

VENTILATION AIR COMPLIANCE: AHU - 1, 2, 3, & 4

UNIT TAG	ZONE NUMBER	SPACE TYPE	USE AREA (SQ. FT.)	ZONE POPULATION	PEOPLE OA RATE - CFM / PERSON	AREA OA RATE - CFM / SF	ZONE DISTRIBUTION EFFECTIVENESS	OS AIRFLOW TO ZONE REQ'D	PRIMARY ZONE CFM	PRIMARY OS FRACTION	SYSTEM POPULATION	OCCUPANT DIVERSITY	UNCORRECTED OS CFM	SYSTEM VENTILATION EFFICIENCY	MINIMUM OA - CFM	TOTAL OA FOR UNIT - CFM
AHU-1	TU-1.101	Office	296	8	5	0.06	0.8	58	345	17%	88	100.0%	798	77.1%	1036	1050
	TU-1.102	Office	236	6	5	0.06	0.8	48	280	17%						
	TU-1.103	Office	379	8	5	0.06	0.8	63	825	8%						
	TU-1.104	Office	493	4	5	0.06	0.8	50	600	8%						
	TU-1.105	Office	470	2	5	0.06	0.8	38	255	15%						
	TU-1.106	Office	520	8	5	0.06	0.8	71	925	8%						
	TU-1.107	Waiting/Break	678	1	5	0.06	0.8	46	550	8%						
	TU-1.108	Office	391	4	5	0.06	0.8	43	510	9%						
	TU-1.109	Conference	432	22	5	0.06	0.8	136	770	18%						
	TU-1.110	Break	446	9	5	0.06	0.8	77	880	9%						
	TU-1.111	Office	565	8	5	0.06	0.8	74	910	8%						
	TU-1.112	Office	918	8	5	0.06	0.8	95	1150	8%						
AHU-2	TU-2.101	Office	557	11	5	0.06	0.8	88	760	12%						
	TU-2.102	Office	608	3	5	0.06	0.8	61	580	11%						
	TU-2.103	Office	183	2	5	0.06	0.8	21	200	10%						
	TU-2.104	Office	377	6	5	0.06	0.8	53	450	12%						
	TU-2.105	Office	313	4	5	0.06	0.8	39	230	17%						
	TU-2.106	Office	166	2	5	0.06	0.8	20	110	18%						
	TU-2.107	Corridor	672	0	--	0.06	0.8	51	500	10%						
	TU-2.108	Office	489	10	5	0.06	0.8	79	570	14%						
	TU-2.109	Office	737	8	5	0.06	0.8	90	750	12%						
	TU-2.110	Office	179	2	5	0.06	0.8	21	200	10%						
	TU-2.111	Office	1267	11	5	0.06	0.8	131	905	14%						
	TU-2.112	Office	202	4	5	0.06	0.8	32	225	14%						
	TU-2.113	Office	286	4	5	0.06	0.8	37	290	13%						
	TU-2.114	Corridor	653	0	--	0.06	0.8	39	400	10%						
TU-2.114	Corridor	672	0	--	0.06	0.8	51	500	10%							
AHU-3	TU-3.201	Office	479	8	5	0.06	0.8	69	635	11%						
	TU-3.202	Office	747	6	5	0.06	0.8	75	670	11%						
	TU-3.203	Classroom	714	30	10	0.12	0.8	386	1060	36%						
	TU-3.204	Office	382	4	5	0.06	0.8	44	320	14%						
	TU-3.205	Office	382	6	5	0.06	0.8	54	1045	5%						
	TU-3.206	Office	244	4	5	0.06	0.8	35	565	6%						
	TU-3.207	Office/Conference	196	6	5	0.06	0.8	42	220	19%						
	TU-3.208	Conference	216	12	5	0.06	0.8	73	400	18%						
	TU-3.209	Office	395	6	5	0.06	0.8	54	750	7%						
	TU-3.210	Office	322	6	5	0.06	0.8	49	850	6%						
	TU-3.211	Office	120	2	5	0.06	0.8	17	115	15%						
	TU-3.212	Office/Reception	299	6	5	0.06	0.8	48	345	14%						
	TU-3.213	Corridor	1810	0	5	0.06	0.8	105	740	14%						
	AHU-4	TU-4.201	Conference	351	18	5	0.06	0.8	109	560	19%					
TU-4.202		Classroom	563	25	10	0.12	0.8	318	1100	29%						
TU-4.203		Classroom	535	25	10	0.12	0.8	314	790	40%						
TU-4.204		Corridor	714	0	--	0.06	0.8	47	510	9%						
TU-4.205		Classroom	1114	45	10	0.12	0.8	584	1600	36%						
TU-4.206		Classroom	1114	45	10	0.12	0.8	584	1600	36%						
TU-4.207		Lobby-Office	993	12	5	0.06	0.8	120	945	13%						
TU-4.208		Office	330	6	5	0.06	0.8	53	305	17%						
TU-4.209		Office	395	5	5	0.06	0.8	49	325	15%						
TU-4.210		Office	395	5	5	0.06	0.8	49	320	15%						
TU-4.211		Office	715	8	5	0.06	0.8	87	630	14%						
TU-4.212	Office/Reception	252	8	5	0.06	0.8	55	355	16%							

NOTES:
REQUIREMENTS REFERENCED FROM ASHRAE STANDARD 62.1-2007

VENTILATION AIR COMPLIANCE: HRU-1

UNIT TAG	ROOM NUMBER	SPACE TYPE	USE AREA (SQ. FT.)	ZONE POPULATION	PEOPLE OA RATE - CFM / PERSON	AREA OA RATE - CFM / SF	ZONE DISTRIBUTION EFFECTIVENESS	OS AIRFLOW TO ZONE REQ'D	PRIMARY ROOM CFM	PRIMARY OS FRACTION	SYSTEM POPULATION	OCCUPANT DIVERSITY	UNCORRECTED OS CFM	SYSTEM VENTILATION EFFICIENCY	MINIMUM OA - CFM	TOTAL OA FOR UNIT - CFM
HRU-1	137	Women's Restroom 137	266	0	--	--	1.0	460	460	100%	0	100.0%	1800	0.0%	1800	1800
	127	Men's Restroom 127	298	0	--	--	1.0	510	510	100%						
	206	Women's Restroom 206	240	0	--	--	1.0	400	400	100%						
	219	Men's Restroom 219	243	0	--	--	1.0	400	400	100%						

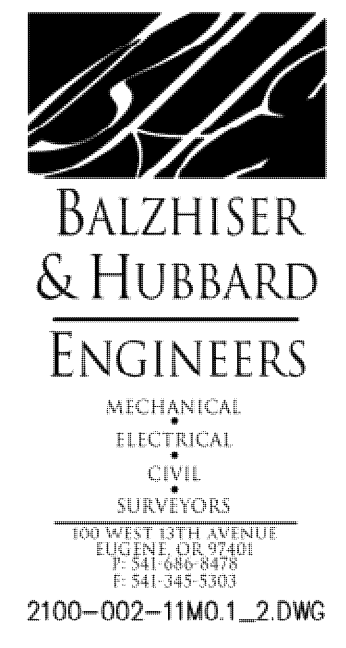
NOTES:
REQUIREMENTS REFERENCED FROM ASHRAE STANDARD 62.1-2007
SPACE VENTILATION DRIVEN BY EXHAUST REQUIREMENTS

MECHANICAL SYMBOLS LIST

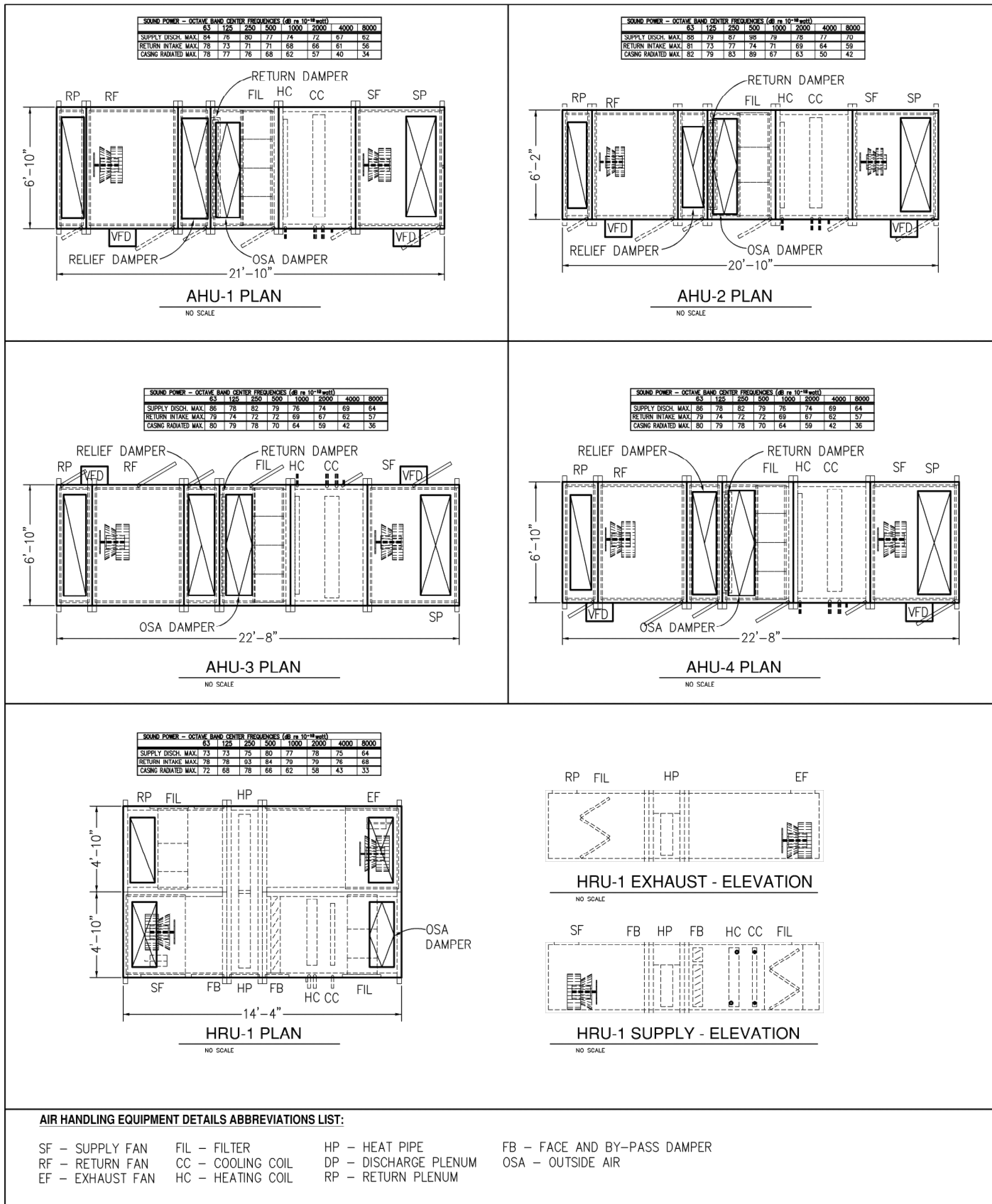
SYMBOL	ABBR.	DESCRIPTION	SYMBOL	ABBR.	DESCRIPTION
		DIRECTION OF AIR FLOW		TU	TERMINAL UNIT
		SUPPLY DUCT UP AND DOWN		EF	EXHAUST FAN
		RETURN DUCT UP AND DOWN		SF	SUPPLY FAN
		EXHAUST DUCT UP AND DOWN		RF	RETURN FAN
		OUTSIDE AIR DUCT UP AND DOWN		HC	HEATING COIL
		RECTANGULAR DUCT - 1ST DIMENSION IS SIDE SHOWN		CC	COOLING COIL
		ROUND DUCT		SU	SUPPLY UNIT
		OVAL DUCT		OA	OUTSIDE AIR
		FLEXIBLE DUCT		SA	SUPPLY AIR
		FLEXIBLE DUCT CONNECTOR		RA	RETURN AIR
		DUCT WITH INTERNAL LINER		EA	EXHAUST AIR
		DUCT DROP/RISE		OSAL	OUTSIDE AIR LOUVER
		DUCT TO BE REMOVED		RAL	RELIEF AIR LOUVER
		MANUAL DAMPER		EAL	EXHAUST AIR LOUVER
		AUTOMATIC DAMPER		SDC	SUPPLY DIFFUSER CEILING
		OPPOSED BLADE DAMPER		SGC	SUPPLY GRILLE CEILING
		STATIC PRESSURE SENSOR		SGW	SUPPLY GRILLE WALL
	AHU	AIR HANDLING UNIT		RGW	RETURN GRILLE CEILING
	ACU	AIR CONDITIONING UNIT		RGW	RETURN GRILLE WALL
		AIR FLOW MEASURING STATION		ECC	EXHAUST GRILLE CEILING
		AIR FLOW (CFM) - TYPE / NECK SIZE - PATTERN		EGW	EXHAUST GRILLE WALL
		ROOM SENSOR W/UNIT CONTROLLED		AFF	ABOVE FINISHED FLOOR
		ROOM THERMOSTAT W/UNIT CONTROLLED		AD	ACCESS DOOR
	DSD	DUCT SMOKE DETECTOR			ROOM NUMBER
	FIL	FILTER			DETAIL & SHEET NUMBER
					KEYED NOTE REFERENCE
					POINT OF CONNECTION BETWEEN NEW & EXISTING WORK

HVAC SHEET INDEX

SHEET NO.	SHEET TITLE
M0.1	HVAC SYMBOLS, SCHEDULES AND SHEET INDEX
M0.2	HVAC SCHEDULES & AHU DETAILS
M0.3	HVAC SCHEDULES
M3.1	BASEMENT PLAN - WEST - HVAC
M3.2	BASEMENT PLAN - EAST - HVAC
M3.3	FIRST FLOOR PLAN - WEST - HVAC
M3.4	FIRST FLOOR PLAN - EAST - HVAC
M3.5	SECOND FLOOR PLAN - WEST - HVAC
M3.6	SECOND FLOOR PLAN - EAST - HVAC
M3.7	ATTIC FLOOR PLAN - HVAC
M3.8	MECH ROOM FLOOR PLAN - MECHANICAL
M3.9	ROOF PLAN - MECHANICAL
M4.1	SECTIONS
M5.1	DETAILS - HVAC



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 C. MARK PENROD
 EXP. 12/31/12
 HVAC SYMBOLS, SCHEDULES AND SHEET INDEX
 SCALE: AS NOTED 11-15-11
 M0.1



AIR HANDLING EQUIPMENT DETAILS ABBREVIATIONS LIST:

- SF - SUPPLY FAN
- RF - RETURN FAN
- EF - EXHAUST FAN
- FIL - FILTER
- CC - COOLING COIL
- HC - HEATING COIL
- HP - HEAT PIPE
- DP - DISCHARGE PLENUM
- RP - RETURN PLENUM
- FB - FACE AND BY-PASS DAMPER
- OSA - OUTSIDE AIR

1 AHU DETAILS
NO SCALE

HEAT RECOVERY UNITS

GENERAL	TAG	HRU-1
	TYPE	MODULAR
	MODEL NO.	CAH013
	LOCATION	MECHANICAL LOFT
	SERVICE	TOILET ROOMS/EXHAUSTS
SUPPLY FAN [B]	CFM	1,000
	ESP (IN. W.G.)	0.75
	TSP (IN. W.G.)	1.7
	FAN WHEEL TYPE	PLENUM - 15
	FAN RPM	1775
	FAN BHP	0.75
	MIN. FAN EFFICIENCY	63.4%
	MOTOR HP	1.5
	VOLT / PHASE	208 / 3
EXHAUST FAN [B]	CFM - PRIMARY (OUTLET)	4,000
	ESP (IN. W.G.)	1.00
	TSP (IN. W.G.)	2.43
	FAN WHEEL TYPE	PLENUM - 16.5
	FAN RPM	2065
	FAN BHP	2.3
	MIN. FAN EFFICIENCY	60.5%
	MOTOR HP	3
	VOLT / PHASE	208 / 3
COOLING COIL	FACE VELOCITY (FPM)	192
	ROWS / FPI	4 / 8
	EAT (DB / WB) - LAT (DB / WB)	(80 / 65) - (60 / 54)
	TOTAL CLG (MBH)	62.4
	SENSIBLE CLG (MBH)	58.3
	EW / LWT	42 / 57
	GPM	8.3
	MAX APD (IN. W.G.)	0.15
	MAX WPD (FT)	5.0
	CONTROL VALVE	2-WAY
HEATING COIL	FACE VELOCITY (FPM)	102
	ROWS / FPI	1 / 10
	EAT (DB) / LAT (DB)	20 / 80
	HEATING (MBH)	116.6
	EW / LWT	160 / 135
	GPM	9.3
	MAX APD (IN. W.G.)	0.15
	MAX WPD (FT)	5.0
	CONTROL VALVE	3 - WAY
HEAT PIPE	SUPPLY FACE VELOCITY (FPM)	205
	EXHAUST FACE VELOCITY (FPM)	386
	ROWS / FPI	5 / 11
	EAT (DEG F) db/wb	20 / 19
	LAT (DEG F) db/wb	59.5 / 42.5
	SP (IN. W.G.)	0.12
	EAT (DEG F) db/wb	70 / 64
	LAT (DEG F) db/wb	40.3 / 40.3
	SP (IN. W.G.)	0.35
	EFFECTIVENESS	79%
COOLING MODE	EAT (DEG F) db/wb	100 / 68
	LAT (DEG F) db/wb	90 / 65
	SP (IN. W.G.)	0.13
	EAT (DEG F) db/wb	75 / 59.5
	LAT (DEG F) db/wb	85 / 63.5
	SP (IN. W.G.)	0.36
	EFFECTIVENESS	39%
EXHAUST FILTER	BANK FACE AREA (SQ. FT.)	26.4
	VELOCITY (FPM)	152
	EFFICIENCY (%) / (MERV)	30% / MERV 7
	CHANGE OUT APD (IN. W.G.)	0.50
SUPPLY FILTER	BANK FACE AREA (SQ. FT.)	26.4
	VELOCITY (FPM)	100
	EFFICIENCY (%) / (MERV)	30% / MERV 7
	CHANGE OUT APD (IN. W.G.)	0.50
	MIN OSA CFM / %	1800 / 100%
	APPROXIMATE UNIT WEIGHT (LBS)	5,500

NOTES:
TEMPERATURES ARE DEGREES F.
BASIS OF DESIGN: MCQUAY
[A] ESP = EXTERNAL STATIC PRESSURE. DUCT LOSS BEYOND THE DUCT CONNECTION AT FAN OR UNIT.
[B] AHU SELECTION CRITERIA AT 1900 FOOT ELEVATION.
[C] FOR COIL PIPING, SEE DETAILS 2 & 3/P5.1.
[D] FOR AHU LAYOUTS, SEE DETAIL 1/M0.2.

AIR HANDLING UNITS

GENERAL	TAG	AHU-1	AHU-2	AHU-3	AHU-4
	MODEL NO.	CAH020	CAH016	CAH020	CAH021
	LOCATION	MECHANICAL LOFT	MECHANICAL LOFT	MECHANICAL LOFT	MECHANICAL LOFT
	SERVICE	FIRST FLOOR - SOUTH	FIRST FLOOR - NORTH	SECOND FLOOR - SOUTH	SECOND FLOOR - NORTH
	UNIT TYPE	INDOOR MODULAR	INDOOR MODULAR	INDOOR MODULAR	INDOOR MODULAR
SUPPLY FAN [C]	CFM	8,000	6,500	8,500	9,000
	ESP (IN. W.G.) - [A]	1.75	1.75	1.75	1.8
	TSP (IN. W.G.) - [B]	3.09	2.77	2.98	3.1
	FAN WHEEL TYPE - SIZE	PL-22	PL-22.5	PL-24.5	PL-24.5
	FAN RPM	1750	1750	1750	1750.0
	FAN BHP	6.1	4.59	6.7	7.1
	FAN EFFICIENCY	63.8%	61.7%	59.5%	60.7%
	MOTOR HP	7.5	7-1/2	7.5	10.0
	VOLT	208	208	208	208
	PHASE	3	3	3	3
	VFD BY SECTION 23 73 00	YES	YES	YES	YES
RETURN FAN [C]	CFM	7,000	5,500	8,000	8,100
	ESP (IN. W.G.) - [A]	0.75	0.75	0.75	0.75
	TSP (IN. W.G.) - [B]	1.00	0.87	0.87	0.87
	FAN WHEEL TYPE - SIZE	PL-24.5	PL-20	PL-24.5	PL-24.5
	FAN RPM	1,160	1,750	1,160	1,160
	FAN BHP	2.34	1.86	2.31	2.34
	MIN. FAN EFFICIENCY	47.1%	40.5%	47.4%	47.4%
	MOTOR HP	3	3	5	5
	VOLT	208	208	208	208
	PHASE	3	3	3	3
	VFD BY SECTION 23 73 00	YES	YES	YES	YES
COOLING COIL	FACE VELOCITY (FPM)	428	426	455	447
	ROWS / FPF	5 / 11	5 / 11	6 / 10	6 / 10
	EAT (DB / WB) - LAT (DB / WB)	(79.3 / 61.5) - (53.0 / 50.5)	(80.3 / 62.9) - (52.8 / 50.8)	(80.5 / 62.5) - (52.5 / 49.5)	(83.5 / 64.3) - (52.7 / 50.7)
	TOTAL CLG (MBH)	249.1	225.2	313.7	358
	SENSIBLE CLG (MBH)	227.2	193.1	257	290.4
	EW / LWT	42 / 58	42 / 58	42 / 58	42 / 58
	GPM	31	28.5	39	45.0
	MAX APD (IN. W.G.)	0.41	0.28	0.54	0.53
	MAX WPD (FT)	7.5	7.5	7.5	12.50
	CONTROL VALVE	2 - WAY	2 - WAY	2 - WAY	3 - WAY
HEATING COIL	CFM	6,000	4,675	6,375	6,700
	FACE VELOCITY (FPM)	436	448	464	445
	ROWS / FPF	1 / 7	1 / 8	1 / 8	1 / 10
	EAT (DB) / LAT (DB)	50 / 65	50 / 65	50 / 65	45 / 65
	HEATING (MBH)	97.2	79	103.3	145.8
	EW / LWT	160 / 130	160 / 130	160 / 130	160 / 130
	GPM	6.5	5.25	6.9	9.8
	MAX APD (IN. W.G.) [D]	0.15	0.15	0.15	0.2
	MAX WPD (FT)	2.5	2.5	2.5	2.5
	CONTROL VALVE	2 - WAY	2 - WAY	2 - WAY	3 - WAY
PRE-FILTER	BANK FACE AREA (SQ. FT.)	38.0	34.3	38.0	38.0
	VELOCITY (FPM)	211	189	224	237.0
	EFFICIENCY (%) / (MERV)	30% / MERV 7	30% / MERV 7	30% / MERV 7	30% / MERV 7
	CHANGE OUT APD (IN. W.G.)	0.50	0.50	0.50	0.50
	MIN OSA CFM / %	1050 / 13%	1110 / 17%	1550 / 18%	2775 / 30%
	APPROXIMATE UNIT WEIGHT (LBS)	6,000	4,200	6,100	6,150

NOTES:
TEMPERATURES ARE DEGREES F.
BASIS OF DESIGN: MCQUAY
[A] EXTERNAL STATIC PRESSURE (ESP) IS DUCT LOSS BEYOND THE DUCT CONNECTION AT FAN OR UNIT.
[B] TOTAL STATIC PRESSURE (TSP) IS (ESP) PLUS CABINET COMPONENT LOSSES.
[C] AHU SELECTION CRITERIA AT 1900 FOOT ELEVATION.
[D] PRESSURE DROP AT FULL COOLING AIRFLOW.
[E] FOR COIL PIPING, SEE DETAIL 2/P5.1.
[F] FOR AHU LAYOUTS, SEE DETAIL 1/M0.2.

UNIT HEATERS

TAG	MODEL NO.	LOCATION	TYPE	CFM	CAPACITY		MOTOR			APPROX WEIGHT (LBS)	REMARKS	
					MBH	GPM	HP	RPM- Hi Speed	VOLT	PHASE		
UH-1	UHH-18	STORAGE 301	HORIZONTAL	400	10.3	1.0	1/30	1550	115	1	18	--
UH-2	UHH-18	STORAGE 303	HORIZONTAL	400	10.3	1.0	1/30	1550	115	1	18	--

NOTES:
BASIS OF DESIGN: TRANE.
CAPACITY BASED ON ENTERING AIR TEMP OF 60 DEGREES F.
ENTERING WATER TEMPERATURE 160 DEGREES F.

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SOU - CHURCHILL HALL RENOVATION ASHLAND, OREGON

M0.2

SCALE: AS NOTED 11-15-11

HVAC SCHEDULES AND AHU DETAILS

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LOUVERED PENTHOUSES						
TAG	SERVICE	CFM	MAXIMUM THROAT VELOCITY (FPM)	MAXIMUM APD	THROAT SIZE (IN.)	LOUVER HEIGHT (IN.)
LP-1	AHU-1 / AHU-3 OSA	16000	500	0.05	60x80	38.5
LP-2	AHU-2 / AHU-4 / HRU-1 OSA	17000	500	0.05	60x80	38.5
LP-3	AHU-1 / AHU-3 EA	14000	550	0.05	58x70	38.5
LP-4	AHU-2 / AHU-4 / HRU-1 EA	15000	550	0.05	58x70	38.5

NOTES:
BASIS OF DESIGN: GREENHECK.

FANS			
TAG	EF-1	EF-2	EF-3
MODEL NO.	BDF-90-4	CSP-B150	BDF-120-5
LOCATION	MECHANICAL ROOM	MECHANICAL LOFT	MECHANICAL ROOM
SERVICE	MECHANICAL ROOM	STORAGE VENTILATION	MECHANICAL ROOM
CFM	1000	100	2100
TYPE	BELT DRIVE DUCT FAN	INLINE CABINET FAN	BELT DRIVE DUCT FAN
SONES	8.5	0.7	7.9
TSP (IN. W.G.)	0.5	0.5	0.5
RPM	807	818	633
O.V. (FPM)	--	--	--
EFF. %	--	--	--
BHP	--	--	--
MOTOR	HP	1/4	3/4
	RPM	1725	1725
	VOLTS	115	208
	PHASE	1	1
APPROX WEIGHT (LBS)	82	12	135
REMARKS	--	SPEED CONTROL	--

NOTES:
BASIS OF DESIGN: GREENHECK.

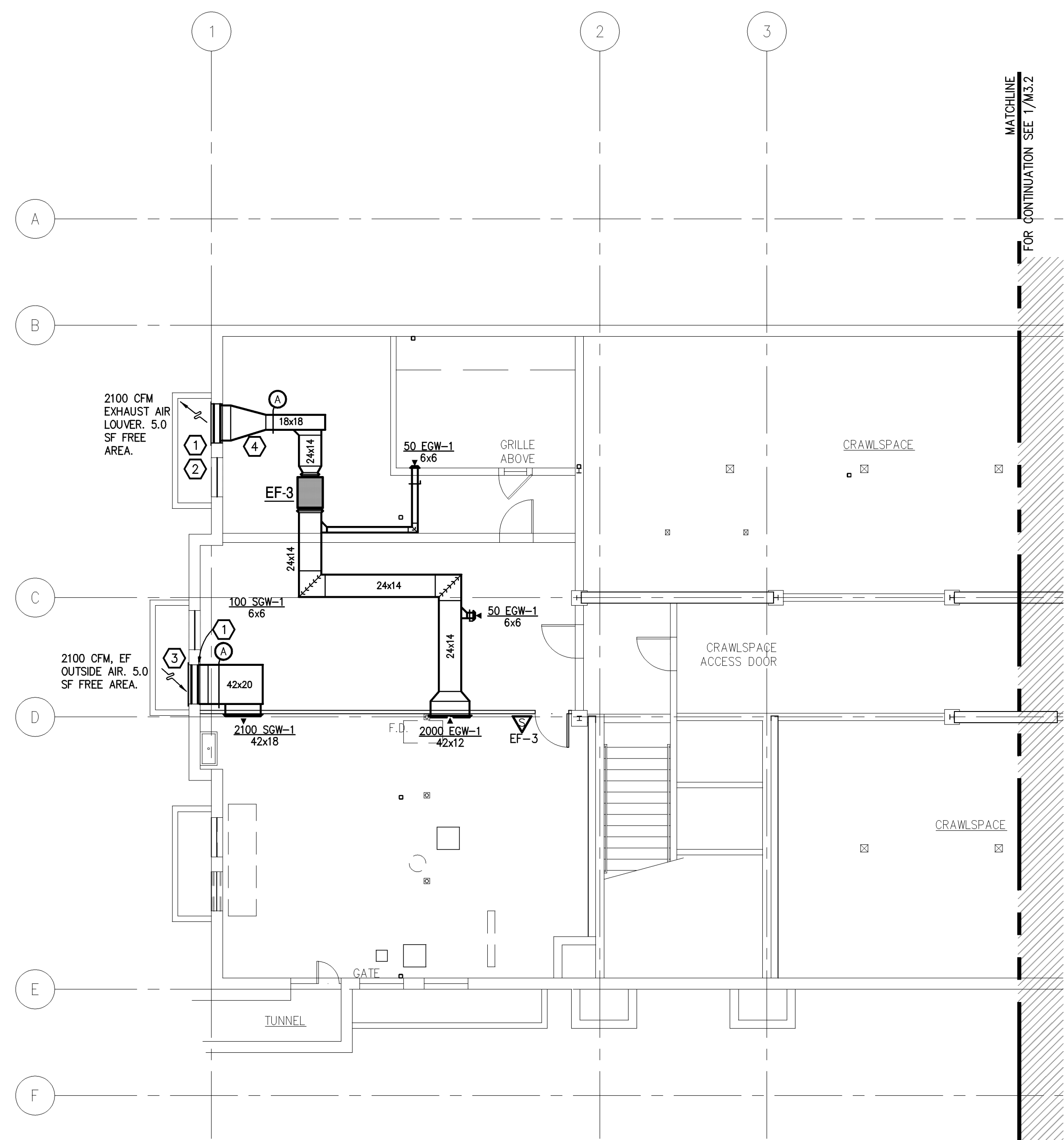
TERMINAL UNITS																			
TAG	MODEL [A]	INLET SIZE (IN)	TOTAL MAX APD [B]	PRIMARY AIR & HEATING COIL										MAX NOISE CRITERIA (NC)		OCCUPANCY SENSOR CONTROL	REMARKS		
				MAX COOLING CFM	MIN CFM (HEATING)	EAT	LAT	MBH	GPM	ROWS	MAX WPD (FT)	CONTROL VALVE		DISCH.	RAD				
												2-WAY	3-WAY						
TU-1.101	SDV	6	0.2	345	180	55	80	4.9	0.50	1	2.50	X		24	20	X			
TU-1.102	SDV	6	0.14	280	145	55	80	3.9	0.50	1	2.50	X		25	<20	X			
TU-1.103	SDV	9	0.17	825	195	55	85	6.3	0.50	1	2.50		X	24	20	X			
TU-1.104	SDV	8	0.16	600	195	55	80	5.3	0.50	1	2.50	X		24	21				
TU-1.105	SDV	6	0.12	255	185	55	80	5.0	0.50	1	2.50	X		25	<20	X			
TU-1.106	SDV	10	0.2	925	220	55	85	7.1	0.50	1	2.50	X		25	21	X			
TU-1.107	SDV	8	0.14	550	270	55	80	7.3	0.50	1	2.50	X		23	<20				
TU-1.108	SDV	8	0.12	510	155	55	80	4.2	0.50	1	2.50	X		23	<20	X			
TU-1.109	SDV	9	0.24	770	420	55	80	11.3	2.00	1	2.50	X		23	24	X			
TU-1.110	SDV	9	0.19	880	255	55	80	6.9	0.50	1	2.50	X		25	20	X			
TU-1.111	SDV	10	0.2	910	230	55	85	7.5	0.50	1	2.50	X		25	20	X			
TU-1.112	SDV	12	0.25	1150	365	55	80	9.9	0.75	1	2.50		X	25	21	X			
TU-2.101	SDV	8	0.23	760	220	55	85	7.1	0.75	1	2.50	X		23	24	X			
TU-2.102	SDV	8	0.19	680	240	55	80	6.5	0.50	1	2.50	X		23	20				
TU-2.103	SDV	5	0.05	200	70	55	85	2.3	0.50	1	2.50	X		25	<20	X			
TU-2.104	SDV	7	0.14	450	150	55	85	4.9	0.50	1	2.50		X	28	24	X			
TU-2.105	SDV	5	0.06	230	125	55	80	3.4	0.50	1	2.50	X		26	<20	X			
TU-2.106	SDV	5	0.02	110	65	55	80	1.8	0.50	1	2.50	X		21	<20	X			
TU-2.107	SDV	7	0.12	500	350	55	80	9.5	0.50	1	2.50		X	25	20				
TU-2.108	SDV	8	0.14	570	195	55	85	6.3	0.50	1	2.50	X		23	20	X			
TU-2.109	SDV	9	0.23	750	290	55	80	7.8	1.50	1	2.50	X		23	24	X			
TU-2.110	SDV	5	0.05	200	70	55	85	2.3	0.50	1	2.50	X		25	<20	X			
TU-2.111	SDV	10	0.17	905	505	55	80	13.6	2.00	1	2.50	X		25	21				
TU-2.112	SDV	5	0.09	225	80	55	85	2.6	0.50	1	2.50		X	25	<20	X			
TU-2.113	SDV	6	0.15	290	110	55	80	3.0	0.50	1	2.50	X		26	<20	X			
TU-2.114	SDV	7	0.26	400	260	55	80	7.0	1.00	1	2.50	X		26	22				
TU-2.115	SDV	7	0.12	500	350	55	80	9.5	0.50	1	2.50	X		25	20				
TU-3.201	SDV	8	0.17	635	190	55	85	6.2	0.50	1	2.50	X		24	21	X			
TU-3.202	SDV	8	0.22	670	295	55	85	9.6	0.75	1	2.50		X	24	22	X			
TU-3.203	SDV	12	0.15	1060	960	55	80	25.9	1.50	2	2.50	X		24	21	X			
TU-3.204	SDV	6	0.17	320	155	55	80	4.2	0.50	1	2.50	X		23	<20	X			
TU-3.205	SDV	10	0.25	1045	225	55	85	7.3	0.50	1	2.50	X		24	21	X			
TU-3.206	SDV	8	0.14	565	135	55	85	4.4	0.50	1	2.50	X		23	20	X			
TU-3.207	SDV	5	0.05	220	110	55	80	3.0	0.50	1	2.50	X		25	<20	X			
TU-3.208	SDV	7	0.26	400	180	55	80	4.9	0.50	1	2.50	X		26	22	X			
TU-3.209	SDV	9	0.23	750	155	55	85	5.0	0.50	1	2.50	X		23	24	X			
TU-3.210	SDV	10	0.18	850	170	55	85	5.5	0.50	1	2.50	X		24	20	X			
TU-3.211	SDV	5	0.02	115	65	55	85	2.1	0.50	1	2.50	X		22	<20	X			
TU-3.212	SDV	8	0.2	345	115	55	85	3.7	0.50	1	2.50	X		24	20	X			
TU-3.213	SDV	8	0.17	740	430	55	80	11.6	2.00	1	2.50	X		24	21				
TU-4.201	SDV	8	0.17	960	270	55	85	8.7	0.75	1	2.50	X		23	20	X			
TU-4.202	SDV	12	0.28	1100	790	55	85	25.6	1.50	2	2.50		X	24	21	X			
TU-4.203	SDV	9	0.28	790	785	55	85	25.4	1.50	2	2.50	X		24	20	X			
TU-4.204	SDV	8	0.12	510	285	55	80	7.7	0.75	1	2.50	X		23	<20				
TU-4.205	SDV	14	0.28	1600	1455	55	85	47.1	2.25	2	2.50		X	24	21	X			
TU-4.206	SDV	14	0.28	1600	1455	55	85	47.1	2.25	2	2.50		X	23	21	X			
TU-4.207	SDV	8	0.21	945	395	55	80	10.7	0.50	1	2.50	X		24	20				
TU-4.208	SDV	6	0.12	255	130	55	80	3.5	0.50	1	2.50	X		25	<20	X			
TU-4.209	SDV	6	0.17	325	155	55	85	5.0	0.50	1	2.50	X		24	<20	X			
TU-4.210	SDV	6	0.17	320	155	55	80	4.2	0.50	1	2.50	X		23	<20	X			
TU-4.211	SDV	8	0.17	630	285	55	85	9.2	1.50	1	2.50		X	24	21	X			
TU-4.212	SDV	6	0.21	355	150	55	80	4.1	0.50	1	2.50	X		25	20	X			

NOTES:
[A] BASIS OF DESIGN: PRICE.
[B] TOTAL APD IS TOTAL PRESSURE DROP ACROSS TERMINAL UNIT AND COIL.
COIL APD IS MAXIMUM ALLOWABLE COIL PRESSURE DROP.
160 DEGREE F ENTERING HEATING WATER TEMPERATURE.
MAXIMUM NOISE CRITERIA (NC) AT 1.25" INLET SP.

SPLIT SYSTEM AIR CONDITIONING UNITS																				
TAG	MODEL NO.	LOCATION	CFM (LO/HI)	INDOOR UNIT					OUTDOOR UNIT					EQUIPMENT SEER	REFRIGERANT PIPE SIZE (IN)					
				COOLING		ELECTRICAL			TAG	MODEL NO.	LOCATION	CAPACITY (MBH)	ELECTRICAL			APPROX WEIGHT (LBS)	RS	RL		
				MIN. CAPACITY (MBH)	TOTAL	FLA	VOLT	PHASE					MCA		VOLT				PHASE	
AC-1	PKA-A24HA	IT ROOM - FIRST FLOOR	570 / 700	19.0	15.0	1	208	1	45	CU-1	PUY-A24NHA	ROOF	24.0	16	208	1	165	17.0	5/8	3/8

NOTES:
BASIS OF DESIGN: MITSUBISHI.
CONDENSING UNIT COOLING CAPACITY LISTED AT 95 DEGREES F AMBIENT, 80 DEGREES F DB / 67 DEGREES F WB ENTERING AIR TEMPERATURE.
RS / RL SIZE LISTED IS FOR REFERENCE ONLY. CONSULT MANUFACTURER INSTRUCTIONS.
TEMPERATURES ARE IN DEGREES F.

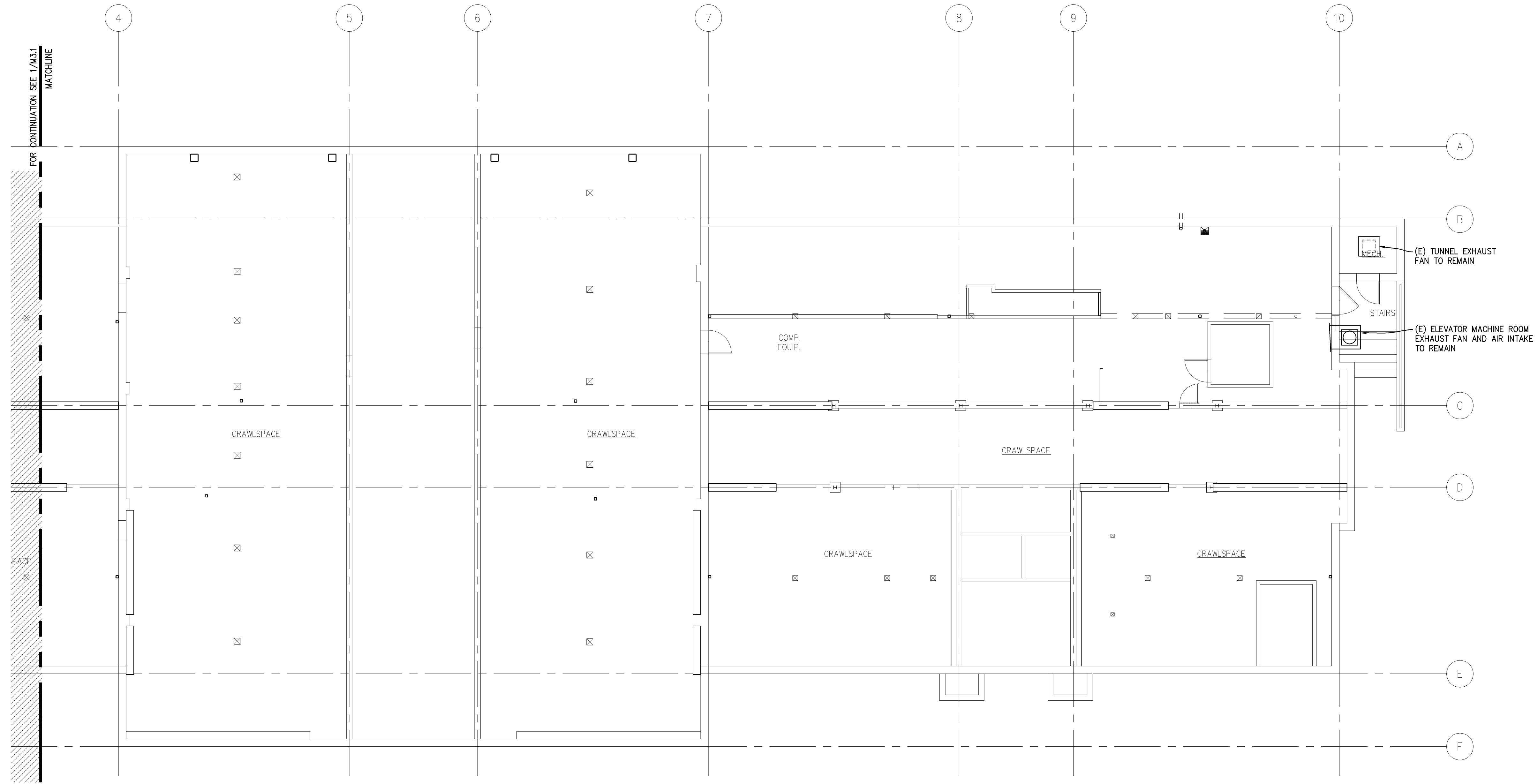
PANEL RADIATION						
TAG	CAPACITY (BTUH)	TYPE	LENGTH (FT)	AWT	GPM	REMARKS
PR-102.1	1,508	1	2.0	150	0.5	--
PR-102.2	1,508	1	2.0	150	0.5	--
PR-105.1	1,508	1	2.0	150	0.5	--
PR-106.1	1,885	1	2.5	150	0.5	--
PR-109.1	1,508	1	2.0	150	0.5	--
PR-110.1	1,508	1	2.0	150	0.5	--
PR-111.1	1,508	1	2.0	150	0.5	--
PR-112.1	1,508	1	2.0	150	0.5	--
PR-113.1	1,508	1	2.0	150	0.5	--
PR-115.1	1,916	2	2.0	150	0.5	--
PR-115.2	1,916	2	2.0	150	0.5	--
PR-118.1	2,395	2	2.5	150	0.5	--
PR-118.2	2,395	2	2.5	150	0.5	--
PR-119.1	5,100	4	3.5	150	0.5	--
PR-120.1	1,508	1	2.0	150	0.5	--
PR-121.1	8,014	3	5.5	150	1	--
PR-122.1	4,371	3	3.0	150	0.5	--
PR-126.1	4,371	3	3.0	150	0.5	--
PR-132.1	2,395	2	2.5	150	0.5	--
PR-133.1	1,508	1	2.0	150	0.5	--
PR-133.2	1,508	1	2.0	150	0.5	--
PR-136.1	2,395	2	2.5	150	0.5	--
PR-142.1	1,916	2	2.0	150	0.5	--
PR-143.1	2,395	2	2.5	150	0.5	--
PR-144.1	1,508	1	2.0	150	0.5	--
PR-146.1	8,014	3	5.5	150	1	--
PR-147.1	4,371	3	3.0	150	0.5	--
PR-148.1	2,874	2	3.0	150	0.5	--
PR-149.1	1,508	1	2.0	150	0.5	--
PR-150.1	1,508	1	2.0	150	0.5	--
PR-153.1	2,874	2	3.0	150	0.5	--
PR-154.1	1,916	2	2.0	150	0.5	--
PR-154.2	1,916	2	2.0	150	0.5	--
PR-154.3	1,916	2	2.0	150	0.5	--
PR-155.1	1,916	2	2.0	150	0.5	--
PR-156.1	2,395	2	2.5	150	0.5	--
PR-160.1	2,395	2	2.5	150	0.5	--
PR-161.1	1,508	1	2.0	150	0.5	--
PR-201.1	1,508	1	2.0	150	0.5	--
PR-202.1	5,100	3	3.5	150	0.5	--
PR-209.1	2,395	2	2.5	150	0.5	--
PR-210.1	1,916	2	2.0	150	0.5	--
PR-211.1	1,916	2	2.0	150	0.5	--
PR-212.1	1,916	2	2.0	150	0.5	--
PR-218.1	2,395	2	2.5	150	0.5	--
PR-220.1						



1 BASEMENT PLAN - WEST - HVAC
 SCALE: 1/8"=1'-0"

- KEYED NOTES:**
- ① PROVIDE 42x30 PLENUM ATTACHED TO LOUVER AT WALL. UTILIZE TOP PORTION OF LOUVER, AND PROVIDE AIRTIGHT INSULATED, MINIMUM 20 GAUGE SHEET METAL BLANK-OFF OVER REMAINDER OF LOUVER OPENING.
 - ② 2100 CFM EXHAUST FAN DISCHARGE. UTILIZE MINIMUM 4.0 SF FREE AREA. MAINTAIN BOTTOM OF LOUVER AREA UTILIZED AT TWO INCHES ABOVE RIM OF AREA WELL.
 - ③ 2100 CFM MAKE-UP AIR. UTILIZE MINIMUM 5.0 SF FREE AREA. MAINTAIN BOTTOM OF LOUVER AREA UTILIZED AT TWO INCHES ABOVE RIM OF AREA WELL.
 - ④ INSULATE EXHAUST PLENUM AND DUCT CONNECTION BETWEEN WALL AND DAMPER IN DUCT.

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1 BASEMENT PLAN - EAST - HVAC 

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

GENERAL NOTES:

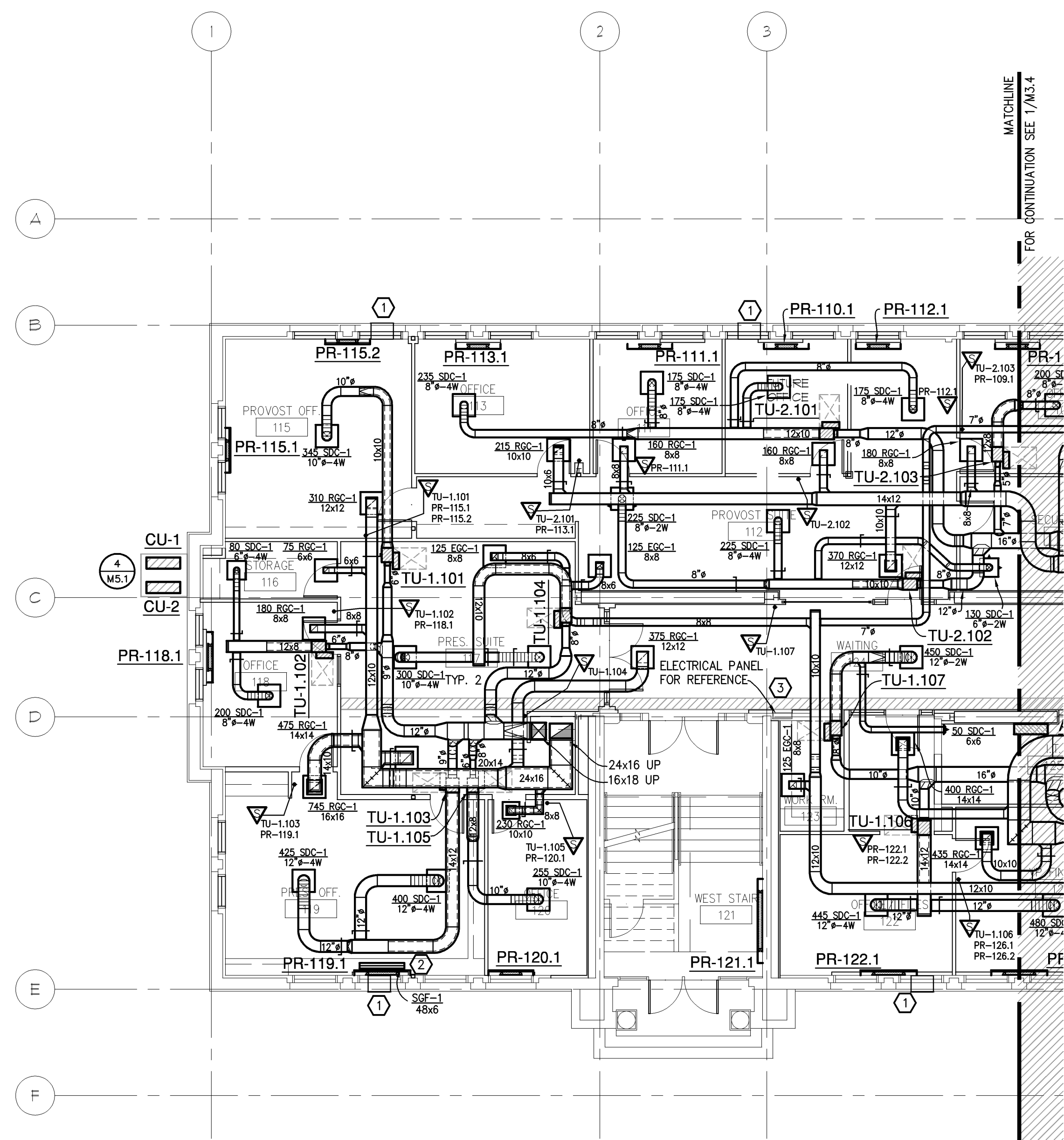
1. SHEET INCLUDED FOR REFERENCE. NO HVAC WORK REQUIRED IN THIS AREA.

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BASEMENT
 PLAN -
 EAST -
 HVAC

SCALE: AS NOTED
 11-15-11

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1 FIRST FLOOR PLAN - WEST - HVAC
 SCALE: 1/8"=1'-0"

- KEYED NOTES:**
- ① EXISTING EXTERIOR GRILLE AND LOUVER IN WALL: PROVIDE SHEETMETAL BLANK-OFF BEHIND LOUVER IN WALL, AND SEAL. PAINT EXTERIOR SURFACE MATTE BLACK. INSULATION AND INTERIOR WALL PATCHING BY ARCHITECTURAL.
 - ② PANEL RADIATOR MOUNTED WITHIN PORTION OF CASE WORK. FLOOR GRILLE MOUNTING IN TOP OF CASEWORK, CENTERED ABOVE PANEL RADIATOR. SEE ARCHITECTURAL DETAIL.
 - ③ COORDINATE ROUTING OF CABLE TRAY WITH DIVISION 26.

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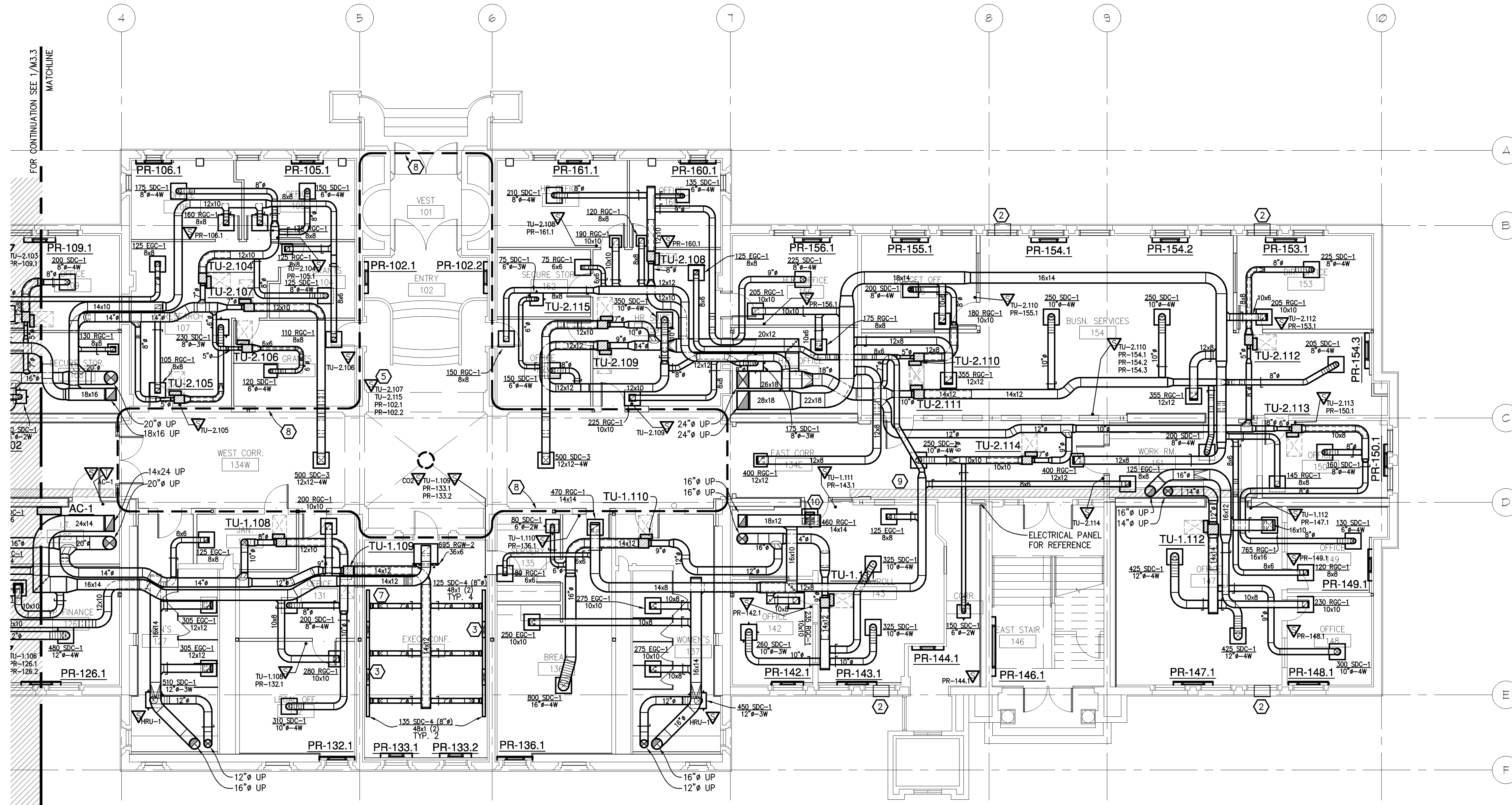
FIRST FLOOR
 PLAN -
 WEST -
 HVAC

SCALE: AS NOTED
 11-15-11

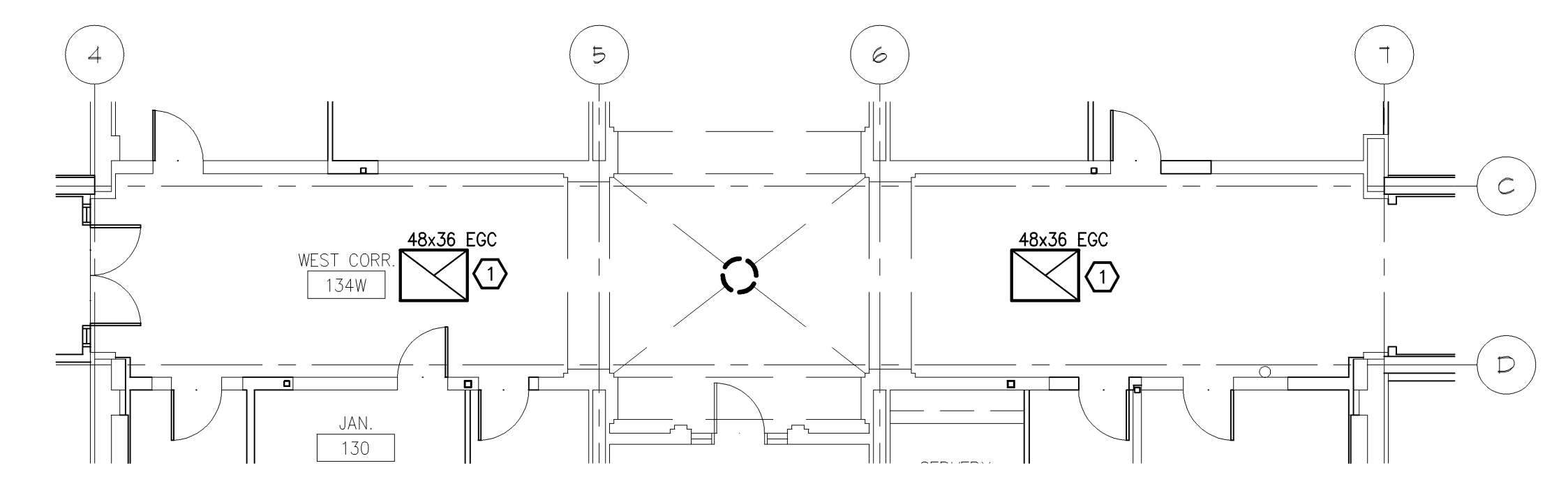
M3.3

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1 FIRST FLOOR PLAN - EAST - HVAC
SCALE: 1/8"=1'-0"



2 PARTIAL FIRST FLOOR PLAN - EAST - HVAC DEMOLITION
SCALE: 1/8"=1'-0"

- KEYED NOTES:**
- ① REMOVE EXISTING GRILLE AND DUCTWORK, IN CONJUNCTION WITH SECOND FLOOR FLOORING REMOVAL. INSTALL NEW GRILLE IN EXISTING LOCATION.
 - ② EXISTING EXTERIOR GRILLE AND LOUVER IN WALL: PROVIDE SHEETMETAL BLANK-OFF BEHIND LOUVER IN WALL, AND SEAL. PAINT EXTERIOR SURFACE MATTE BLACK. INSULATION AND INTERIOR WALL PATCHING BY ARCHITECTURAL.
 - ③ CONTINUOUS LINEAR SLOT FACE WITH BLOCKED OUT SECTIONS BETWEEN PLENUMS.
 - ④ DUCT UP IN CHASE. FOR CONTINUATION SEE SHEET M3.6.
 - ⑤ TEMPERATURE SENSOR MOUNTED 9'-0" AFF LOCATED ABOVE WOOD PANELING, TRIM, AND MOLDING.
 - ⑥ INSTALL BAS OUTSIDE TEMPERATURE SENSOR ON OUTSIDE WALL IN VICINITY SHOWN BETWEEN GRADE AND WINDOW ELEVATION.
 - ⑦ STACK DUCTS. SHOWN OFFSET FOR CLARITY.
 - ⑧ EXISTING WALLS AND CEILING WITHIN BOUNDARY WILL REMAIN INTACT. EMPLOY EXTRA CARE WORKING IN AND ADJACENT TO AREAS TO PROTECT FINISHES.
 - ⑨ COORDINATE ROUTING OF CABLE TRAY WITH DIVISION 26.
 - ⑩ TAP OFF BOTTOM OF DUCT. VOLUME DAMPER IN RISER.

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FIRST FLOOR
PLAN -
EAST -
HVAC

SCALE: AS NOTED
11-15-11

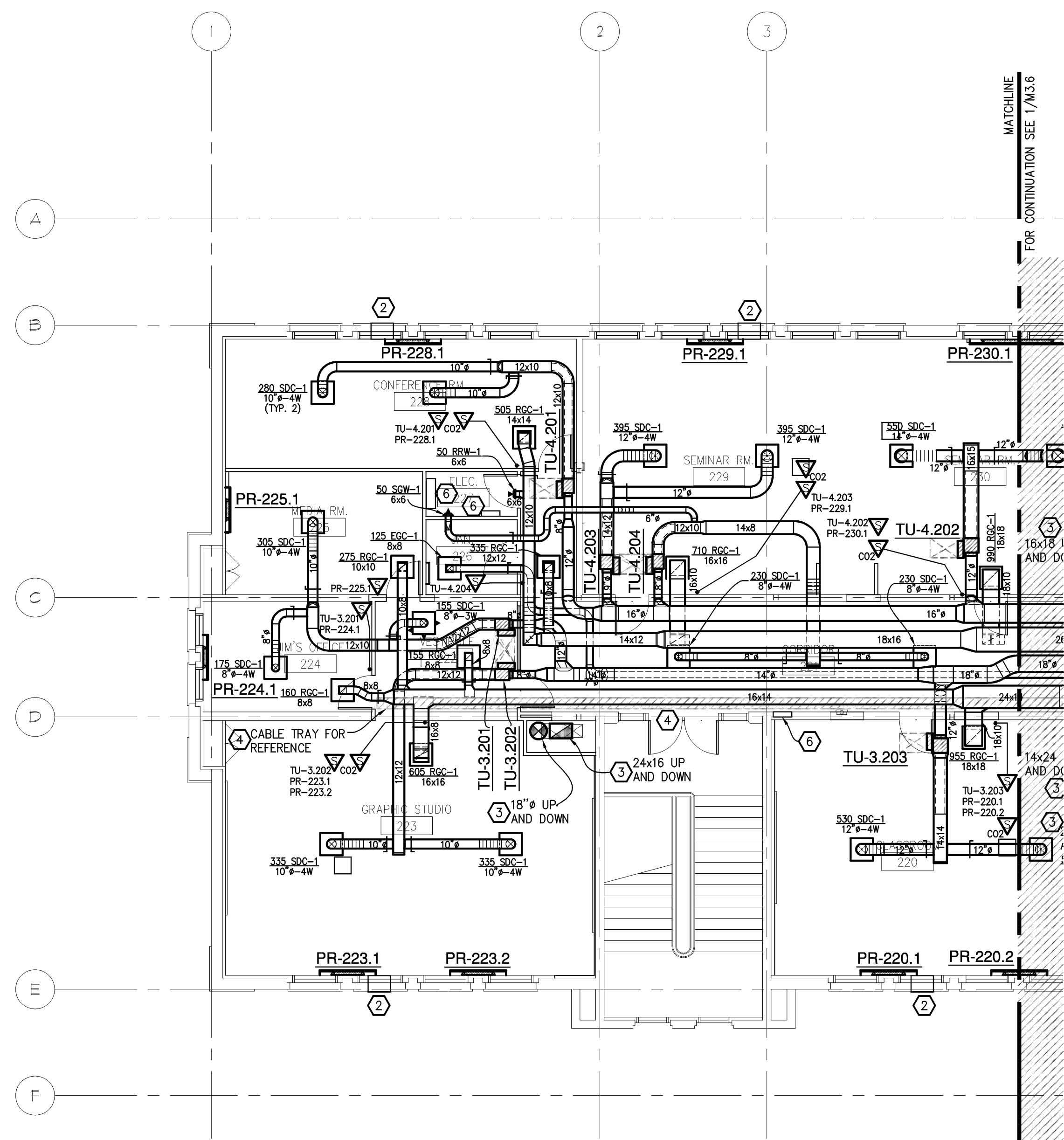
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M3.4

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1 SECOND FLOOR PLAN - WEST - HVAC
 SCALE: 1/8"=1'-0"

KEYED NOTES:

①	ROUTE DUCT IN JOIST SPACE.
②	EXISTING EXTERIOR GRILLE AND LOUVER IN WALL: PROVIDE SHEETMETAL BLANK-OFF BEHIND LOUVER IN WALL, AND SEAL. PAINT EXTERIOR SURFACE MATTE BLACK. INSULATION AND INTERIOR WALL PATCHING BY ARCHITECTURAL.
③	FOR CONTINUATION SEE SHEET M3.7.
④	COORDINATE ROUTING OF CABLE TRAY WITH DIVISION 26.

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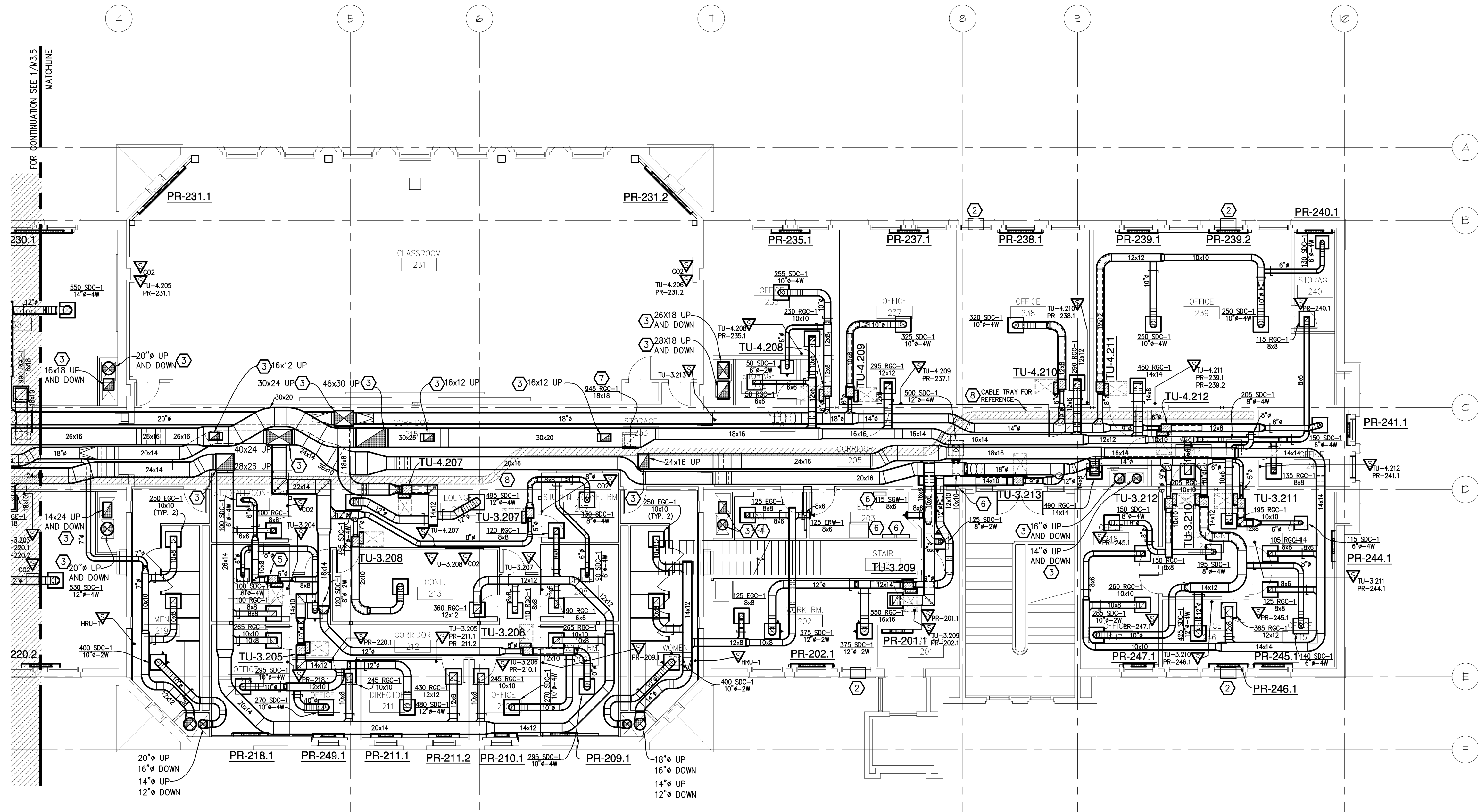
SECOND FLOOR
 PLAN -
 WEST -
 HVAC

SCALE: AS NOTED
 11-15-11



M3.5

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1 SECOND FLOOR PLAN - EAST - HVAC
 SCALE: 1/8"=1'-0"

- KEYED NOTES:**
- ① ROUTE DUCT IN JOIST SPACE.
 - ② EXISTING EXTERIOR GRILLE AND LOUVER IN WALL: PROVIDE SHEETMETAL BLANK-OFF BEHIND LOUVER IN WALL, AND SEAL. PAINT EXTERIOR SURFACE MATTIE BLACK. INSULATION ADN INTERIOR WALL PATCHING BY ARCHITECTURAL.
 - ③ FOR CONTINUATION SEE SHEET M3.8.
 - ④ 16"Ø UP AND DOWN IN CHASE. 12x18 UP AND DOWN IN CHASE.
 - ⑤ TU-3.204
 - ⑥ ELECTRICAL PANELS FOR REFERENCE.
 - ⑦ TAP OFF BOTTOM OF DUCT. DAMPER IN RISER.
 - ⑧ COORDINATE ROUTING OF CABLE TRAY WITH DIVISION 26.

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SECOND FLOOR
 PLAN -
 EAST -
 HVAC

SCALE: AS NOTED
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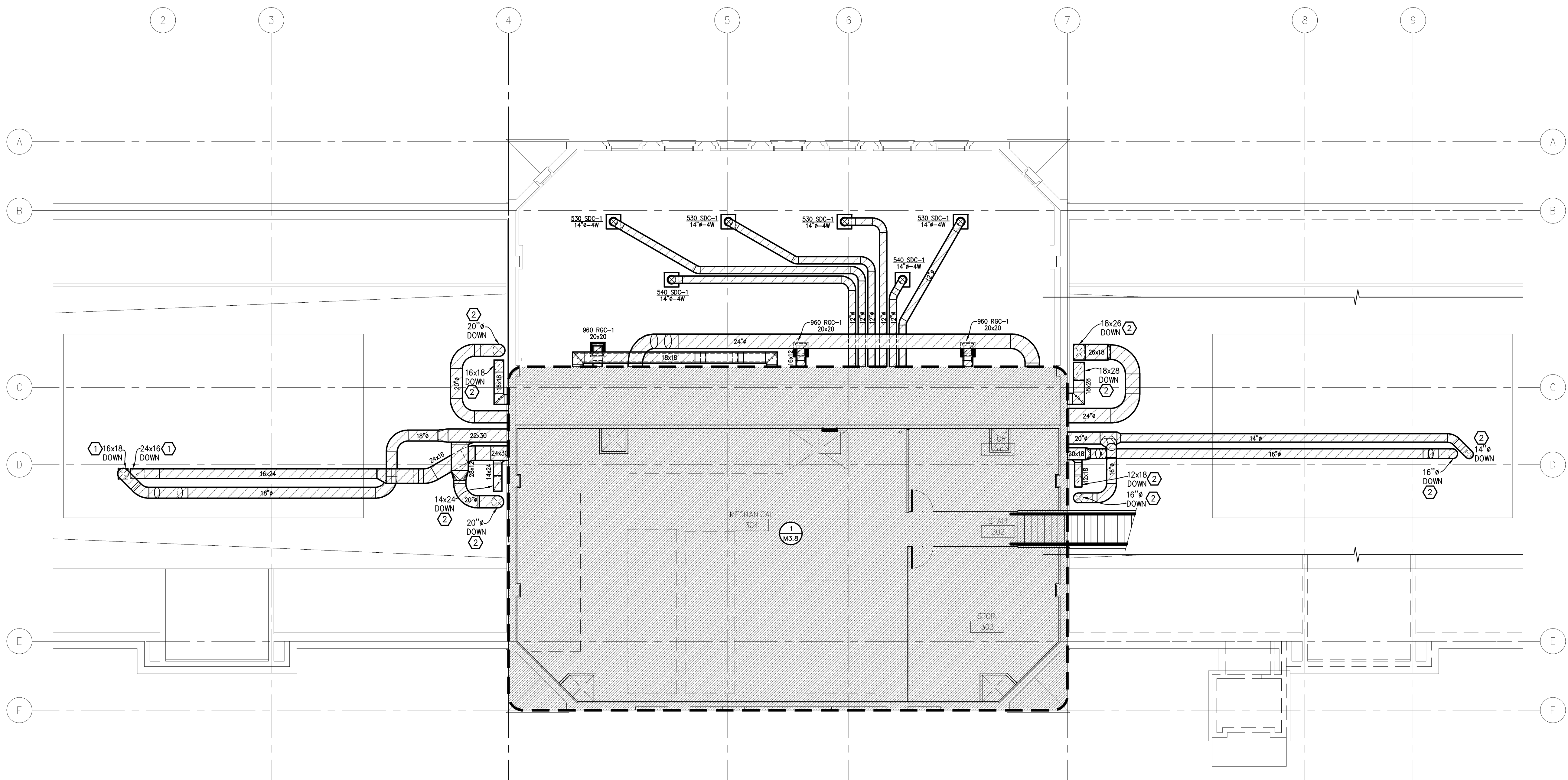
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M3.6

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1 ATTIC FLOOR PLAN
 SCALE: 1/8"=1'-0"

- GENERAL NOTES:**
- HATCHED DUCTWORK OUTSIDE MECHANICAL ROOM IN UNCONDITIONED SPACE.
- KEYED NOTES:**
- FOR CONTINUATION SEE SHEET 1/M3.5.
 - FOR CONTINUATION SEE SHEET 1/M3.6.

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ATTIC FLOOR
 PLAN -
 MECHANICAL

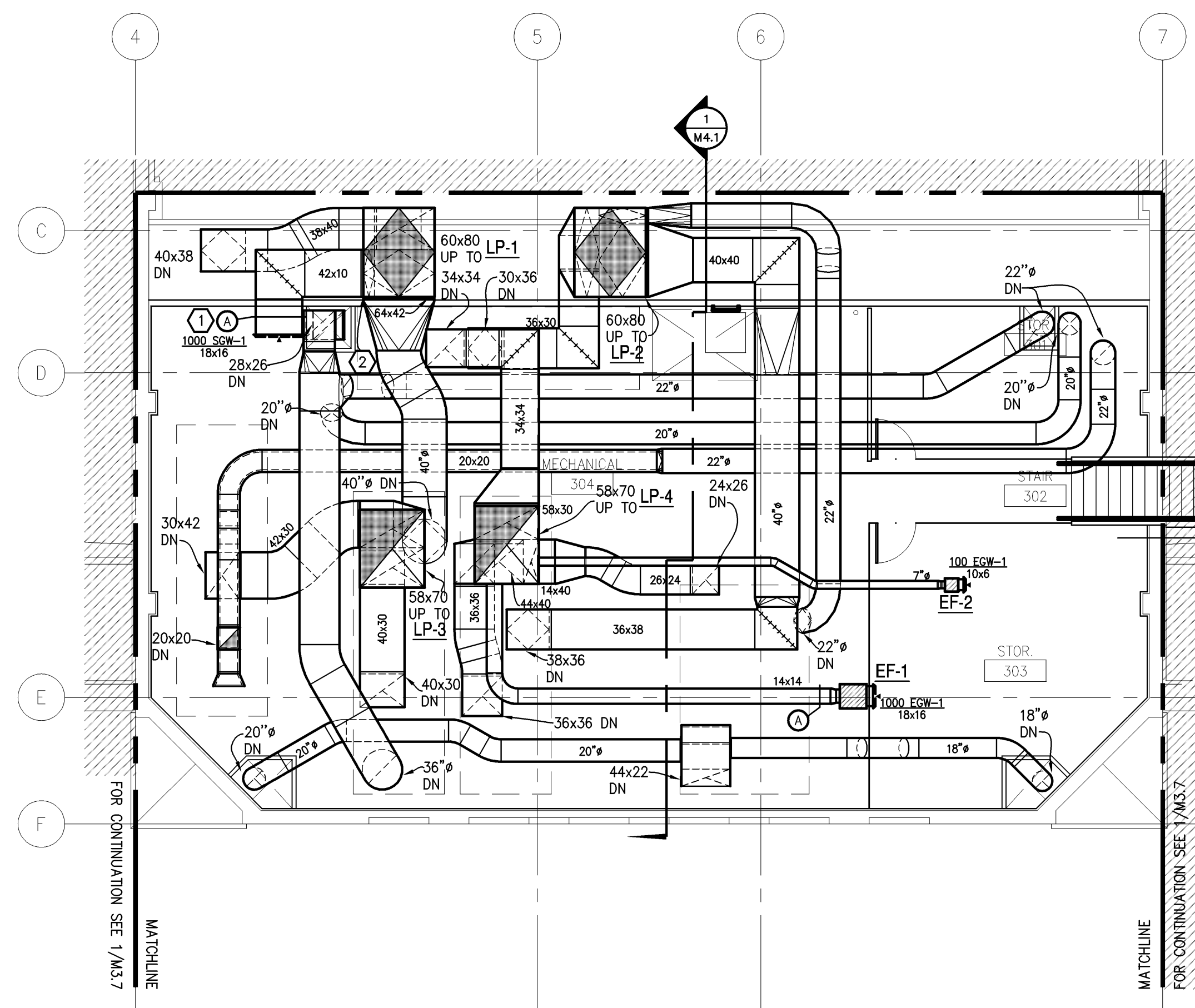
SCALE: AS NOTED
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M3.7

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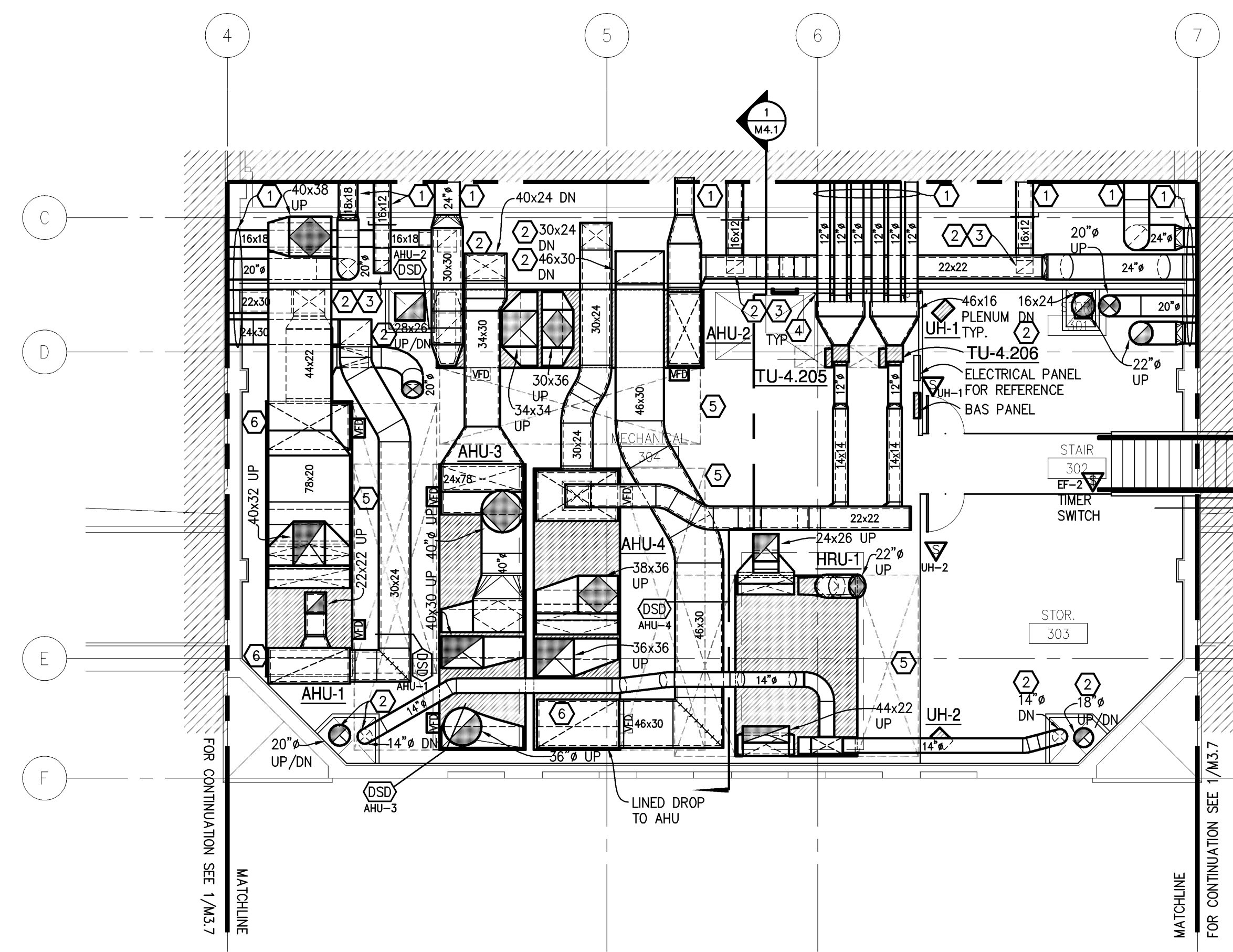
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2 PARTIAL ATTIC FLOOR PLAN - UPPER - MECHANICAL

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

- | GENERAL NOTES FOR 2/M3.8: | |
|---------------------------|--|
| 1. | FOR DUCTWORK RISERS UP TO ROOF REFER TO 1/M3.9 FOR CONTINUATION. |
| 2. | FOR DUCTWORK RISERS DN REFER TO 1/M3.8 FOR CONTINUATION. |
-
- | KEYED NOTES: FOR 2/M3.8: | |
|--------------------------|---|
| ① | MECHANICAL ROOM OUTSIDE AIR GRAVITY DUCT. |
| ② | EXTEND 42x10 DUCT UP INSIDE 60x80 DUCT UP TO TOP OF CURB. |



1 PARTIAL ATTIC FLOOR PLAN - LOWER - MECHANICAL

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

- | GENERAL NOTES FOR 1/M3.8: | |
|---------------------------|--|
| 1. | FOR DUCTWORK RISERS UP REFER TO 2/M3.8 FOR CONTINUATION. |
-
- | KEYED NOTES: FOR 1/M3.8: | |
|--------------------------|--|
| ① | FOR CONTINUATION SEE 1/M3.7. |
| ② | FOR CONTINUATION SEE 1/M3.6. |
| ③ | BRANCH DUCT DOWN TO MAIN. |
| ④ | ORIENT BALANCING DAMPER WITH OPERATOR ON BOTTOM OF DUCT. |
| ⑤ | SERVICE ACCESS, TYP. TO 7'-0" AFF. |
| ⑥ | LINED DUCT TO AHU. |

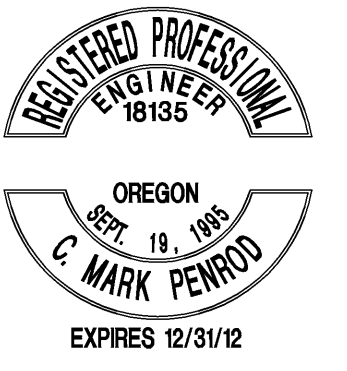


SCALE: AS NOTED
11-15-11

M3.8

MECH ROOM
FLOOR PLAN -
MECHANICAL

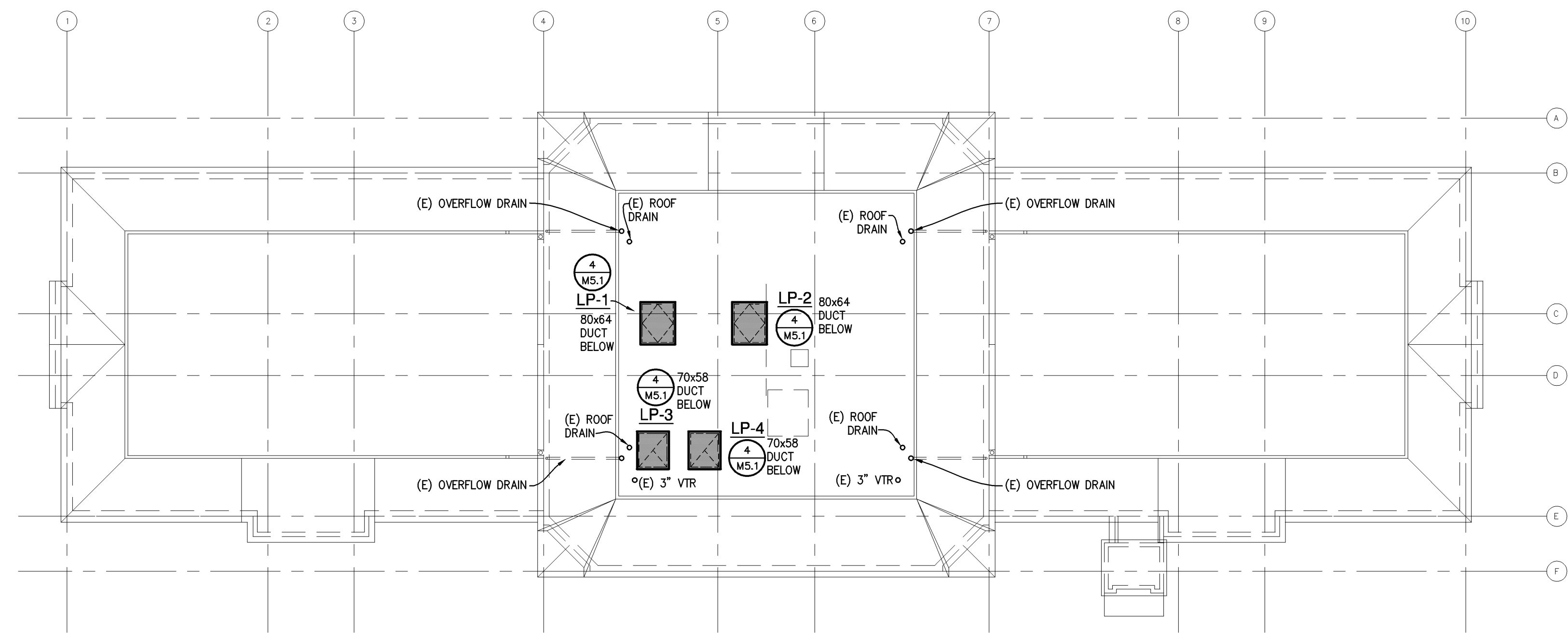
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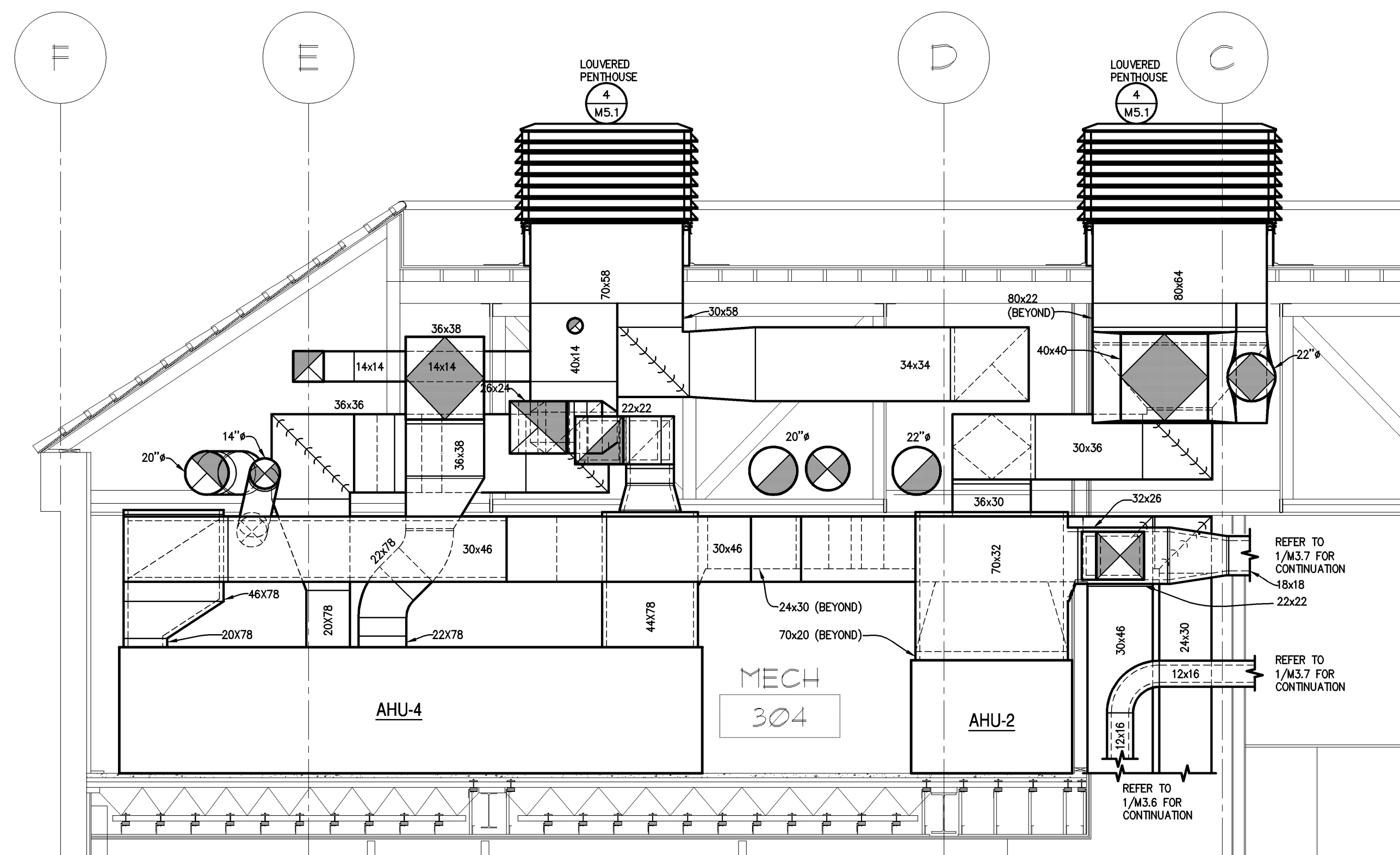
1 ROOF PLAN - MECHANICAL
 SCALE: 1/16"=1'-0"

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ROOF PLAN -
 MECHANICAL

SCALE: AS NOTED
 11-15-11

M3.9



1 SECTION LOOKING WEST
1/4"=1'-0"

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SECTIONS

SCALE: AS NOTED
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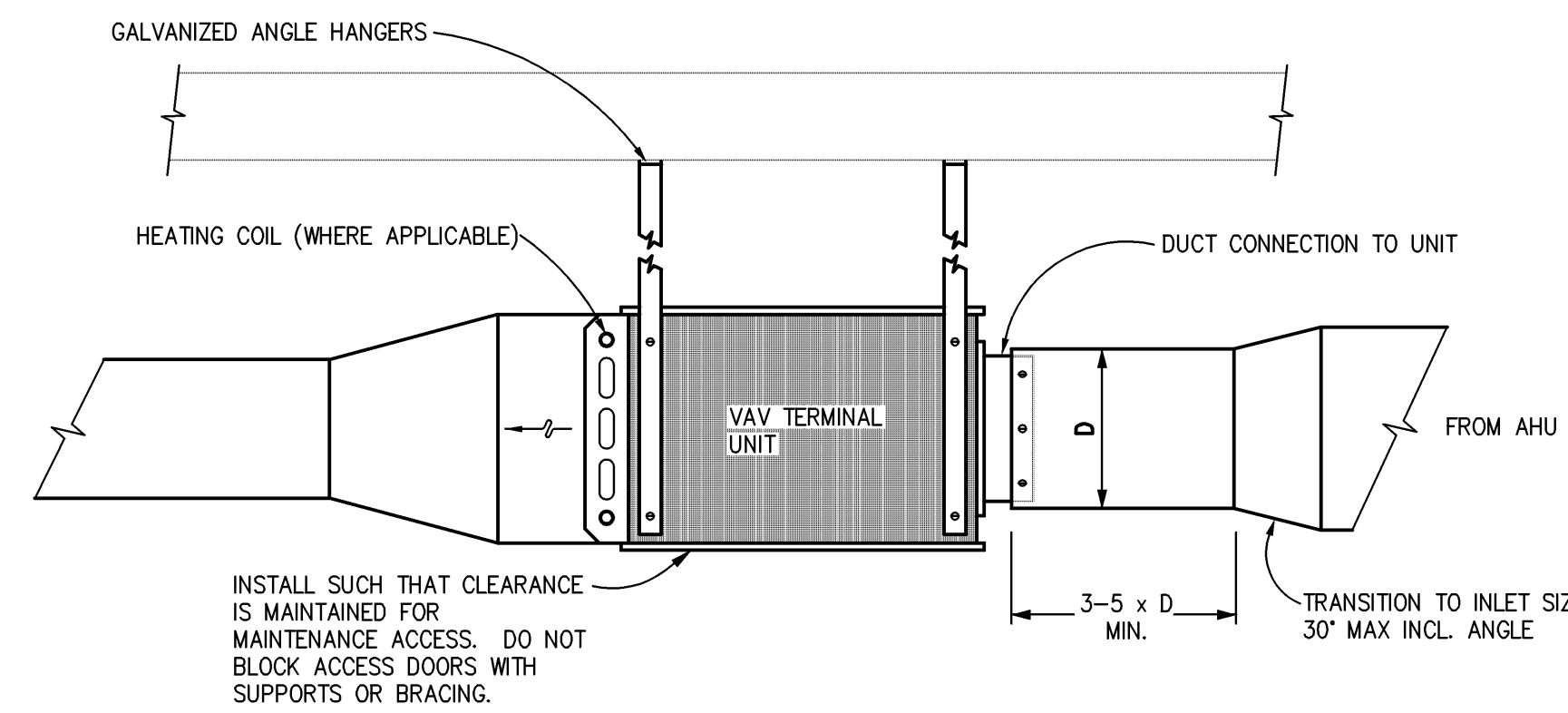
M4.1

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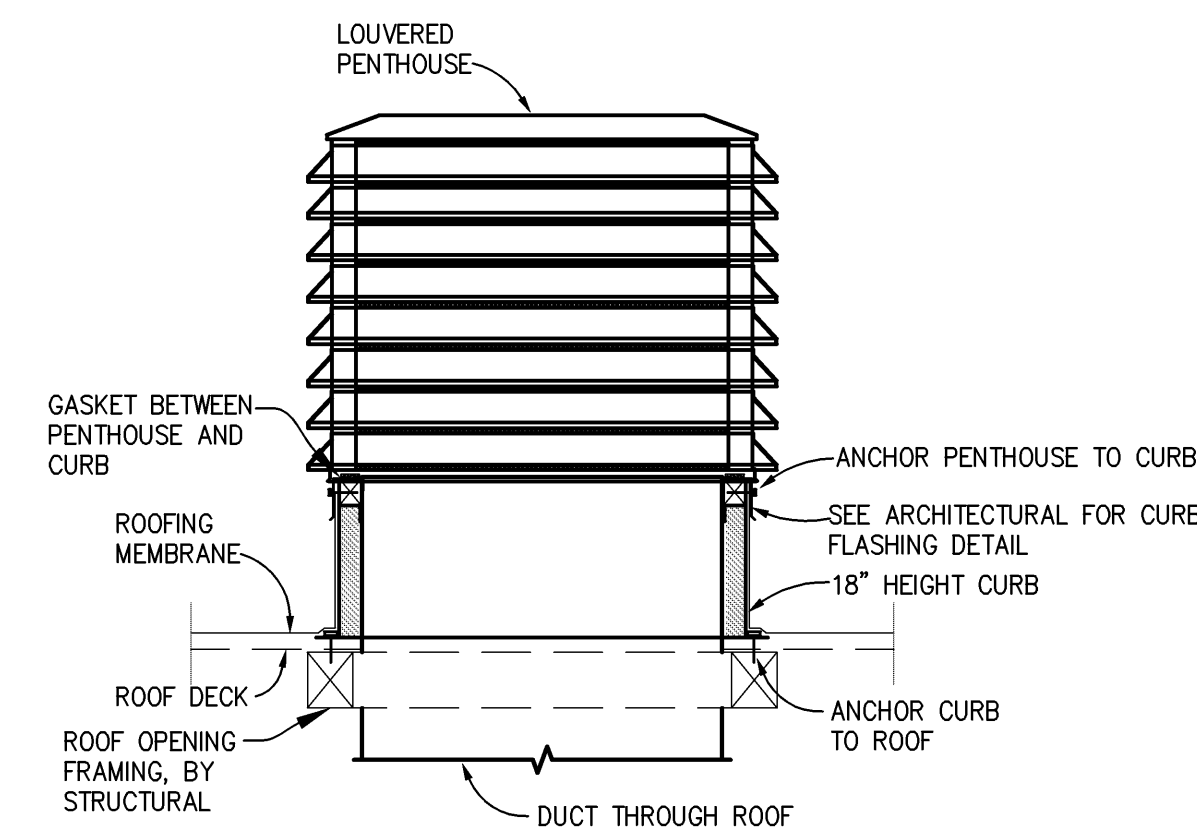
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DESCRIPTION	PLAN VIEW	DESCRIPTION	SHEETMETAL DUCTWORK
RADIUS ELBOW		ROUND TO ROUND TRANSITION	
TAKE-OFF WITH 45° ENTRY		ROUND TAKE-OFF	
TRANSITION		ROUND TAKE-OFF	
MITERED OFFSET		RECTANGULAR-TO-ROUND TAKE-OFF WITH 45° ENTRY	

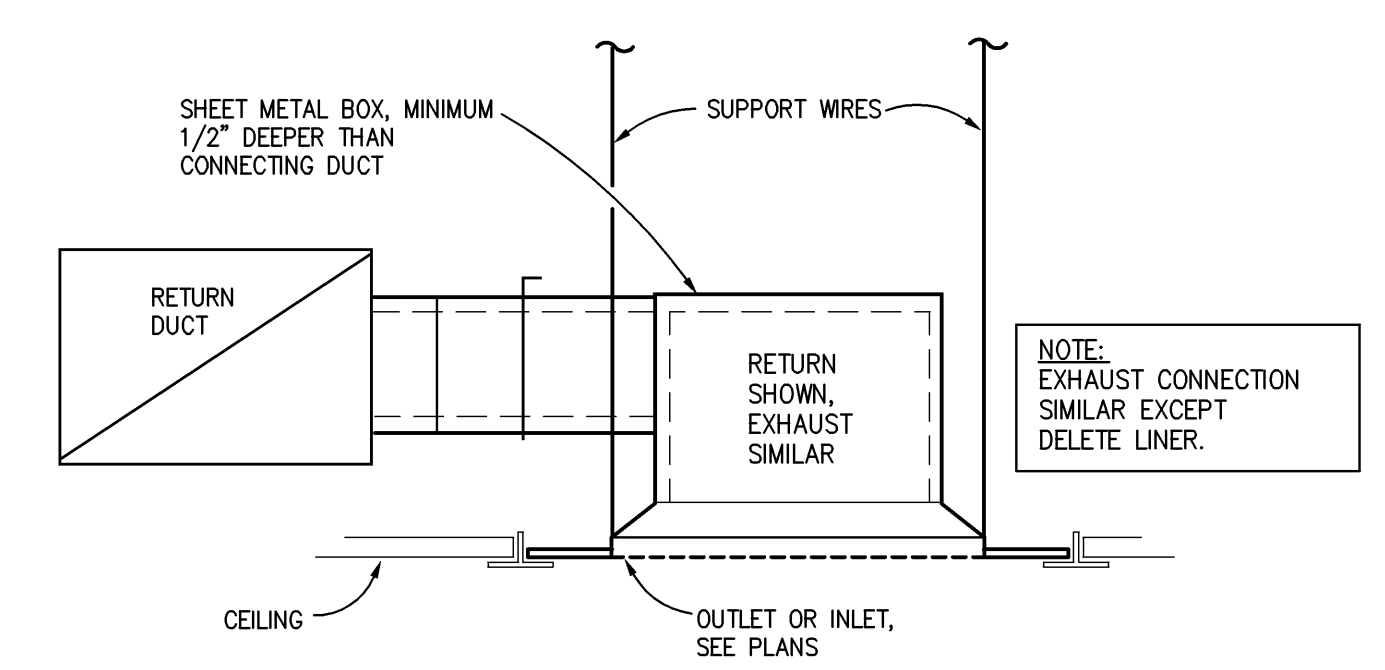
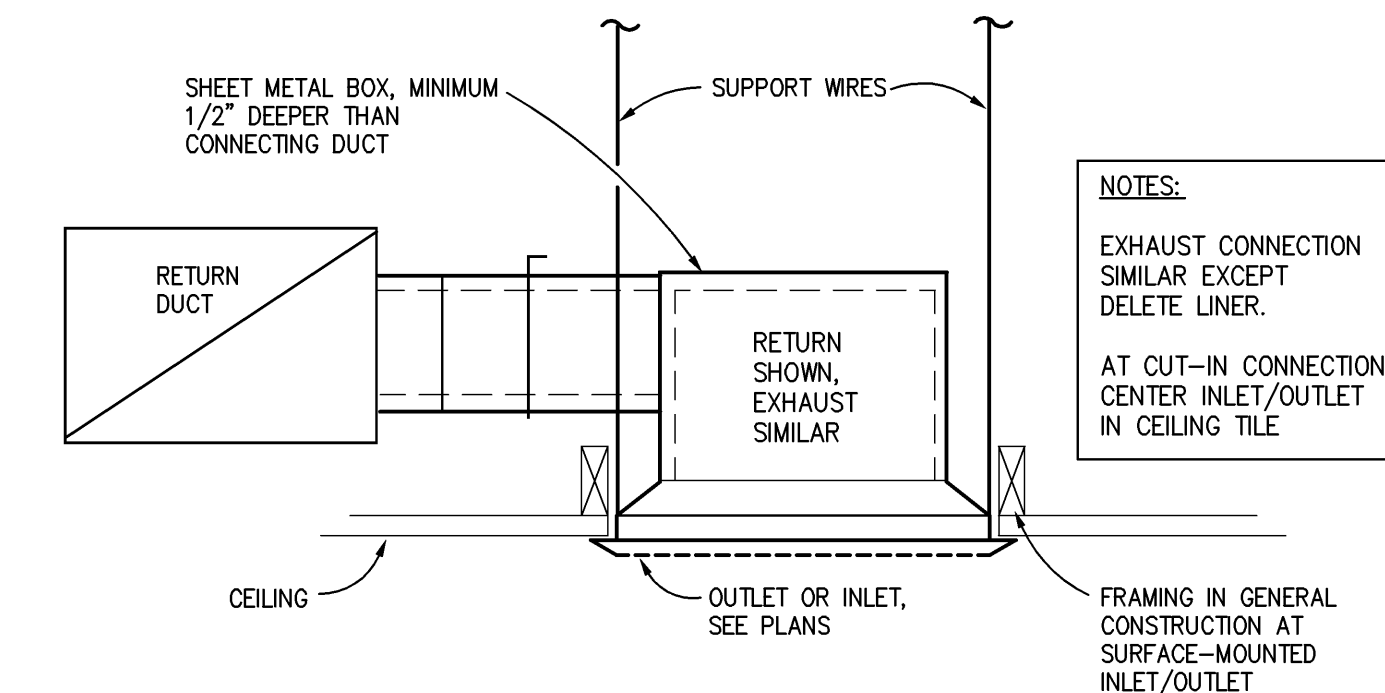
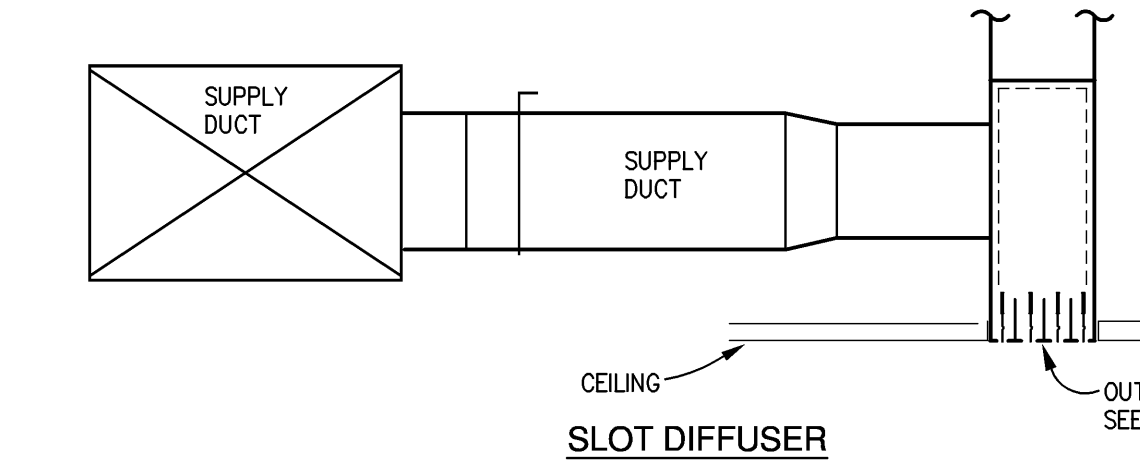
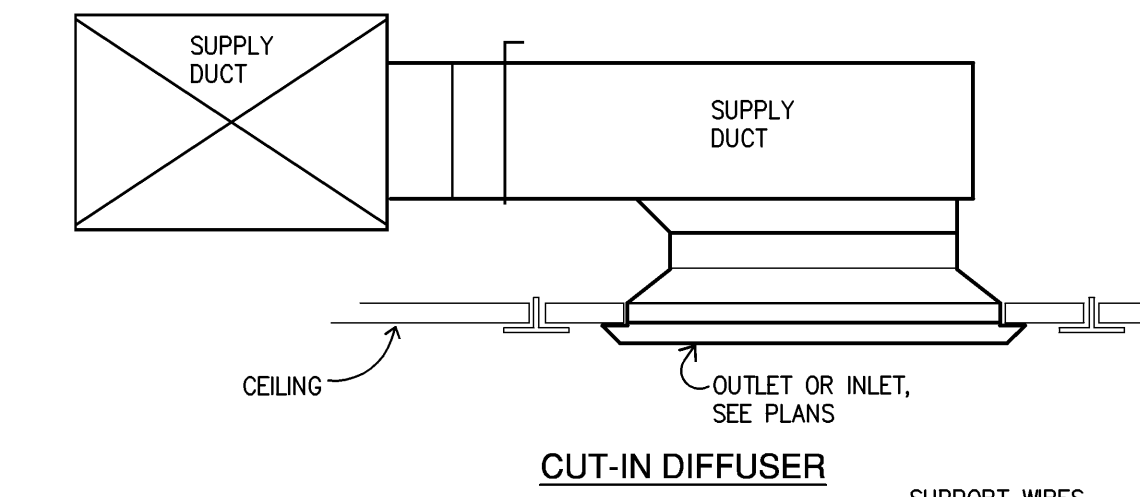
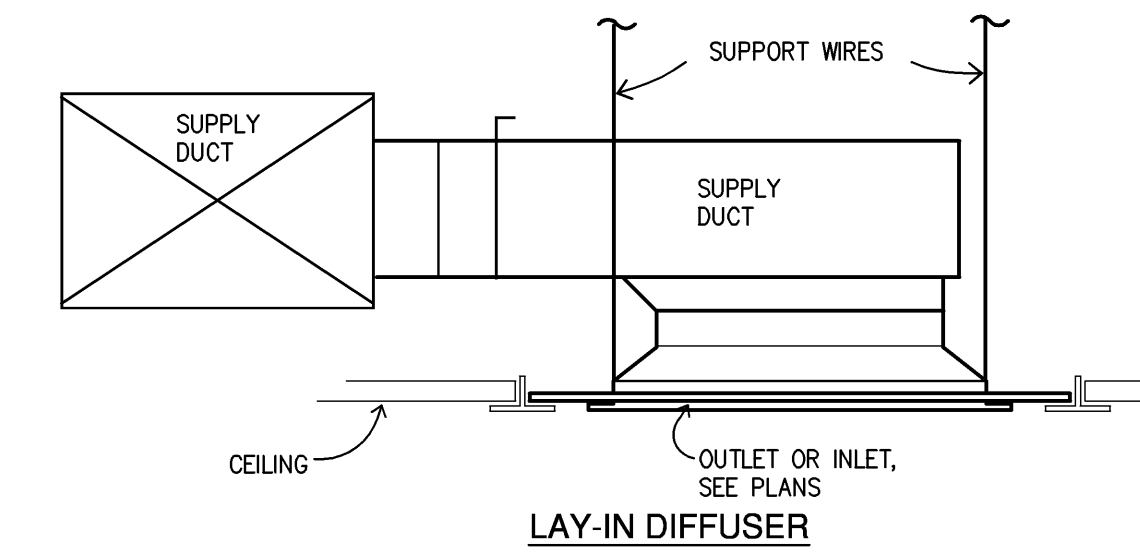
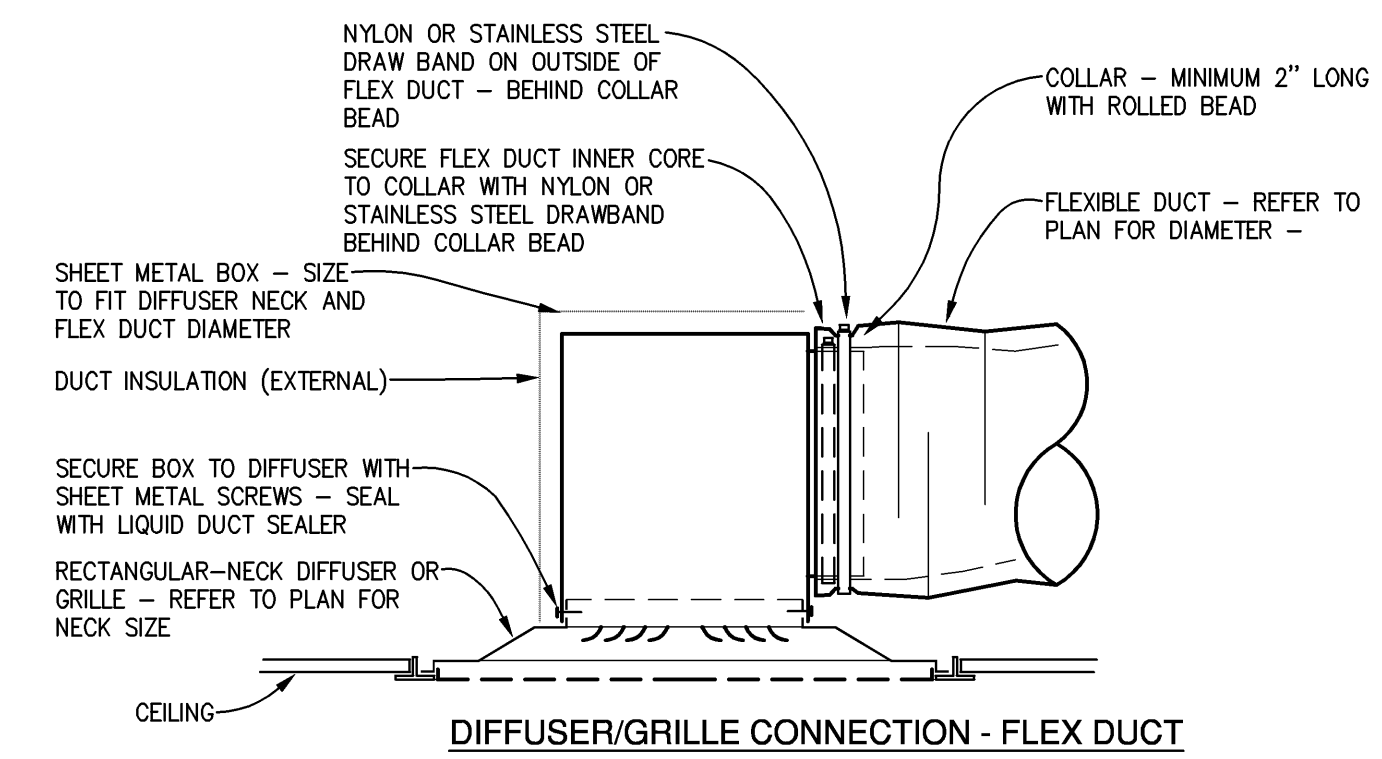
2 DUCT CONSTRUCTION
NO SCALE



3 TERMINAL UNIT MOUNTING
NO SCALE



4 LOUVERED PENTHOUSE
NO SCALE



1 DIFFUSER/RETURN/EXHAUST CONNECTIONS
NO SCALE

ORW
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SOU - CHURCHILL HALL
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DETAILS -
 HVAC

SCALE: AS NOTED
 11-15-11

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M5.1