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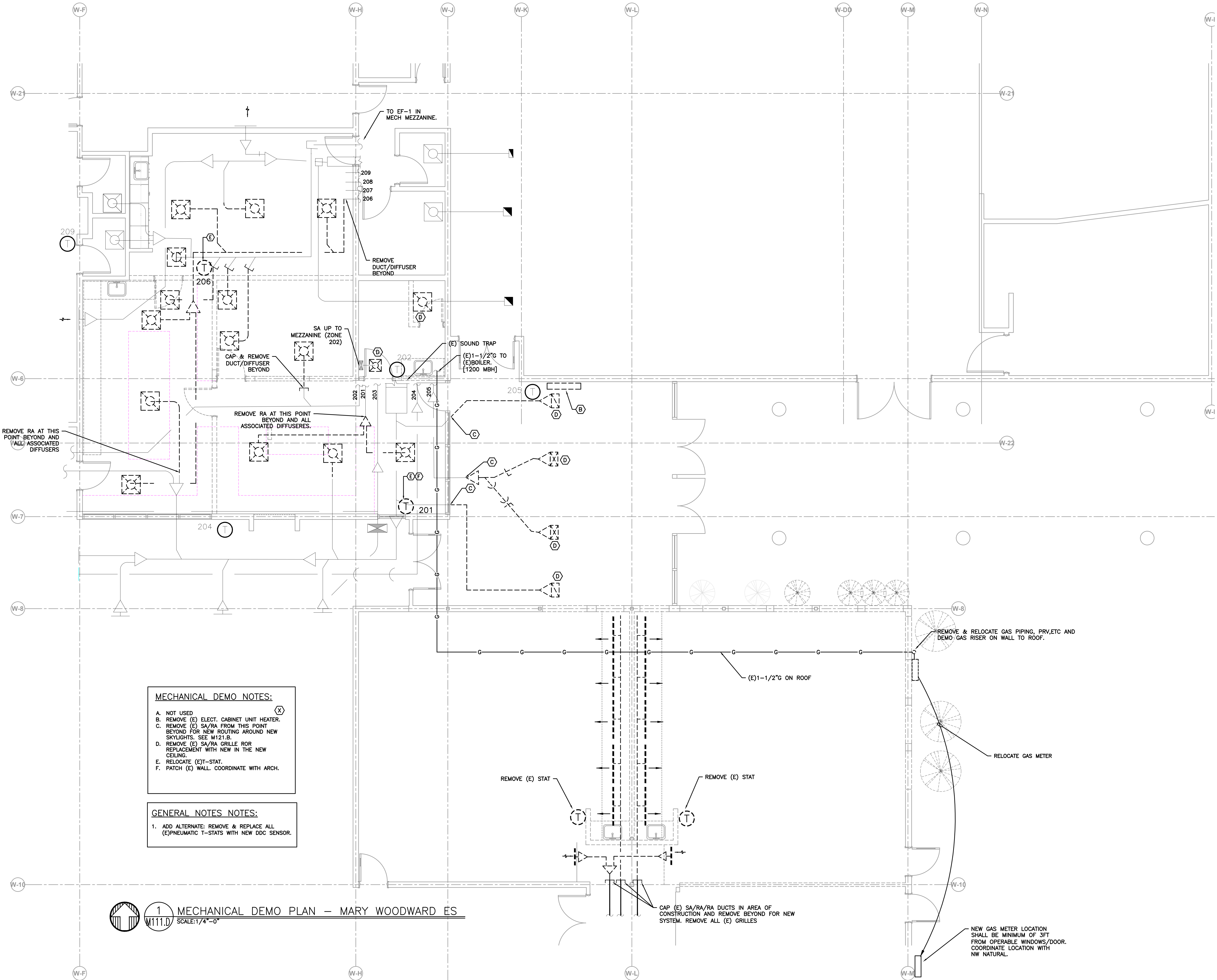
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Tigard Tualatin School District

Mary Woodward
Elementary
School
2000 SW Katherine
St.
Tigard, Oregon 97223

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DEVELOPMENT

MECHANICAL DEMO PLAN
WOODWARD ES

M111.D

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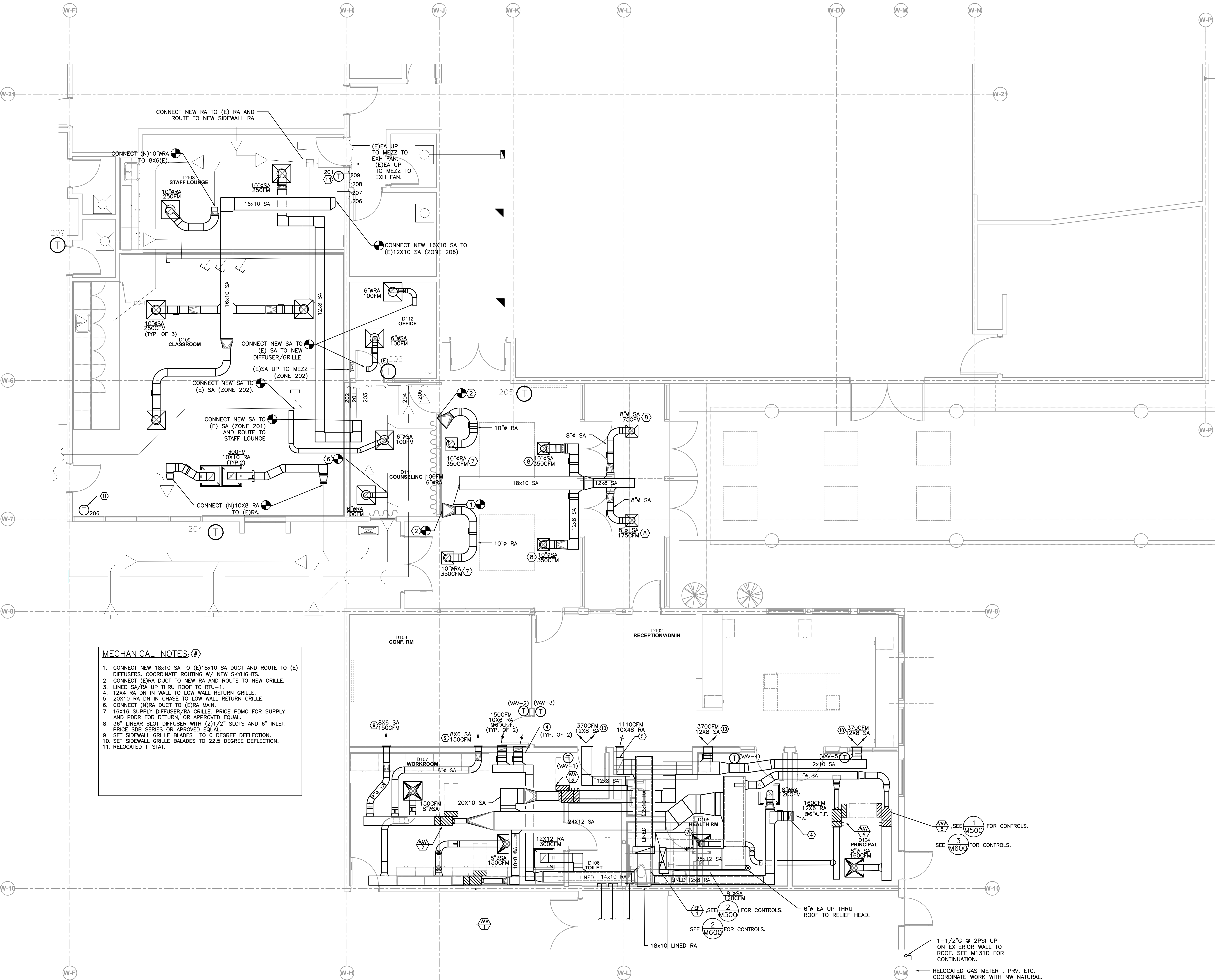
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MECHANICAL NOTES:

1. CONNECT NEW 18x10 SA TO (E)18x10 SA DUCT AND ROUTE TO (E) DIFFUSERS. COORDINATE ROUTING W/ NEW SKYLIGHTS.
2. CONNECT (E)RA DUCT TO NEW RA AND ROUTE TO NEW GRILLE.
3. LINED SA/RA UP THRU ROOF TO RTU-1.
4. 12x4 RA DN IN WALL TO LOW WALL RETURN GRILLE.
5. 20x10 RA DN IN CHASE TO LOW WALL RETURN GRILLE.
6. CONNECT (N)RA DUCT TO (E)RA MAIN.
7. 16x16 SUPPLY DIFFUSER/RA GRILLE. PRICE PDMC FOR SUPPLY AND PDDR FOR RETURN, OR APPROVED EQUAL.
8. 36" LINEAR SLOT DIFFUSER WITH (2)1/2" SLOTS AND 6" INLET. PRICE SOB SERIES OR APPROVED EQUAL.
9. SET SIDEWALL GRILLE BLADES TO 0 DEGREE DEFLECTION.
10. SET SIDEWALL GRILLE BLADES TO 22.5 DEGREE DEFLECTION.
11. RELOCATED T-STAT.

1 MECHANICAL PLAN - MARY WOODWARD ES
M121.D
SCALE: 1/4"=0'

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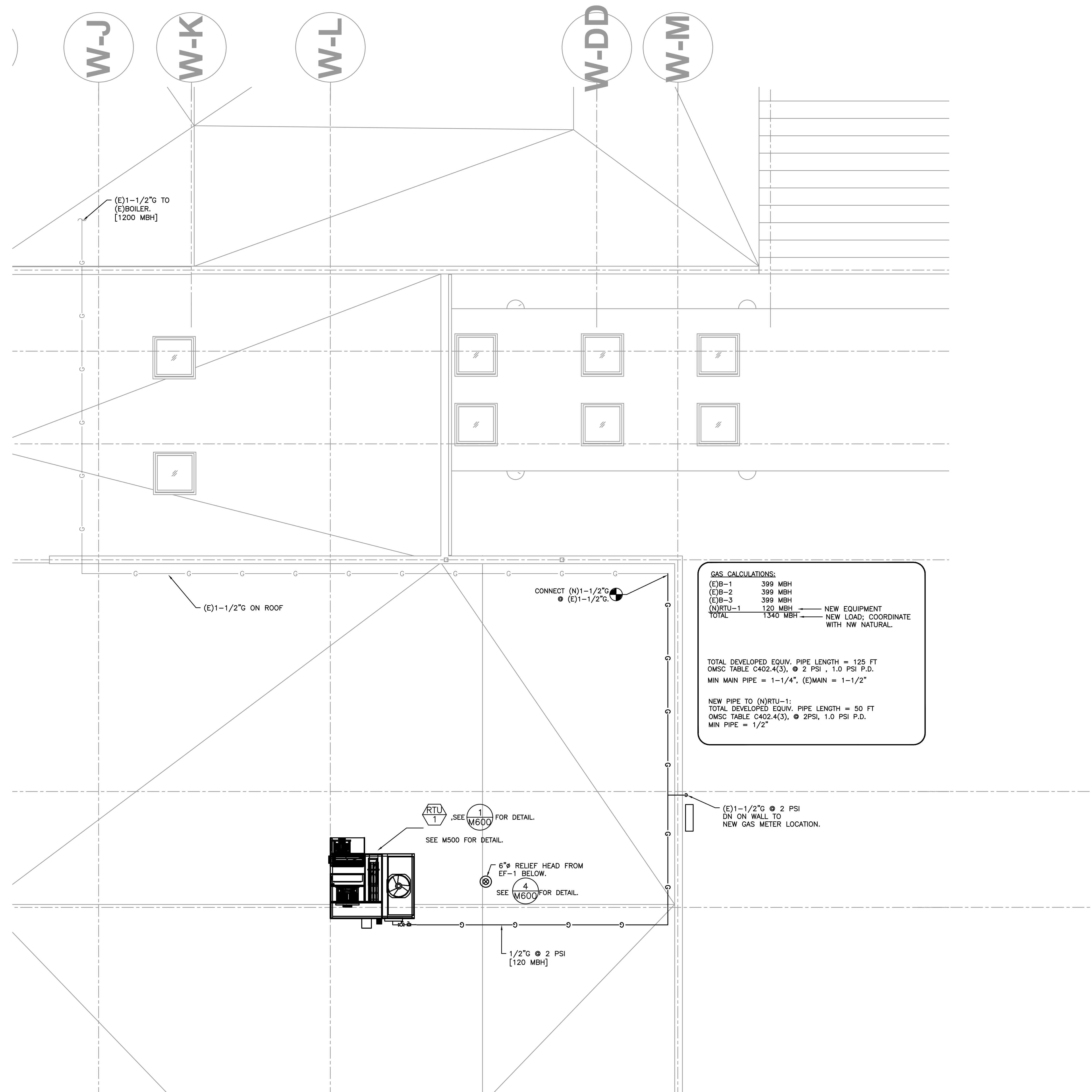
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MECHANICAL PLAN
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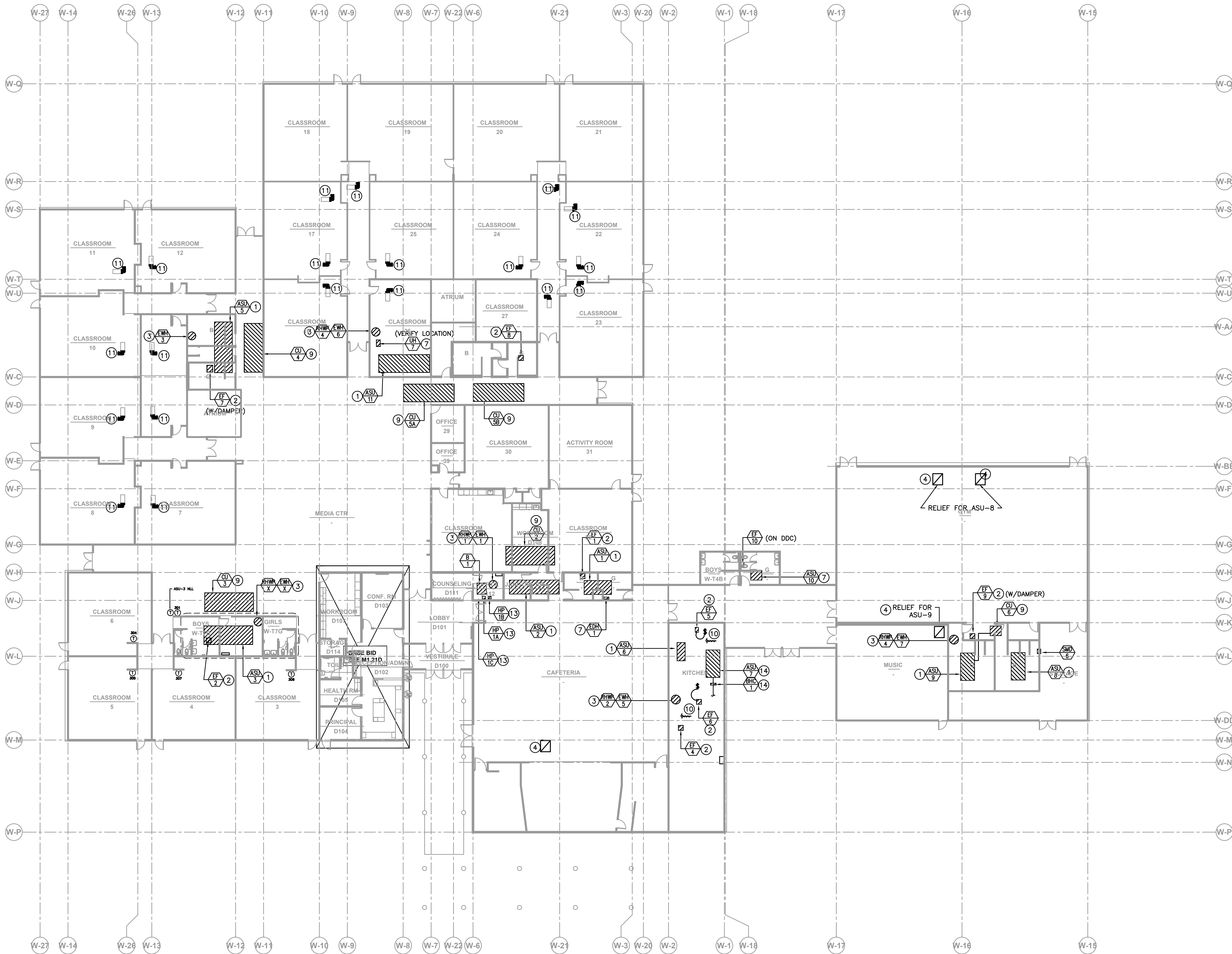
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MECHANICAL ROOF PLAN
WOODWARD ES

M131.D



CONTROL DRAWING KEYED NOTES – ALTERNATES:

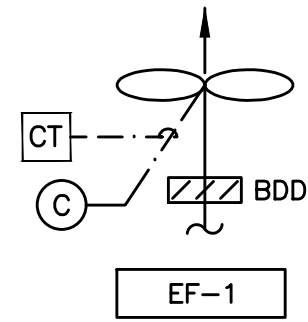
1. PROVIDE DIGITAL DAMPER ACTUATOR AT OSA, RELIEF AND MIXING DAMPERS TO REPLACE EXISTING PNEUMATIC ACTUATORS. RETROFIT EXISTING HEATING VALVE WITH DIGITAL ACTUATOR KIT. CONFIRM VALVE CONFIGURATION PRIOR TO SUBMITTAL.
2. REMOVE PE SWITCH AND OPERATE FAN DIRECTLY FROM DIGITAL CONTROLS. PROVIDE RIB OR STARTER FOR 120V UNIT AS REQUIRED. WHERE DAMPER IS NOTED ON THE PLAN, REPLACE EXISTING PNEUMATIC ACTUATOR WITH DIGITAL DAMPER ACTUATOR.
3. REMOVE (E)PE SWITCH AND OPERATE ELECTRIC WATER HEATER AND ASSOCIATED RECIRC PUMP DIRECTLY FROM DDC.
4. PROVIDE DIGITAL DAMPER ACTUATOR. CONNECT NEW ACTUATOR TO EXISTING JCI SYSTEM CONTROL PANEL. ALTER PROGRAMMING AS REQUIRED FOR THE NEW DIGITAL DEVICE.
5. REMOVE PE SWITCH AND OPERATE ELECTRIC HEATERS DIRECTLY FROM DIGITAL CONTROLS. PROVIDE RIB OR RATED CONTACTOR FOR 120 V OPERATION AS REQUIRED.
6. REMOVE (E)PE SWITCH AND OPERATE FAN DIRECTLY FROM DDC. FOR HW UNIT, RETROFIT HEATING COIL VALVE WITH DIGITAL ACTUATOR KIT.
7. PROVIDE DIGITAL DAMPER ACTUATOR FOR MULTIZONE DAMPERS. # OF ZONES SHOWN ON PLAN.
8. REMOVE PE SWITCH AND OPERATE DIRECTLY FROM DIGITAL CONTROLS.
9. REMOVE (E)PNEUMATIC DAMPER ACTUATOR AT STEAM AND STOVE HOODS (EF-5 & EF-6) AND REPLACE WITH DIGITAL DAMPER ACTUATOR. ALTER PROGRAMMING AS REQUIRED FOR THE NEW DIGITAL DEVICE.
10. (E) BY-PASS VAV BOXES: PROVIDE NEW CONTROLLER. NEW CONTROLLER TO ACCOMMODATE FUTURE VAV BOX WITH REHEAT, FLOW MEASURE, ETC.
11. (E) FIRE SMOKE DAMPER – REMOVE (E)PNEUMATIC DAMPER ACTUATOR AND REPLACE WITH NEW DIGITAL ACTUATOR.
12. REMOVE (E) PE SWITCH AND OPERATE PUMP DIRECTLY FROM DIGITAL CONTROLS.
13. PROVIDE DIGITAL OSA DAMPER, FACE/BY-PASS DAMPER TO REPLACE (E)PNEUMATIC ACTUATORS. RETROFIT (E) BOOSTER HEATING COIL VALVE WITH DIGITAL ACTUATOR KIT. CONFIRM VALVE SIZING PRIOR TO SUBMITTAL.

CONTROL DRAWING GENERAL NOTES:

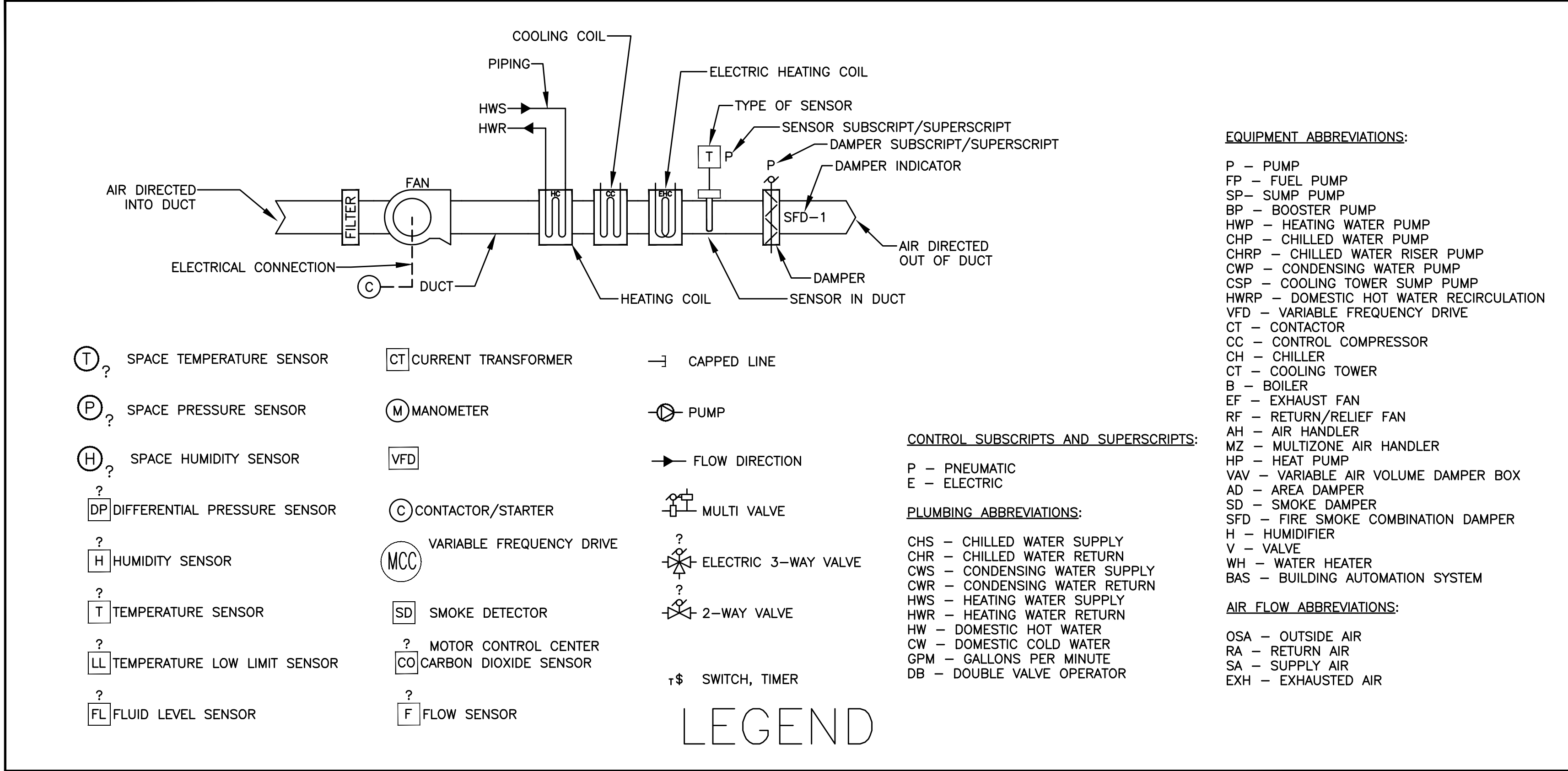
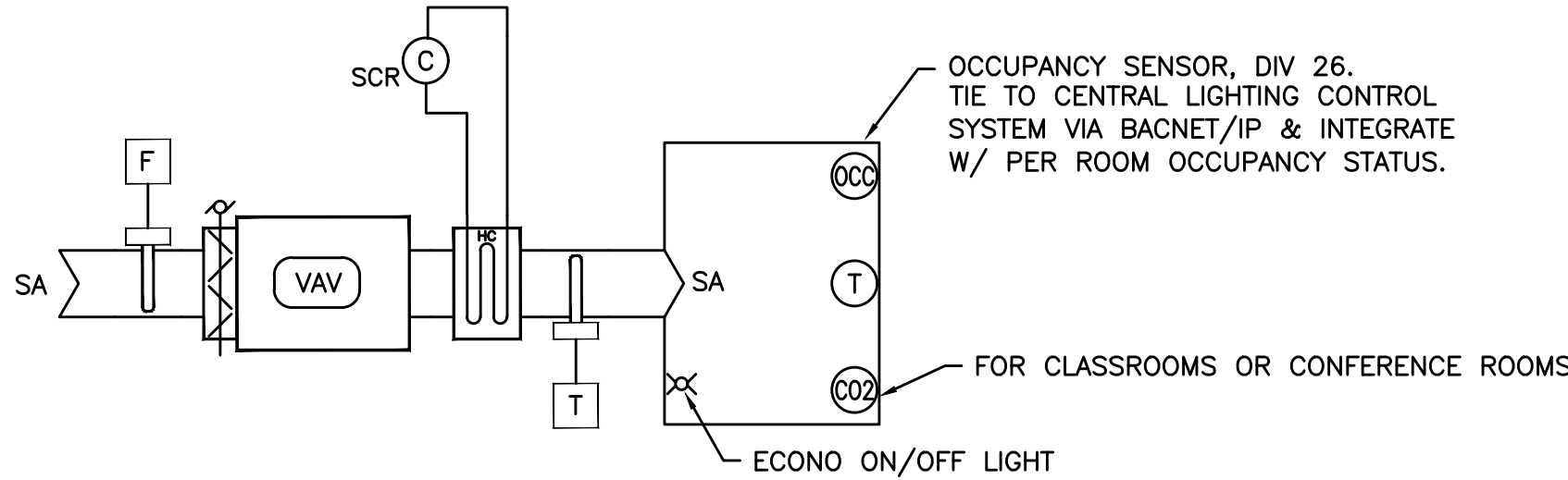
1. WHERE EXISTING PNEUMATIC DEVICES ARE REMOVED, REMOVE ALL ASSOCIATED PNEUMATIC PIPING AND CONTROLS. CONNECT NEW ACTUATOR / DDC DEVICES TO EXISTING JCI SYSTEM CONTROL PANEL. ALTER PROGRAMMING AS REQUIRED FOR THE NEW DIGITAL DEVICE. CONFIRM DAMPER AND VALVE SIZES PRIOR TO SUBMITTAL.

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2 EXHAUST FAN CONTROL DIAGRAM
SCALE: SCHEMATIC



1 VAV BOX W/ ELECT RH CONTROL DIAGRAM
SCALE: SCHEMATIC

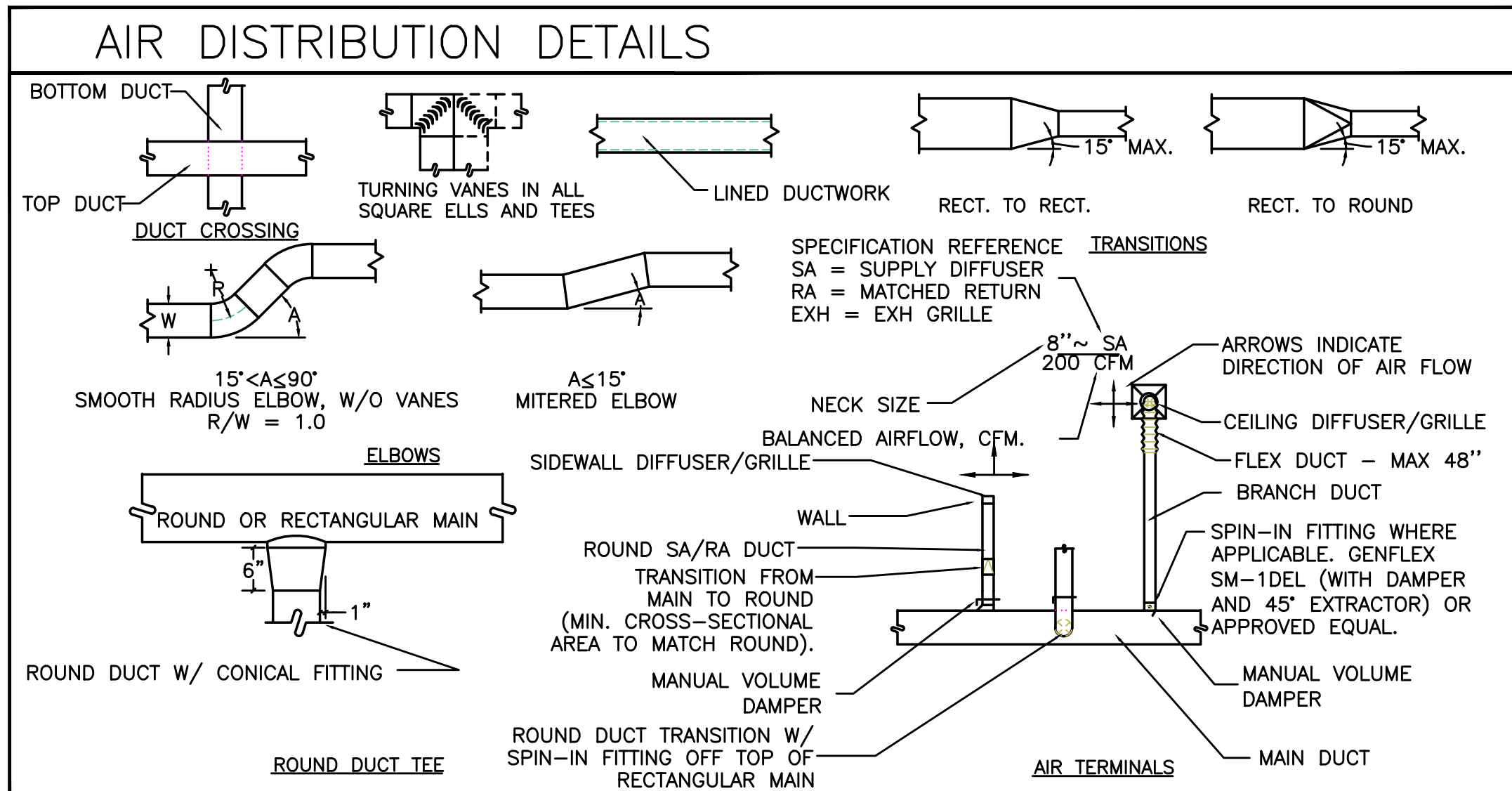


(*) MINIMUM POINTS TO BE MAPPED TO GRAPHIC

CONTROLS FOR RTU-1 (*)			
POINT DESCRIPTION	READ	WRITE	READ/WRITE
UNIT ENABLE/DISABLE			X
EXH FAN SPEED	X		
EXHAUST STATUS	X		
SUPPLY FAN STATUS	X		
SUPPLY FAN SPEED	X		
OUTSIDE AIR/ECONOMIZER DAMPER POSITION	X		
RA CO2	X		
RA TEMP	X		
DISCHARGE AIR TEMP	X		
DISCHARGE AIR PRESSURE	X		
MIXED AIR TEMP	X		
HEATING SECTION STATUS	X		
SMOKE DETECTOR	X		
COOLING STATUS	X		
ALARM CODE	X		
DISCHARGE AIR TEMP SETPOINT			X
DISCHARGE AIR PRESSURE SETPOINT			X

CONTROLS FOR EXHAUST FANS, SEE 2/M5.00				
POINT DESCRIPTION	INPUT		OUTPUT	
	DIGITAL	ANALOG	DIGITAL	ANALOG
START/STOP TYP OF ALL			X	
STATUS	X			

CONTROLS FOR VAV TERMINAL UNIT, SEE 1/M5.00				
POINT DESCRIPTION	INPUT		OUTPUT	
	DIGITAL	ANALOG	DIGITAL	ANALOG
SPACE TEMP		X		
AIR FLOW		X		
DAMPER POSITION				X
DISCHARGE TEMPERATURE		X		
ELECTRIC HEATER			X	
ECONO ON/OFF			X	
SPACE OCCUPANCY	X			
SPACE CO2		X		



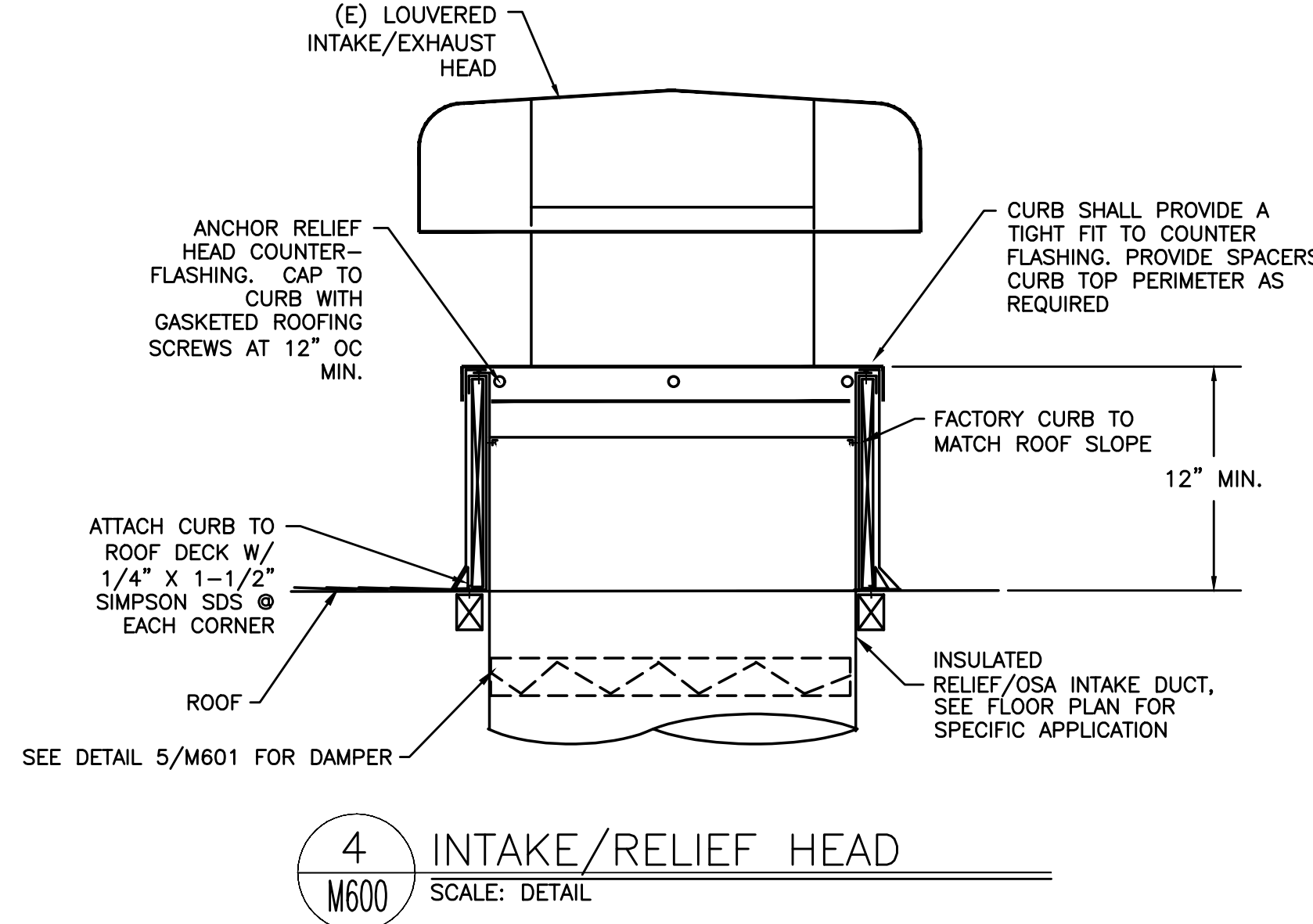
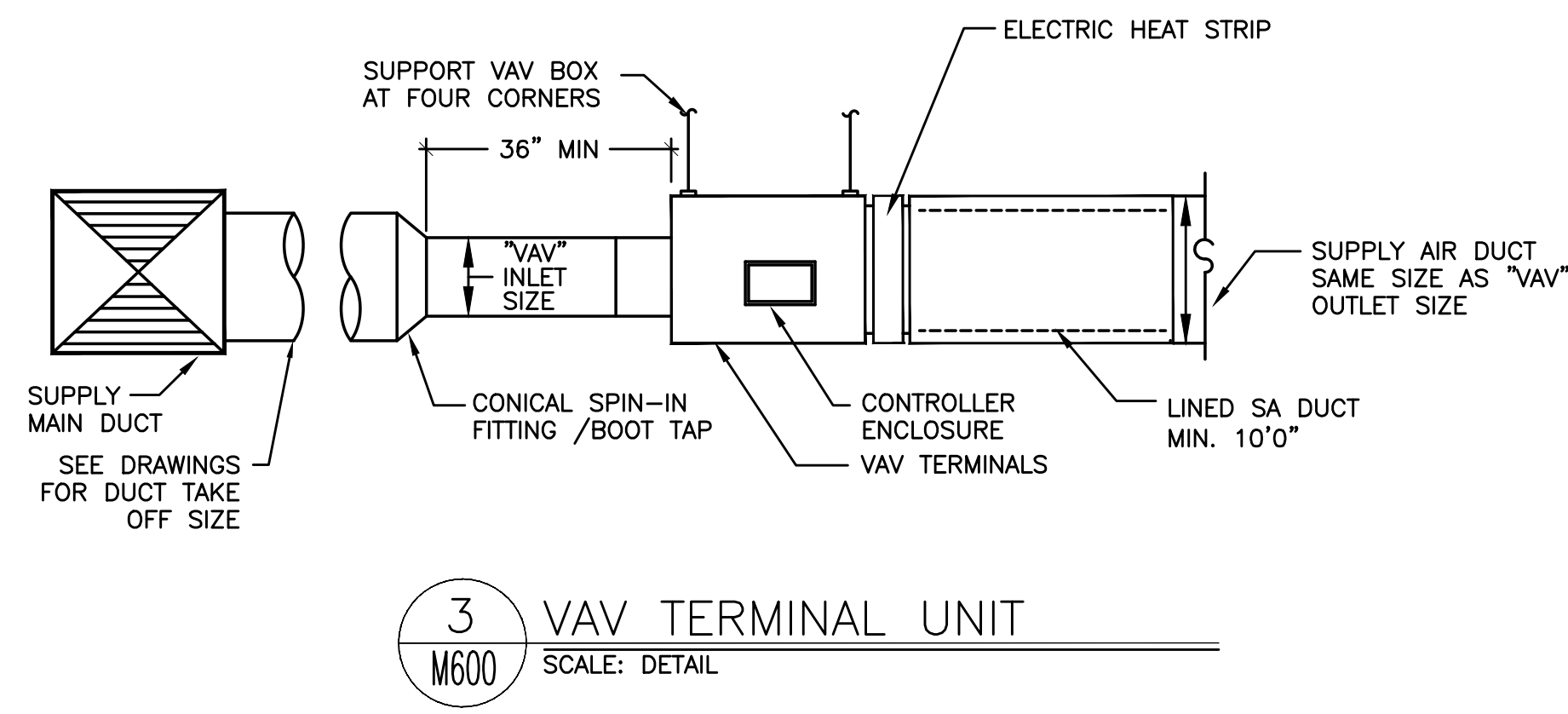
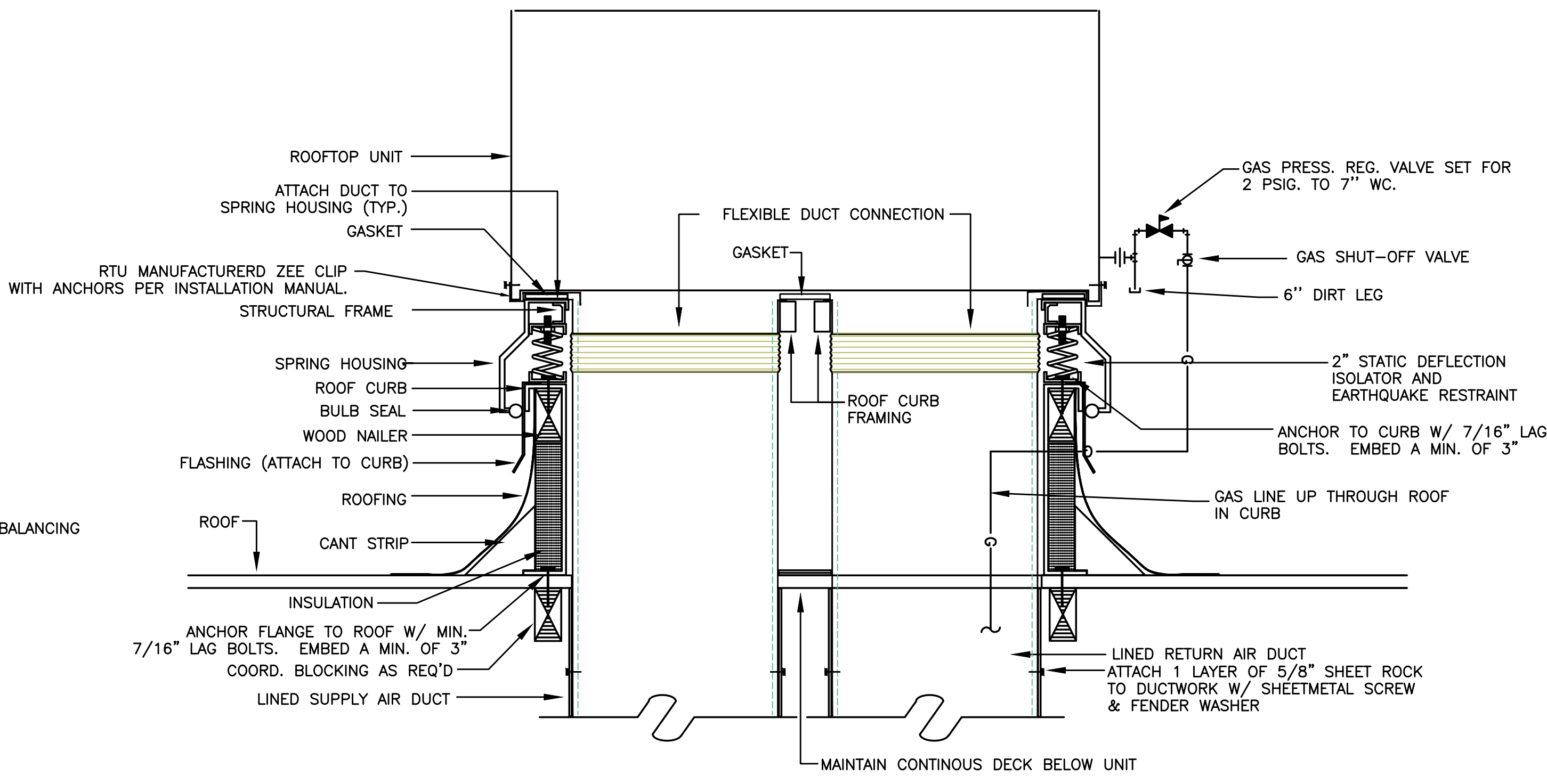
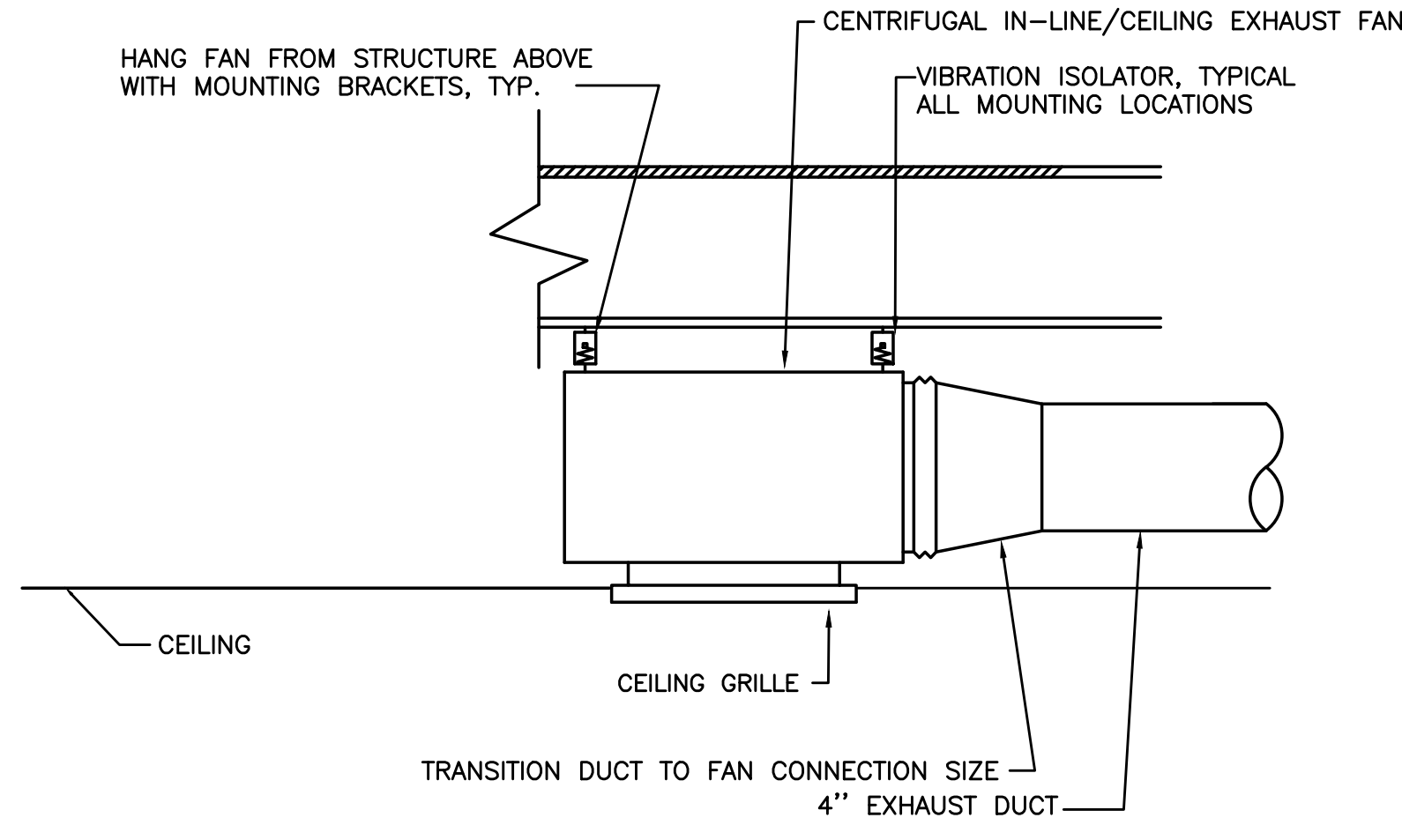
MECHANICAL LEGEND		
	SUPPLY AIR DIFFUSER	AFF..... ABOVE FINISH FLOOR
	RETURN AIR GRILLE	AHU..... AIR HANDLING UNIT
	EXHAUST AIR GRILLE	B.D..... BOTTOM OF DUCT
	PERFORATED RETURN AIR PANEL	BHP..... BRAKE HORSEPOWER
	DIRECTIONAL AIR FLOW	BTU..... BRITISH THERMAL UNITS
	MANUAL VOLUME DAMPER	CFM..... CUBIC FEET PER MINUTE
	SUPPLY OR OUTSIDE AIR DUCT UP & DOWN	CONN..... CONNECTION
	RETURN AIR DUCT UP & DOWN	CONT..... CONTINUATION
	EXHAUST AIR DUCT UP & DOWN	COW..... DOMESTIC COLD WATER
	VAV TERMINAL UNIT	DB..... DRY BULB
	VVT TERMINAL UNIT	DIA..... DIAMETER
	EXISTING	DIST..... DISTRIBUTION
	CONNECT TO EXISTING	EA..... EXHAUST AIR
	THERMOSTAT OR TEMP. SENSOR	EDB..... ENTERING DRY BULB TEMPERATURE
	NOTE	EWT..... ENTERING WET BULB TEMPERATURE
	EQUIPMENT DESIGNATOR	FF..... FINISH FLOOR
	BALL VALVE	FIXT..... FIXTURE
	GATE VALVE	FPM..... FEET PER MINUTE
	CHECK VALVE	FPS..... FEET PER SECOND
	BALANCING VALVE	FT..... FEET / FOOT
	THERMOMETER	GA..... GAUGE
	DIRECTION OF FLOW	GPM..... GALLONS PER MINUTE
	PUMP	H..... HEIGHT
	STRAINER	HP..... HORSEPOWER
	PRESSURE GAUGE	I.D..... INSIDE DIAMETER
	PETE'S PLUG	IN..... INCHES
	DOUBLE CHECK ASSEMBLY	L..... LENGTH
	PRESSURE REDUCING VALVE	LBS..... POUNDS
	UNION	LDB..... LEAVING DRY BULB
	2-WAY CONTROL VALVE	LWB..... LEAVING WET BULB
	3-WAY CONTROL VALVE	LWT..... LEAVING WATER TEMPERATURE
	CAP	MAX..... MAXIMUM
	SMOKE DETECTOR	MBH..... THOUSANDS OF BTUs PER HOUR
	MOTORIZED DAMPER	MIN..... MINIMUM
		NC..... NOISE CRITERIA
		N.C..... NORMALLY CLOSED
		N.I.M..... NOT IN MECHANICAL
		NO..... NUMBER
		N.O..... NORMALLY OPEN
		O.A..... OUTSIDE AIR
		PSI..... POUNDS PER SQUARE INCH
		P/T..... PRESSURE / TEMPERATURE
		R.A..... RETURN AIR
		RECT..... RECTANGULAR
		REQ'D..... REQUIRED
		S.A..... SUPPLY AIR
		S.P..... STATIC PRESSURE
		SQ..... SQUARE
		TEMP..... TEMPERATURE
		TYP..... TYPICAL
		VAV..... VARIABLE AIR VOLUME
		W..... WIDTH
		WB..... WET BULB
		WPD..... WATER PRESSURE DROP
		Ø..... DIAMETER
		(E) EXISTING
		----- (D) DEMOLISH
		----- NEW WORK
		HWS..... (HWS) HEATING WATER SUPPLY
		HWR..... (HWR) HEATING WATER RETURN
		▲..... FIRE DAMPER
		■..... FIRE / SMOKE DAMPER
		Ⓢ..... SMOKE DAMPER
		SEISMIC BRACING
		===== LATERAL BRACING
		===== LONGITUDINAL BRACING
		===== LONGITUDINAL & LATERAL BRACING

ROOFTOP HVAC UNITS	
MARK NUMBER	RTU 1
SYSTEM	ADMIN
TYPE	VAV
DISCHARGE	VERTICAL
TOTAL CFM	1990
ECONOMIZER	YES
MIN. OSA	30
MAX OSA (FULL OCCUPANCY)	225
CO2 CONTROL	YES
EXTERNAL SP. (*H2O)	1.25"
MOTOR HP.	4 HP/NOTE 1
TOTAL CFM	2000
EXTERNAL SP (*H2)	0.50"
FAN POWER	1.3 HP/NOTE 1
FILTER TYPE	2"- MERV 8
HEATING	
GAS INPUT(MBH)	120MBH
EFF. (AFUE)	80.0%
MODULATING/TURN DOWN:	5:1
COOLING	
TOTAL CLG. (TONS)	5
SENSIBLE CLG. (MBH)	54
ENT. EVAP AIR TEMP (DB/WB.)	80/64
AMBIENT AIR (°F)	95
EER/SEER	18 SEER
REFRIGERANT	410A
DESIGN WEIGHT (LBS.)	1500 #
SMOKE DETECTOR (RETURN DUCT)	YES
SPRING ISOLATION ROOF CURB	YES
CONVENIENCE OUTLET - ALWAYS POWERED	YES
BASIS OF DESIGN - DAIKIN	DPS 005A

NOTES:
1. PROVIDE WITH ECM MOTOR

EXHAUST FANS	
MARK NUMBER	EF 1
NOTE 1	CEILING
SYSTEM	RESTROOM
CFM	100
TOTAL SP. (IN H2O)	.30"
RPM	720
MOTOR HP	128 W
CONTROLLED BY	SWITCH
INTERLOCKED WITH	-
DAMPER TYPE	BDD
ISOLATION	RIS
DESIGN WEIGHT (LBS)	10
MAX. SONES	1.6
ELECTRICAL (V/ø) (POWER)	115/1
BASIS OF DESIGN	GREENCHECK SP-BT50

1. PROVIDE WITH SPEED CONTROL NEAR FAN FOR BALANCING



VAV BOXES WITH ELECTRIC HEAT																		
MARK NO.	TYPE	MAX COOLING CFM	20% OF COOLING CFM	MIN VENTILATION CFM	MIN 300 CFM	MAXIMUM DEADBAND CFM	MAXIMUM HEATING CFM 50% or VENT	INLET IN.	OUTLET IN.	SA INLET TEMP DEG. F	SA TEMP AT HEATING DEG. F	REHEAT COIL LOAD MBH	ELEC COIL INPUT KW	CONTROLS TYPE	MAX. STATIC LOSS *	MAX. DISCHARGE SOUND POWER LEVEL **	MAX. RADIATED SOUND POWER LEVEL **	CONTROL TYPE
VAV-1	VAV	300	60	15	150	150	150	6	12X8	55	110	8.9	2.61	SCR	0.75	67	59	DDC
VAV-2	VAV	300	60	87	150	150	150	6	12X8	55	110	8.9	2.61	SCR	0.75	67	59	DDC
VAV-3	VAV	1110	222	65	0	222	555	12	16X15	55	90	21.0	6.15	SCR	0.75	67	59	DDC
VAV-4	VAV	120	24	14	60	60	60	4	12X8	55	90	2.3	0.66	SCR	0.75	67	59	DDC
VAV-5	VAV	160	32	15	80	80	80	6	12X8	55	90	3.0	0.89	SCR	0.75	67	59	DDC
TOTAL		1990				662	995					44.1						

* - INCLUDING COIL, SOUND ATTENUATOR SECTION & VAV BOX

** - THIRD OCTAVE CERTIFIED RATING IN ACCORDANCE WITH ARI STANDARD 880-94

* - INCLUDING COIL, SOUND ATTENUATOR SECTION & VAV BOX
** - THIRD OCTAVE CERTIFIED RATING IN ACCORDANCE WITH ARI STANDARD 880-94

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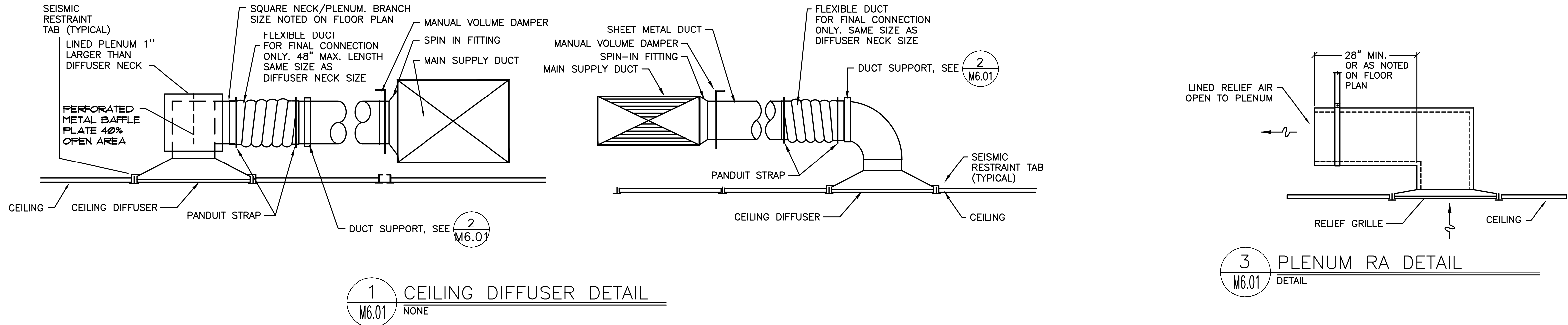
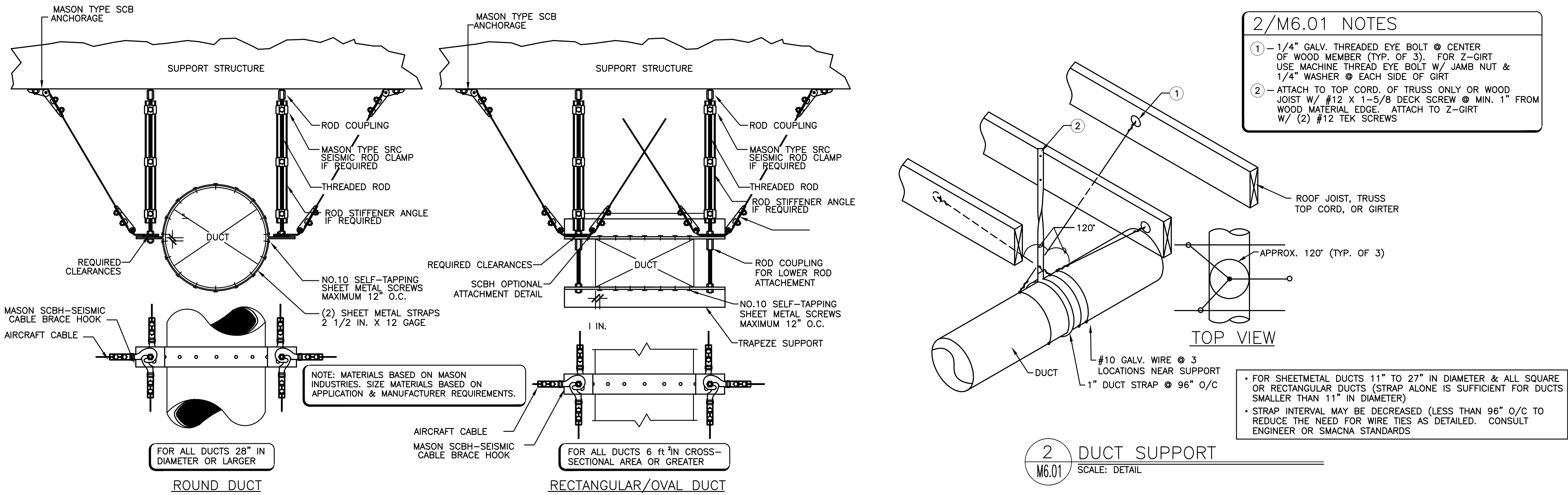
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VENTILATION AIR SCHEDULE RTU-1																
ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF FIXTURES (PLUMBING)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/PP) OR(CFM/FIXT) *	OUTSIDE AIR REQUIREMENT (CFM/SQ FT.)	OUTSIDE AIR REQUIRED (CFM)	ZONE OSA (CFM)	SUPPLY AIR (CFM)	PRIMARY OSA FRACTION	RETURN AIR (CFM)	EXHAUST AIR (CFM)	Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS	
	Az			Pz	Rp	Ra	Vbz	Ez	Voz	Vpz	Zp		Evz			
D104 PRINCIPAL	160	5		1	5	0.06	15	1.0	15	160	0.09	160	0	0.98	15.39	RTU-1
D103 CONFERENCE	280	50		14	5	0.06	87	1.0	87	300	0.29	300	0	1.12	91.49	RTU-1
D105 HEALTH	150	5		1	5	0.06	14	1.0	14	120	0.12	120	0	0.95	14.76	RTU-1
D107 WORK ROOM	400	5		2	5	0.06	34	1.0	34	300	0.11	300	0	1.05	35.84	RTU-1
D102 RECEPTION ADMIN (INT)	575	10		6	5	0.06	65	1.0	65	1110	0.06	1110	0	1.24	67.98	RTU-1
D106 TOILET	85	0	1	0	50		0			0		0	75			RTU-1, EF-1
TOTAL	1650			24			214		214	1990		1990	75	0.95	225	
									Vou	Vps			Ev			
CORRECTED TOTAL OUTDOOR AIR FLOW RATE											225	CFM	Corrected OSA Fraction		Zs =	0.11

VENTILATION AIR SCHEDULE - EXISTING UNIT																
ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF FIXTURES (PLUMBING)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/PP) OR(CFM/FIXT) *	OUTSIDE AIR REQUIREMENT (CFM/SQ FT.)	OUTSIDE AIR REQUIRED (CFM)	ZONE OSA (CFM)	SUPPLY AIR (CFM)	PRIMARY OSA FRACTION	RETURN AIR (CFM)	EXHAUST AIR (CFM)	Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS	
	Az			Pz	Rp	Ra	Vbz	Ez	Voz	Vpz	Zp		Evz			
D100 VESIBULE	220	0		0	0	0.06	13	1.0	13	350	0.04	0	0	0.99	14.71	EXIST.
D 101 LOBBY	440	30		14	5	0.06	96	1.0	96	700	0.14	700	0	1.07	107.39	EXIST.
D111 COUNSELING	135	5		1	5	0.06	13	1.0	13	100	0.13	100	0	0.90	14.59	EXIST.
D112 OFFICE	105	5		1	5	0.06	11	1.0	11	100	0.11	100	0	0.91	12.59	EXIST.
D 109 CLASSROOM	860	25		22	10	0.12	323	1.0	323	750	0.43	750	0	1.28	360.05	EXIST.
TOTAL	1760			38			457		457	2000		950	0	0.90	509	
									Vou	Vps			Ev			
CORRECTED TOTAL OUTDOOR AIR FLOW RATE											387	CFM	Corrected OSA Fraction		Zs =	0.25

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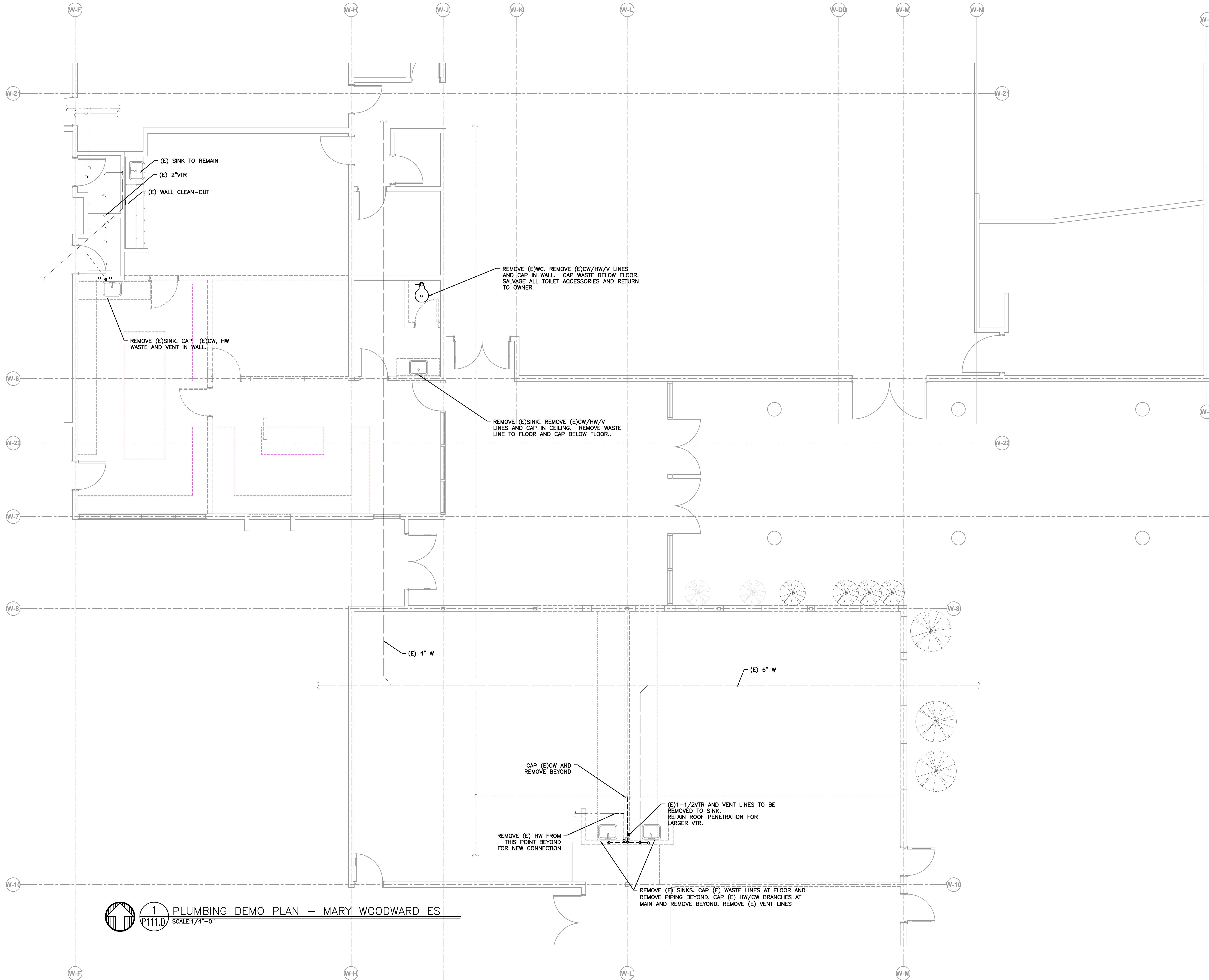
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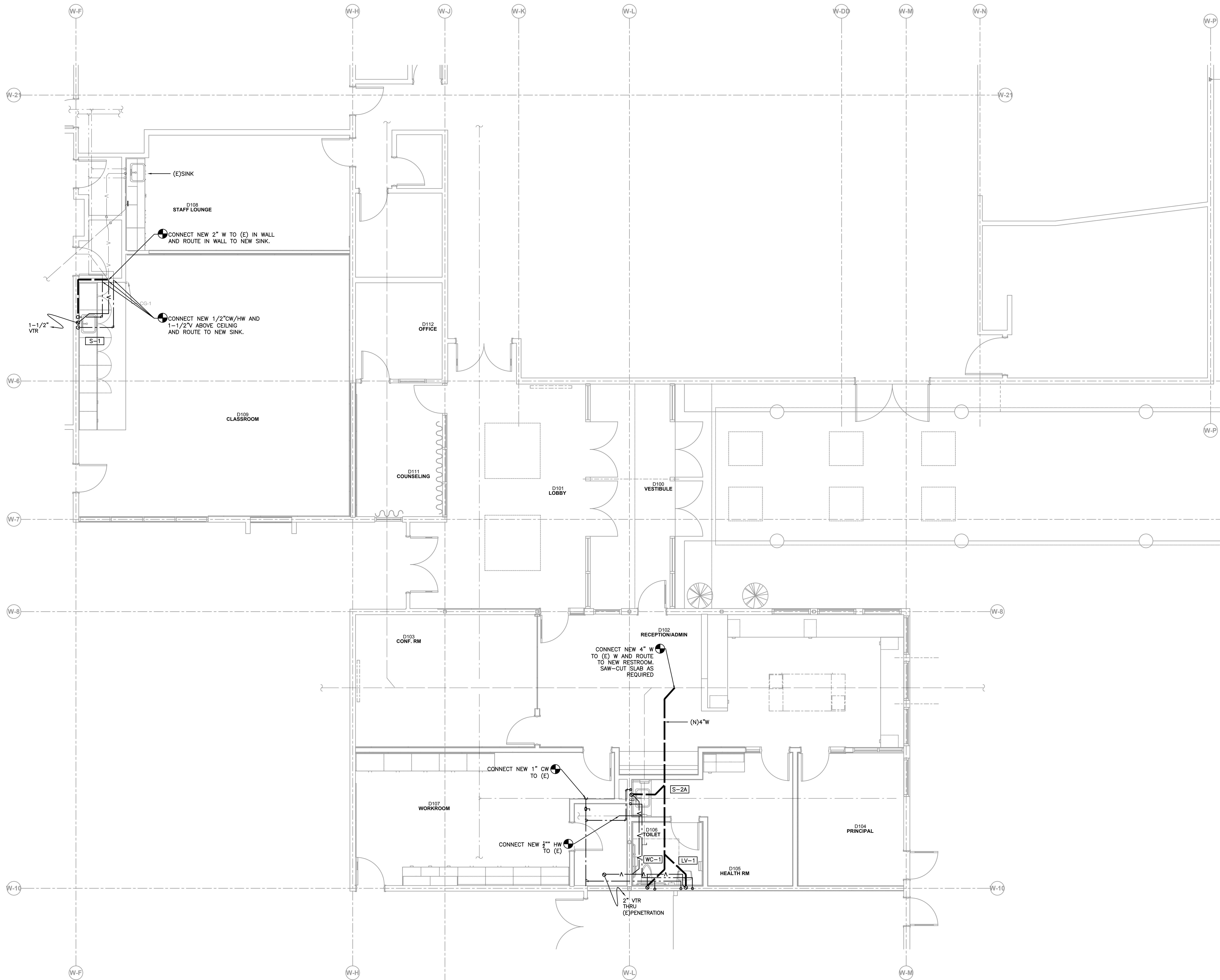
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PLUMBING DEMO PLAN
WOODWARD ES

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1 PLUMBING PLAN - MARY WOODWARD ES
P121.D SCALE: 1/4" = 0'

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PLUMBING PLAN
WOODWARD ES

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1 OVERALL PLUMBING PLAN
P200.D SCALE: 1/4"=0'

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OVERALL PLUMBING PLAN

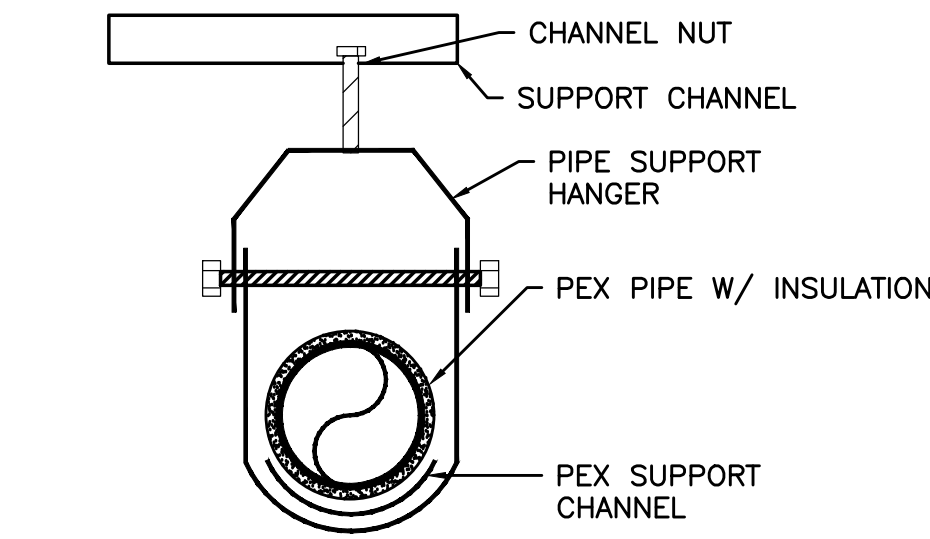
P200.D

PLUMBING CONNECTION SCHEDULE						
MARK	FIXTURE	W	V	CW	HW	REMARKS
S-1	SINK - CLASSROOM	2"	1-1/2"	1/2"	1/2"	1-COMP, SEE NOTE 1
S-2A	SINK - NURSE	2"	1-1/2"	1/2"	1/2"	1-COMP, SEE NOTE 1
WC-1	WATER CLOSET	4"	2"	1"		FLOOR MOUNT, FLUSH VALVE
LV-1	LAVATORY	1-1/2"	1-1/2"	1/2"	1/2"	WALL MOUNT

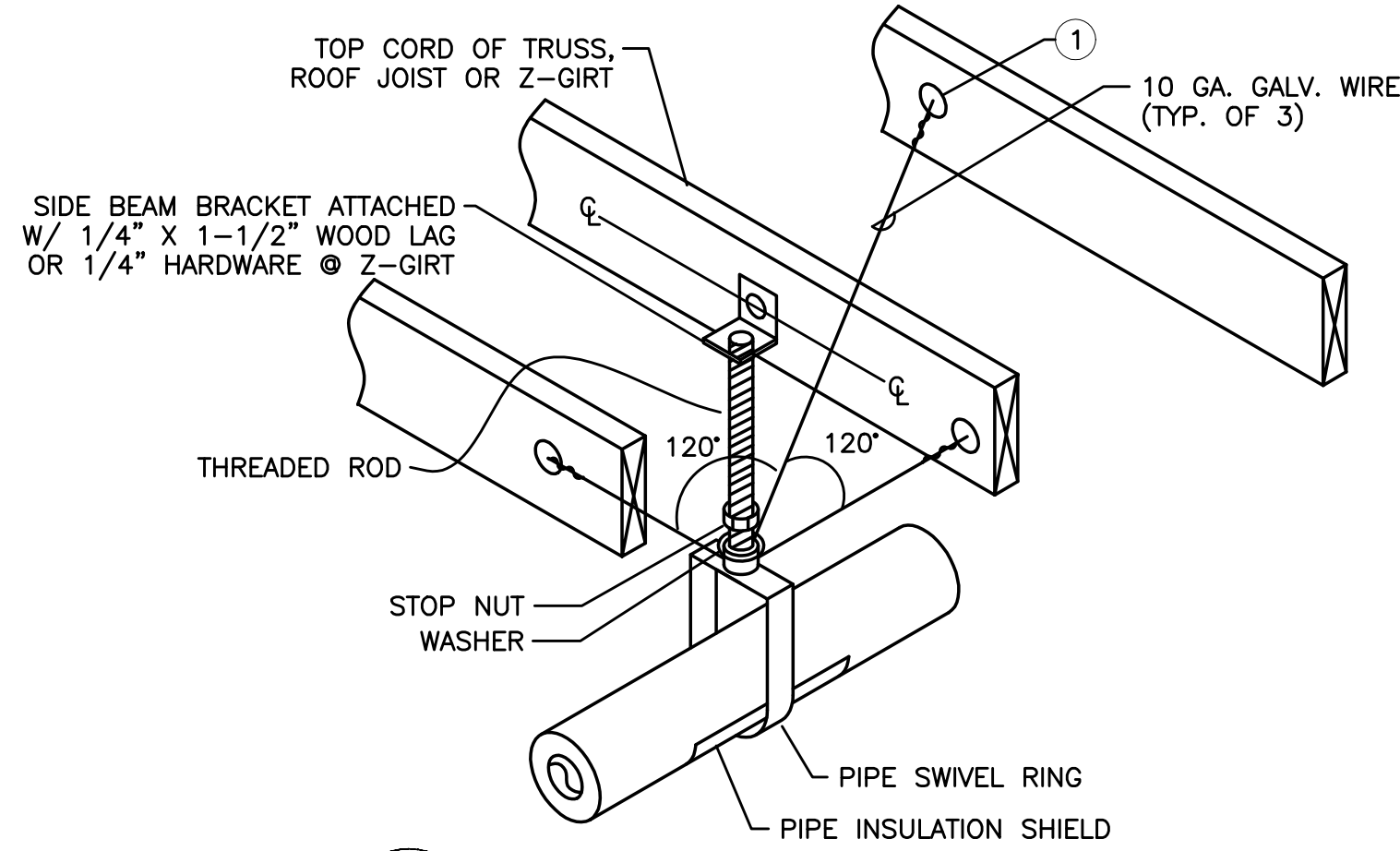
NOTES:
1: PROVIDE FAUCET RE-INFORCEMENT PER DETAIL 4/P6.01.

PLUMBING LEGEND			
AFF	 ABOVE FINISHED FLOOR	— — — — — (CW) COLD WATER	
ARCH	 ARCHITECTURAL	— — — — — (NPW) NON-POTABLE COLD WATER	
B.G.	 BELOW GRADE	— — — — — (HW) HOT WATER	
BTU	 BRITISH THERMAL UNIT	— — — — — (HWR) HOT WATER RECIRC	
CAP.	 CAPACITY	— — — — — (W) ABOVE GRADE WASTE	
C.I.	 CAST IRON	— — — — — (W) BELOW GRADE WASTE	
COMP.	 COMPARTMENT	— V — V (V) VENT	
CONT.	 CONTINUATION	— RD — (RD) RAIN DRAIN	
CU.	 CUBIC	— — — — —RD (UG RD) UNDERGROUND RAIN DRAIN	
DF	 DRINKING FOUNTAIN	— OD — (OD) OVERFLOW RAIN DRAIN	
DI	 DEIONIZED (WATER)	— — — — — NEW WORK ENTITY	
DIA.	 DIAMETER	— — — — — (D) DEMOLISH, (R) RELOCATE	
ELEV.	 ELEVATION	— — — — — (E) EXISTING ENTITY	
EW	 ELECTRIC WATER COOLER	— — — — — (CW) EXISTING COLD WATER	
FD	 FLOOR DRAIN	— — — — — (HW) EXISTING HOT WATER	
FDC	 FIRE DEPARTMENT CONNECTION	— — — — — (HWR) EXISTING HOT WATER RECIRC	
FHC	 FIRE HOSE CABINET	— — — — — (W) EXISTING WASTE BELOW GRADE	
F.F.	 FINISH FLOOR	— V — V (V) EXISTING VENT	
FLG.	 FLANGE	— RD — (RD) EXISTING RAIN DRAIN	
FT	 FOOT / FEET	— — — — — BACKGROUND	
G	 GAS		
GA.	 GAUGE	⚠..... PRESSURE/TEMP RELIEF VALVE	
GALV.	 GALVANIZED	⚡..... BUTTERFLY VALVE	
GPM	 GALLONS PER MINUTE	⚡..... GAS PRESSURE REGULATING VALVE	
G.V.	 GATE VALVE	⚡ OR ⚡..... TOP CONNECTION	
HP	 HORSEPOWER	⚡..... BOTTOM CONNECTION	
HR.	 HOUR	⚡..... PIPE TURNED UP, PIPE TURNED DOWN	
I.E.	 INVERT ELEVATION	⚡..... GATE VALVE	
KW	 KILOWATT	⚡..... BALL VALVE	
LAV	 LAVATORY	⚡..... BALANCING VALVE	
LBS	 POUNDS	⚡..... CHECK VALVE	
MAX.	 MAXIMUM	⚡..... UNION	
MBH	 THOUSANDS OF BTUs PER HOUR	⚡..... DOUBLE CHECK ASSEMBLY	
MIN.	 MINIMUM		
M.J.	 MECHANICAL JOINT		
N.I.M.	 NOT IN MECHANICAL		
OS&Y	 OUTSIDE STEM & YOKE		
PROT.	 PROTECTION		
PRV	 PRESSURE REDUCING VALVE		
PSI	 POUNDS PER SQUARE INCH		
PSIG	 POUNDS PER SQUARE INCH		
P/T	 PRESSURE / TEMPERATURE		
REQ'D	 REQUIRED		
RPBP	 REDUCED PRESSURE BACKFLOW PREVENTER		
RPM	 REVOLUTIONS PER MINUTE		
TYP.	 TYPICAL		
UR	 URINAL		
VTR	 VENT THROUGH ROOF		
WC	 WATER CLOSET		

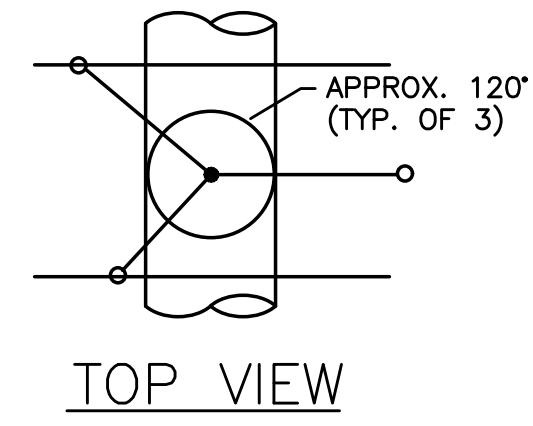
⬡ XX	 EQUIPMENT MARK NUMBER
XXX	 FIXTURE MARK
(E)	 EXISTING
#	 NOTE
⊕	 CONNECT TO EXISTING
T	 CAP
⊥	 TEE
⌒	 ELBOW
⦿	 CLEANOUT



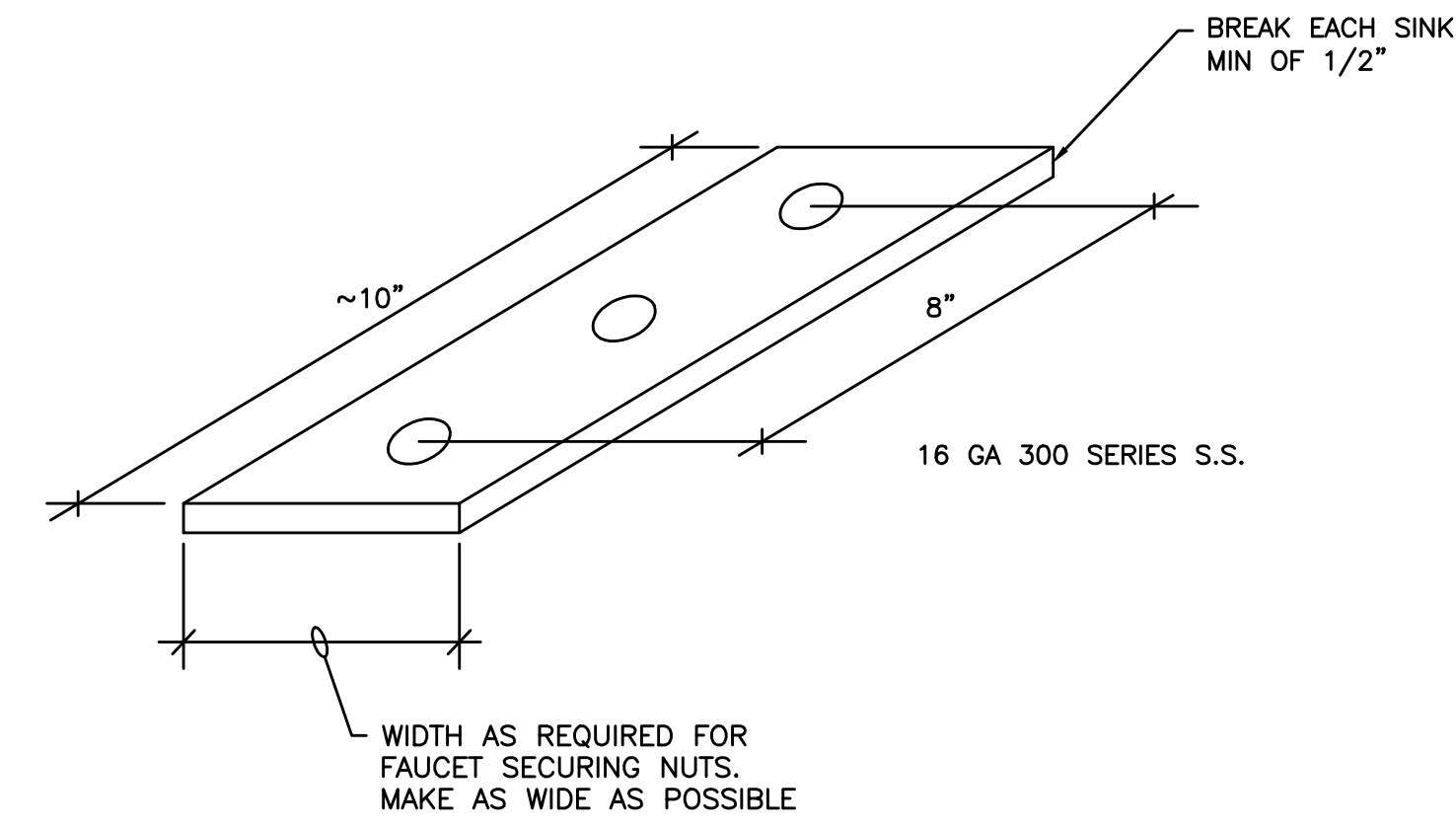
3 PEX SUPPORT
SCALE: DETAIL



1 NON-SEISMIC PIPE SUPPORT
SCALE: DETAIL



3/P601 NOTES
① — 1/4" GALV. THREADED EYE BOLT @ CENTER OF WOOD MEMBER (TYP. OF 3). FOR Z-GIRT USE MACHINE THREAD EYE BOLT W/ JAMB NUT & 1/4" WASHER @ EACH SIDE OF GIRT
* — MAXIMUM HANGER SPACING SHALL BE AS FOLLOWS:
1-1/4" AND SMALLER PIPE 7' SPAN
1-1/2" PIPE 9' SPAN



2 SINK REINFORCEMENT
SCALE: DETAIL

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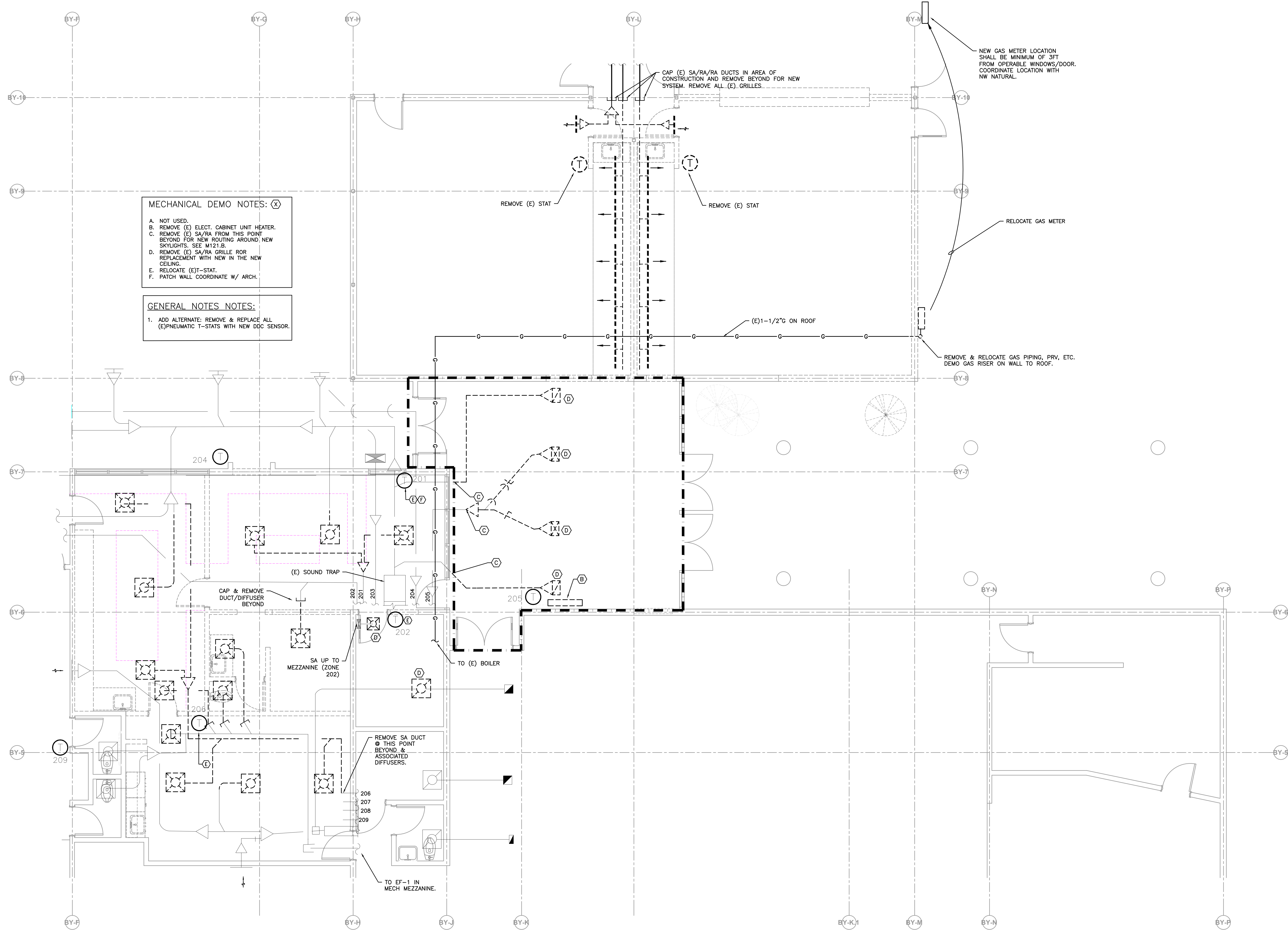
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PLUMBING LEGENDS AND
SCHEDULES

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MECHANICAL DEMO NOTES: (X)

A. NOT USED.
B. REMOVE (E) ELECT. CABINET UNIT HEATER.
C. REMOVE (E) SA/RA FROM THIS POINT BEYOND FOR NEW ROUTING AROUND NEW SKYLIGHTS. SEE M121.B.
D. REMOVE (E) SA/RA GRILLE ROR REPLACEMENT WITH NEW IN THE NEW CEILING.
E. RELOCATE (E)T-STAT.
F. PATCH WALL COORDINATE W/ ARCH.

GENERAL NOTES:

1. ADD ALTERNATE: REMOVE & REPLACE ALL (E)PNEUMATIC T-STATS WITH NEW DDC SENSOR.

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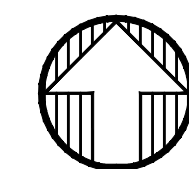
Tigard Tualatin School District

Edward Byrom
Elementary School
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Tualatin, Oregon 97062

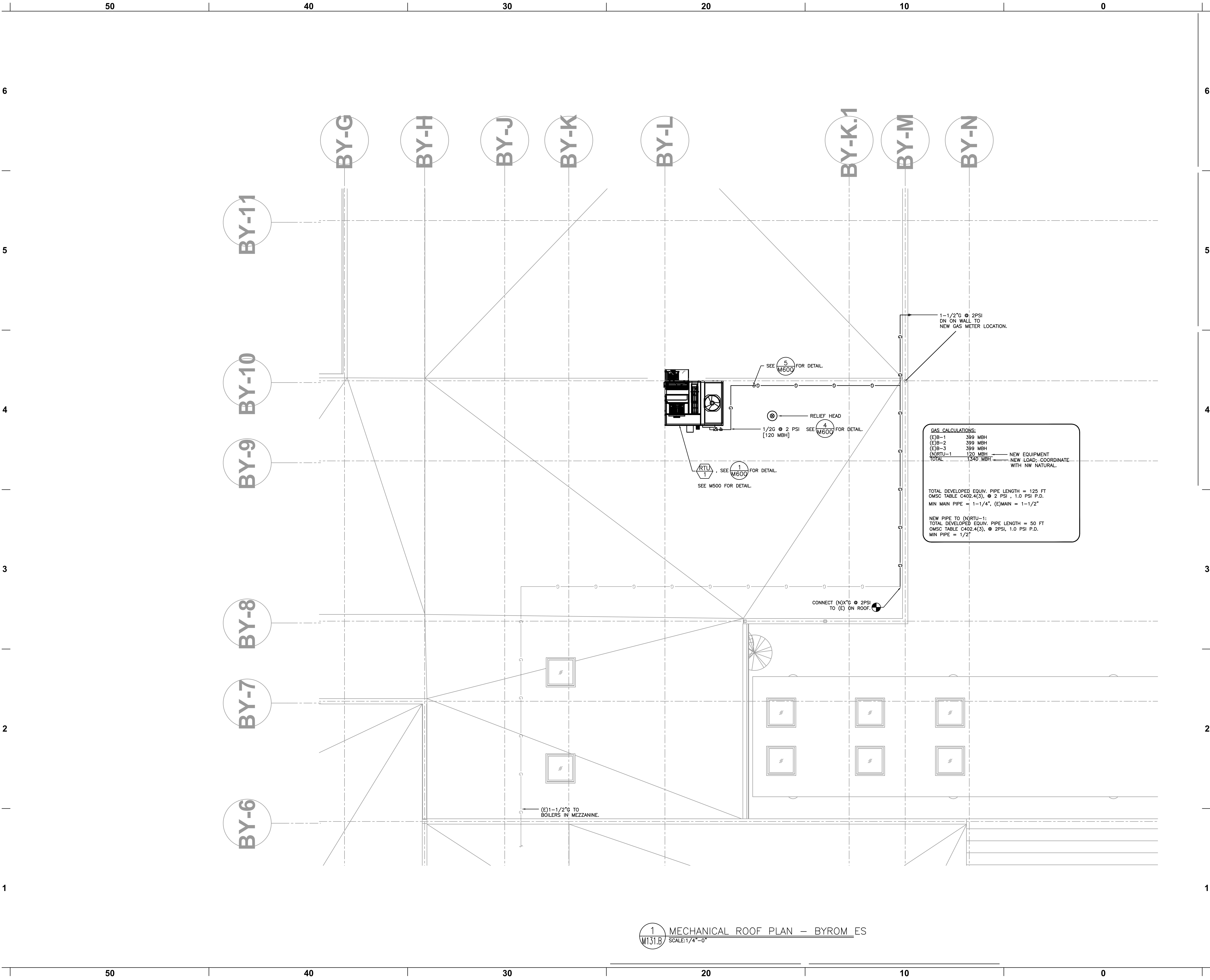
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MECHANICAL DEMO PLAN
BYROM ES

M111.B



MECHANICAL DEMO PLAN -- BYROM ES
M111.B SCALE: 1/4" = 0'



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MECHANICAL ROOF PLAN
BYROM ES

M131.B

1 MECHANICAL ROOF PLAN — BYROM ES
M131.B SCALE:1/4"=0"

07/16/2007 2:09:45: 54
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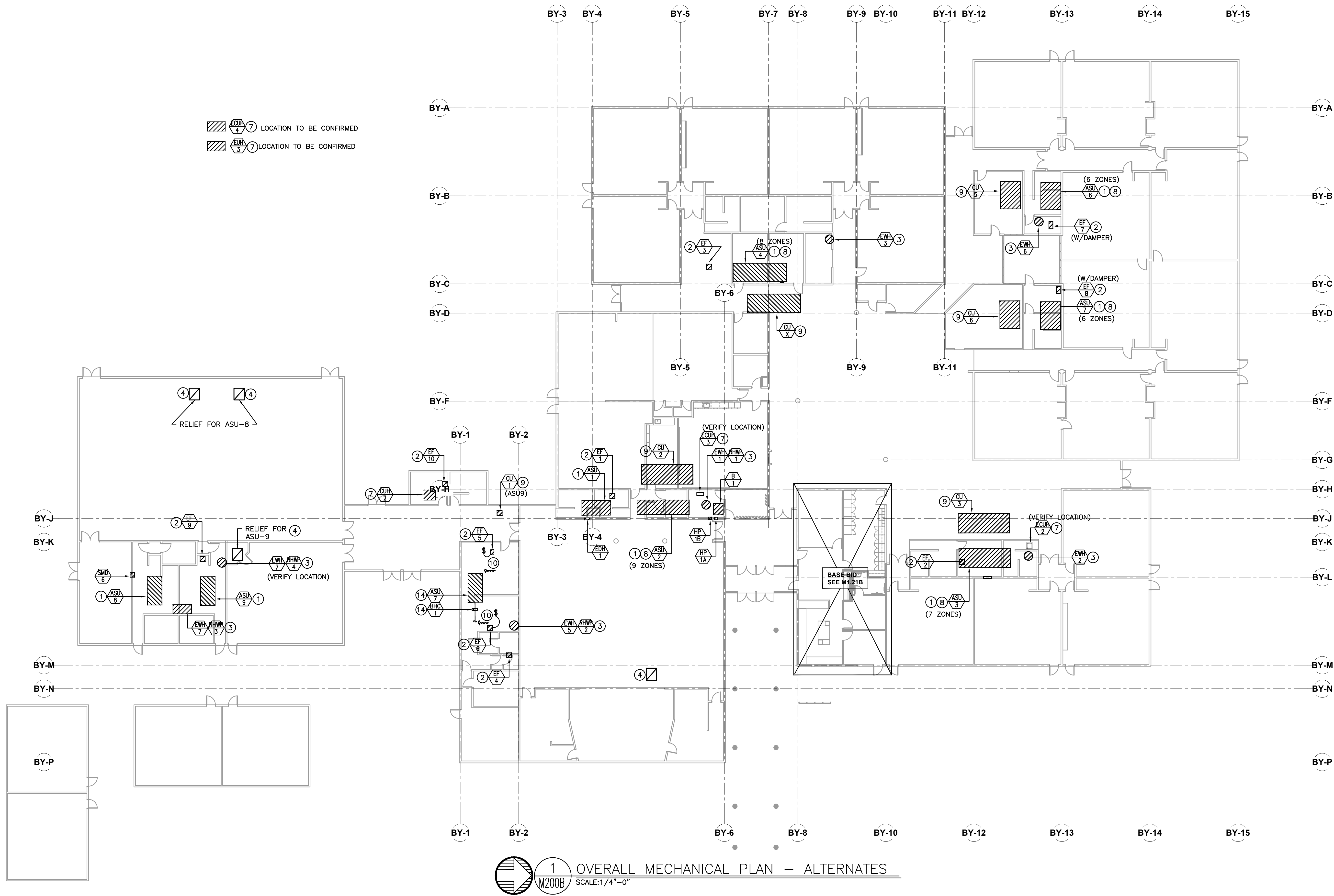
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30

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CONTROL DRAWING KEYED NOTES – ALTERNATES:

1. PROVIDE DIGITAL DAMPER ACTUATOR AT OSA, RELIEF AND MIXING DAMPERS TO REPLACE EXISTING PNEUMATIC ACTUATORS. RETROFIT EXISTING HEATING VALVE WITH DIGITAL ACTUATOR KIT. CONFIRM VALVE CONFIGURATION PRIOR TO SUBMITTAL.
2. REMOVE PE SWITCH AND OPERATE FAN DIRECTLY FROM DIGITAL CONTROLS. PROVIDE RIB OR STARTER FOR 120V UNIT AS REQUIRED. WHERE DAMPER IS NOTED ON THE PLAN, REPLACE EXISTING PNEUMATIC ACTUATOR WITH DIGITAL DAMPER ACTUATOR.
3. REMOVE (E)PE SWITCH AND OPERATED ELECTRIC WATER HEATER AND ASSOCIATED RECIRC PUMP DIRECTLY FROM DDC.
4. PROVIDE DIGITAL DAMPER ACTUATOR. CONNECT NEW ACTUATOR TO EXISTING JCI SYSTEM CONTROL PANEL. ALTER PROGRAMMING AS REQUIRED FOR THE NEW DIGITAL DEVICE.
5. REMOVE PE SWITCH AND OPERATE ELECTRIC HEATERS DIRECTLY FROM DIGITAL CONTROLS. PROVIDE RIB OR RATED CONTACTOR FOR 120 V OPERATION AS REQUIRED.
6. -
7. REMOVE (E)PE SWITCH AND OPERATE FAN DIRECTLY FROM DDC. FOR HW UNIT, RETROFIT HEATING COIL VALVE WITH DIGITAL ACTUATOR KIT.
8. PROVIDE DIGITAL DAMPER ACTUATOR FOR MULTIZONE DAMPERS, # OF ZONES SHOWN ON PLAN.
9. REMOVE PE SWITCH AND OPERATE DIRECTLY FROM DIGITAL CONTROLS.
10. REMOVE (E)PNEUMATIC DAMPER ACTUATOR AT STEAM AND STOVE HOODS (EF-5 & EF-6) AND REPLACE WITH DIGITAL DAMPER ACTUATOR. ALTER PROGRAMMING AS REQUIRED FOR THE NEW DIGITAL DEVICE.
11. REMOVE (E) BY-PASS VAV BOXES AND REPLACE WITH NEW SINGLE DUCT VAV BOX WITH DDC CONTROL.
12. (E)FIRE SMOKE DAMPER – REMOVE (E)PNEUMATIC DAMPER ACTUATOR AND REPLACE WITH NEW DIGITAL ACTUATOR.
13. REMOVE (E) PE SWITCH AND OPERATE PUMP DIRECTLY FROM DIGITAL CONTROLS.
14. PROVIDE DIGITAL OSA DAMPER, FACE/BY-PASS DAMPER TO REPLACE (E)PNEUMATIC ACTUATORS. RETROFIT (E)BOOSTER HEATING COIL VALVE WITH DIGITAL ACTUATOR KIT. CONFIRM VALVE SIZING PRIOR TO SUBMITTAL.

CONTROL DRAWING GENERAL NOTES:

1. WHERE EXISTING PNEUMATIC DEVICES ARE REMOVED, REMOVE ALL ASSOCIATED PNEUMATIC PIPING AND CONTROLS. CONNECT NEW ACTUATOR / DDC DEVICES TO EXISTING JCI SYSTEM CONTROL PANEL. ALTER PROGRAMMING AS REQUIRED FOR THE NEW DIGITAL DEVICE. CONFIRM DAMPER AND VALVE SIZES PRIOR TO SUBMITTAL.

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OVERALL MECHANICAL
PLAN - ALTERNATES

M200.B

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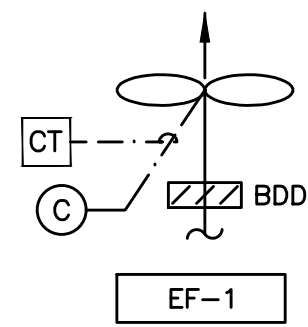
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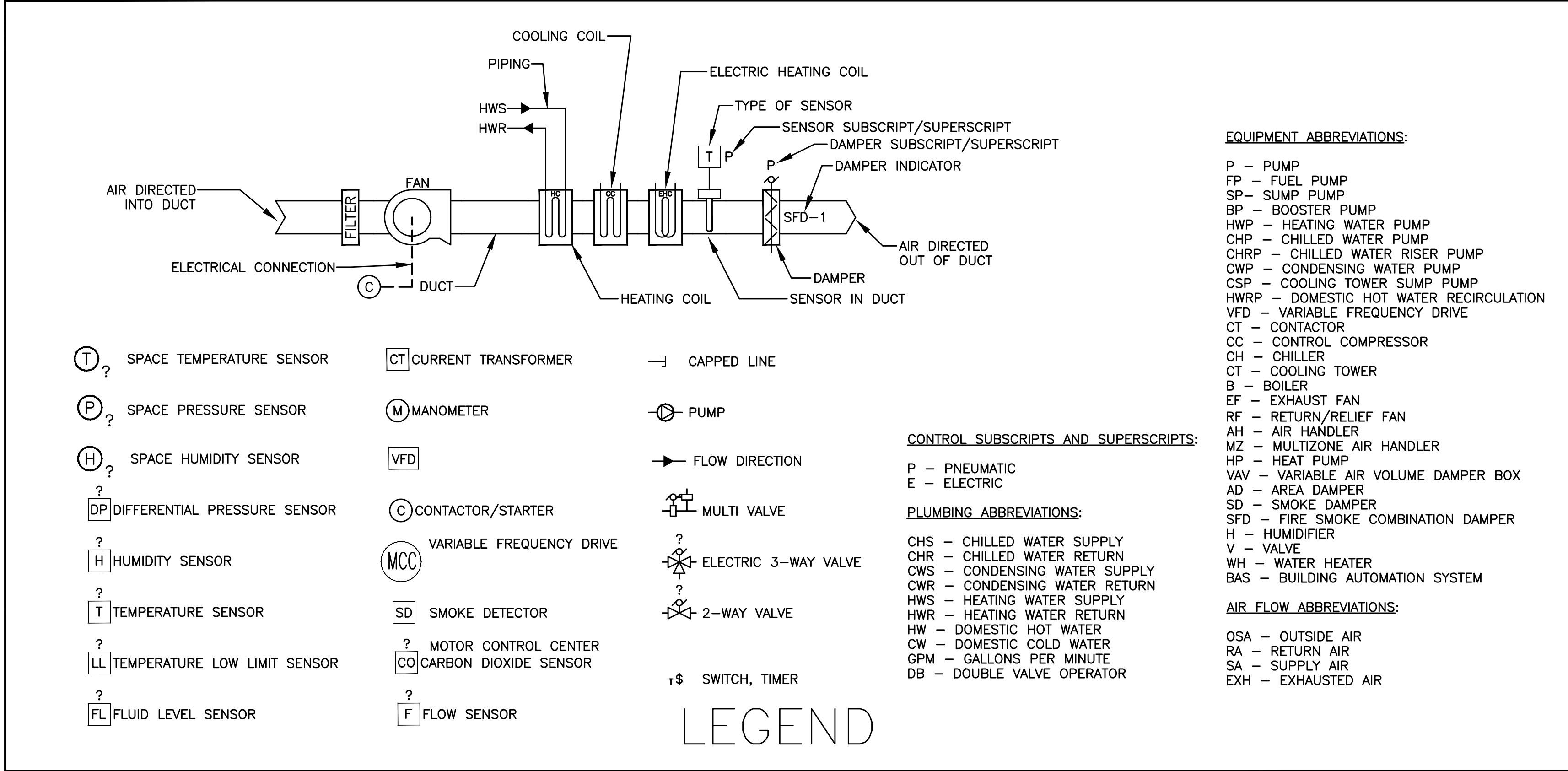
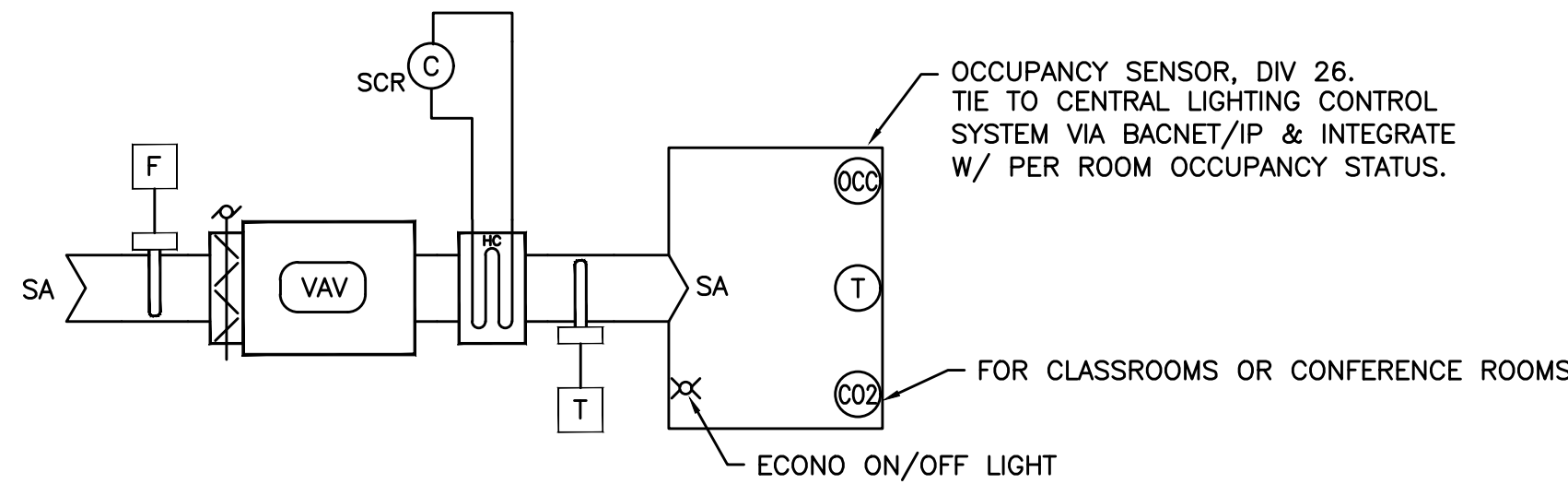
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2 EXHAUST FAN CONTROL DIAGRAM
SCALE: SCHEMATIC



1 VAV BOX W/ ELECT RH CONTROL DIAGRAM
SCALE: SCHEMATIC



POINT DESCRIPTION	INPUT		OUTPUT		ALARM
	DIGITAL	ANALOG	DIGITAL	ANALOG	
SPACE TEMP		X			
AIR FLOW		X			
DAMPER POSITION				X	
DISCHARGE TEMPERATURE		X			
ELECTRIC HEATER			X		
ECONO ON/OFF			X		
SPACE OCCUPANCY	X				
SPACE CO2		X			

POINT DESCRIPTION	INPUT		OUTPUT		ALARM
	DIGITAL	ANALOG	DIGITAL	ANALOG	
START/STOP TYP OF ALL			X		
STATUS	X				

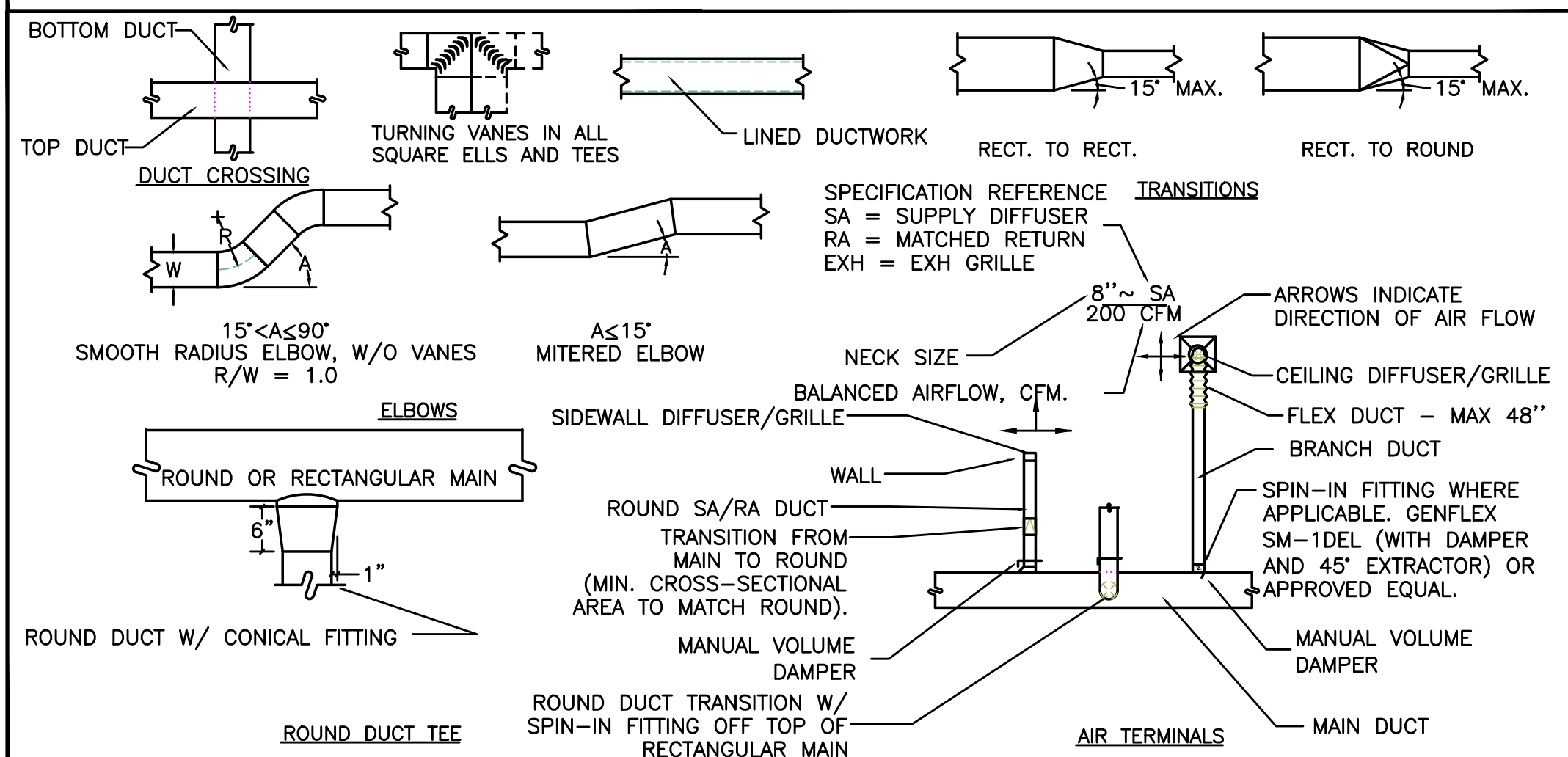
CONTROLS FOR RTU-1 (*)			
POINT DESCRIPTION	READ	WRITE	READ/WRITE
UNIT ENABLE/DISABLE			X
EXH FAN SPEED	X		
EXHAUST STATUS	X		
SUPPLY FAN STATUS	X		
SUPPLY FAN SPEED	X		
OUTSIDE AIR/ECONOMIZER DAMPER POSITION	X		
RA CO2	X		
RA TEMP	X		
DISCHARGE AIR TEMP	X		
DISCHARGE AIR PRESSURE	X		
MIXED AIR TEMP	X		
HEATING SECTION STATUS	X		
SMOKE DETECTOR	X		
COOLING STATUS	X		
ALARM CODE	X		
DISCHARGE AIR TEMP SETPOINT			X
DISCHARGE AIR PRESSURE SETPOINT			X

(*) MINIMUM POINTS TO BE MAPPED TO GRAPHIC

MECHANICAL LEGEND

	SUPPLY AIR DIFFUSER	AFF	ABOVE FINISH FLOOR
	RETURN AIR GRILLE	AHU	AIR HANDLING UNIT
	EXHAUST AIR GRILLE	B.D.	BOTTOM OF DUCT
	PERFORATED RETURN AIR PANEL	BHP	BRAKE HORSEPOWER
	DIRECTIONAL AIR FLOW	BTU	BRITISH THERMAL UNITS
	MANUAL VOLUME DAMPER	CFM	CUBIC FEET PER MINUTE
	SUPPLY OR OUTSIDE AIR DUCT UP & DOWN	CONN.	CONNECTION
	RETURN AIR DUCT UP & DOWN	CONT.	CONTINUATION
	EXHAUST AIR DUCT UP & DOWN	CW	DOMESTIC COLD WATER
	VAV TERMINAL UNIT	DB	DRY BULB
	VT TERMINAL UNIT	DIA.	DIAMETER
	EXISTING	DIST.	DISTRIBUTION
	CONNECT TO EXISTING	EA	EXHAUST AIR
	THERMOSTAT OR TEMP. SENSOR	EDB	ENTERING DRY BULB TEMPERATURE
	NOTE	EWB	ENTERING WET BULB TEMPERATURE
	EQUIPMENT DESIGNATOR	EWT	ENTERING WATER TEMPERATURE
	BALL VALVE	FF	FINISH FLOOR
	GATE VALVE	FIXT.	FIXTURE
	CHECK VALVE	FPM	FEET PER MINUTE
	BALANCING VALVE	FPS	FEET PER SECOND
	THERMOMETER	FT.	FEET / FOOT
	DIRECTION OF FLOW	GA.	GAUGE
	PUMP	GPM	GALLONS PER MINUTE
	STRAINER	HP	HORSEPOWER
	PRESSURE GAUGE	I.D.	INSIDE DIAMETER
	PETE'S PLUG	IN.	INCHES
	DOUBLE CHECK ASSEMBLY	L	LENGTH
	PRESSURE REDUCING VALVE	LBS.	POUNDS
	UNION	LDB	LEAVING DRY BULB
	2-WAY CONTROL VALVE	LWB	LEAVING WET BULB
	3-WAY CONTROL VALVE	LWT	LEAVING WATER TEMPERATURE
	CAP	MAX.	MAXIMUM
	SMOKE DETECTOR	MBH	THOUSANDS OF BTUs PER HOUR
	MOTORIZED DAMPER	MIN.	MINIMUM
		NC	NOISE CRITERIA
		N.C.	NORMALLY CLOSED
		N.I.M.	NOT IN MECHANICAL
		NO.	NUMBER
		N.O.	NORMALLY OPEN
		O.A.	OUTSIDE AIR
		P	PERSON
		PSI	POUNDS PER SQUARE INCH
		P/T	PRESSURE / TEMPERATURE
		R.A.	RETURN AIR
		RECT.	RECTANGULAR
		REQ'D	REQUIRED
		S.A.	SUPPLY AIR
		S.P.	STATIC PRESSURE
		SQ.	SQUARE
		TEMP.	TEMPERATURE
		TYP.	TYPICAL
		VAV	VARIABLE AIR VOLUME
		W	WIDTH
		WB	WET BULB
		WPD	WATER PRESSURE DROP
		Ø	DIAMETER
		(E)	EXISTING
		(D)	DEMOLISH
		---	NEW WORK
		HWS	(HWS) HEATING WATER SUPPLY
		HWR	(HWR) HEATING WATER RETURN
			FIRE DAMPER
			FIRE / SMOKE DAMPER
			SMOKE DAMPER
		SEISMIC BRACING	
			LATERAL BRACING
			LONGITUDINAL BRACING
			LONGITUDINAL & LATERAL BRACING

AIR DISTRIBUTION DETAILS



ROOFTOP HVAC UNITS

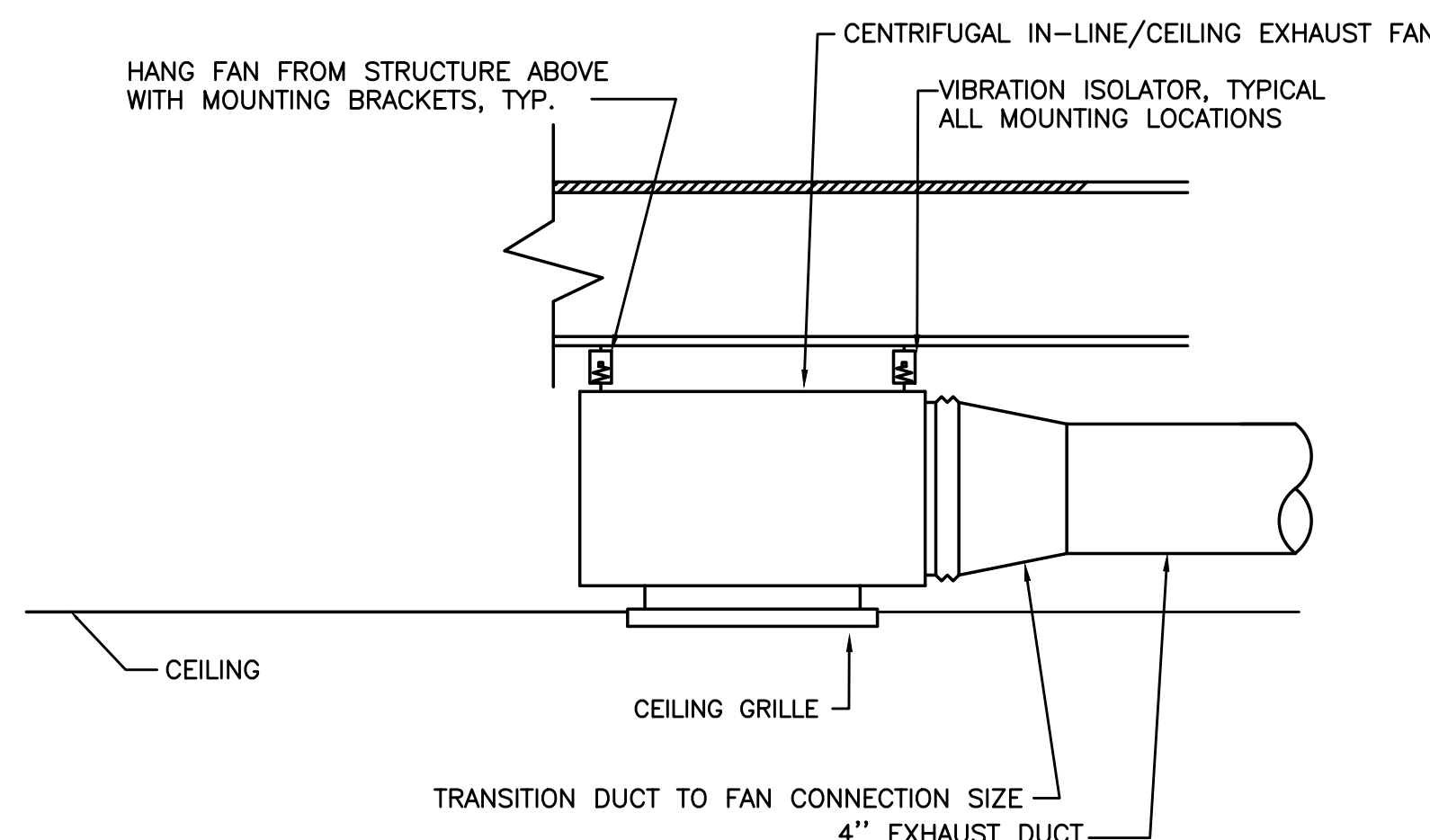
MARK NUMBER	RTU 1
SYSTEM	ADMIN
TYPE	VAV
DISCHARGE	VERTICAL
TOTAL CFM	1980
ECONOMIZER	YES
MIN. OSA	25
MAX OSA (FULL OCCUPANCY)	225
CO2 CONTROL	YES
EXTERNAL SP. (H2O)	1.25"
MOTOR HP.	4 HP/NOTE 1
TOTAL CFM	2000
EXTERNAL SP (H2)	0.50"
FAN POWER	1.3 HP/NOTE 1
FILTER TYPE	2" MERV 8
HEATING	
GAS INPUT(MBH)	120MBH
EFF. (AFUE)	80.0%
MODULATING/TURN DOWN:	5:1
COOLING	
TOTAL CLG. (TONS)	5
SENSIBLE CLG. (MBH)	54
ENT. EVAP AIR TEMP (DB/WB.)	80/64
AMBIENT AIR (°F)	95
EER/SEER	18 SEER
REFRIGERANT	410A
DESIGN WEIGHT (LBS.)	1500 #
SMOKE DETECTOR (RETURN DUCT)	YES
SPRING ISOLATION ROOF CURB	YES
CONVENIENCE OUTLET - ALWAYS POWERED	YES
BASIS OF DESIGN - DAIKIN	DPS 005A

NOTES:
1. PROVIDE WITH ECM MOTOR

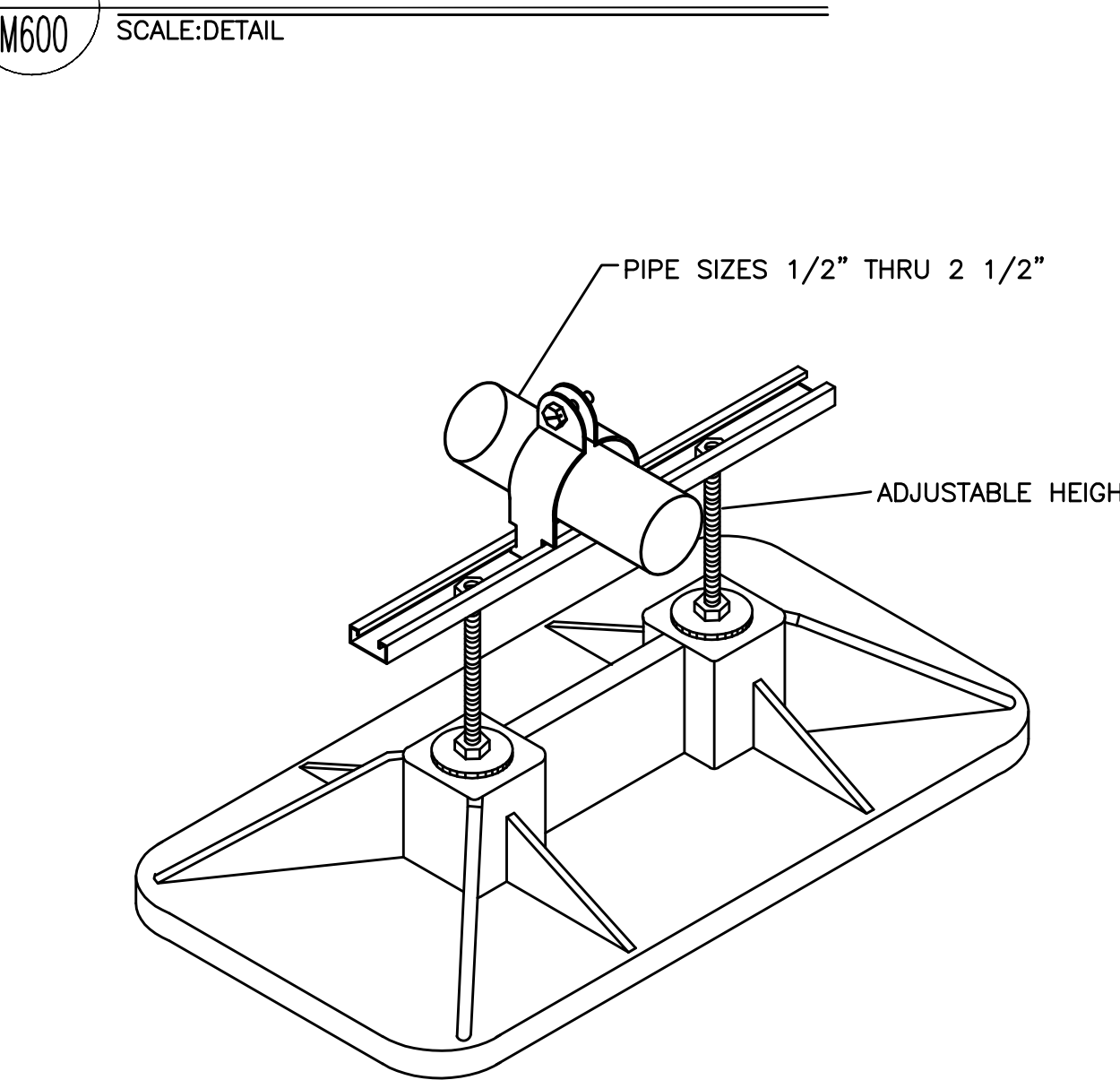
EXHAUST FANS

MARK NUMBER	EF 1
TYPE	CEILING
SYSTEM	RESTROOM
CFM	100
TOTAL SP. (IN H2O)	.30"
RPM	720
MOTOR HP	128 W
CONTROLLED BY	SWITCH
INTERLOCKED WITH	-
DAMPER TYPE	BDD
ISOLATION	RIS
DESIGN WEIGHT (LBS)	10
MAX. SONES	1.6
ELECTRICAL (V/Ø) (POWER)	115/1
BASIS OF DESIGN	GREENCHECK SP-B150

1. PROVIDE WITH SPEED CONTROL NEAR FAN FOR BALANCING

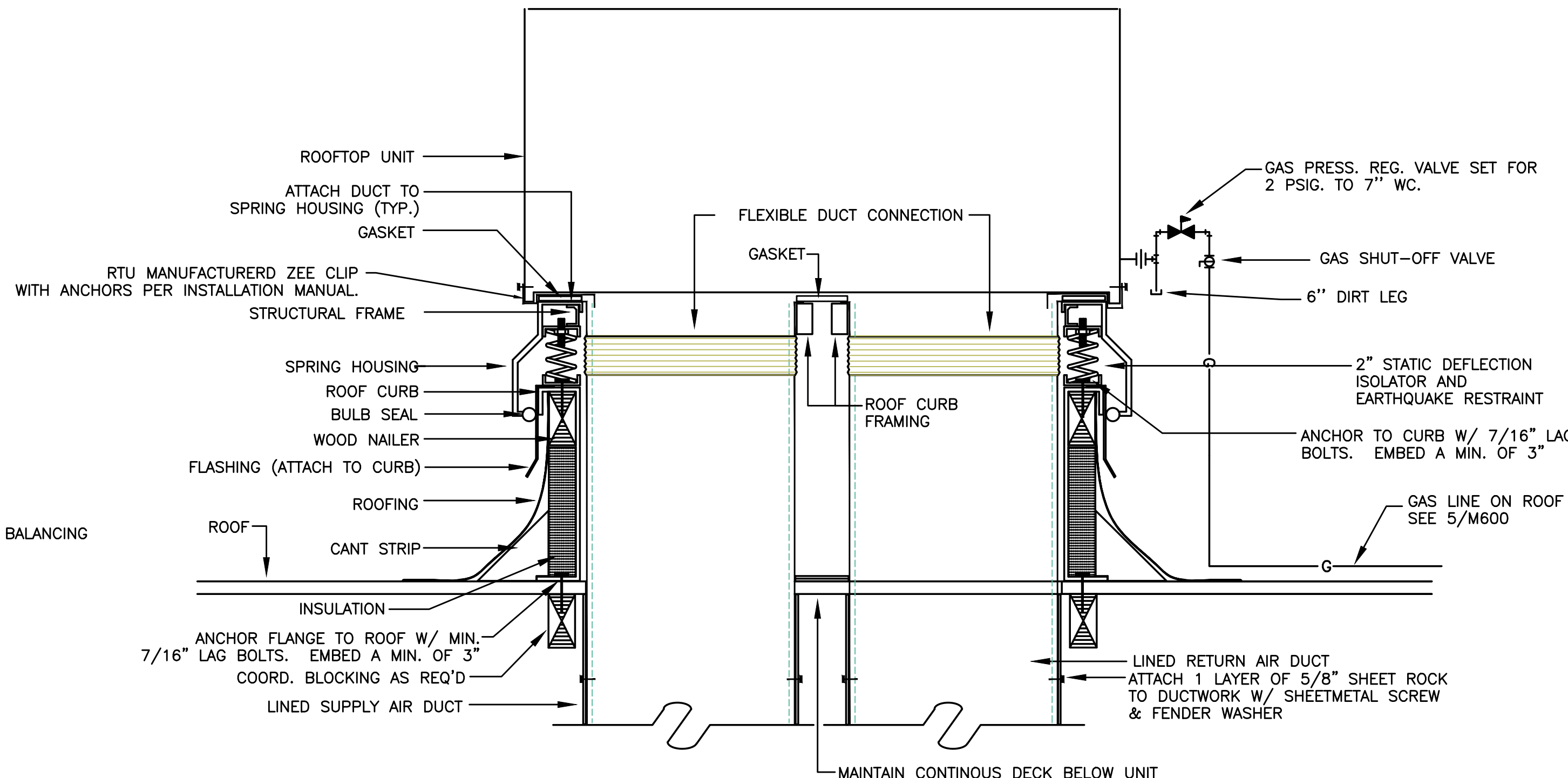


RESTROOM EXHAUST FAN



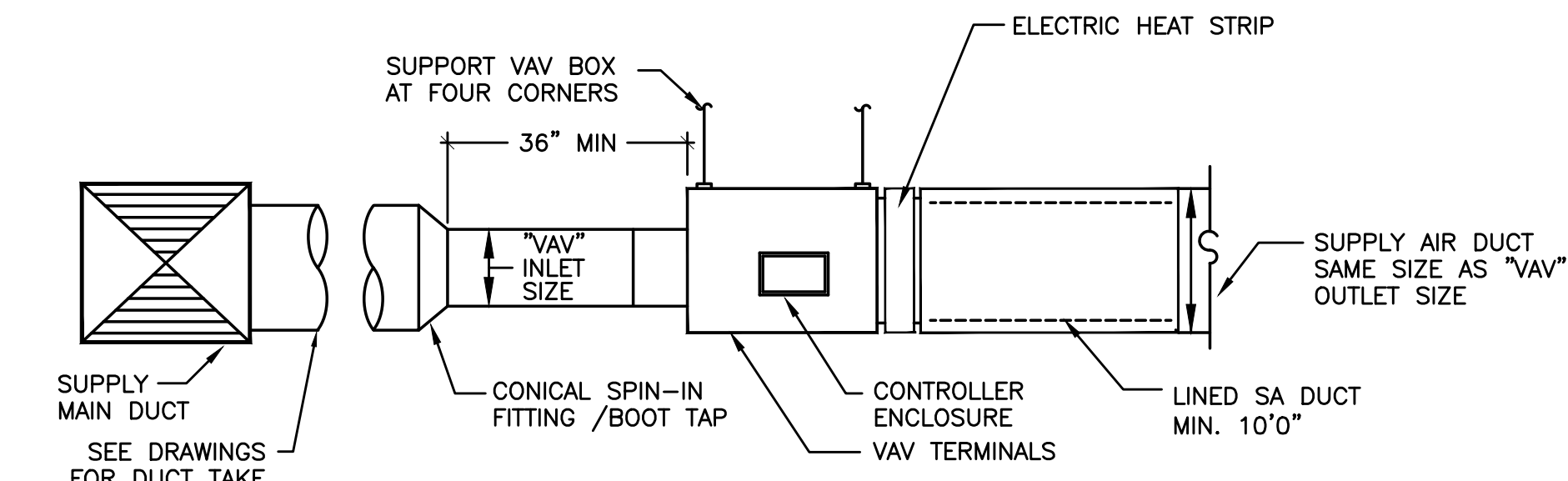
ROOF PIPING SUPPORT DETAIL

SCALE: DETAIL



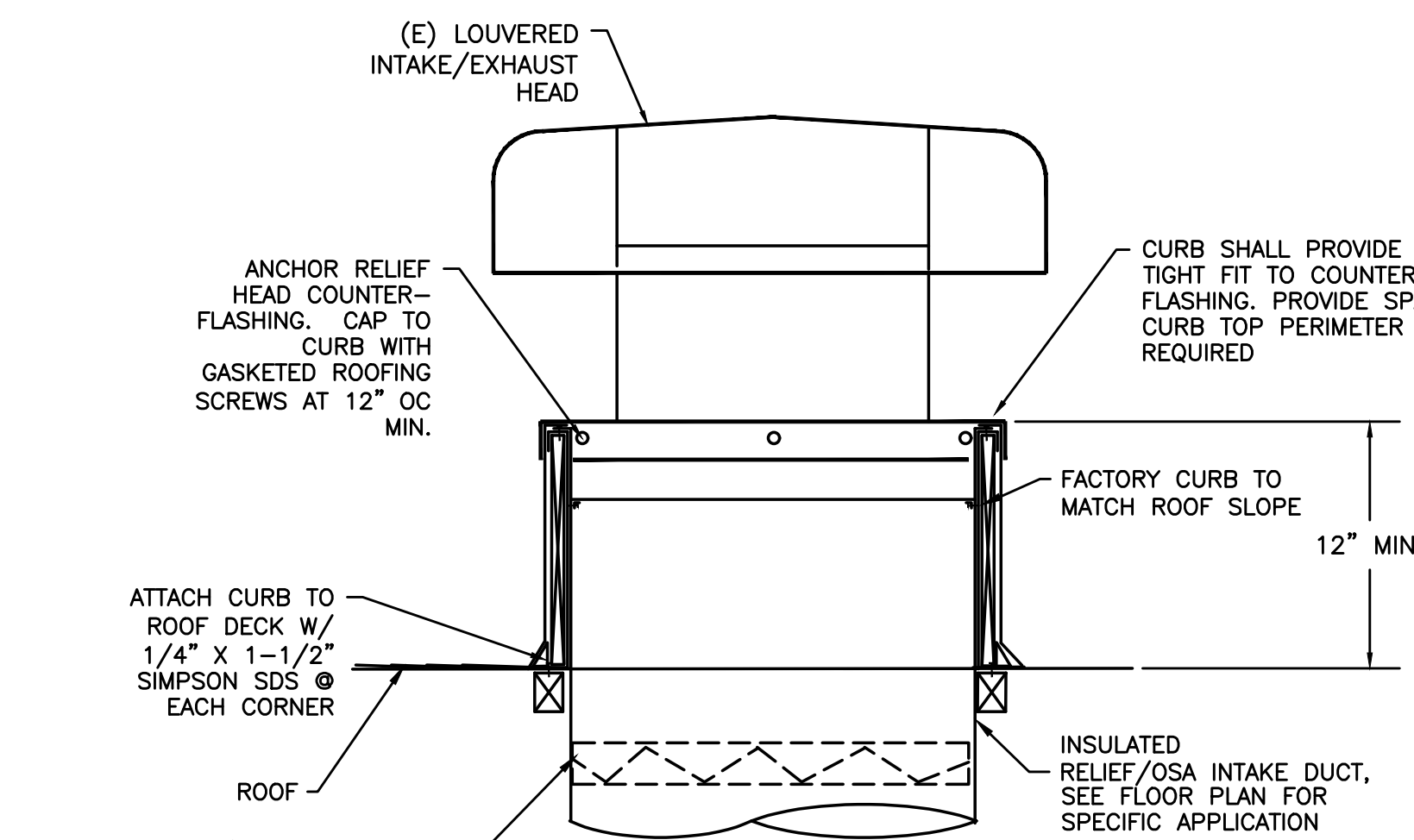
RTU INSTALLATION DETAIL

SCALE: DETAIL



VAV TERMINAL UNIT

SCALE: DETAIL



INTAKE/RELIEF HEAD

SCALE: DETAIL

VAV BOXES WITH ELECTRIC HEAT

MARK NO.	TYPE	MAX COOLING CFM	20% OF COOLING CFM	MIN VENTILATION CFM	MIN 300 CFM	MAXIMUM DEADBAND CFM	MAXIMUM HEATING CFM 50% or VENT	INLET IN.	OUTLET IN.	SA INLET TEMP DEG. F	SA TEMP AT HEATING DEG. F	REHEAT COIL LOAD MBH	ELEC COIL INPUT KW	CONTROLS TYPE	MAX. STATIC LOSS *	MAX. DISCHARGE SOUND POWER LEVEL **	MAX. RADIATED SOUND POWER LEVEL **	CONTROL TYPE
VAV-1	VAV	250	50	34	125	125	125	6	12X8	55	110	7.4	2.18	SCR	0.75	67	59	DDC
VAV-2	VAV	300	60	87	150	150	150	6	12X8	55	110	8.9	2.61	SCR	0.75	67	59	DDC
VAV-3	VAV	1110	222	65	0	222	555	12	16X15	55	90	21.0	6.15	SCR	0.75	67	59	DDC
VAV-4	VAV	120	24	14	60	60	60	4	12X8	55	90	2.3	0.66	SCR	0.75	67	59	DDC
VAV-5	VAV	200	40	15	100	100	100	6	12X8	55	90	3.8	1.11	SCR	0.75	67	59	DDC
TOTAL		1980				657	990					43.4						

* - INCLUDING COIL, SOUND ATTENUATOR SECTION & VAV BOX

** - THIRD OCTAVE CERTIFIED RATING IN ACCORDANCE WITH ARI STANDARD 880-94

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Elementary School
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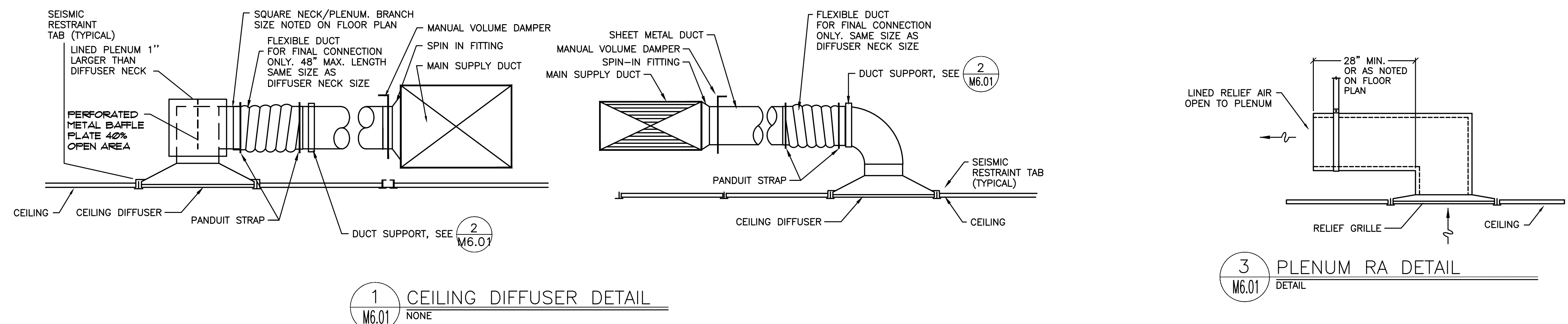
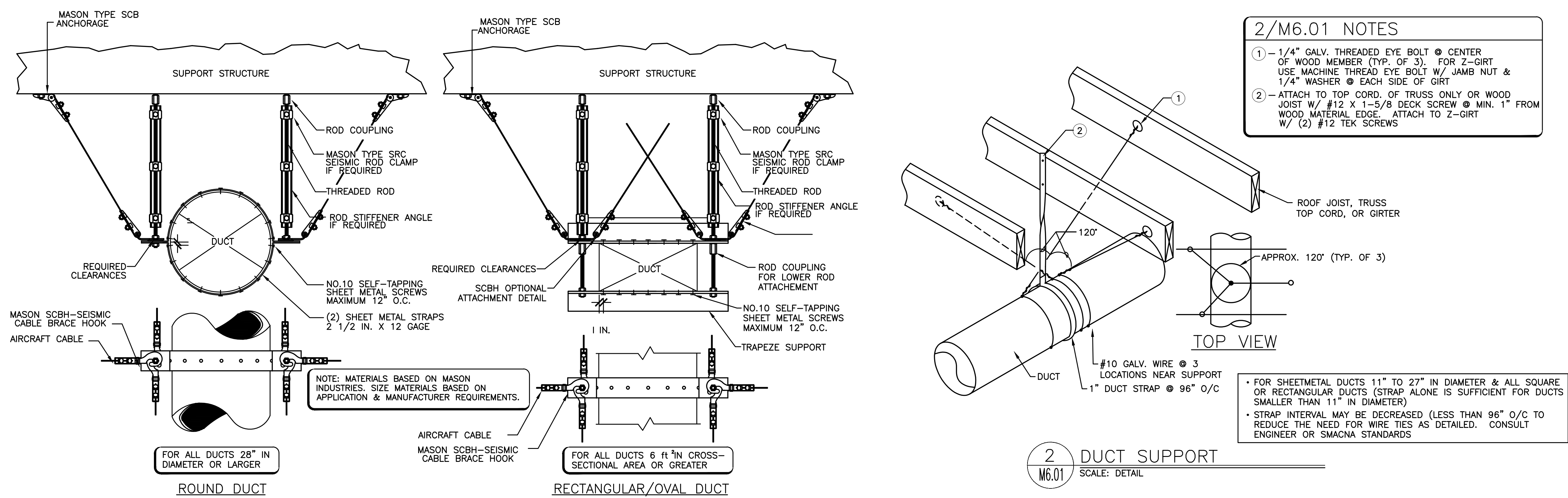
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MECHANICAL LEGENDS
AND SCHEDULES

M600.B



VENTILATION AIR SCHEDULE RTU-1												
ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD	NUMBER OF FIXTURES	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT	OUTSIDE AIR REQUIREMENT	OUTSIDE AIR REQUIRED (CFM)		ZONE	SUPPLY	PRIMARY	RETURN
	(#/1000 SQ. FT.)	(PLUMBING)	(CFM/P)	(CFM/SQ. FT.)	(CFM/FIXT) *				OSA (CFM)	AIR (CFM)	OSA FRACTION	AIR (CFM)
	Az			Pz	Rp	Ra	Vbz	Ez	Voz	Vpz	Zp	
B104 PRINCIPAL	160	5		1	5	0.06	15	1.0	15	200	0.07	200
B103 CONFERENCE	275	50		14	5	0.06	87	1.0	87	300	0.29	300
B105 HEALTH	150	5		1	5	0.06	14	1.0	14	120	0.12	120
B107 WORK ROOM	400	5		2	5	0.06	34	1.0	34	250	0.14	250
A102 RECEPTION ADMIN (INT)	575	10		6	5	0.06	65	1.0	65	1110	0.06	1110
B106 TOILET	65	0	1	0	50		0			0		0
TOTAL	1645			24			214		214	1980		1980
									Vou	Vps		
CORRECTED TOTAL OUTDOOR AIR FLOW RATE											225	CFM

VENTILATION AIR SCHEDULE - EXISTING UNIT												
ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD	NUMBER OF FIXTURES	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT	OUTSIDE AIR REQUIREMENT	OUTSIDE AIR REQUIRED (CFM)		ZONE	SUPPLY	PRIMARY	RETURN
	(#/1000 SQ. FT.)	(PLUMBING)	(CFM/P)	(CFM/SQ. FT.)	(CFM/FIXT) *				OSA (CFM)	AIR (CFM)	OSA FRACTION	AIR (CFM)
	Az			Pz	Rp	Ra	Vbz	Ez	Voz	Vpz	Zp	
B100 VESIBULE	220	0		0	0	0.06	13	1.0	13	350	0.04	0
B101 LOBBY	440	30		14	5	0.06	96	1.0	96	700	0.14	700
B111 COUNSELING	135	5		1	5	0.06	13	1.0	13	100	0.13	100
B112 OFFICE	105	5		1	5	0.06	11	1.0	11	100	0.11	100
B 109 CLASSROOM	860	25		22	10	0.12	323	1.0	323	750	0.43	750
TOTAL	1760			38			457		457	2000		950
									Vou	Vps		
CORRECTED TOTAL OUTDOOR AIR FLOW RATE											387	CFM

MAR K DATE DESCRIPTION

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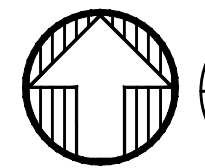
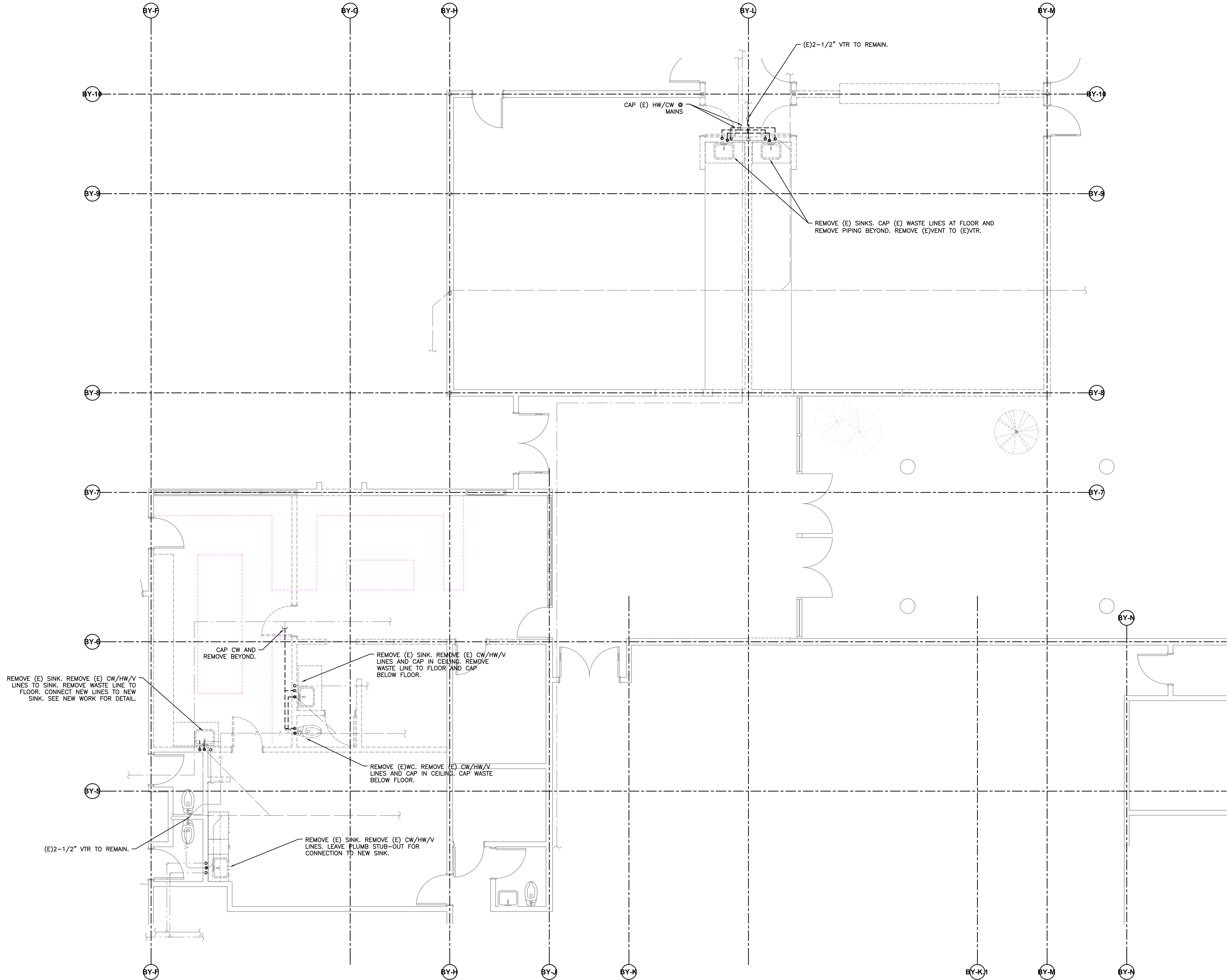
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MECHANICAL LEGENDS AND SCHEDULES

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P111.B

PLUMBING DEMO PLAN - BYROM ES
SCALE: 1/4" = 0'

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Elementary School
21800 S.W. 91st Ave
Tualatin, Oregon 97062

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1 PLUMBING PLAN - BYROM ES
P121.B SCALE: 1/4" = 0'

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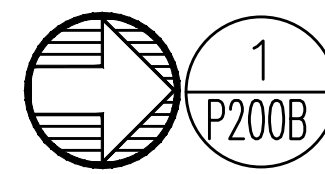
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6



1 OVERALL PLUMBING PLAN
P200B SCALE:1/4"=0'

KEYED NOTES:
1. NEW FLOOR AND WAISTCOTING TILES TO BE INSTALLED. REMOVE (E) WATER CLOSET FOR THE TILE WORK AND RE-INSTALL (E) FIXTURE.

6

5

4

3

2

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OVERALL PLUMBING PLAN

P200B