	PHASE	MOTOR HP	OUTSIDE AIR, CFM	
AH-1	12,250	-	270,480	270,480	79	62	55	53	45	55	54.1	-	351,624	63.8	95.0	180	165	46.9	-	208	60	3	5	1,225	(1, 2, 3)
AH-2	12,250	-	270,480	270,480	79	62	55	53	45	55	54.1	-	351,624	63.8	95.0	180	165	46.9	-	208	60	3	5	1,225	(1, 2, 4)

CONDENSING HOT WATER BOILER SCHEDULE

NOTES:
(1) SEA LEVEL RATING
(2) SEA LEVEL RATING AT 140 DEGREE EWT.
(3) 4,500 FT ELEVATION RATING AT 140 DEGREE EWT.
(4) PROVIDE WITH BACNET INTERFACE COMMUNICATION, CONDENSATE NEUTRALIZING TANK, CONTROL ISOLATION VALVE, MASTER CONTROLLER AND SLAVE CONTROLLER
(5) TURNDOWN SHALL BE 15:1
(6) BOILER SHALL BE CAPABLE OF VARIABLE FLOW RATE DOWN TO 35 GPM.
(7) CONTRACTOR SHALL SHOW THE REBATE FROM THE UTILITY COMPANY ON THE SCHEDULE OF VALUES AS A CREDIT TO THE OWNER. CREDIT SHALL BE INCLUDED IN CONTRACTORS BID ON BID DAY.

SYMBOL	INPUT CAPACITY BTU/HR (1)	OUTPUT CAPACITY BTU/HR (2)	OUTPUT CAPACITY BTU/HR (3)	GPM	EWT, F	LWT, F	PRESSURE DROP, FT.	ELECTRICAL		WATER VOLUME, GALLONS	SHIPPING WEIGHT, LBS	AERCO MODEL	REMARKS
								VOLT/HZ/PH	FLA				
B-1	4,000,000	3,500,000	3,115,000	392	164	180	3.5	208 / 60 / 3	10	55	2,350	BMK4000	
B-2	4,000,000	3,500,000	3,115,000	392	164	180	3.5	208 / 60 / 3	10	55	2,300	BMK4000	

HVAC PIPE INSULATION SCHEDULE

NOTES:
(1) FIRE AND SMOKE HAZARD RATINGS SHALL NOT EXCEED INDEXES AS FOLLOWS: FLAME SPREAD OF 25, FUEL CONTRIBUTION OF 50, SMOKE DEVELOPMENT OF 50.

DUTY	FLUID OPERATING TEMPERATURE RANGE AND USAGE, F	INSULATION CONDUCTIVITY, BTU*IN./(HR*FT^2*F)	MEAN RATING TEMPERATURE, F	INSULATION THICKNESS, INCHES				
				PIPE DIAMETER, INCHES				
				< 1	1 TO < 1.5	1.5 TO < 4	4 TO <8	>= 8
HEATING WATER	141-200	0.25 - 0.29	125	1.5	1.5	2.0	2.0	2.0

PLUMBING FIXTURE SCHEDULE

NOTES:
(1) PROVIDE WITH REMOVABLE TRAP GUARD

MARK	FIXTURE	PIPE SIZE						REMARKS
		TRAP	WASTE	VENT	CW	HW	GAS	
CR-1	CONDENSATE RECIEVER FUNNEL DRAIN	3	3	2				WATTS FD-100-EG

CHEMICAL POT FEEDER SCHEDULE

NOTES:
(1) PROVIDE WITH INLET OUTLET AND DRAIN CONNECTIONS

MARK	DUTY	CAPACITY, GALLONS	DIAMETER, IN.	HEIGHT, IN.	WEIGHT, LBS
CF-1	HEATING WATER SYSTEM	5	8	16	55

NATURAL GAS LOAD SUMMARY

NOTES:

ELEVATION, FT =	4500	
HEATING VALUE, BTU/CF =	890	
DEVELOPED LENGTH, FT =	110	
PRESSURE, PSIG	1	(VERIFY WITH QUESTAR)

MARK	ITEM	INPUT PER UNIT, BTU/HR	TOTAL INPUT, CFH	PIPE SIZE, DIAMETER
WH-1	WATER HEATER	199,900	225	1
B-1	BOILER	4,000,000	4,494	2
B-2	BOILER	4,000,000	4,494	2
TOTAL		8,199,900	9,213	4

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CAD DWG FILE: I:\JOBS\2021\21113\CAD\FKM601.DWG
DRAWN BY: TGA
CHECKED BY: HLA

SHEET TITLE

MECHANICAL SCHEDULES AND DETAILS

SHEET NUMBER

M601

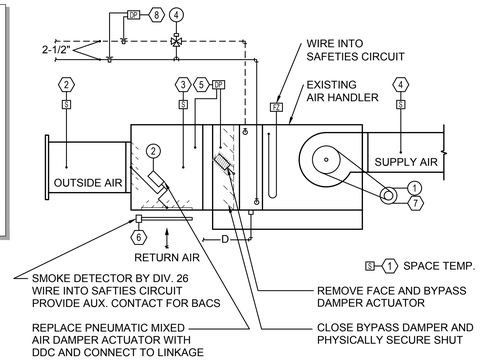
GENERAL NOTE:
1. NEW COIL CONTROL VALVE FOR AH-1 SHALL BE 3-WAY AS SHOWN , NEW CONTROL VALVE FOR AH-2 SHALL BE 2-WAY.

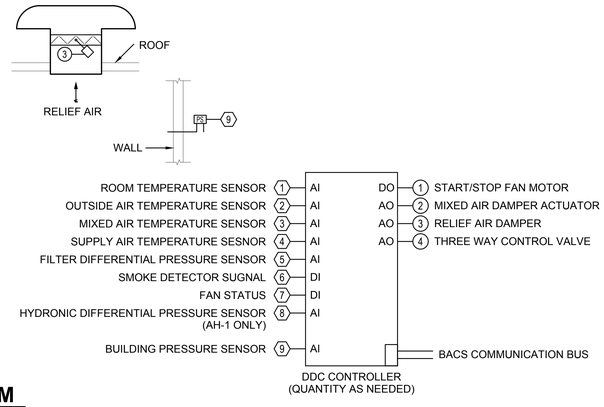
2. CONTROLS UPGRADE FOR AH-1 SHALL BE BID AS ALTERNATE #1.

3. CONTROLS UPGRADE FOR AH-2 SHALL BE ALTERNATE #2.

4. SAFETIES CIRCUIT SHALL SHUT DOWN AHU WHEN TRIPPED.

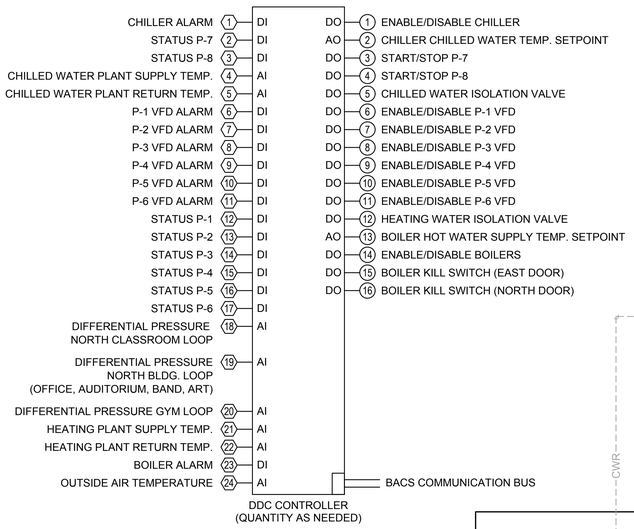
5. HYDRONICS DIFFERENTIAL PRESSURE SENSOR WILL ONLY BE ON AH-1 AND BE USED TO CONTROL P-5 AND P-6.

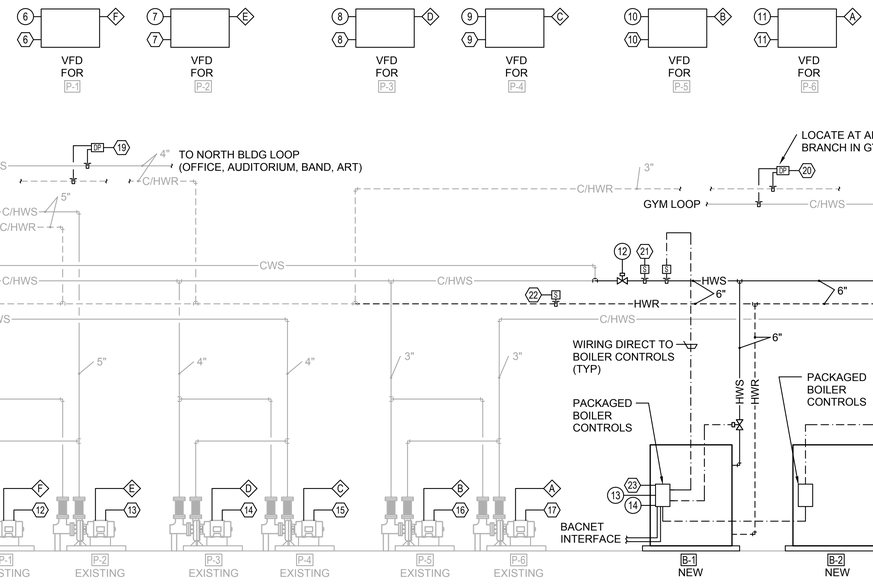




1 AIR HANDLING UNIT CONTROL DIAGRAM

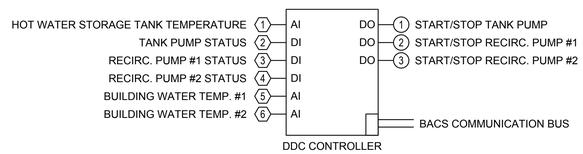
SCALE: N.T.S. (TYPICAL AT AH-1 AND AH-2)

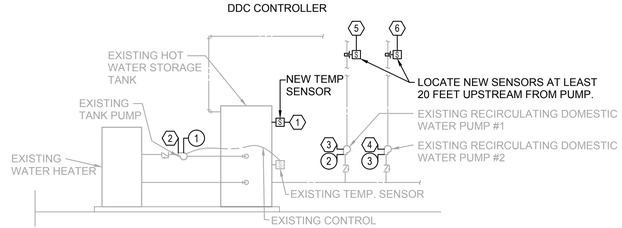




2 CHILLER/BOILER PLANT CONTROL DIAGRAM

SCALE: N.T.S.





2 DOMESTIC HOT WATER CONTROL DIAGRAM

SCALE: N.T.S.

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DRAWN BY:	TGA
CHECKED BY:	HLA

SHEET TITLE

MECHANICAL CONTROLS

SHEET NUMBER

ME501

WIRING DEVICE SYMBOLS

SYMBOL	DESCRIPTION	MOUNTING	REMARKS
$	SINGLE-POLE TOGGLE SWITCH	+48"	
$^{a}	SINGLE-POLE TOGGLE SWITCH	+48"	SUBSCRIPT KEYS SWITCH TO FIXTURES CONTROLLED.
$_2	DOUBLE-POLE TOGGLE SWITCH	+48"	
$_3	THREE-WAY TOGGLE SWITCH	+48"	
$_4	FOUR-WAY TOGGLE SWITCH	+48"	
$_K	KEY-OPERATED SINGLE-POLE TOGGLE SWITCH	+48"	
$_P	SINGLE-POLE TOGGLE SWITCH WITH PILOT LIGHT	+48"	
$_DIM	DIMMER SWITCH	+48"	RATE DIMMER SWITCH FOR MAXIMUM POSSIBLE WATTAGE
$_TIM	TIMER SWITCH	+48"	
$_LV	(2) SINGLE-POLE TOGGLE SWITCH	+48"	DUAL LEVEL SWITCH OUTBOARD LAMPS SEPARATELY FROM INBOARD LAMPS.
$^{a}_{LV}	LOW VOLTAGE MOMENTARY CONTACT SWITCH	+48"	
$_3PM	3-POSITION MOMENTARY CONTACT SWITCH	+48"	REFER TO DETAIL UP-ON; CENTER-NEUTRAL; DOWN-OFF
$_3PN	3-POSITION MAINTAINED CONTACT SWITCH	+48"	UP-ON; CENTER-OFF; DOWN-ON
$_OS	WALL MOUNTED OCCUPANCY SENSOR SWITCH	+48"	
$_DS	DUAL RELAY WALL MOUNTED OCCUPANCY SENSOR SWITCH	+48"	
◐	OCCUPANCY SENSOR	AS NOTED	CEILING MOUNTED WITH SUBSCRIPT 'C'; WALL-MOUNTED WITH SUBSCRIPT 'W'
⊖	SPLIT-WIRED DUPLEX RECEPTACLE	+18"	
⊖	SIMPLEX RECEPTACLE	+18"	
⊖	DUPLEX RECEPTACLE	+18"	
⊖	125/250V RECEPTACLE	+18"	RANGE – NEMA 14-50R DRYER – NEMA 14-30R
⊕	FOURPLEX RECEPTACLE	+18"	
⊖	GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLE	+18"	
⊕	GROUND FAULT CIRCUIT INTERRUPTER FOURPLEX RECEPTACLE	+18"	
⊖	EMERGENCY DUPLEX RECEPTACLE	+18"	
⊕	EMERGENCY FOURPLEX RECEPTACLE	+18"	
	MULTI-OUTLET ASSEMBLY	4" ABOVE BACKSPLASH	
	POWER / TELEPHONE POLE	FLOOR/CEILING	
	CORD DROP WITH DUPLEX RECEPTACLE		REFER TO DETAIL
(5-20R)	SPECIAL PURPOSE OUTLET	+18"	SUBSCRIPT IN PARENTHESIS INDICATES NEMA CONFIGURATION IF SHOWN, REFER TO DRAWINGS AND/OR EQUIPMENT SCHEDULES. CONFIRM EXACT CONFIGURATION WITH OWNER PRIOR TO INSTALLATION.

BRANCH CIRCUITING SYMBOLS

SYMBOL	DESCRIPTION	REMARKS
	1 CIRCUIT, 2 WIRE BRANCH CIRCUIT HOME RUN TO PANEL	ARROWS: NUMBER OF ARROWS INDICATES NUMBER OF CIRCUITS REQUIRED.
	2 CIRCUIT, 4 WIRE BRANCH CIRCUIT HOME RUN TO PANEL	SHORT CROSS LINES: NUMBER OF SHORT CROSS LINES INDICATES NUMBER OF PHASE, TRAVELER, AND/OR SWITCHED CONDUCTORS REQUIRED IF GREATER THAN 1 (ONE).
	3 CIRCUIT, 6 WIRE BRANCH CIRCUIT HOME RUN TO PANEL	LONG CROSS LINES: NUMBER OF LONG CROSS LINES INDICATES NUMBER OF NEUTRAL CONDUCTORS REQUIRED FOR MULTI-WIRE HOME RUNS.
	MULTIPLE WIRE BRANCH CIRCUITING BETWEEN FIXTURES, SWITCHES, DEVICES, ETC.	EQUIPMENT GROUND AND ISOLATED GROUND CONDUCTORS: EQUIPMENT GROUND AND ISOLATED GROUND CONDUCTORS ARE NOT SHOWN, BUT ARE REQUIRED AS NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS.
	BRANCH CIRCUITING (U.N.O.) TURNED UP OR TOWARDS OBSERVER.	
	BRANCH CIRCUITING (U.N.O.) TURNED DOWN OR AWAY FROM OBSERVER.	
	BRANCH CIRCUITING (U.N.O.) CONTINUATION	
	CONDUIT STUB-IN	CAP AND MARK
	INCOMING SERVICE	
	JUNCTION BOX	MOUNT AS NOTED. SUBSCRIPT 'F' INDICATES TO PROVIDE A FLOOR BOX WITH BLANK COVERPLATE

GEAR AND CONTROL SYMBOLS

SYMBOL	DESCRIPTION	MOUNTING	REMARKS
T	MANUAL STARTER WITH THERMAL OVERLOAD(S)	AT EQUIPMENT	
	ELECTRIC MOTOR		
	NON-FUSED DISCONNECT SWITCH	TOP AT +48"-72"	
	FUSED DISCONNECT SWITCH	TOP AT +48"-72"	
	CIRCUIT BREAKER AND ENCLOSURE	TOP AT +48"-72"	
	MAGNETIC STARTER	TOP AT +48"-72"	
	COMBINATION MAGNETIC STARTER / NON-FUSED DISCONNECT	TOP AT +48"-72"	
	COMBINATION MAGNETIC STARTER / FUSED DISCONNECT	TOP AT +48"-72"	
	COMB. MAGNETIC STARTER / MOTOR CIRCUIT PROTECTOR (MCP)	TOP AT +48"-72"	
VFD	COMB. VARIABLE FREQUENCY DRIVE / MOTOR CIRCUIT PROTECTOR (MCP)	FLOOR OR WALL AS SPECIFIED	TOP AT +72" IF WALL MOUNTED
RVS	REDUCED VOLTAGE STARTER	FLOOR OR WALL AS SPECIFIED	TOP AT +72" IF WALL MOUNTED
	LOAD CENTER (SURFACE-MOUNTED)	TOP AT +72"	14"W X 3"D
	LOAD CENTER (FLUSH-MOUNTED)	TOP AT +72"	14"W X 3"D

ELECTRICAL SHEET INDEX

ABBREVIATION SCHEDULE

NOTE: NOT ALL ABBREVIATIONS MAY BE USED.

A	ABOVE COUNTER	ISO	ISOLATED
A	AMP OR AMPS	KVA	KILO VOLT AMPERES
ADJ	ADJACENT	KW	KILOWATTS
AFF	ABOVE FINISHED FLOOR	LFMC	LIQUID-TIGHT METAL CONDUIT
AHJ	AUTHORITY HAVING JURISDICTION	LFNC	LIQUID-TIGHT NONMETAL CONDUIT
AL	ALUMINUM	MCA	MINIMUM CIRCUIT AMPS
C	CONDUIT	MLO	MAIN LUGS ONLY
CB	CIRCUIT BREAKER	N.C.	NORMALLY CLOSED
CKT	CIRCUIT	N.I.C.	NOT IN CONTRACT
C.O.'S	CONVENIENCE OUTLETS	N.L.	NIGHT LIGHT
CU	COPPER	N.O.	NORMALLY OPEN
EA	EACH	O.C.	ON CENTER(S)
ELEC	ELECTRICAL	OCP	OVER CURRENT PROTECTION
EM	EMERGENCY	QTY	QUANTITY
EMT	ELECTRIC METALLIC TUBING	R	REMOVE
ENT	ELECTRIC NONMETALLIC TUBING	REQ.	REQUIREMENTS
EQUIP	EQUIPMENT	RMC	RIGID METAL CONDUIT
EWC	ELECTRIC WATER COOLER	RNC	RIGID NONMETALLIC CONDUIT
E. EX	EXISTING	RR	REMOVE AND RELOCATE
EXP	EXPLOSION PROOF	SS	SURGE SUPPRESSION
FA	FIRE ALARM	SCP	SECURITY CONTROL PANEL
FACP	FIRE ALARM CONTROL PANEL	TR	TAMPER RESISTANT
FLA	FULL LOAD AMPS	TYP	TYPICAL
FMC	FLEXIBLE METAL CONDUIT	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
FOB	FREIGHT ON BOARD	UF	UNDER FLOOR
GND	GROUND CONDUCTOR	UG	UNDERGROUND
H/OA	HAND-OFF-AUTO	U.N.O.	UNLESS NOTED OTHERWISE
HP	HORSE POWER	W/	WITH
IG	ISOLATED GROUND	WP	WEATHER PROOF
IMC	INTERMEDIATE METAL CONDUIT	XFMR	TRANSFORMER
INS	INSULATED		

GENERAL PROJECT NOTES:

1. DIVISION 26 CONTRACTOR IS RESPONSIBLE FOR READING AND APPLYING WHAT IS IN THE SPECIFICATIONS TO THIS PROJECT. ANYTHING THAT IS NOT INCLUDED ON THE PROJECT THAT IS CALLED OUT IN THE SPECIFICATION SHALL BE LISTED ON THE SUBSTANTIAL COMPLETION PUNCHLIST. THE CONTRACTOR WILL BE REQUIRED TO REMEDY THESE DEFICIENCIES. THERE WILL BE NO EXCEPTIONS.
2. THE CONTRACTOR MAY SCHEDULE A PRE-CONSTRUCTION MEETING, AT THEIR DISCRETION WITH THE ELECTRICAL ENGINEER AND REVIEW THE DRAWINGS AND SPECIFICATIONS. THE MEETING SHALL BE A MAXIMUM OF ONE HOUR AND SHALL TAKE PLACE AT THE ENGINEER'S OFFICE.
3. THE FOLLOWING ITEMS ARE SOME OF THE REQUIREMENTS THAT ARE LISTED IN THE SPECIFICATIONS. THESE ITEMS DO NOT REPRESENT ALL ITEMS AND THE CONTRACTOR IS RESPONSIBLE FOR MEETING ALL REQUIREMENTS OF THE SPECIFICATIONS:
   A. INSULATED THROAT CONNECTORS OR PLASTIC BUSHINGS SHALL BE UTILIZED FOR ALL CONDUIT SIZES USED ON THIS PROJECT.
   B. A DEDICATED NEUTRAL CONDUCTOR WILL BE PROVIDED FOR ALL LIGHTING AND POWER CIRCUITS.
   C. THE CONTRACTOR SHALL LABEL ALL ELECTRICAL EQUIPMENT AS IT IS CALLED OUT IN THE SPECIFICATIONS.
   D. THE CONTRACTOR SHALL PROVIDE SEISMIC SUPPORT AND BRACING FOR ALL ELECTRICAL EQUIPMENT AS REQUIRED BY LOCAL AND NATIONAL CODE.
4. THE CONTRACTOR SHALL FOLLOW THE PANELBOARD SCHEDULES AS INDICATED IN THE DRAWINGS. EACH CIRCUIT BREAKER HAS BEEN ASSIGNED A SPECIFIC AREA OF THE BUILDING. NO DEVIATION WILL BE ALLOWED WITHOUT THE APPROVAL FROM THE ELECTRICAL ENGINEER.
5. THE CONTRACTOR SHALL INSTALL PROPER WIRE SIZE AS CALLED OUT ON THE PANELBOARD SCHEDULES. HOWEVER, THE CONTRACTOR IS RESPONSIBLE TO ENSURE THE WIRE IS LARGE ENOUGH FOR VOLTAGE DROP.
6. THE CONTRACTOR SHALL VERIFY ALL MECHANICAL OVERCURRENT DEVICES FOR THE ACTUAL MECHANICAL EQUIPMENT SUPPLIED ON THE JOB, PRIOR TO RELEASE OF ANY ELECTRICAL DISTRIBUTION EQUIPMENT. CONTACT THE ELECTRICAL ENGINEER WITH ANY DISCREPANCIES.
7. THE CONTRACTOR SHALL VISIT THE SITE BEFORE SUBMITTING THE BID, AND SHALL EXAMINE ALL PHYSICAL CONDITIONS WHICH MAY BE MATERIAL TO THE PERFORMANCE OF HIS WORK. NO EXTRA PAYMENTS WILL BE ALLOWED TO THE CONTRACTOR AS A RESULT OF EXTRA WORK MADE NECESSARY BY HIS FAILURE TO DO SO. ANY CASE OF DISCREPANCY OR LACK OF CLARITY SHALL BE PROMPTLY IDENTIFIED TO THE OWNER'S REPRESENTATIVE AND THE ENGINEER FOR CLARIFICATION.
8. THE CONTRACTOR SHALL MAKE SURE THAT ALL BRANCH CIRCUITS THAT ARE AFFECTED BY THIS PROJECT ARE NOT OVERLOADED. PROVIDE ADDITIONAL BRANCH CIRCUITS FROM ELECTRICAL PANELS AS NECESSARY TO COMPLY WITH THE BRANCH CIRCUIT LOADING REQUIREMENTS. PROVIDE ALL MATERIAL AND LABOR AS NECESSARY FOR A COMPETE AND OPERATING SYSTEM.
9. PROVIDE UPDATED, TYPED PANELBOARD SCHEDULE(S) TO REFLECT ALL THE CHANGES MADE INCLUDING EXISTING LOADS. THE EXISTING LOADS SHALL BE NAMED THE SAME AS LISTED ON THE EXISTING PANELBOARD SCHEDULE.

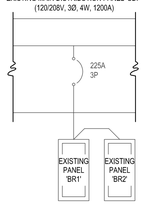
ELECTRICAL SYMBOL SCHEDULE GENERAL NOTES

1. MOUNT ALL OUTLETS, DEVICES, AND EQUIPMENT AT HEIGHTS INDICATED BELOW, UNLESS NOTED OTHERWISE ON THE DRAWINGS, UNLESS NOTED OTHERWISE, HEIGHTS ARE GIVEN FROM FINISHED FLOOR TO CENTER OF OUTLET BOX.
2. WHERE OUTLETS, DEVICES, AND EQUIPMENT ARE NOTED BY SUBSCRIPTS, REFER TO ABBREVIATION SCHEDULE FOR DEFINED REQUIREMENTS.
3. NOT ALL ELECTRICAL SYMBOLS MAY BE USED.

GENERAL SYMBOLS

SYMBOL	DESCRIPTION	REMARKS
XX	KEYED NOTE	
1 / E-1	DETAIL REFERENCE	TOP NUMBER INDICATES DETAIL NUMBER; BOTTOM LETTER-NUMBER INDICATES WHERE DETAIL IS SHOWN.
2 / E-2	ELEVATION REFERENCE	TOP NUMBER INDICATES ELEVATION NUMBER; BOTTOM LETTER-NUMBER INDICATES WHERE ELEVATION IS SHOWN.
3 / E-3	SECTION REFERENCE	TOP NUMBER INDICATES SECTION NUMBER; BOTTOM LETTER-NUMBER INDICATES WHERE SECTION IS SHOWN.
100	ARCHITECTURAL ROOM NUMBER	
AHU 1	EQUIPMENT NAME / NUMBER	TOP NUMBER ABBREVIATES EQUIPMENT NAME OR TYPE; BOTTOM NUMBER INDICATES EQUIPMENT NUMBER. REFER TO EQUIPMENT SCHEDULE.
1	REVISION NUMBER	USED TO DENOTE CHANGES EITHER ISSUED BY ADDENDUM OR DURING CONSTRUCTION AND TO DENOTE RECORD DRAWING CHANGES.
	REVISION CLOUD	USED TO DENOTE AREAS, DEVICES, EQUIPMENT DETAILS, ETC. AFFECTED BY REVISION.
	BREAKLINE	USED TO BREAK DRAWINGS.

EXISTING MAIN DISTRIBUTION PANEL 'CDP'
(120/208V, 3Ø, 4W, 1200A)



1 ONE-LINE DIAGRAM
SCALE: NONE

EQUIPMENT SCHEDULE

UNIT NAME	DESCRIPTION	LOAD	TYPE	VOLTAGE	PHASE	AMPERAGE	CONDUIT SIZE	WIRES NO.	WIRES SIZE	STARTER / DISCONNECT/ CONNECTION AT UNIT NOTE	STARTER SIZE	OCP SIZE	OCP POLES	DISCONNECT SIZE	DISCONNECT POLES	REMARKS
B-1	CONDENSING HOT WATER BOILER	10	FLA	208	3	10	3/4"	3	12	10A	-	20	3	30	3	
B-2	CONDENSING HOT WATER BOILER	10	FLA	208	3	10	3/4"	3	12	10A	-	20	3	30	3	
P-1	(EXISTING) PUMP	20	HP	208	3	58	-	-	-	5A	VFD	100	3	-	-	REUSE EXISTING BRANCH CIRCUIT FOR BOTH INCOMING (FROM BREAKER) AND OUTGOING (TO MOTOR). MAKE ALL REQUIRED TERMINATIONS, EXTEND AS REQUIRED.
P-2	(EXISTING) PUMP	20	HP	208	3	58	-	-	-	5A	VFD	100	3	-	-	
P-3	(EXISTING) PUMP	10	HP	208	3	28.4	-	-	-	5A	VFD	60	3	-	-	
P-4	(EXISTING) PUMP	10	HP	208	3	28.4	-	-	-	5A	VFD	60	3	-	-	
P-5	(EXISTING) PUMP	7.5	HP	208	3	22	-	-	-	5A	VFD	45	3	-	-	
P-6	(EXISTING) PUMP	7.5	HP	208	3	22	-	-	-	5A	VFD	45	3	-	-	

SIZE ALL FUSES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

STARTER / DISCONNECT NOTES:

1. MANUAL STARTER WITH THERMAL OVERLOAD
2. MANUAL STARTER WITH THERMAL OVERLOAD PROTECTION & LOW VOLTAGE RELAY / CONTACTOR FOR ATC CONTROL
3. COMBINATION MAGNETIC STARTER / FUSED DISCONNECT
4. COMBINATION MAGNETIC STARTER / MOTOR CIRCUIT PROTECTOR (MCP)
5. COMBINATION VARIABLE FREQUENCY DRIVE / MOTOR CIRCUIT PROTECTOR (MCP)
6. REDUCED VOLTAGE STARTER
7. COMBINATION TWO-SPEED STARTER / FUSED DISCONNECT
8. COMBINATION TWO-SPEED STARTER / MOTOR CIRCUIT PROTECTOR (MCP)
9. NON-FUSED DISCONNECT SWITCH
10. FUSED DISCONNECT SWITCH
11. BREAKER AND ENCLOSURE
12. DIRECT CONNECTION
13. DUPLEX RECEPTACLE OUTLET
14. SPECIAL PURPOSE OUTLET
15. SHUNT-TRIP BREAKER AND ENCLOSURE
16. TOGGLE SWITCH
17. MAGNETIC STARTER

INSTALLATION NOTES:

A. FURNISHED, INSTALLED, & CONNECTED UNDER DIVISION 26.
B. FURNISHED & INSTALLED UNDER ANOTHER DIVISION REQUIRING CONNECTIONS UNDER DIVISION 26.
C. FURNISHED UNDER ANOTHER DIVISION BUT INSTALLED AND CONNECTED UNDER DIVISION 26.
D. FURNISHED, INSTALLED, & CONNECTED UNDER ANOTHER DIVISION
E. FURNISHED BY OWNER, INSTALLED & CONNECTED BY DIVISION 26

PANELBOARD SCHEDULE

PANEL NAME: BR1 (EXISTING)
MOUNTING: SURFACE
ENCLOSURE: NEMA 1
DOOR STYLE: STANDARD
VOLTAGE: 208Y/120
PHASE: 3
WIRE: 4
MIN. A.I.C. RATING:
MAINS TYPE: MLO/FEED-THRU LUGS
BUS MATERIAL: ALUMINUM
BUS RATING: 225 AMPS
MCB RATING: NONE
SPD: NONE
NEUTRAL: 100% RATED
BRANCH OCP TYPE: BOLT-ON CBs
ISOLATED GROUND: NO

NOTE	CIRCUIT DESCRIPTION	BREAKER AMPS	BREAKER POLE	LOAD TYPE	CKT. #	CONNECTED LOAD/PHASE (VA) A	B	C	CKT. #	LOAD TYPE	BREAKER AMPS	BREAKER POLE	CIRCUIT DESCRIPTION	NOTE
9	EAST BOILER RM LTG	20	1		1				2		20	1	EXISTING LOAD	9
9	WEST BOILER RM LTG	20	1		3				4		20	1	EAST RM TUNNEL LTG	9
9	EXISTING LOAD	20	1		5				6		20	1	EXISTING LOAD	9
9	OUTLETS NORTH WALL	20	1		7				8		20	1	WATER HEATER	9
9	HVAC BLDG AUTOMATION	20	1		9				10		20	1	EXISTING LOAD	9
9	PUMPS COIL WATER	20	1		11				12		15	3	COMPRESSOR	9
8	HVAC CONTROLS	-	-	E	13	100			14		-	-	-	-
9	EXISTING LOAD	30	1		15				16		-	-	-	-
9	EXISTING LOAD	15	3		17				18		15	3	EXISTING LOAD	9
-	-	-	-		19				20		-	-	-	-
-	-	-	-		21				22		-	-	-	-
9	EXISTING LOAD	15	3		23				24		15	3	NORTH BOILER CONDO PUMP	9
-	-	-	-		25				26		-	-	-	-
-	-	-	-		27				28		-	-	-	-
	TOTAL CONNECTED LOAD PER PHASE (VA):					100								
	TOTAL ESTIMATED DEMAND LOAD PER PHASE (VA):					100								
	TOTAL ESTIMATED DEMAND LOAD PER PHASE (AMPS):					1								

TYPE	LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
P	SUB-PANEL	SUB-PANEL LOADS BROKEN OUT BY LOAD CLASIFICATION BELOW			
R	RECEPTACLES	-	-	-	TOTAL CONNECTED LOAD: 100 VA
L	LIGHTING	-	-	-	25% OF LARGEST MOTOR: -
C	CONTINUOUS	-	-	-	TOTAL ESTIMATED DEMAND LOAD: 100 VA
E	EQUIPMENT	100 VA	100%	100 VA	TOTAL ESTIMATED DEMAND BALANCED CURRENT: AMPS
M	MOTOR	-	-	-	MAXIMUM ESTIMATED DEMAND PHASE CURRENT: 1 AMPS
K	KITCHEN	-	-	-	
	OTHER	-	-	-	

PANELBOARD SCHEDULE

PANEL NAME: BR2 (EXISTING)
MOUNTING: SURFACE
ENCLOSURE: NEMA 1
DOOR STYLE: STANDARD
VOLTAGE: 208Y/120
PHASE: 3
WIRE: 4
MIN. A.I.C. RATING:
MAINS TYPE: MLO
BUS MATERIAL: ALUMINUM
BUS RATING: 225 AMPS
MCB RATING: NONE
SPD: NONE
NEUTRAL: 100% RATED
BRANCH OCP TYPE: BOLT-ON CBs
ISOLATED GROUND: NO

NOTE	CIRCUIT DESCRIPTION	BREAKER AMPS	BREAKER POLE	LOAD TYPE	CKT. #	CONNECTED LOAD/PHASE (VA) A	B	C	CKT. #	LOAD TYPE	BREAKER AMPS	BREAKER POLE	CIRCUIT DESCRIPTION	NOTE
9	PUMP #5	60	3	M	1	2,640	1,200		2	E	20	3	BOILER, B-1	10
-	-	-	-	M	3			2,640	4	E	-	-	-	-
-	-	-	-	M	5				6	E	-	-	-	-
9	PUMP #6	60	3	M	7		1,200		8	E	20	3	BOILER, B-2	8
-	-	-	-	M	9			1,200	10	E	-	-	-	-
-	-	-	-	M	11				12	E	-	-	-	-
9	CHILLER GFI RECEPTACLE	20	1		13				14		20	1	SPARE	
	SPARE	20	1		15				16		20	1	SPARE	
	SPARE	20	1		17				18		20	1	EXISTING LOAD	9
	SPACE				19				20				SPACE	
9	PUMP #8	70	3	M	21		3,408	3,408	22	M	70	3	PUMP #3	9
-	-	-	-	M	23				24	M	-	-	-	-
-	-	-	-	M	25	3,408	3,408		26	M	-	-	-	-
9	PUMP #2	100	3	M	27				28	M	70	3	PUMP #4	9
-	-	-	-	M	29				30	M	-	-	-	-
-	-	-	-	M	31				32	M	-	-	-	-
9	PUMP #1	100	3	M	33		6,960	3,408	34	M	70	3	PUMP #7	9
-	-	-	-	M	35			6,960	36	M	-	-	-	-
-	-	-	-	M	37	6,960	3,408		38	M	-	-	-	-
	TOTAL CONNECTED LOAD PER PHASE (VA):					22,224	22,224	22,224						
	TOTAL ESTIMATED DEMAND LOAD PER PHASE (VA):					23,964	23,964	23,964						
	TOTAL ESTIMATED DEMAND LOAD PER PHASE (AMPS):					200	200	200						

TYPE	LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
P	SUB-PANEL	SUB-PANEL LOADS BROKEN OUT BY LOAD CLASIFICATION BELOW			
R	RECEPTACLES	-	-	-	TOTAL CONNECTED LOAD: 66,672 VA
L	LIGHTING	-	-	-	25% OF LARGEST MOTOR: 5,220 VA
C	CONTINUOUS	-	-	-	TOTAL ESTIMATED DEMAND LOAD: 71,892 VA
E	EQUIPMENT	7,200 VA	100%	7,200 VA	TOTAL ESTIMATED DEMAND BALANCED CURRENT: 200 AMPS
M	MOTOR	59,472 VA	100%	59,472 VA	MAXIMUM ESTIMATED DEMAND PHASE CURRENT: 200 AMPS
K	KITCHEN	-	-	-	
	OTHER	-	-	-	

PANELBOARD SCHEDULE KEYED NOTES:
1. PROVIDE CLASS A GROUND FAULT INTERRUPTER TYPE CIRCUIT BREAKER.
2. PROVIDE ARC FAULT CIRCUIT INTERRUPTER TYPE CIRCUIT BREAKER.
3. PROVIDE 30 MILLIAMPERE EQUIPMENT GROUND FAULT PROTECTOR TYPE CIRCUIT BREAKER.
4. PROVIDE SHUNT-TRIP TYPE CIRCUIT BREAKER WITH 120V COIL.
5. PROVIDE HACR RATED CIRCUIT BREAKER.
6. PROVIDE HANDLE CLAMP FOR HOLDING CIRCUIT BREAKER IN THE "ON" OR "OFF" POSITION.
7. PROVIDE SWITCHING RATED CIRCUIT BREAKER.
8. PROVIDE NEW CIRCUIT BREAKER IN EXISTING PANELBOARD (WHERE PANEL IS INDICATED AS EXISTING) OF SAME MANUFACTURER AND A.I.C. RATING AS EXISTING.
9. EXISTING LOAD.
10. NEW LOAD ON AN EXISTING BREAKER.

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10/21/2022
6307784-2202
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STATE OF UTAH

BOILER REPLACEMENT AT HIGHLAND JR. HIGH SCHOOL

OGDEN SCHOOL DISTRICT
325 GRAMERCY AVENUE
OGDEN, UTAH

MARK	DATE	DESCRIPTION
1		
2		
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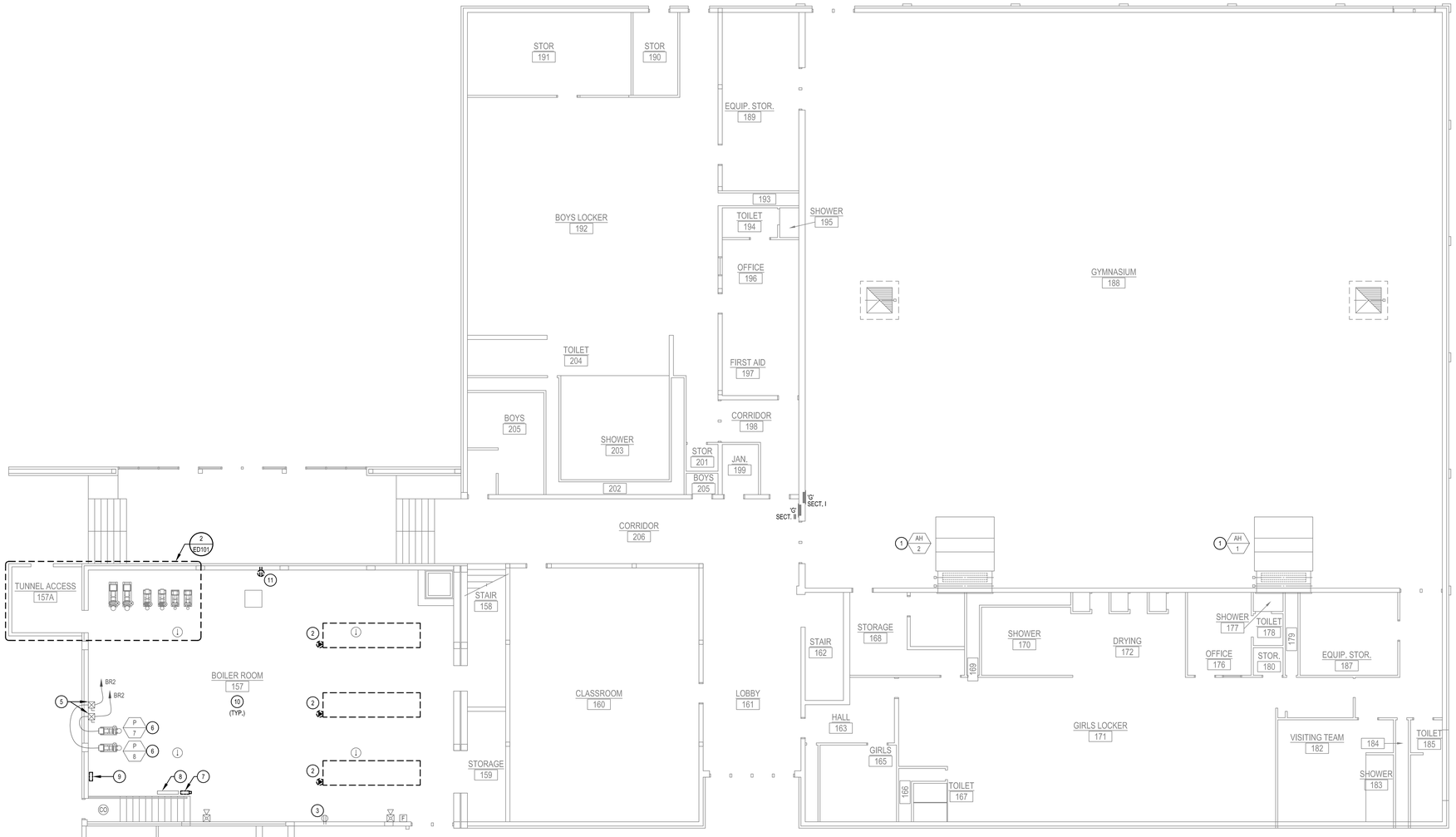
ISSUE TYPE:	CONSTRUCTION DOCUMENTS
ISSUE DATE:	MARCH 23, 2022
PROJECT NO:	21113
CAD DWG FILE:	
DRAWN BY:	LRL
CHECKED BY:	TS

SHEET TITLE

SYMBOLS, SCHEDULES, AND DETAILS

SHEET NUMBER

EG001



1 ELECTRICAL DEMOLITION PLAN

SCALE: 1/8"=1'-0"

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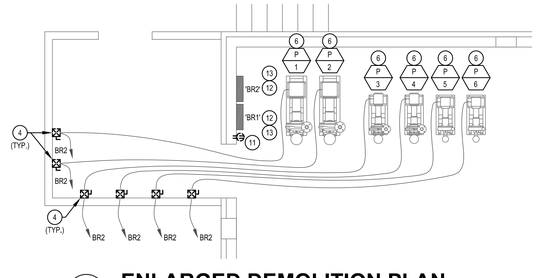
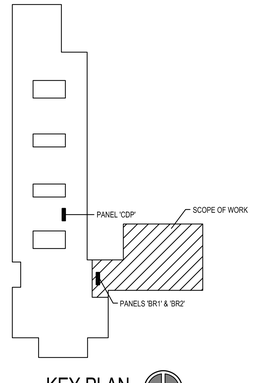


2 ENLARGED DEMOLITION PLAN

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



KEY PLAN

NORTH

GENERAL DEMOLITION NOTES:

1. UNLESS SPECIFICALLY NOTED OTHERWISE, REMOVE ALL ELECTRICAL ITEMS SHOWN IN DARK AND DASHED LINES. LIGHT AND SOLID ITEMS ARE TO REMAIN. DEMOLITION ITEMS ARE SHOWN TO GIVE A BASIC DESCRIPTION OF THE EXTENT OF DEMOLITION WORK, BUT MAY NOT BE INCLUSIVE. PROVIDE DEMOLITION WORK IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:
   - A. DISCONNECT AND REMOVE ANY/ALL FIXTURES, DEVICES, EQUIPMENT, ETC. REQUIRED FOR PROPER COMPLETION OF THE WORK WHETHER SHOWN OR NOT.
   - B. RELOCATE, REWIRE, AND/OR RECONNECT ANY/ALL FIXTURES, DEVICES, EQUIPMENT, ETC. THAT FOR ANY REASON OBSTRUCTS CONSTRUCTION.
   - C. LEAVE ALL EXISTING FIXTURES, DEVICES, EQUIPMENT, ETC. IN PORTIONS OF THE BUILDING NOT BEING REMODELED, IN WORKING CONDITION. RESTORE ALL INTERRUPTED BRANCH CIRCUITS, FEEDERS, ETC.
   - D. REMOVE AND DISPOSE OF ALL RACEWAYS, CONDUCTORS, BOXES, DEVICES, EQUIPMENT, ETC. THAT ARE NOT TO BE REUSED. TERMINATE AT ACCESSIBLE JUNCTION BOX BY PROVIDING PROPER KNOCK-OUT CLOSURE, TAPE CONDUCTORS, LABEL AS "SPARE" WITH CIRCUIT NO., ZONE NO, OR OTHER CHARACTERISTIC IDENTIFYING SOURCE.
   - E. EXISTING RACEWAYS MAY BE REUSED, IF IN PLACE, WHERE POSSIBLE, AND WHERE IN COMPLIANCE WITH THE SPECIFICATIONS AND THE INTENT OF THE CONTRACT DOCUMENTS. UPGRADE AND OR PROVIDE NEW CONDUIT SUPPORTS WHERE NECESSARY FOR ALL RACEWAYS BEING REUSED. ENSURE INTEGRITY OF EXISTING RACEWAYS BEFORE REUSE.
   - F. CONCEAL ALL RACEWAY AND WIRING IN EXISTING WALLS, CEILINGS, FLOORS, ETC. THE USE OF WIREMOLD IS PERMITTED ONLY WHERE SPECIFICALLY NOTED ON DRAWING.
   - G. DO NOT PENETRATE STRUCTURAL ELEMENTS OF FLOORS, WALLS, CEILINGS, ROOFS, ETC.
   - H. COORDINATE WITH OWNER WHAT EQUIPMENT SHOULD BE DISPOSED OF AND WHAT EQUIPMENT IS TO BE RETURNED TO OWNER.
   - I. FIRE ALARM SYSTEM MUST REMAIN OPERATIONAL DURING ALL PHASES OF CONSTRUCTION.
2. ALL CONDUITS, BOXES, ETC THAT ARE LOCATED IN THE AFFECTED CONSTRUCTION AREA SHALL BE RELOCATED OR REROUTED AS NECESSARY.
3. BRANCH CIRCUITS, IF SHOWN WHERE TAKEN FROM EXISTING RECORD DRAWINGS AND PANEL SCHEDULES. CONTRACTOR TO TRACE OUT ALL CIRCUIT PRIOR TO ANY DEMOLITION.
4. ALL ITEMS ARE EXISTING AND ARE TO REMAIN UNLESS NOTED OTHERWISE.
5. THIS AND ANY OTHER DEMOLITION DRAWINGS ARE NOT INTENDED TO BE ALL-INCLUSIVE, NOR TO DEFINE THE SCOPE OF ALL DEMOLITION WORK REQUIRED FOR THIS PROJECT. DEMOLITION DRAWINGS ARE SHOWN ONLY TO AID THE CONTRACTOR IN PREPARING THE BID AND PERFORMING THE WORK. CONTRACTOR SHALL EXAMINE ALL CONTRACT DOCUMENTS AND VISIT THE SITE DURING BIDDING TO DETERMINE THE TOTAL EXTENT AND SCOPE OF THE DEMOLITION PORTION OF THIS WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION WORK REQUIRED TO CARRY OUT THE WORK AS SHOWN IN THE CONTRACT DOCUMENTS.
6. TO MAKE NEW SERVICE CONNECTIONS TO EQUIPMENT THE CONTRACTOR MUST COORDINATE WITH OWNER 7 DAYS IN ADVANCE TO SCHEDULE A POWER OUTAGE. FOLLOW THE REQUIREMENTS OF LOCAL CODES FOR ELECTRICAL SERVICE INTERRUPTIONS.

KEYED NOTES: (#)

1. EXISTING AIR HANDLER TO REMAIN IN PLACE.
2. DISCONNECT POWER FROM EXISTING STEAM BOILER TO BE REMOVED. REMOVE EXISTING BRANCH CIRCUIT CONDUCTORS BACK TO THE SOURCE, COMPLETE. TURN OFF BREAKER AND LABEL AS SPARE. CUT BELOW GRADE CONDUIT FLUSH WITH THE FINISHED FLOOR. COORDINATE WORK WITH THE MECHANICAL CONTRACTOR.
3. EXISTING DUPLEX OUTLET TO REMAIN IN PLACE.
4. DISCONNECT, REMOVE, AND DISPOSE OF EXISTING PUMP STARTER. EXISTING UPSTREAM AND DOWNSTREAM BRANCH CIRCUIT TO REMAIN IN PLACE FOR REUSE. IF THE CONDUIT IS DAMAGED DURING THE DEMOLITION, REPAIR AS NECESSARY.
5. EXISTING PUMP STARTER TO REMAIN IN PLACE.
6. EXISTING PUMP TO REMAIN IN PLACE.
7. EXISTING ALERTON MECHANICAL PLANT CONTROLS TO BE REMOVED BY MECHANICAL. REMOVE EXISTING BRANCH CIRCUIT BACK TO THE NEXT DEVICE THAT IS TO REMAIN IN PLACE OR SOURCE. REMOVE EXISTING DATA CONNECTION.
8. CONTROL PANEL TO REMAIN IN PLACE. REMOVE EXISTING BRANCH CIRCUIT BACK TO THE SOURCE COMPLETELY. COORDINATE WORK WITH THE MECHANICAL CONTRACTOR.
9. DISCONNECT POWER FROM EXISTING BARBER COLEMAN MICRO 8000 ENERGY MANAGEMENT SYSTEM TO BE REMOVED. REMOVE EXISTING BRANCH CIRCUIT BACK TO THE NEXT DEVICE THAT IS TO REMAIN IN PLACE OR SOURCE. COORDINATE WORK WITH THE MECHANICAL CONTRACTOR.
10. EXISTING FIRE ALARM SYSTEM TO REMAIN OPERATIONAL DURING CONSTRUCTION.
11. DISCONNECT, REMOVE, AND DISPOSE OF EXISTING DUPLEX OUTLET. EXISTING BRANCH CIRCUIT TO REMAIN IN PLACE FOR REUSE. IF THE CONDUIT IS DAMAGED DURING THE DEMOLITION, REPAIR AS NECESSARY.
12. EXISTING BRANCH PANEL TO REMAIN IN PLACE.
13. CONTRACTOR SHALL TRACE OUT ALL CIRCUITS ON THIS PANEL AND PROVIDE NEW TYPE WRITTEN SCHEDULE.

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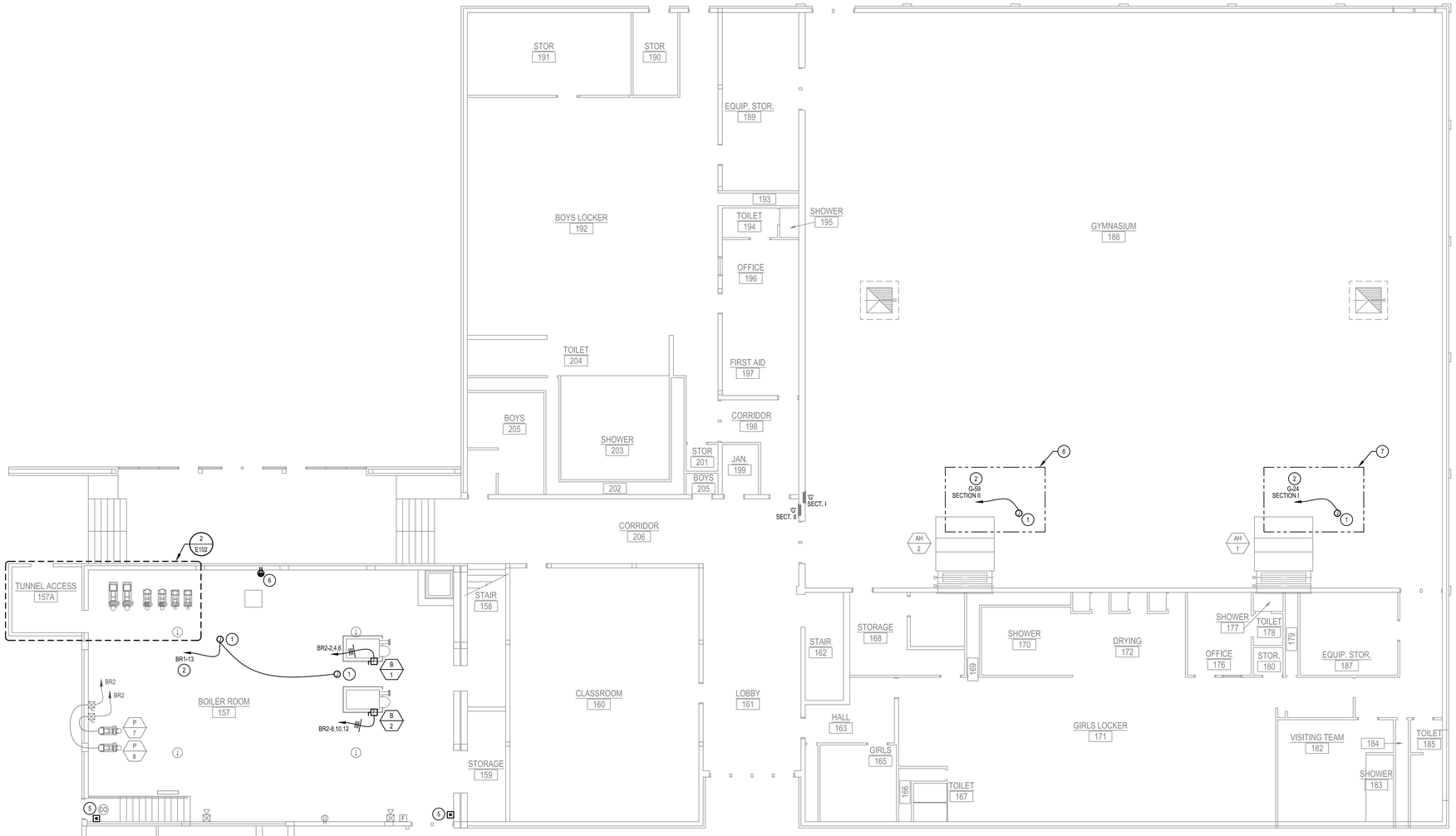
CHECKED BY:	TS

SHEET TITLE

ELECTRICAL DEMOLITION PLAN

SHEET NUMBER

ED101



1 ELECTRICAL REMODEL PLAN

SCALE: 1/8"=1'-0"

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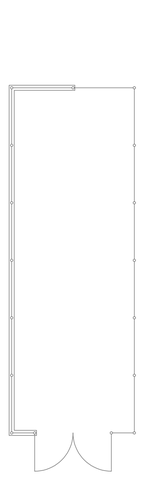
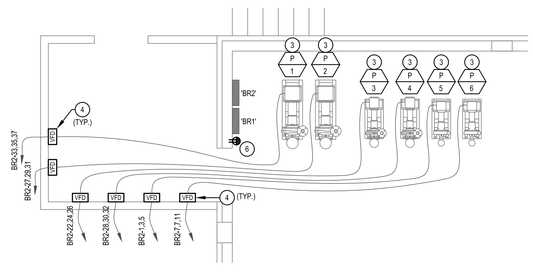
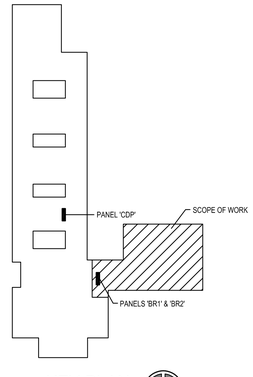




2 ENLARGED REMODEL PLAN

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



KEY PLAN

NORTH

GENERAL NOTES:

1. THE DIVISION 26 CONTRACTOR SHALL DETERMINE THE EXACT ROUTING OF ALL CONDUITS IN THE FIELD. THIS PLAN REPRESENTS A SCHEMATIC REPRESENTATION OF DEVICE LOCATIONS AND CONDUIT RUNS.

KEYED NOTES: (#)

1. PROVIDE NEW 120V JUNCTION BOX FOR HVAC CONTROLS. COORDINATE INSTALLATION WITH THE MECHANICAL CONTRACTOR.
2. PROVIDE NEW 20A, 1-POLE CIRCUIT BREAKER IN EXISTING PANEL, WESTINGHOUSE. NEW BREAKER SHALL BE OF THE SAME MANUFACTURER AND INTERRUPTING CIRCUIT AS THE EXISTING INSTALLED. CONTRACTOR TO FIELD VERIFY ALL REQUIREMENTS PRIOR TO ORDERING BREAKER.
3. CONNECT EXISTING PUMP TO NEW VFD.
4. PROVIDE NEW VFD FOR PUMP. RECONNECT TO EXISTING BRANCH CIRCUIT. SEE EQUIPMENT SCHEDULE FOR ADDITIONAL INFORMATION.
5. EPO BUTTON FOR BOILER SHUTDOWN BY DIVISION 23. PROVIDE CONDUIT AND BACKBOX AS REQUIRED. COORDINATE WITH MECHANICAL PRIOR TO ROUGH-IN.
6. PROVIDE NEW GFCI DUPLEX OUTLET. RECONNECT TO EXISTING BRANCH CIRCUIT.
7. BID THIS WORK AS ALTERNATE #1.
8. BID THIS WORK AS ALTERNATE #2.

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BOILER REPLACEMENT AT HIGHLAND JR. HIGH SCHOOL

OGDEN SCHOOL DISTRICT
325 GRAMERCY AVENUE
OGDEN, UTAH

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