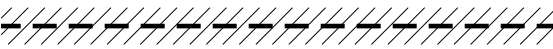

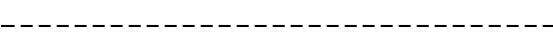


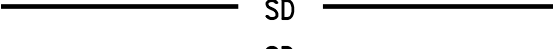



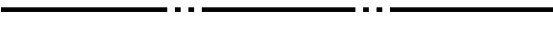


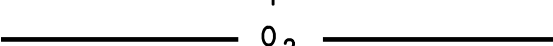
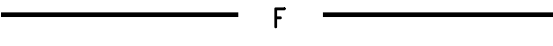
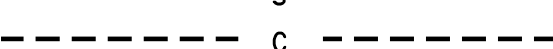
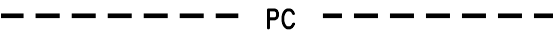


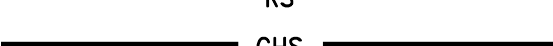


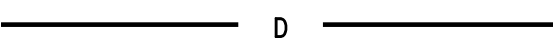

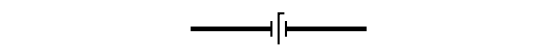
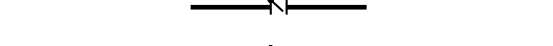

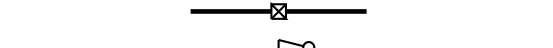
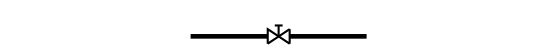

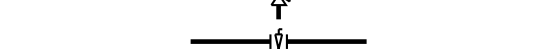




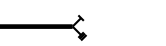



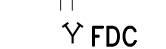


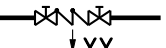

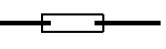

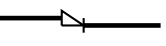
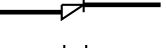
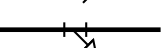
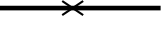

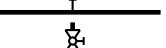

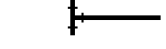
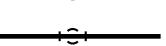
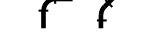
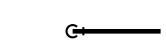







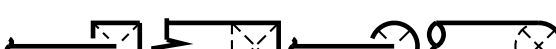












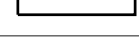




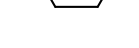


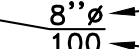

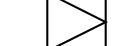






























MECHANICAL SYMBOLS AND ABBREVIATIONS		
SYMBOL	ABBREV.	DESCRIPTION
	(D)	PIPING / EQUIPMENT TO BE REMOVED
	(N)	PIPING / EQUIPMENT TO BE PROVIDED
	(E)	PIPING / EQUIPMENT TO REMAIN
	(F)	FUTURE PIPING / EQUIPMENT
	W	SANITARY DRAIN (ABOVE GRADE DRAIN)
	W	SANITARY DRAIN (BELOW GRADE DRAIN)
	W	SANITARY DRAIN (PUMPED)
	SD	STORM DRAIN (ABOVE GRADE DRAIN)
	SD	STORM DRAIN (BELOW GRADE DRAIN)
	V	VENT
	ACID	ACID DRAIN
	AV	ACID VENT
	CW	COLD WATER
	HW	HOT WATER
	HWR	HOT WATER RETURN
	G	NATURAL GAS
	A	COMPRESSED AIR
	P	PROPANE
	O ₂	OXYGEN
	F	FIRE PROTECTION
	S	STEAM (15 PSIG)
	C	CONDENSATE RETURN
	PC	CONDENSATE RETURN (PUMPED)
	HWS	HEATING WATER SUPPLY (LOW TEMP)
	HWR	HEATING WATER RETURN
	RL	REFRIGERANT LIQUID LINE
	RS	REFRIGERANT SUCTION LINE
	CHS	CHILLED WATER SUPPLY
	CHR	CHILLED WATER RETURN
	CWS	CONDENSING WATER SUPPLY
	CWR	CONDENSING WATER RETURN
	D	DRAIN (INDIRECT)
		TRIPLE DUTY VALVE
		BALL VALVE
		BUTTERFLY VALVE
		CHECK, SWING VALVE
		CHECK, SPRING VALVE
		BALANCING VALVE
		FLOW CONTROL VALVE
		FLOAT VALVE
		GATE VALVE
		GATE ANGLE VALVE
		GLOBE ANGLE VALVE
		PLUG VALVE
		SAFETY RELIEF VALVE
		GLOBE VALVE
		PRESSURE REDUCING VALVE
		SOLENOID VALVE
		2-WAY CONTROL VALVE
		3-WAY CONTROL VALVE
		HOSE BIB
	FD	FLOOR DRAIN
	FS	FLOOR SINK
	WCO	WALL CLEAN OUT
	CB	CATCH BASIN
		WALL HYDRANT / HOSE BIB
		FIRE DEPARTMENT CONNECTION
		FIRE HYDRANT
		WATER HAMMER ARRESTOR
	BFP	BACKFLOW PREVENTER, DOUBLE CHECK
	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
		CAP
		UNION
		EXPANSION JOINT
		FLEXIBLE JOINT
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER STRAIGHT INVERT
		ECCENTRIC REDUCER STRAIGHT CROWN
		STRAINERS/FILTERS Y-PATTERN W/ PLUG
		STRAINERS/FILTERS Y-PATTERN W/ BLOWOFF
		ANCHOR
		GUIDE
	AAV	AUTOMATIC AIR VENT
		PETE'S PLUG
	MAV	MANUAL AIR VENT
		RISE
		TEE
		TEE, OUTLET UP
		TEE, OUTLET DOWN
		ELBOW
		ELBOW, OUTLET UP
		ELBOW, OUTLET DOWN
	/	AND/OR
	CL	CENTER LINE
	Ø	DIAMETER/PHASE
	#	NUMBER/POUNDS

MECHANICAL SYMBOLS AND ABBREVIATIONS		
SYMBOL	ABBREV.	DESCRIPTION
	SA	SUPPLY DUCT TURN UP
	SA	SUPPLY DUCT TURN DOWN
	RA	RETURN AIR
	EXH	EXHAUST
	OSA	OUTSIDE AIR
	FSD	FIRE SMOKE DAMPER
	FD	FIRE DAMPER
	MVD	MANUAL VOLUME DAMPER
		MOTORIZED DAMPER
		BACKDRAFT DAMPER
		TEMPERATURE SENSOR
		WALL MOUNTED THERMOSTAT
		CEILING MOUNTED THERMOSTAT
		ACOUSTICAL LINER
		FLEXIBLE DUCT TO GRILLE/DIFFUSER
		EQUIPMENT CONNECTION
		DUCT PRESSURE CLASS SYMBOL
		SUPPLY DIFFUSER/GRILLE
		RETURN DIFFUSER/GRILLE
		EXHAUST DIFFUSER/GRILLE
		LINEAR SLOT DIFFUSER
		SIDEWALL DIFFUSER/GRILLE
		DETAIL/SECTION NUMBER
		DETAIL/SECTION SYMBOL
		DRAWING WHERE DETAIL/SECTION APPEARS
		POINT OF CONNECTION TO (E)
		NEW EQUIPMENT IDENTIFICATION
		NEW EQUIPMENT MARK
		NEW EQUIPMENT NUMBER
		EXISTING EQUIPMENT IDENTIFICATION
		EXISTING EQUIPMENT MARK
		EXISTING EQUIPMENT NUMBER
		NECK SIZE (IN)
		DIFFUSER/GRILLE MARK
		CFM
	AD	ACCESS DOOR
	AF	AIR FOIL (FAN)
	AFF	ABOVE FINISHED FLOOR
	APD	AIR PRESSURE DROP
	AVG	AVERAGE
	BHP	BRAKE HORSEPOWER
	BI	BACKWARD INCLINED (FAN)
	BLDG	BUILDING
	BOD	BOTTOM OF DUCT
	BOP	BOTTOM OF PIPE
	BTU	BRITISH THERMAL UNIT
	BTUH	BTU PER HOUR
	CFM	CUBIC FEET PER MINUTE
	CI	CAST IRON
	CO	CLEAN OUT
	COTG	CLEAN OUT TO GRADE
	CONC	CONCRETE
	COND	CONDENS - (ER, ING, ATE)
	CONT	CONTINU - (E, ED, OUS, ATION)
	CU FT	CUBIC FEET
	dB	DECIBEL
	DB	DRY BULB
	DDC	DIRECT DIGITAL CONTROL(S)
	DEG	DEGREE
	DEMO	DEMOLISH(ED)
	DIA	DIAMETER
	DN	DOWN
	DS	DOWNSPOUT
	EA	EACH
	EAT	ENTERING AIR TEMPERATURE
	EFF	EFFICIENCY
	ELEV	ELEVATION
	ELEC	ELECTRIC(AL)
	ENT	ENTERING
	EQUIP	EQUIPMENT
	ESP	EXTERNAL STATIC PRESSURE
	EWT	ENTERING WATER TEMPERATURE
	EXH	EXHAUST (AIR)
	EXIST	EXISTING
	F	FAHRENHEIT

MECHANICAL ABBREVIATIONS	
ABBREV.	DESCRIPTION
FC	FORWARD CURVED (FAN)
FCO	FLOOR CLEAN OUT
FF	FINISHED FLOOR
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FA	FREE AREA
FT	FOOT OR FEET
GA	GAUGE
GAL	GALLON(S)
GALV	GALVANIZED
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	HEAD / HUB DRAIN
HG	MERCURY
HOA	HAND OFF AUTO
HP	HEAT PUMP / HORSEPOWER
HR	HOUR
HTG	HEATING
HZ	HERTZ (FREQUENCY)
IE	INVERT ELEVATION
IN	INCH(ES)
KW	KILOWATT
HWH	KILOWATT-HOUR
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	BTU PER HOUR (THOUSANDS)
MECH	MECHANICAL
MIN	MINIMUM
N/A	NOT APPLICABLE
NC	NOISE CRITERIA / NORMALLY CLOSED
NIC	NOT IN CONTRACT
NIM	NOT IN MECHANICAL
NO	NORMALLY OPEN / NUMBER
NTS	NOT TO SCALE
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER / OVERFLOW DRAIN
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OSA	OUTSIDE AIR
PD	PRESSURE DROP/ DIFFERENCE
PH	PHASE
PPM	PARTS PER MILLION
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	PSI, ABSOLUTE
PSIG	PSI, GAUGE
P&T	PRESSURE & TEMPERATURE RELIEF VALVE
(R)	RELOCATE(D)
R	RADIUS
RA	RETURN (AIR)
RD	ROOF DRAIN
RECIRC	RECIRCULATE - (E, ING, OR)
REQ	REQUIRED
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY (AIR)
SAT	SATURATION
SCFM	CFM, STANDARD CONDITIONS
SD	SMOKE DAMPER / STORM DRAIN
SEC	SECOND
SF	SQUARE FEET
SM	SHEET METAL
SP	STATIC PRESSURE
SPEC	SPECIFICATION(S)
SQ FT	SQUARE FEET
SS	STAINLESS STEEL
STD	STANDARD
STRUCT	STRUCTURAL
SYS	SYSTEM
TEMP	TEMPERATURE
TONS	TONS OF REFRIGERATION
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
VAC	VACUUM
VAV	VARIABLE AIR VOLUME (BOX/UNIT/SYSTEM)
VD	VOLUME DAMPER
VEL	VELOCITY
VENT	VENTILATION
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VTR	VENT THROUGH ROOF
VVT	VARIABLE VOLUME AND TEMPERATURE
W/	WITH
W	WASTE/WATT
WB	WET BULB
WPD	WATER PRESSURE DROP
WT	WEIGHT
ZD	ZONE DAMPER

DRAWING INDEX	
DWG.	DESCRIPTION
MT0.1	TITLE SHEET ELECTRICAL / HVAC
E2.1	PARTIAL FLOOR PLANS - DEMOLITION - ELECTRICAL
E3.1	PARTIAL FLOOR PLANS - ELECTRICAL
M2.1	PARTIAL FLOOR PLANS - DEMOLITION - HVAC
M3.1	PARTIAL FLOOR PLANS - HVAC
M5.1	P&I DIAGRAMS - HVAC
M5.2	P&I DIAGRAMS - HVAC
M5.3	P&I DIAGRAMS - HVAC

NOTE:
 NOT ALL SYMBOLS AND ABBREVIATIONS MAY BE USED.

MARK	DATE	DESCRIPTION



KELSO SCHOOL DISTRICT
 KELSO HIGH SCHOOL
 BOILER REPLACEMENT
 1904 ALLEN STREET
 KELSO, WA 98626

BID SET
 04/08/19

TITLE SHEET
 ELECT. / HVAC

2018-65

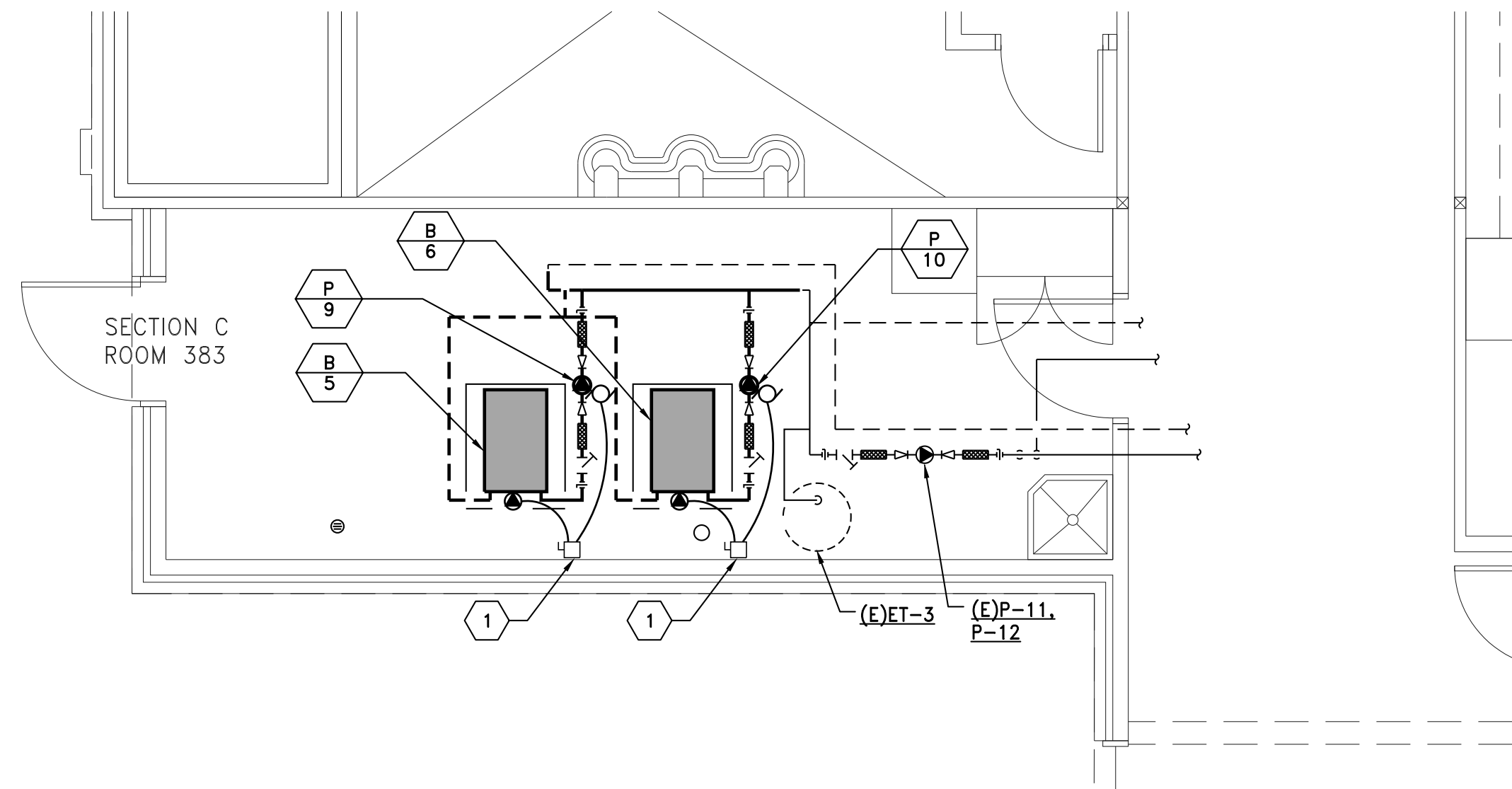
SHEET NO.

MT0.1

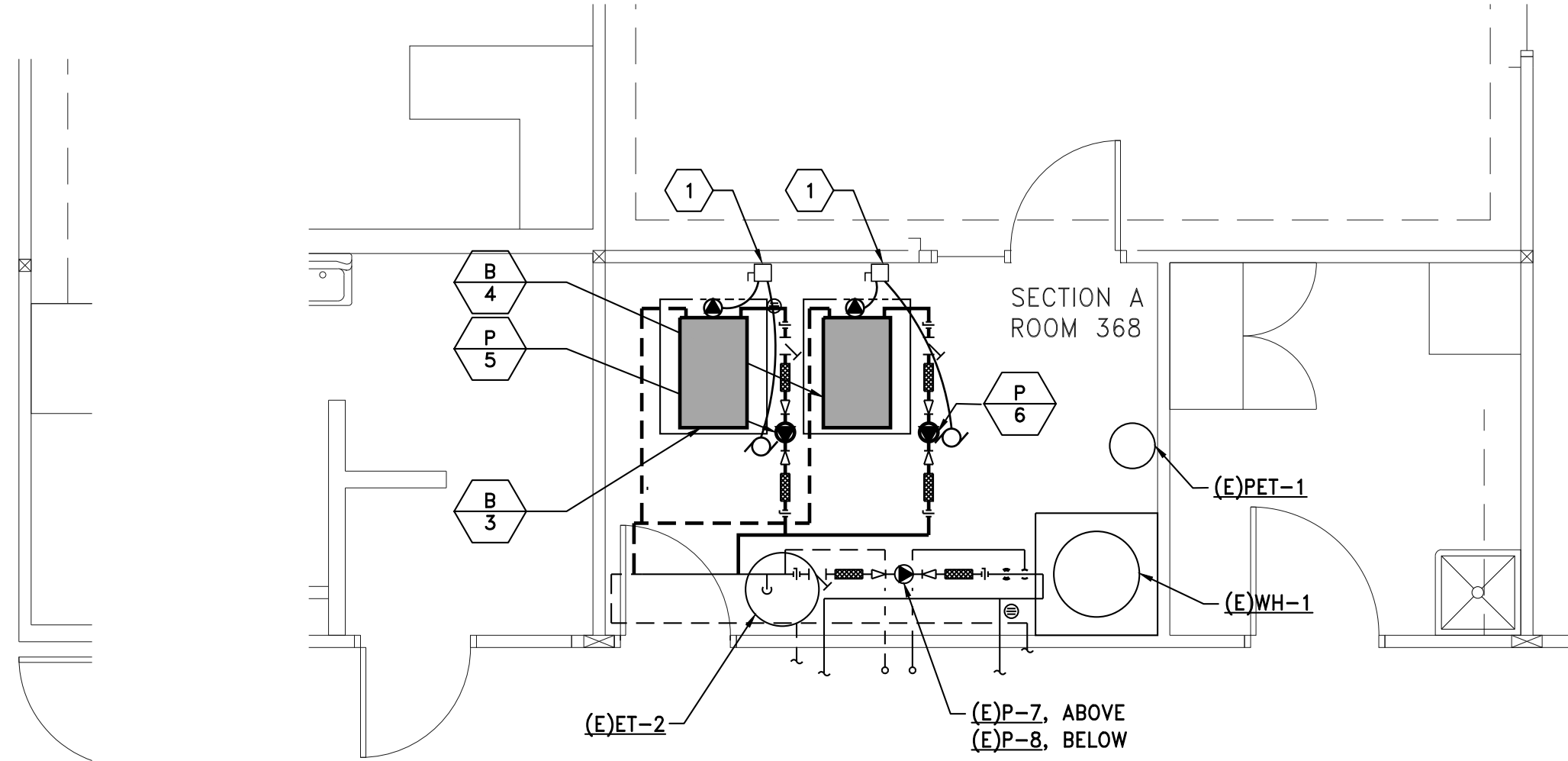
6915 SW MACADAM AVE.
 SUITE 200
 PORTLAND, OREGON 97219
 PHONE: 503.892.1188
 FAX: 503.892.1190
 CONTACT...ALLEN CRISANAZ
 engineering@mke-inc.com



MARK	DATE	DESCRIPTION



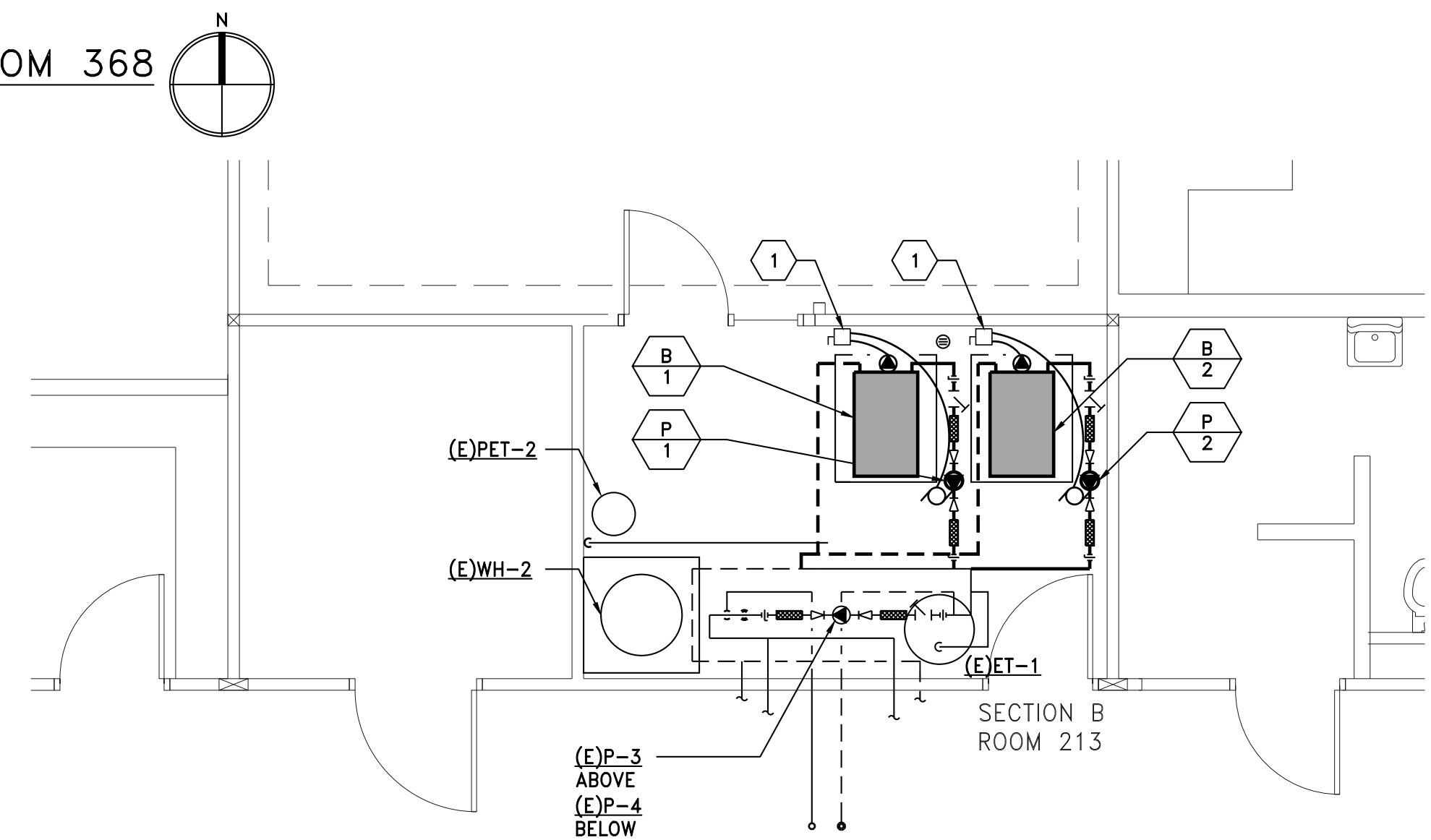
3 ENLARGED ELECTRICAL PLAN - SECTOR C - ROOM 383
E3.1 SCALE: 1/4" = 1'-0" 0 2' 4' 8'



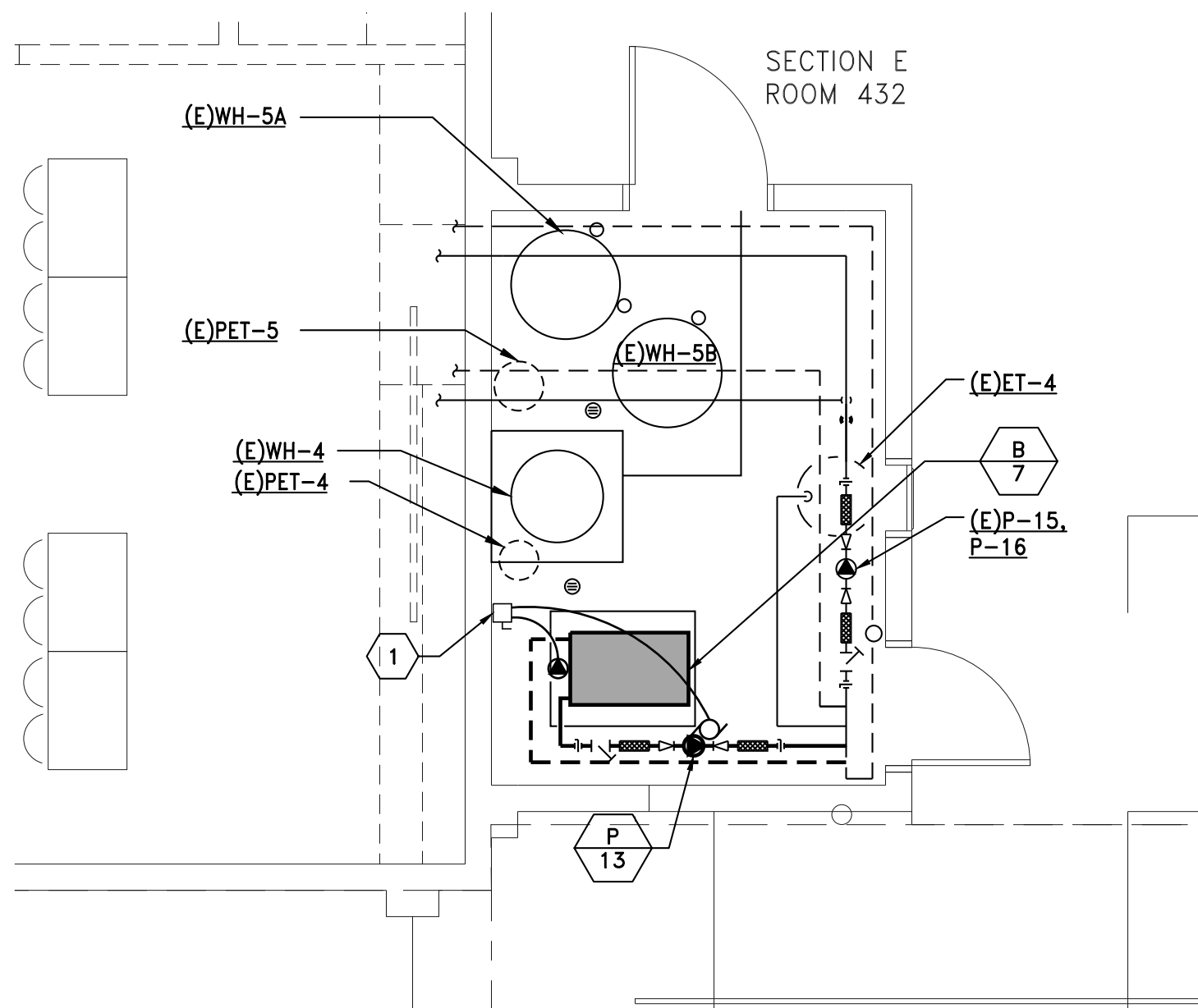
2 ENLARGED ELECTRICAL PLAN - SECTOR A - ROOM 368
E3.1 SCALE: 1/4" = 1'-0" 0 2' 4' 8'

KEYED NOTES: ⬡

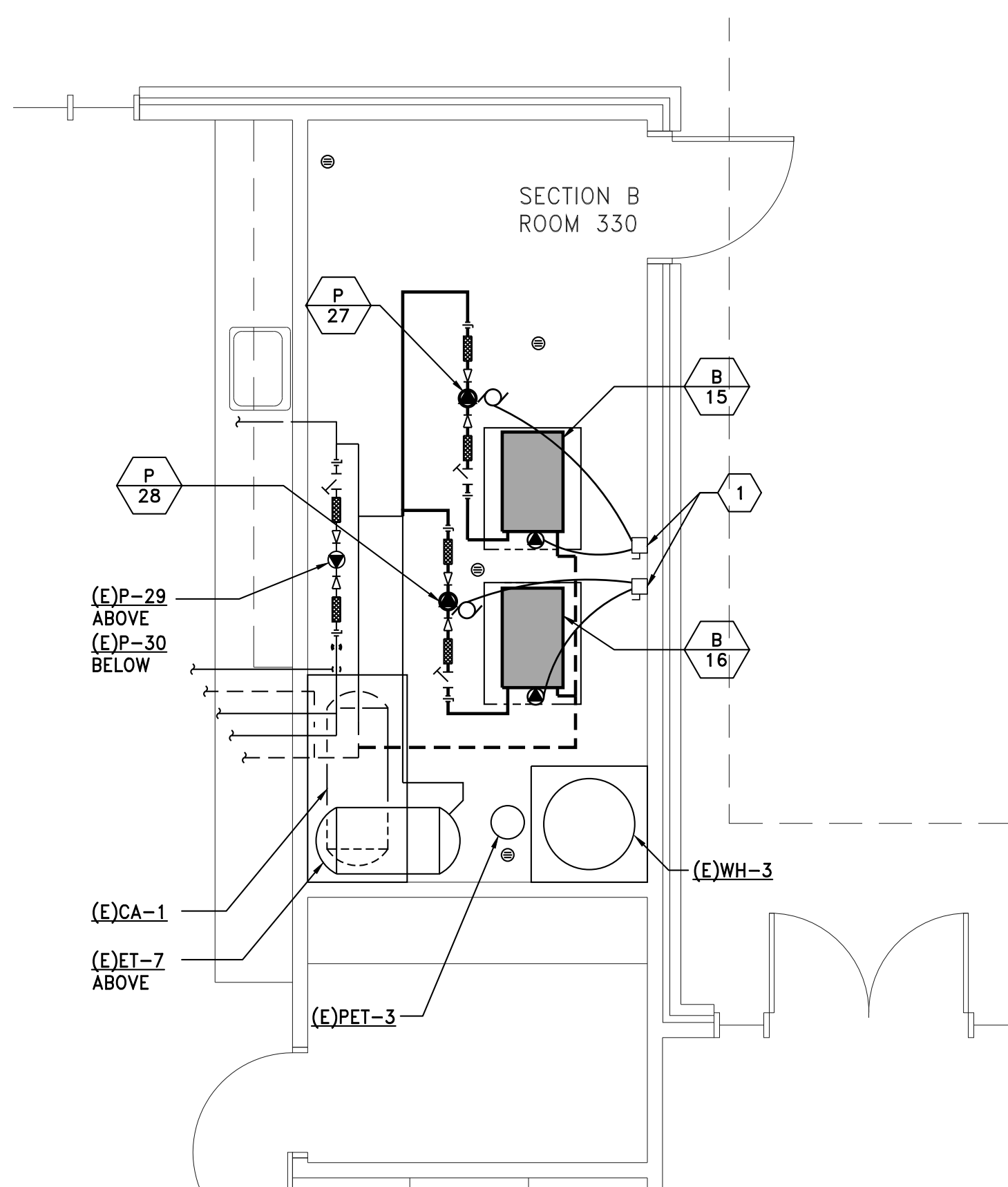
- EXISTING DISCONNECT SWITCH FOR EXISTING BOILER WITH INTEGRAL PUMP TO REMAIN. DEMOLISH EXISTING BOILER ELECTRICAL CONNECTION. CONNECT NEW BOILER AND PUMP AS TWO SEPARATE CONNECTIONS. THE EXISTING DISCONNECT SWITCH MAY BE RE-USED. VERIFY EXACT LOCATION OF DISCONNECT WITHIN BOILER EACH BOILER ROOM. PROVIDE (2) #10 WITH (1) #10 GROUND TO EACH BOILER AND EACH PUMP SINCE THE EXISTING CIRCUIT BREAKER IS 30AMP, 1 POLE. USE EMT WITH FLEX CONDUIT FOR APPROXIMATELY LAST 3 FT. TO PIECE OF EQUIPMENT. ELECTRICAL LOAD FOR BOILER (13.1A@120V) AND PUMP (4.7A@120V) REMAINS UNCHANGED. UPDATE NAME PLATE TO INCLUDE PUMP NUMBER.



5 ENLARGED ELECTRICAL PLAN - SECTOR B - ROOM 213
M3.1 SCALE: 1/4" = 1'-0" 0 2' 4' 8'

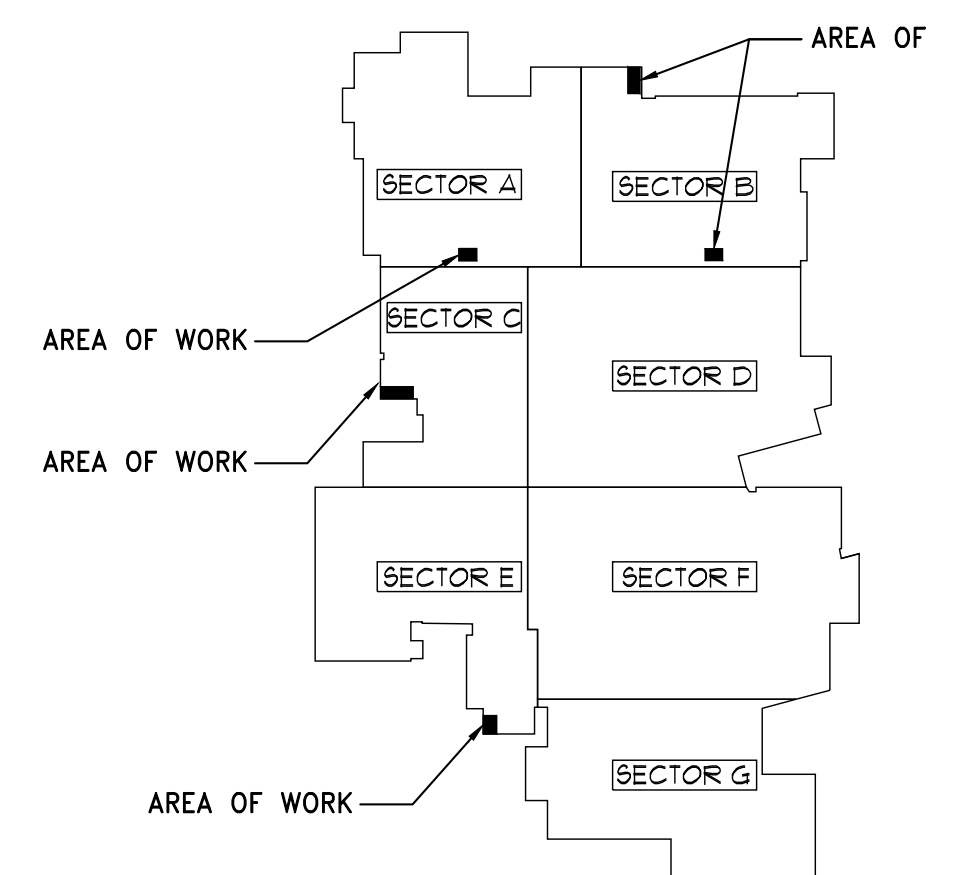


3 ENLARGED ELECTRICAL PLAN - SECTOR E - ROOM 432
E3.1 SCALE: 1/4" = 1'-0" 0 2' 4' 8'



4 ENLARGED ELECTRICAL PLAN - SECTOR B - ROOM 330
E3.1 SCALE: 1/4" = 1'-0" 0 2' 4' 8'

ELECTRICAL SYMBOLS	
	HEAVY DUTY SAFETY SWITCH
	ELECTRICAL MOTOR CONNECTION
	ELECTRICAL EQUIPMENT CONNECTION



KEY PLAN

HOT WATER BOILER																				
SYMBOL MARK	DESCRIPTION	SERVICE	FUEL	INPUT (MBH)	OUTPUT (MBH)	GPM	SUPPLY TEMP (°F)	RETURN TEMP (°F)	DOE AFUE (%)	RELIEF SETTING (PSIG)	FLUE SIZE (IN)	AIR INLET (IN)	GAS CONN. (IN)	VOLTAGE	PH.	BURNER MOTOR HP	MCA	FLA	OPERATING WEIGHT (LBS)	COMMENTS
B-1	CONDENSING FIRE-TUBE	SECTOR B RM 213	NATURAL GAS	1,000	900	45.0	140	120	90	50	4	8	1 1/2	120	1			13.1	1,600	
B-2	CONDENSING FIRE-TUBE	SECTOR B RM 213	NATURAL GAS	1,000	900	45.0	140	120	90	50	4	8	1 1/2	120	1			13.1	1,600	
B-3	CONDENSING FIRE-TUBE	SECTOR A RM 368	NATURAL GAS	1,000	900	45.0	140	120	90	50	4	8	1 1/2	120	1			13.1	1,600	
B-4	CONDENSING FIRE-TUBE	SECTOR A RM 368	NATURAL GAS	1,000	900	45.0	140	120	90	50	4	8	1 1/2	120	1			13.1	1,600	
B-5	CONDENSING FIRE-TUBE	SECTOR C RM383	NATURAL GAS	1,000	900	45.0	140	120	90	50	4	8	1 1/2	120	1			13.1	1,600	
B-6	CONDENSING FIRE-TUBE	SECTOR C RM 383	NATURAL GAS	1,000	900	45.0	140	120	90	50	4	8	1 1/2	120	1			13.1	1,600	
B-7	CONDENSING FIRE-TUBE	SECTOR E RM 432	NATURAL GAS	1,000	900	45.0	140	120	90	50	4	8	1 1/2	120	1			13.1	1,600	
B-15	CONDENSING FIRE-TUBE	SECTOR E RM 432	NATURAL GAS	1,000	900	45.0	140	120	90	50	4	8	1 1/2	120	1			13.1	1,600	
B-16	CONDENSING FIRE-TUBE	SECTOR B RM 330	NATURAL GAS	1,000	900	45.0	140	120	90	50	4	8	1 1/2	120	1			13.1	1,600	
NOTES:																				

PUMP														
SYMBOL MARK	DESCRIPTION	SERVICE	SIZE (IN)	GPM	HEAD (FT)	VOLTAGE	PH.	HP	MCA	FLA	RPM	ISOLATION	WEIGHT (LBS)	COMMENTS
P-1	IN-LINE PUMP	B-1	1-1/2 - 1-1/2	45.0	15	120	1	1/2		4.7	1,750	FLEX	70	
P-2	IN-LINE PUMP	B-2	1-1/2 - 1-1/2	45.0	15	120	1	1/2		4.7	1,750	FLEX	70	
P-5	IN-LINE PUMP	B-3	1-1/2 - 1-1/2	45.0	15	120	1	1/2		4.7	1,750	FLEX	70	
P-6	IN-LINE PUMP	B-4	1-1/2 - 1-1/2	45.0	15	120	1	1/2		4.7	1,750	FLEX	70	
P-9	IN-LINE PUMP	B-5	1-1/2 - 1-1/2	45.0	15	120	1	1/2		4.7	1,750	FLEX	70	
P-10	IN-LINE PUMP	B-6	1-1/2 - 1-1/2	45.0	15	120	1	1/2		4.7	1,750	FLEX	70	
P-13	IN-LINE PUMP	B-7	1-1/2 - 1-1/2	45.0	15	120	1	1/2		4.7	1,750	FLEX	70	
P-27	IN-LINE PUMP	B-15	1-1/2 - 1-1/2	45.0	15	120	1	1/2		4.7	1,750	FLEX	70	
P-28	IN-LINE PUMP	B-16	1-1/2 - 1-1/2	45.0	15	120	1	1/2		4.7	1,750	FLEX	70	
NOTES:														

MARK	DATE	DESCRIPTION



KELSO SCHOOL DISTRICT
 KELSO HIGH SCHOOL
 BOILER REPLACEMENT
 1904 ALLEN STREET
 KELSO, WA 98626

BID SET
 04/08/19

SCHEDULES
 HVAC

2018-65

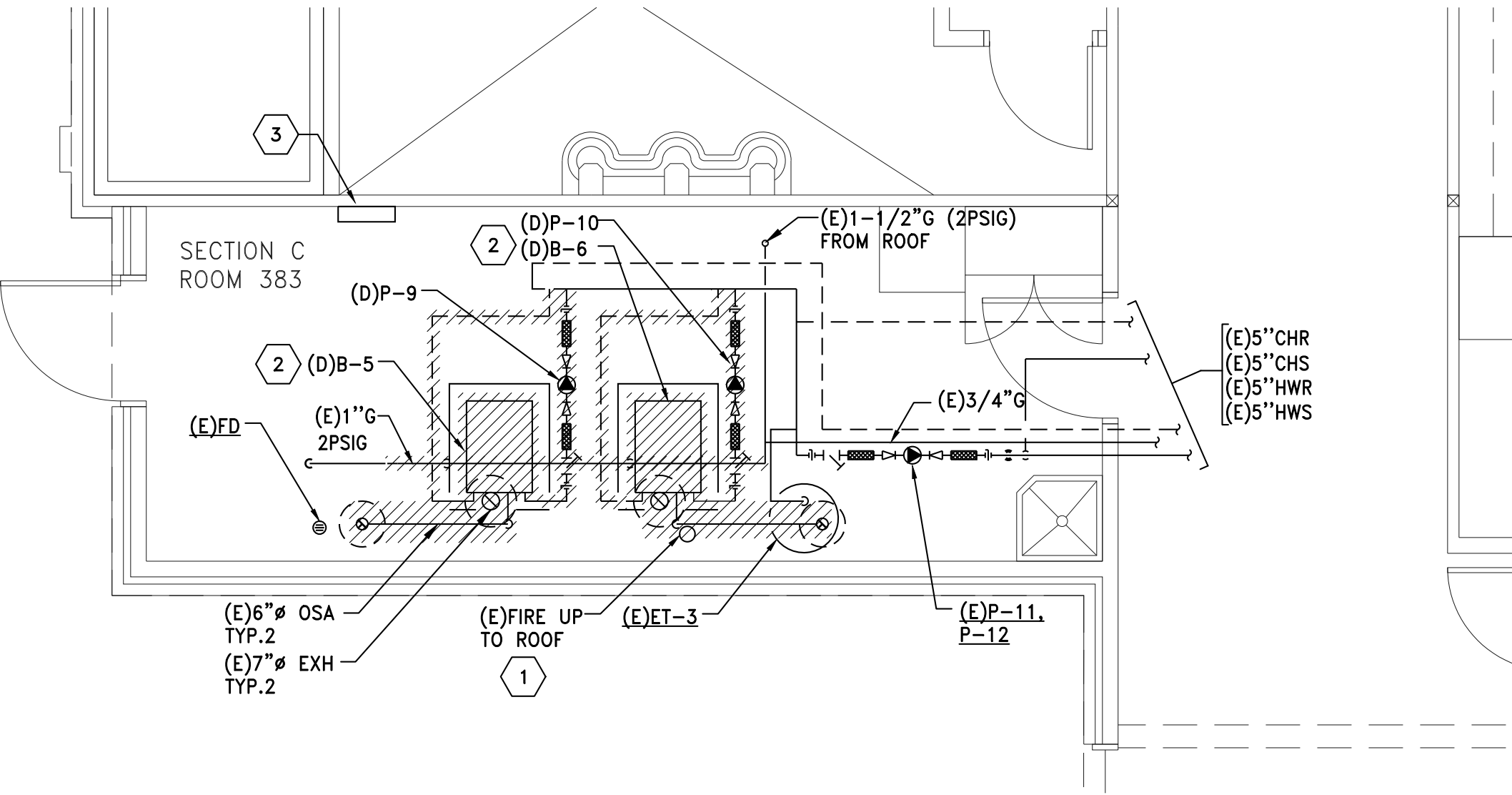
SHEET NO.

M1.1

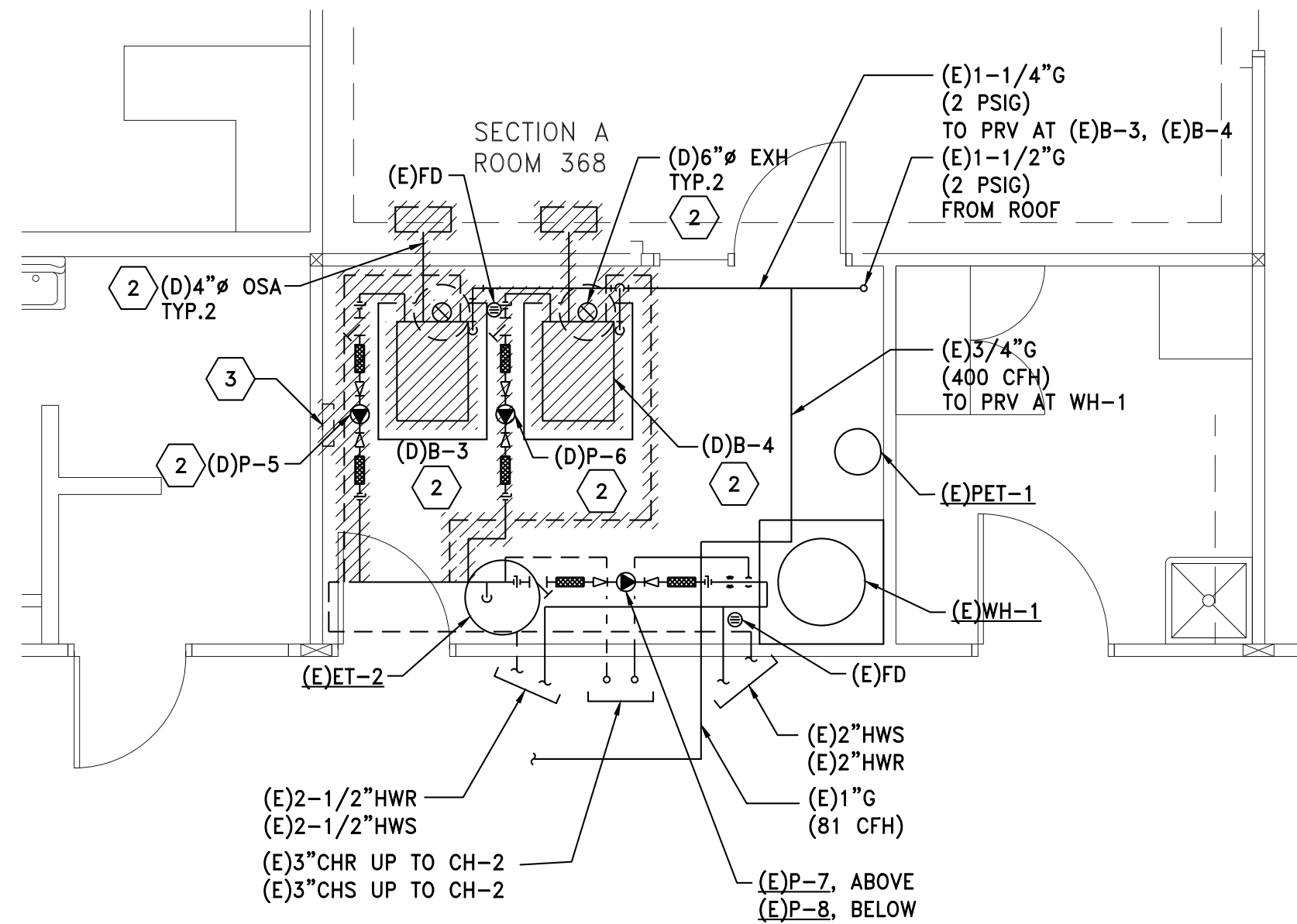
MARK	DATE	DESCRIPTION

KEYED NOTES:

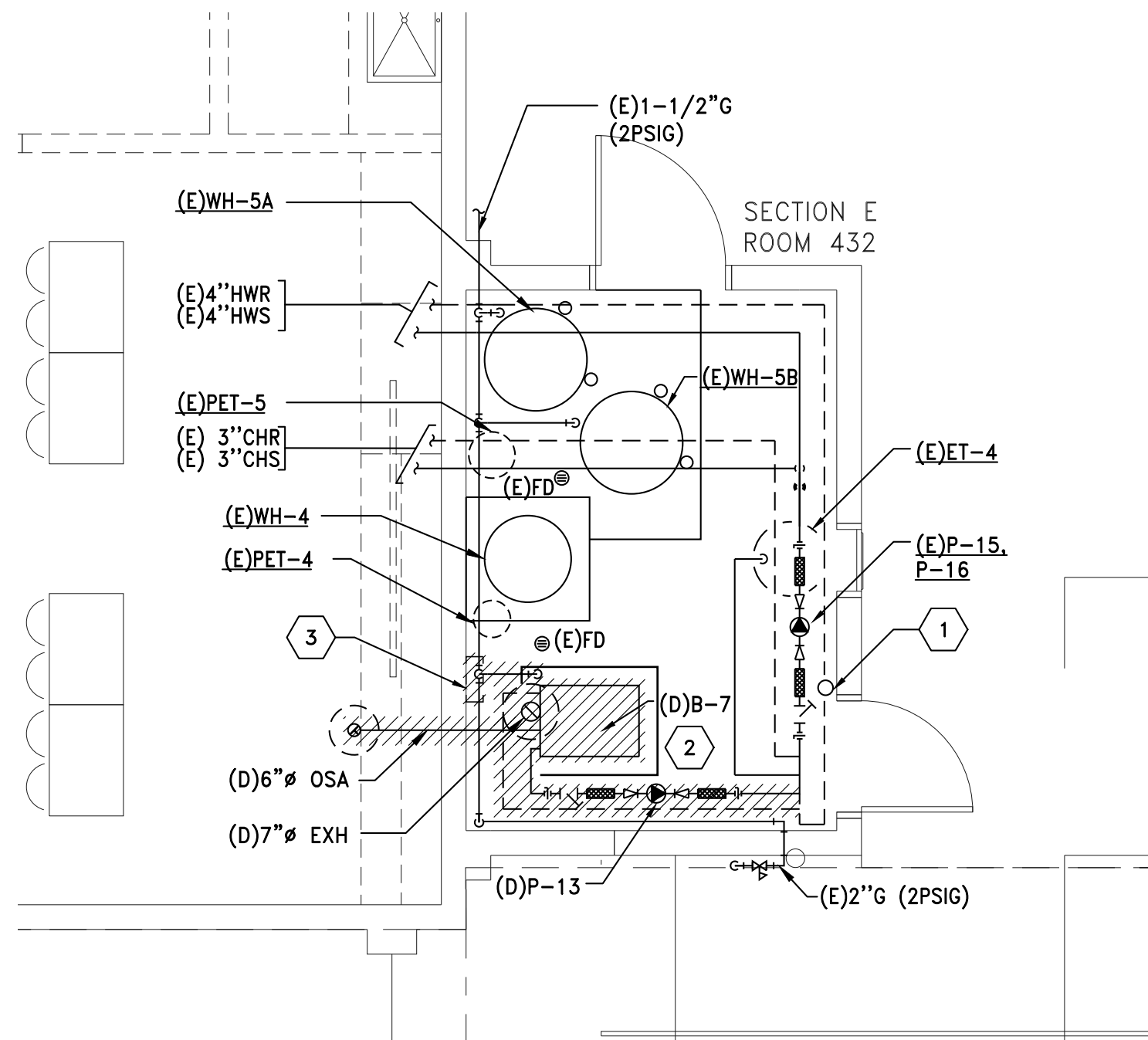
1. TEMPORARILY DISCONNECT AND SALVAGE (E) FIRE SPRINKLER DRY PIPE VALVE AND APPURTENANCES.
2. DISCONNECT AND REMOVE (E) BOILER, HWS, HWR AND G PIPING, FLUE, AIR COMBUSTION AND APPURTENANCES.
3. DISCONNECT AND REMOVE (E) TEKMAR CONTROLS.



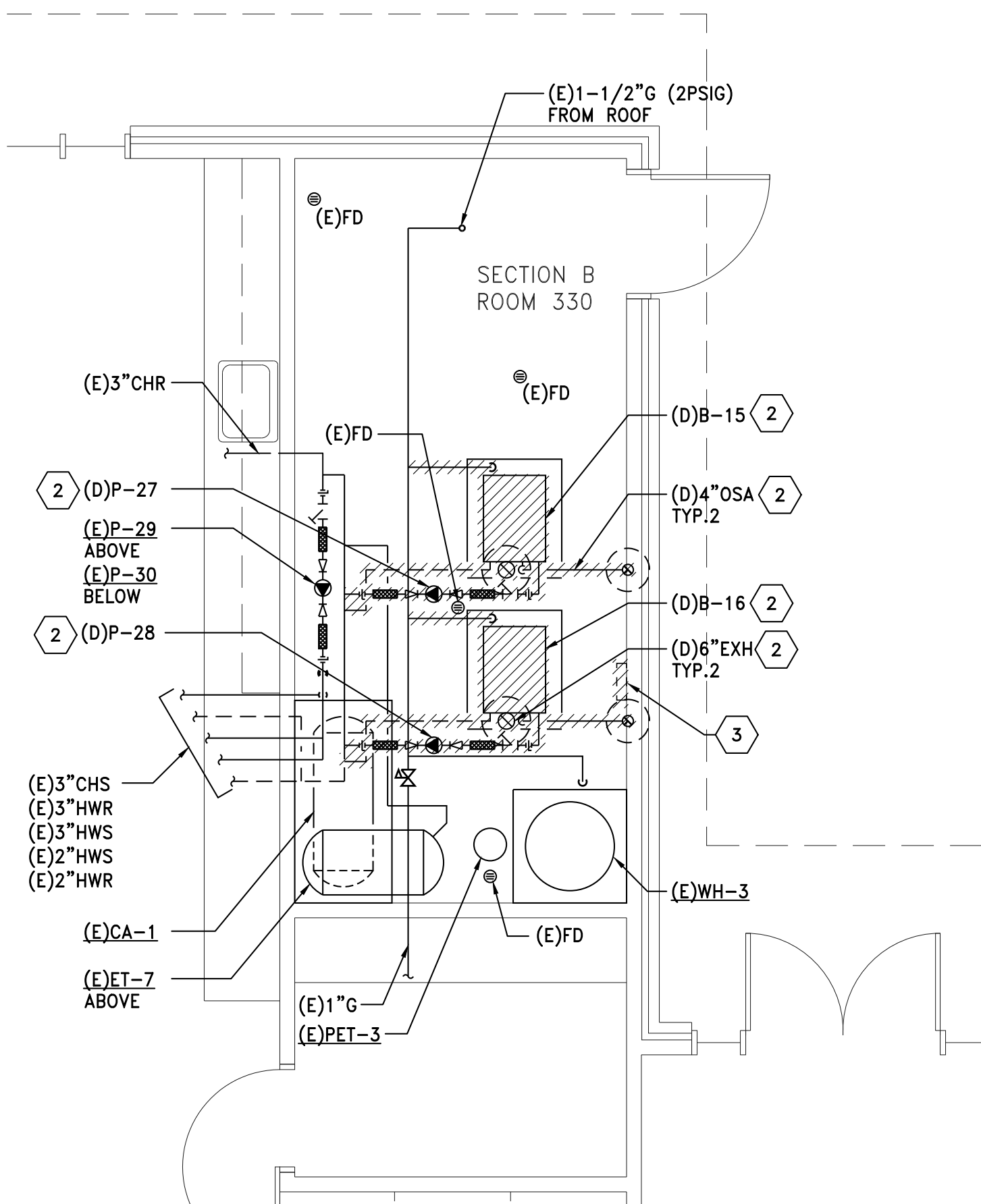
3 ENLARGED HVAC DEMOLITION PLAN - SECTOR C - ROOM 383
M2.1 SCALE: 1/4" = 1'-0" 0 2' 4' 8'



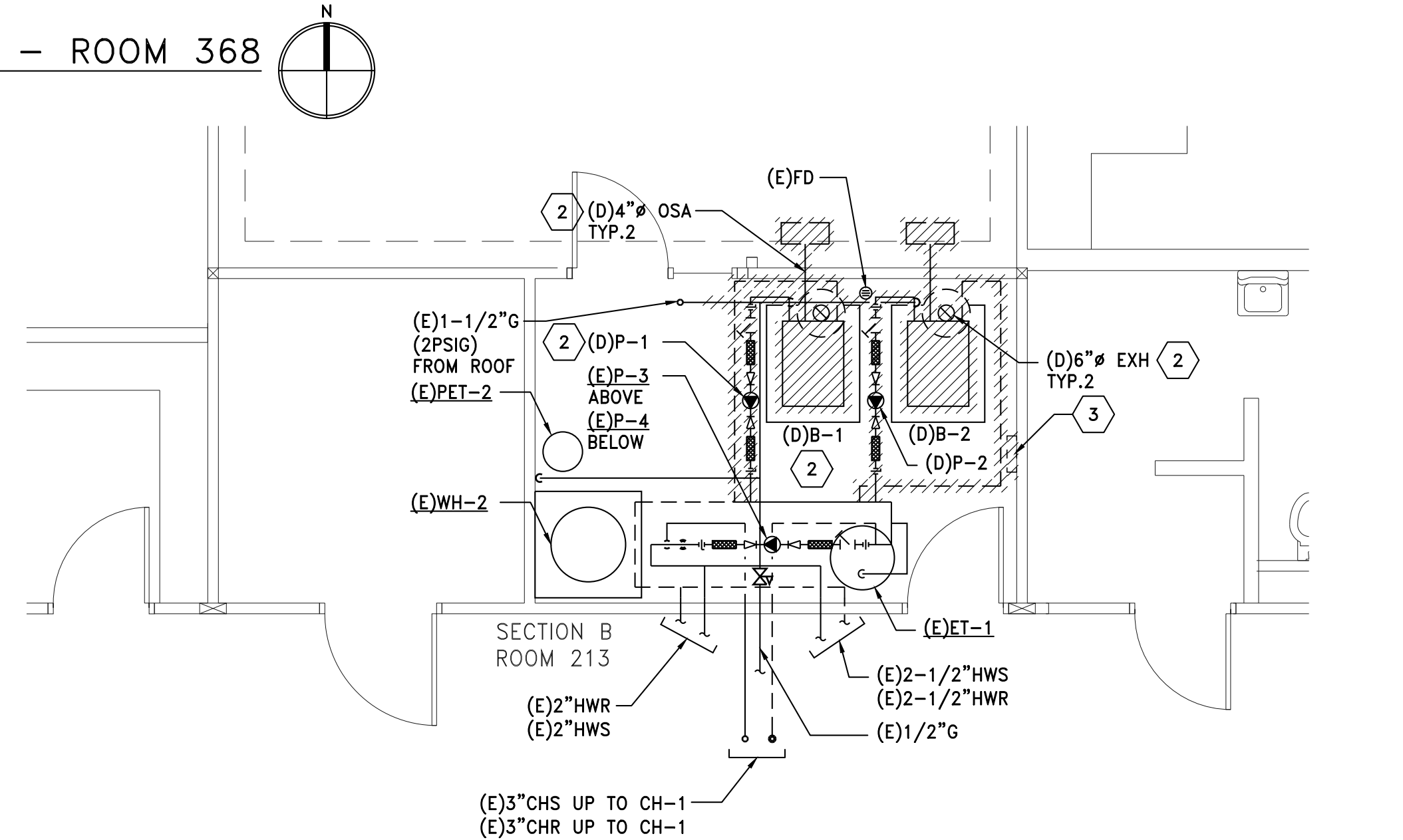
2 ENLARGED HVAC DEMOLITION PLAN - SECTOR A - ROOM 368
M2.1 SCALE: 1/4" = 1'-0" 0 2' 4' 8'



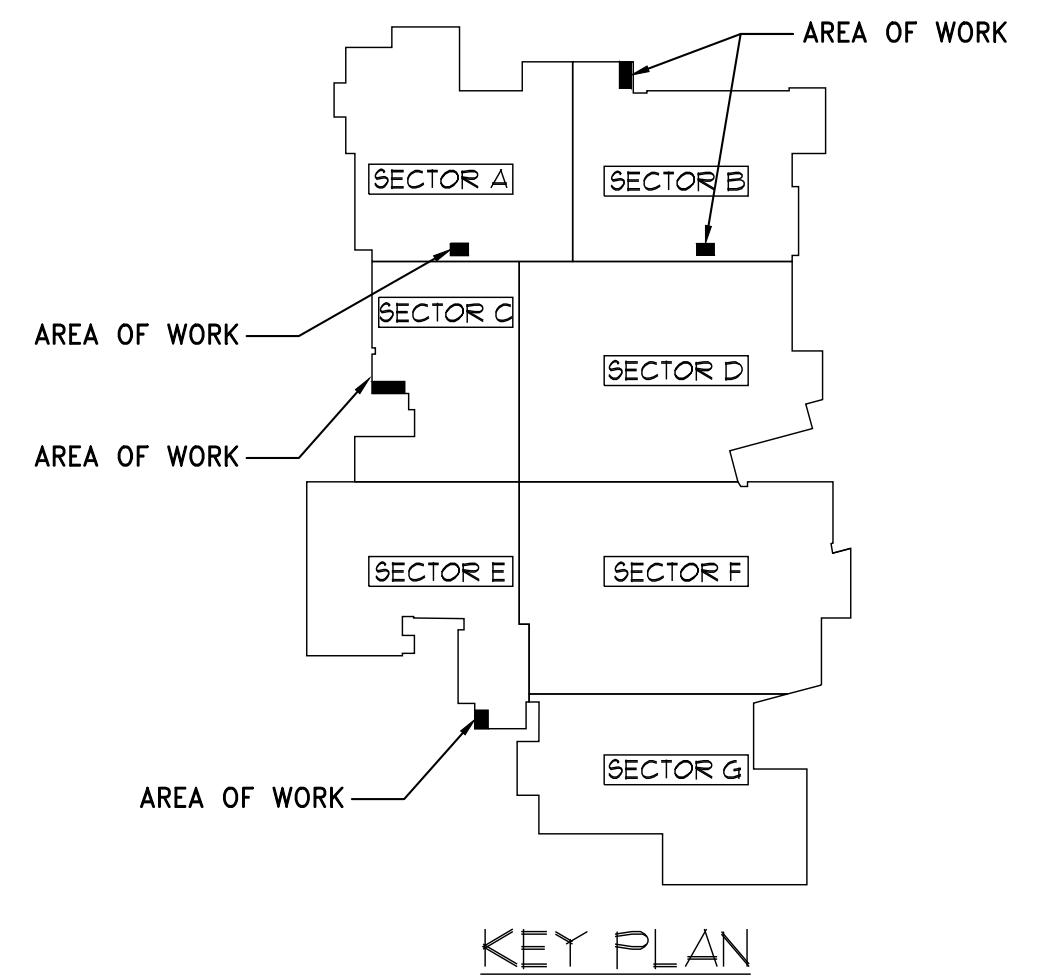
3 ENLARGED HVAC DEMOLITION PLAN - SECTOR E - ROOM 432
M2.1 SCALE: 1/4" = 1'-0" 0 2' 4' 8'



4 ENLARGED HVAC DEMOLITION PLAN - SECTOR B - ROOM 330
M2.1 SCALE: 1/4" = 1'-0" 0 2' 4' 8'



5 ENLARGED HVAC DEMOLITION PLAN - SECTOR B - ROOM 213
M2.1 SCALE: 1/4" = 1'-0" 0 2' 4' 8'



KEY PLAN

COLLINS
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950 12th AVE., SUITE 200
LONGVIEW, WA 98632
PHONE: 360-425-0000
E-MAIL: ORAGC@COLLINSARCHGROUP.COM

**KELSO SCHOOL DISTRICT
KELSO HIGH SCHOOL
BOILER REPLACEMENT**

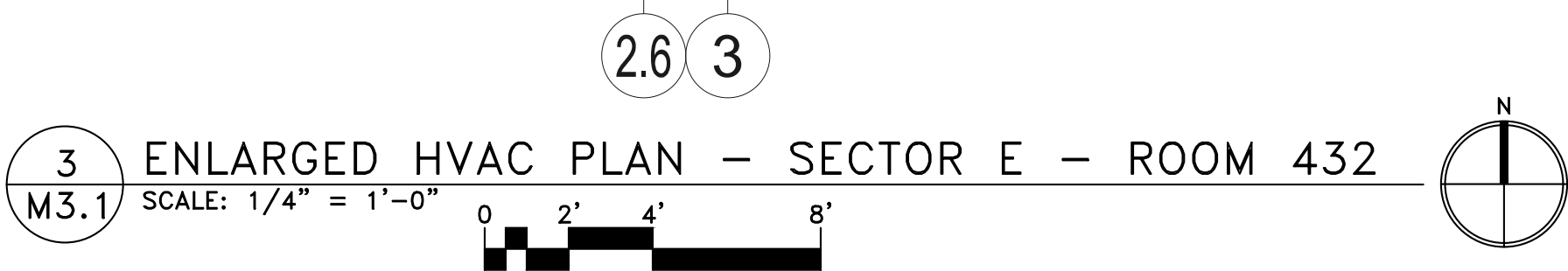
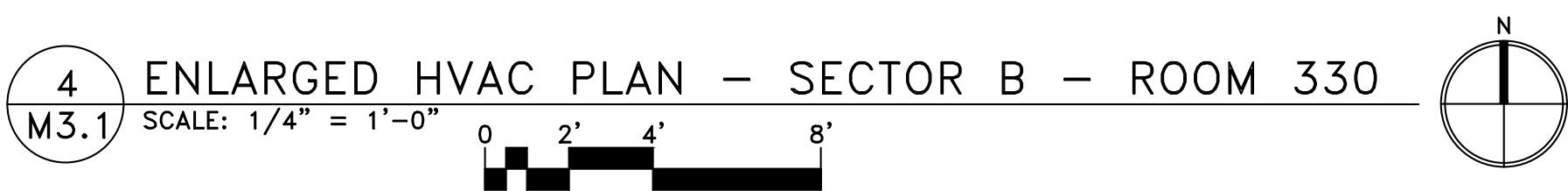
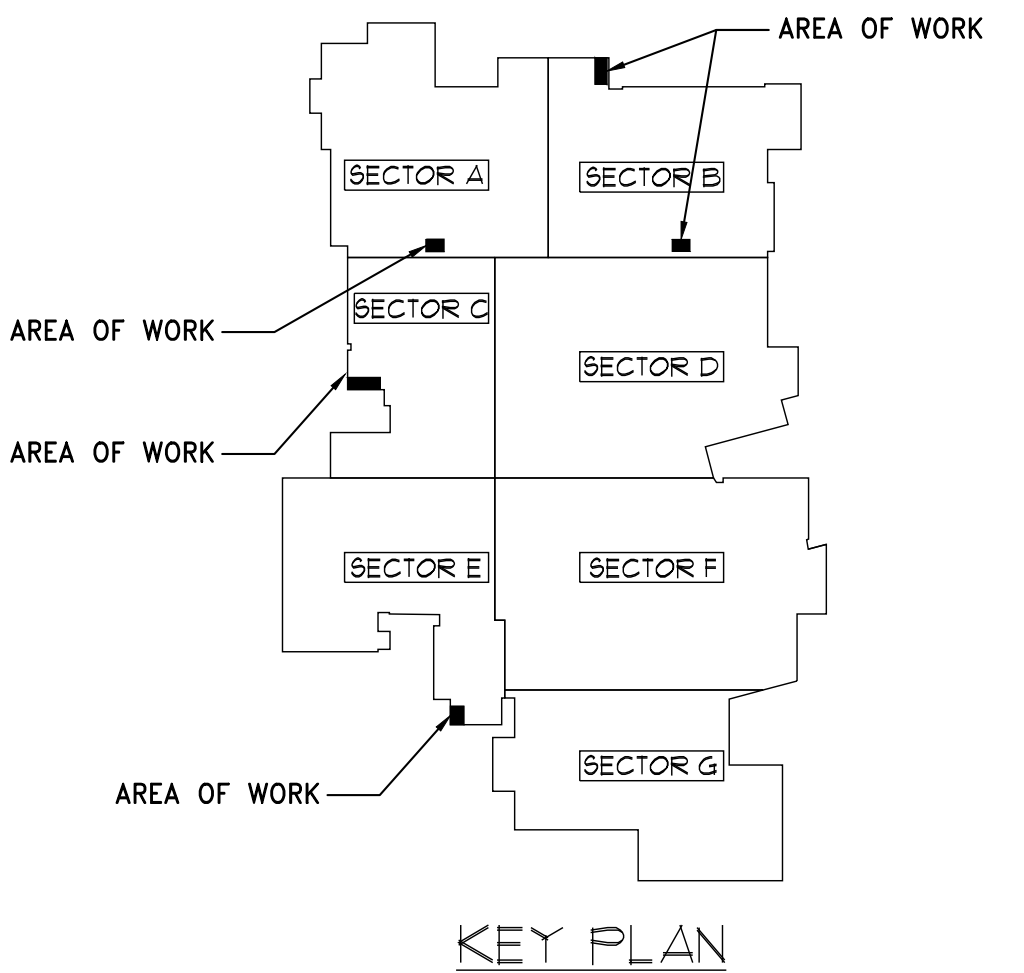
1904 ALLEN STREET
KELSO, WA 98626

PARTIAL
HVAC PLANS

M3.1

6915 SW MACADAM AVE.
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CONTACT...ALLEN CRISANAZ
engineering@mke-inc.com

MKE
MKE & ASSOCIATES, INC.
CONSULTING ENGINEERS
MECHANICAL AND ELECTRICAL SYSTEMS



MARK	DATE	DESCRIPTION



BID SET

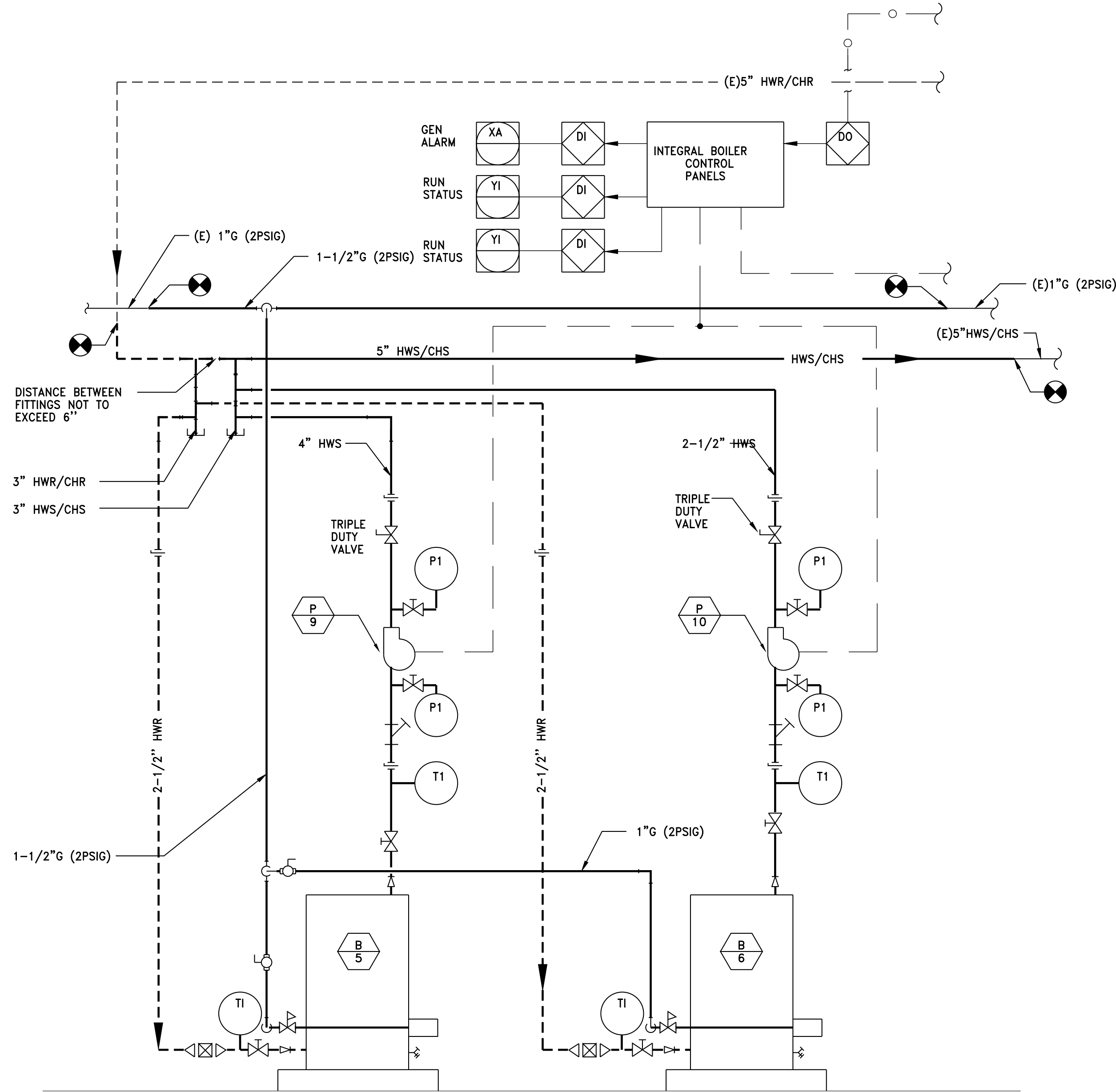
04/08/19

P&I DIAGRAMS

2018-65

SHEET NO.

M5.1

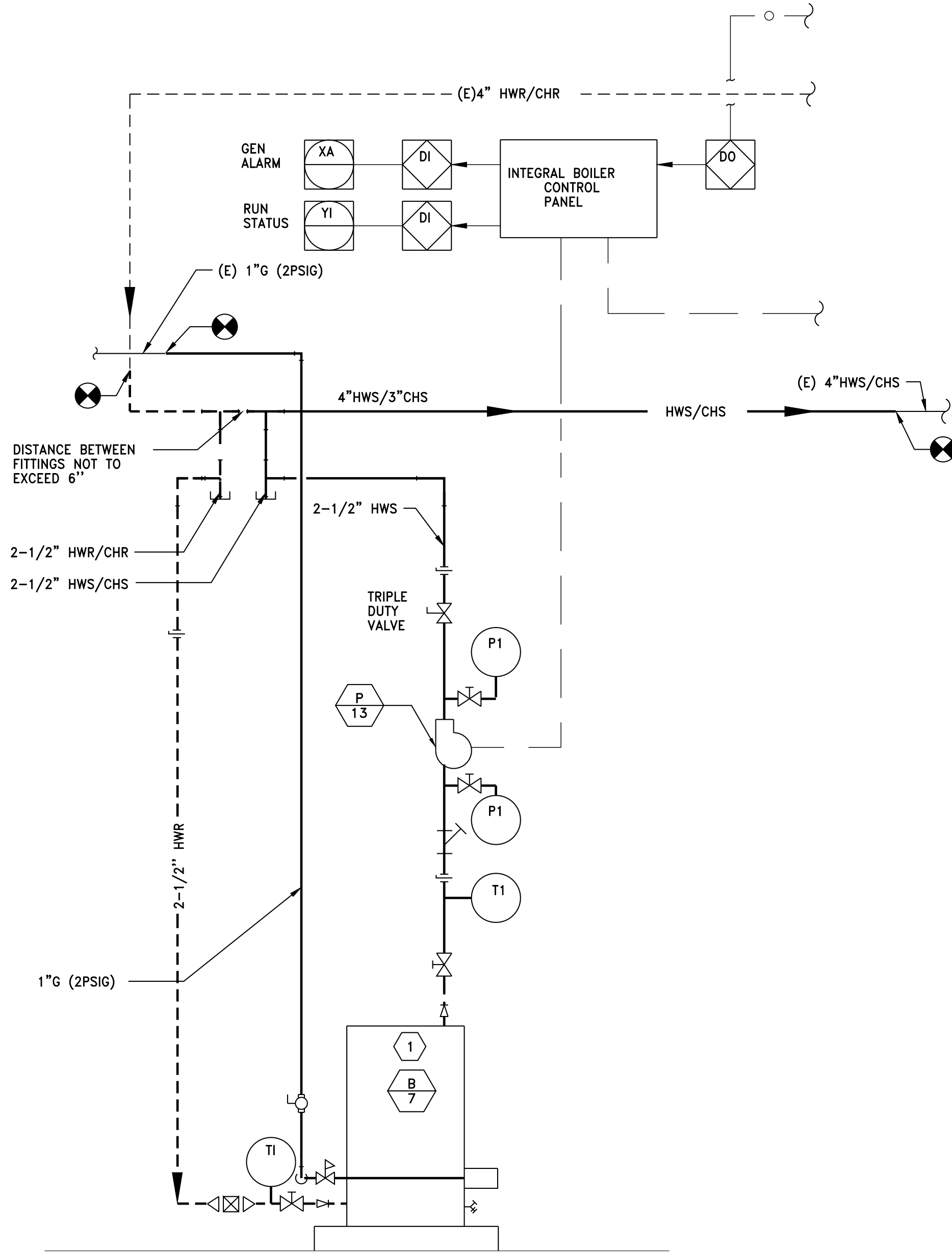


1

M5.1

PARTIAL P&I DIAGRAM – SECTOR C ROOM 383 – HEATING & COOLING SYSTEM

SCALE: NTS



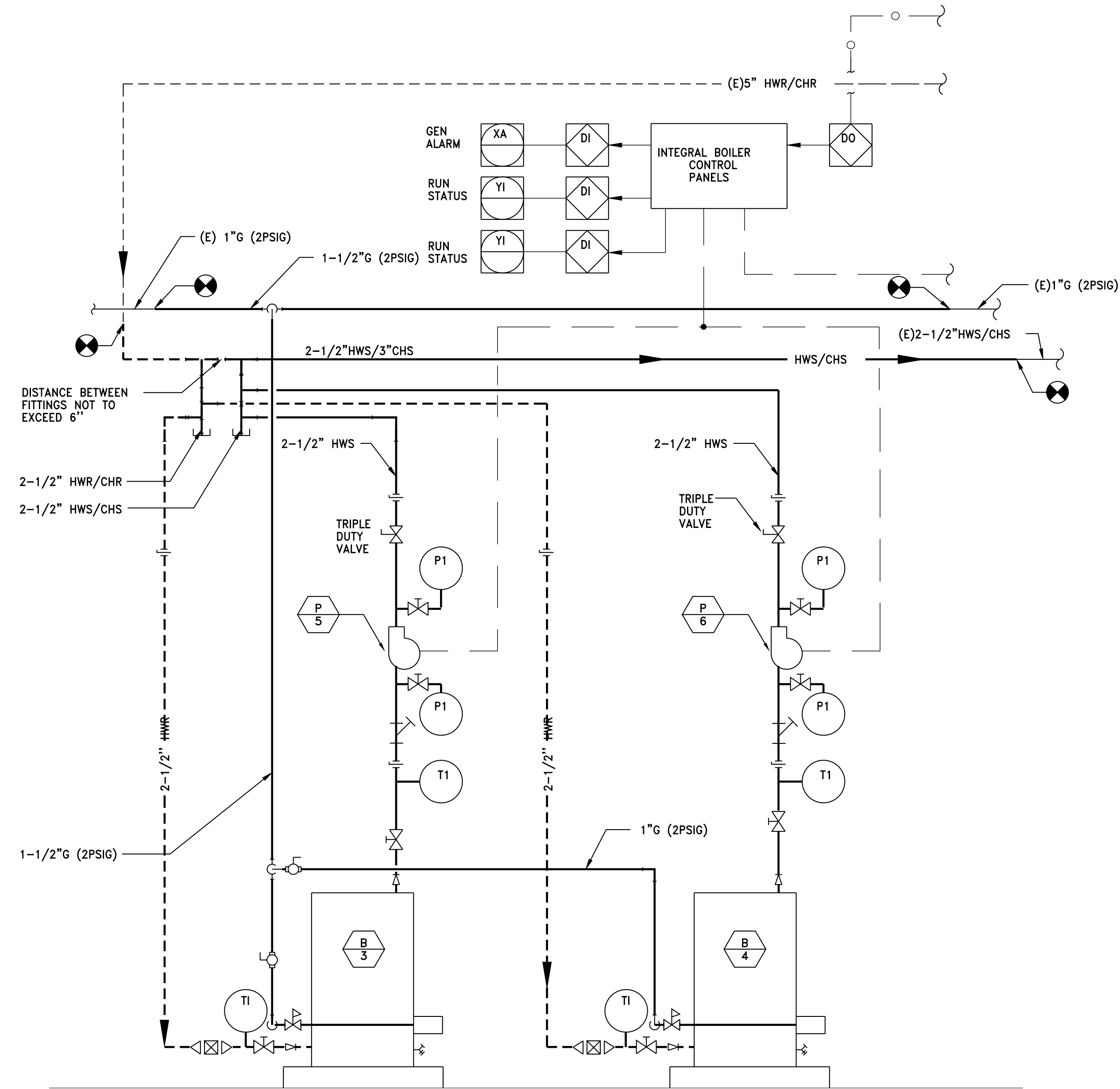
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M5.1

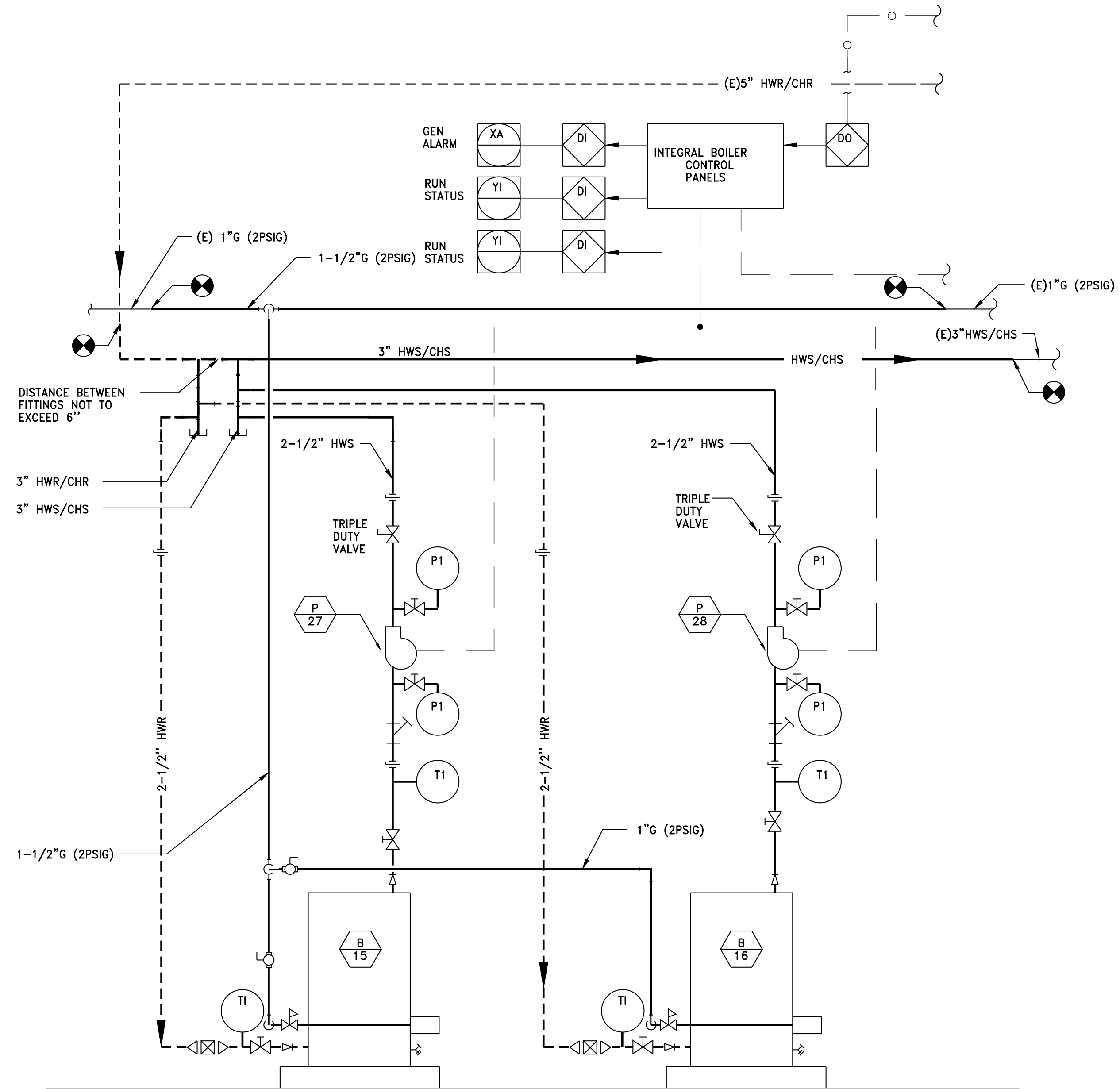
PARTIAL P&I DIAGRAM – SECTOR E ROOM 432 – HEAT & COOL SYSTEM

SCALE: NTS

PLOTTED: KENDAL PELTON 4/3/2019 10:38 AM
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1 PARTIAL P&I DIAGRAM - SECTOR A ROOM 368 - HEATING & COOLING SYSTEM
M5.2 SCALE: NTS



2 PARTIAL P&I DIAGRAM - SECTOR B ROOM 330 - HEAT & COOL SYSTEM
M5.2 SCALE: NTS

MARK	DATE	DESCRIPTION

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KELSO SCHOOL DISTRICT
KELSO HIGH SCHOOL
BOILER REPLACEMENT
1904 ALLEN STREET
KELSO, WA 98626

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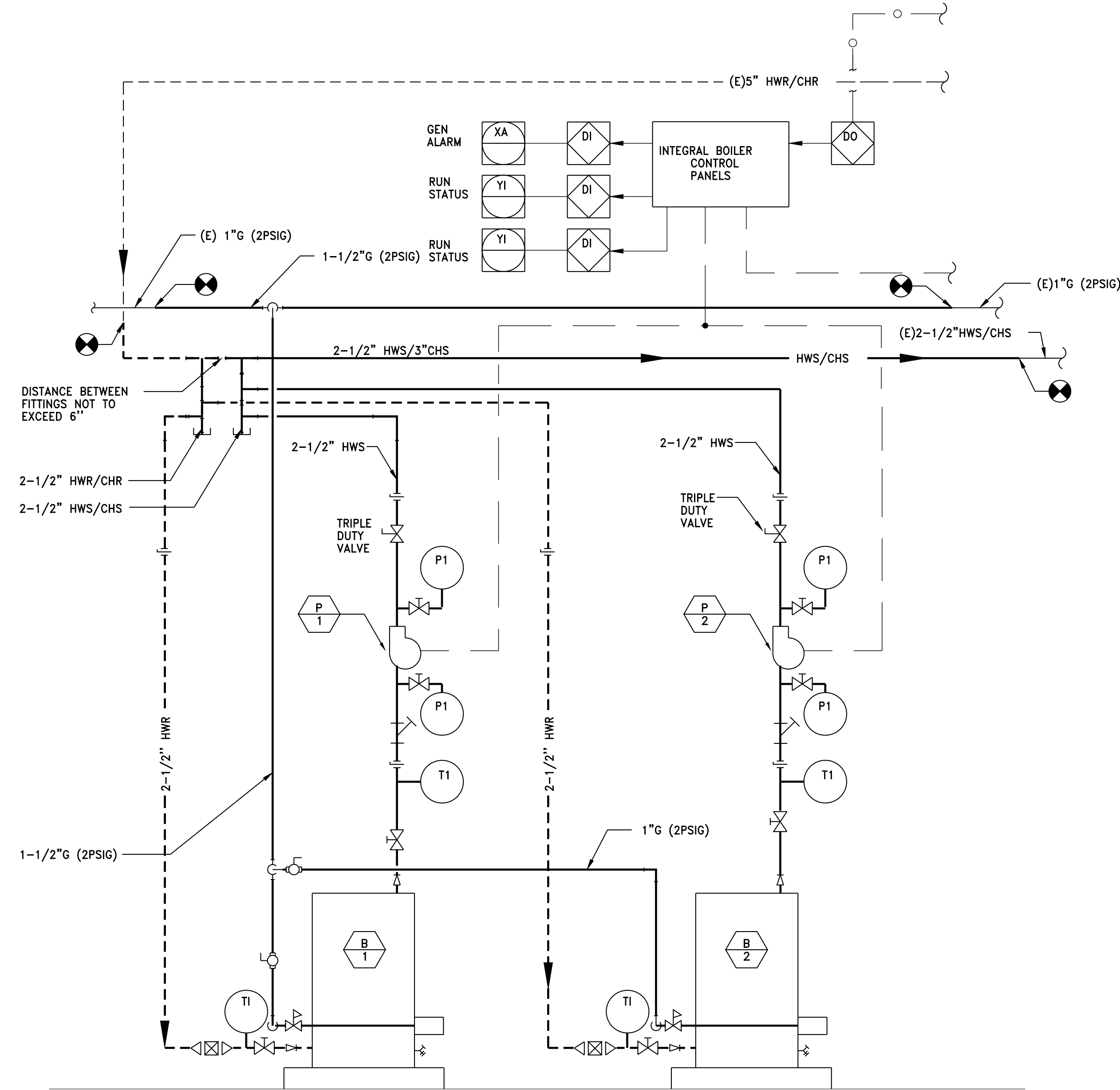
P&I DIAGRAMS

2018-65
SHEET NO.

M5.2

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CONSULTING ENGINEERS
MECHANICAL AND ELECTRICAL SYSTEMS

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3 PARTIAL P&I DIAGRAM - SECTOR B ROOM 213 - HEATING & COOLING SYSTEM
M5.3 SCALE: NTS

MARK	DATE	DESCRIPTION



KELSO SCHOOL DISTRICT
KELSO HIGH SCHOOL
BOILER REPLACEMENT
1904 ALLEN STREET
KELSO, WA 98626

BID SET
04/08/19

P&I DIAGRAMS

2018-65
SHEET NO.

M5.3

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