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Tigard Tualatin School District

**Durham
Elementary
School**
7980 S.W. Durham Rd.
Tigard, Oregon 97224

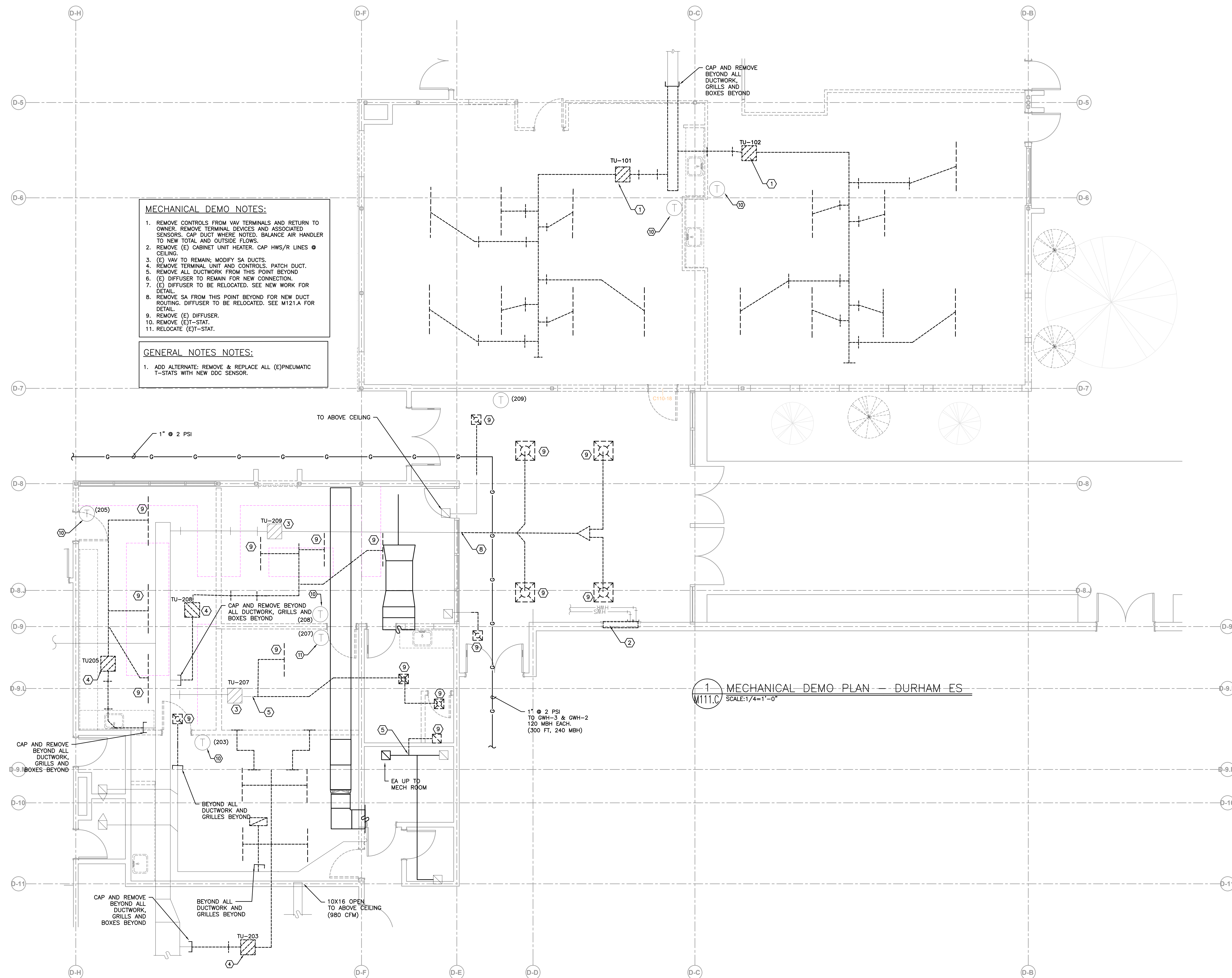
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80% CONSTRUCTION
DEVELOPMENT

MECHANICAL DEMO PLAN
DURHAM ES

M111.C



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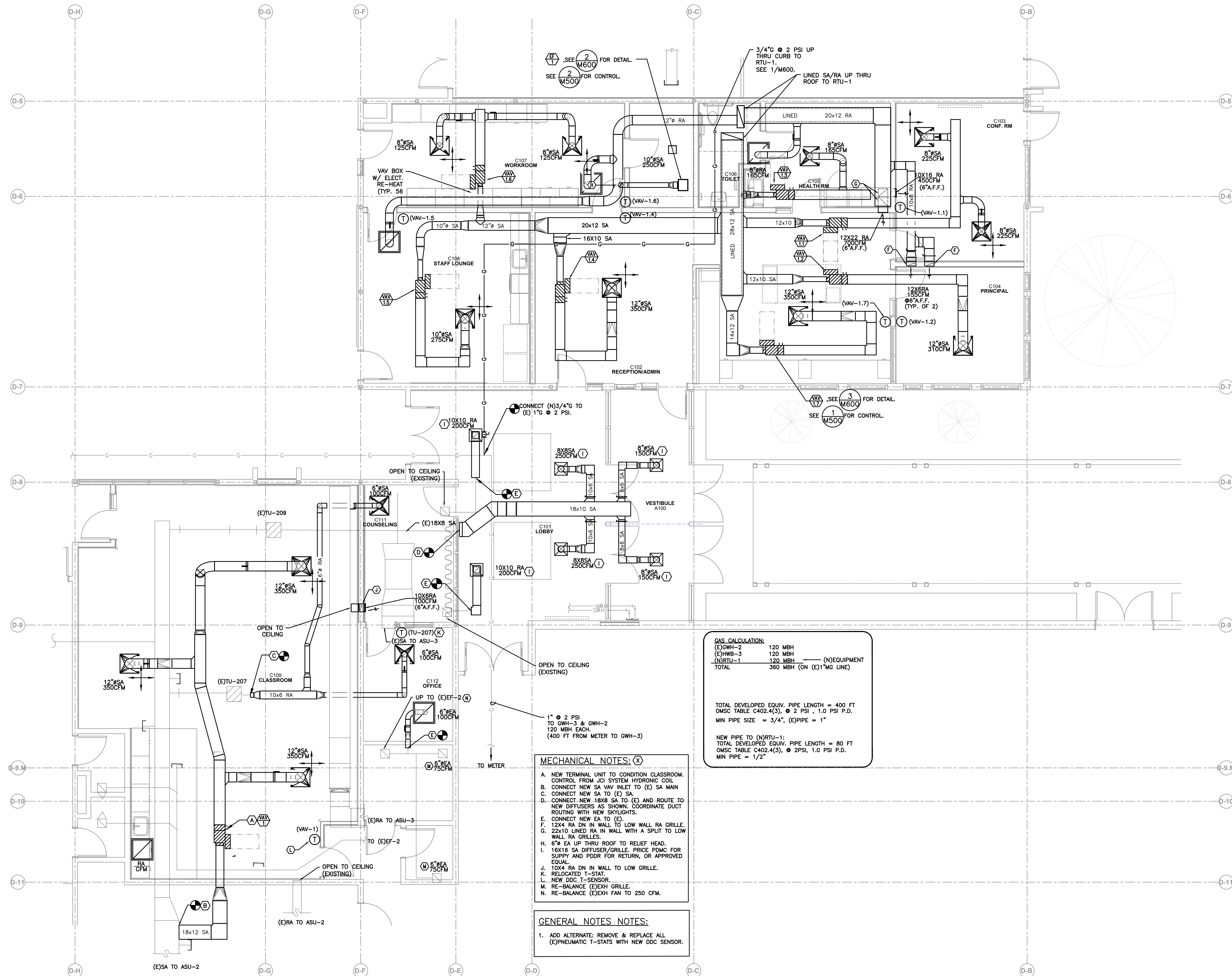
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DEVELOPMENT

MECHANICAL PLAN -
DURHAM ES

M121.C



1 MECHANICAL PLAN — DURHAM ES
W121.C SCALE: 1/4"=1'-0"

01 January, 2000

6

5

4

3

2

1

50

40

30

20

10

0

6

5

4

3

2

1

BORA

Bora Architects, Inc.
720 SW Washington, Suite 800
Portland, Oregon 97205
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MECHANICAL ROOF PLAN
DURHAM ES

M131.C

1 MECHANICAL ROOF PLAN — DURHAM ES
M131.C SCALE: 1/4" = 1' - 0"

50

40

30

20

10

0

6

5

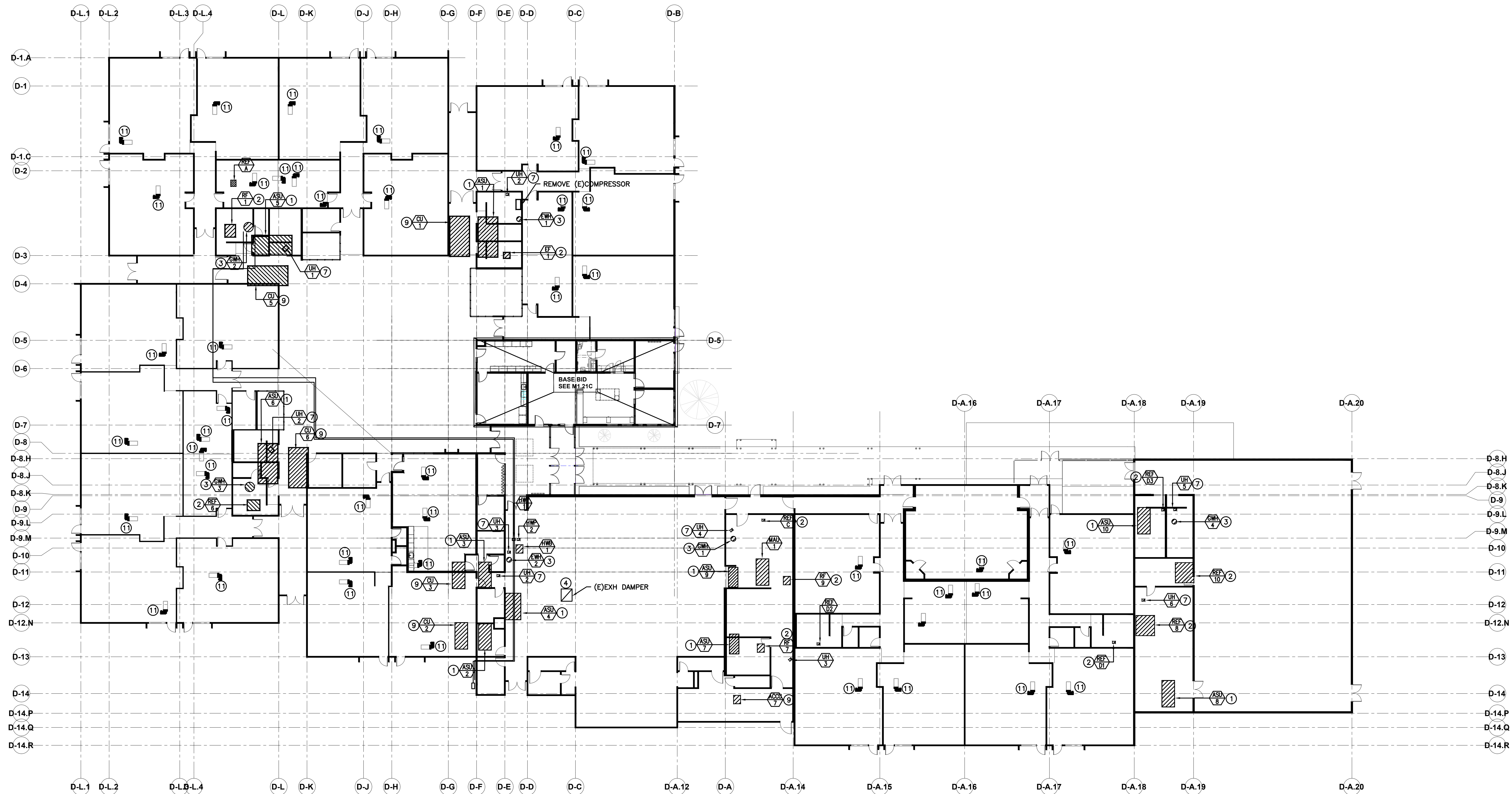
4

3

2

1

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1 OVERALL MECHANICAL PLAN - ALTERNATES
M2.000 SCALE: 1/16" = 1'-0"

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 RIR 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 RIR 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. (E) BY-PASS VAV BOXES WITH DDC CONTROLLER TO REMAIN AS-IS.
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 DAMPER, FACE/PE 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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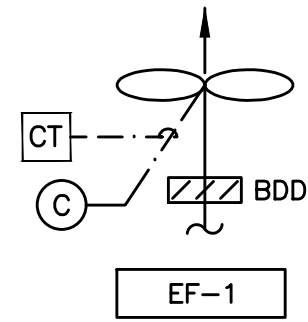
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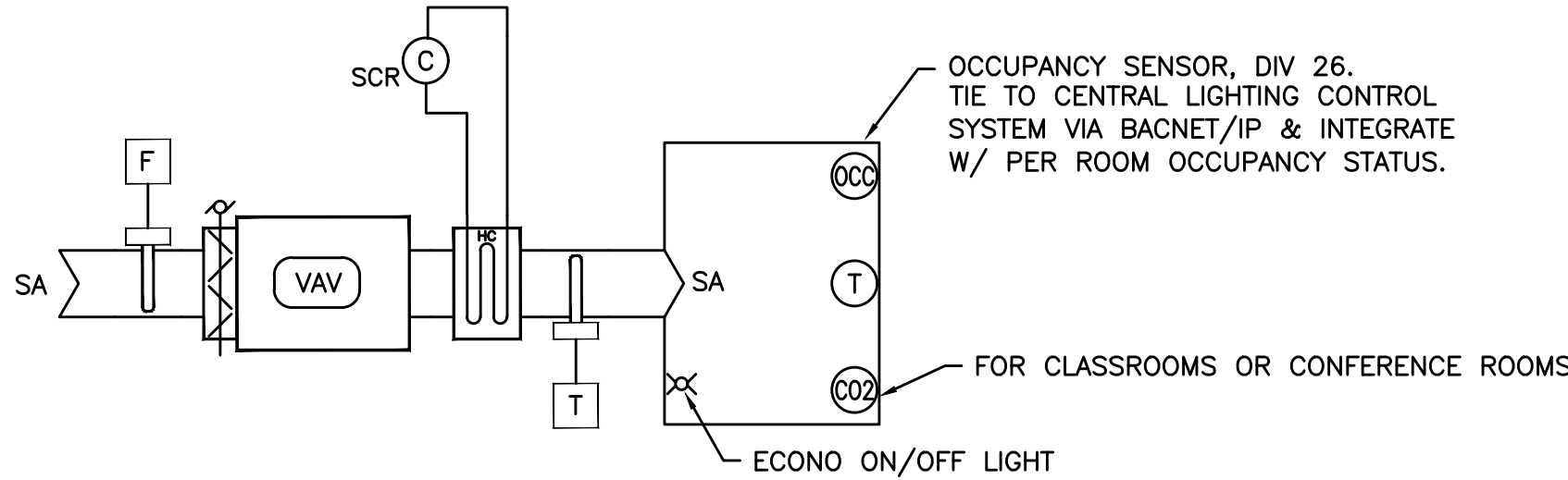
80% CONSTRUCTION
DEVELOPMENTMECHANICAL VERALL
PLAN - ALTERNATES

M200.C

2 EXHAUST FAN CONTROL DIAGRAM
SCALE: SCHEMATIC



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



LEGEND

- SPACE SENSORS:**
- T** SPACE TEMPERATURE SENSOR
 - P** SPACE PRESSURE SENSOR
 - H** SPACE HUMIDITY SENSOR
 - DP** DIFFERENTIAL PRESSURE SENSOR
 - H** HUMIDITY SENSOR
 - T** TEMPERATURE SENSOR
 - LL** TEMPERATURE LOW LIMIT SENSOR
 - FL** FLUID LEVEL SENSOR
- MECHANICAL & ELECTRICAL:**
- CT** CURRENT TRANSFORMER
 - M** MANOMETER
 - VFD** VARIABLE FREQUENCY DRIVE
 - C** CONTACTOR/STARTER
 - MCC** MOTOR CONTROL CENTER
 - SD** SMOKE DETECTOR
 - CO** CARBON DIOXIDE SENSOR
 - F** FLOW SENSOR
- VALVES & PIPING:**
- CAPPED LINE
 - PUMP
 - FLOW DIRECTION
 - +** MULTI VALVE
 - +** ELECTRIC 3-WAY VALVE
 - +** 2-WAY VALVE
 - r\$** SWITCH, TIMER

CONTROL SUBSCRIPTS AND SUPERSSCRIPTS:

- P** - PNEUMATIC
E - ELECTRIC
- PLUMBING ABBREVIATIONS:**
- CHS - CHILLED WATER SUPPLY
 - CHR - CHILLED WATER RETURN
 - CWS - CONDENSING WATER SUPPLY
 - CWR - CONDENSING WATER RETURN
 - HWS - HEATING WATER SUPPLY
 - HWR - HEATING WATER RETURN
 - HW - DOMESTIC HOT WATER
 - CW - DOMESTIC COLD WATER
 - GPM - GALLONS PER MINUTE
 - DB - DOUBLE VALVE OPERATOR
- EQUIPMENT ABBREVIATIONS:**
- P - PUMP
 - FP - FUEL PUMP
 - SP - SUMP PUMP
 - BP - BOOSTER PUMP
 - HWP - HEATING WATER PUMP
 - CHP - CHILLED WATER PUMP
 - CHRP - CHILLED WATER RISER PUMP
 - CWP - CONDENSING WATER PUMP
 - CSP - COOLING TOWER SUMP PUMP
 - HWRP - DOMESTIC HOT WATER RECIRCULATION
 - VFD - VARIABLE FREQUENCY DRIVE
 - CT - CONTACTOR
 - CC - CONTROL COMPRESSOR
 - CH - CHILLER
 - CT - COOLING TOWER
 - B - BOILER
 - EF - EXHAUST FAN
 - RF - RETURN/RELIEF FAN
 - AH - AIR HANDLER
 - MZ - MULTIZONE AIR HANDLER
 - HP - HEAT PUMP
 - VAV - VARIABLE AIR VOLUME DAMPER BOX
 - AD - AREA DAMPER
 - SD - SMOKE DAMPER
 - SFD - FIRE SMOKE COMBINATION DAMPER
 - H - HUMIDIFIER
 - V - VALVE
 - WH - WATER HEATER
 - BAS - BUILDING AUTOMATION SYSTEM
- AIR FLOW ABBREVIATIONS:**
- OSA - OUTSIDE AIR
 - RA - RETURN AIR
 - SA - SUPPLY AIR
 - EXH - EXHAUSTED AIR

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

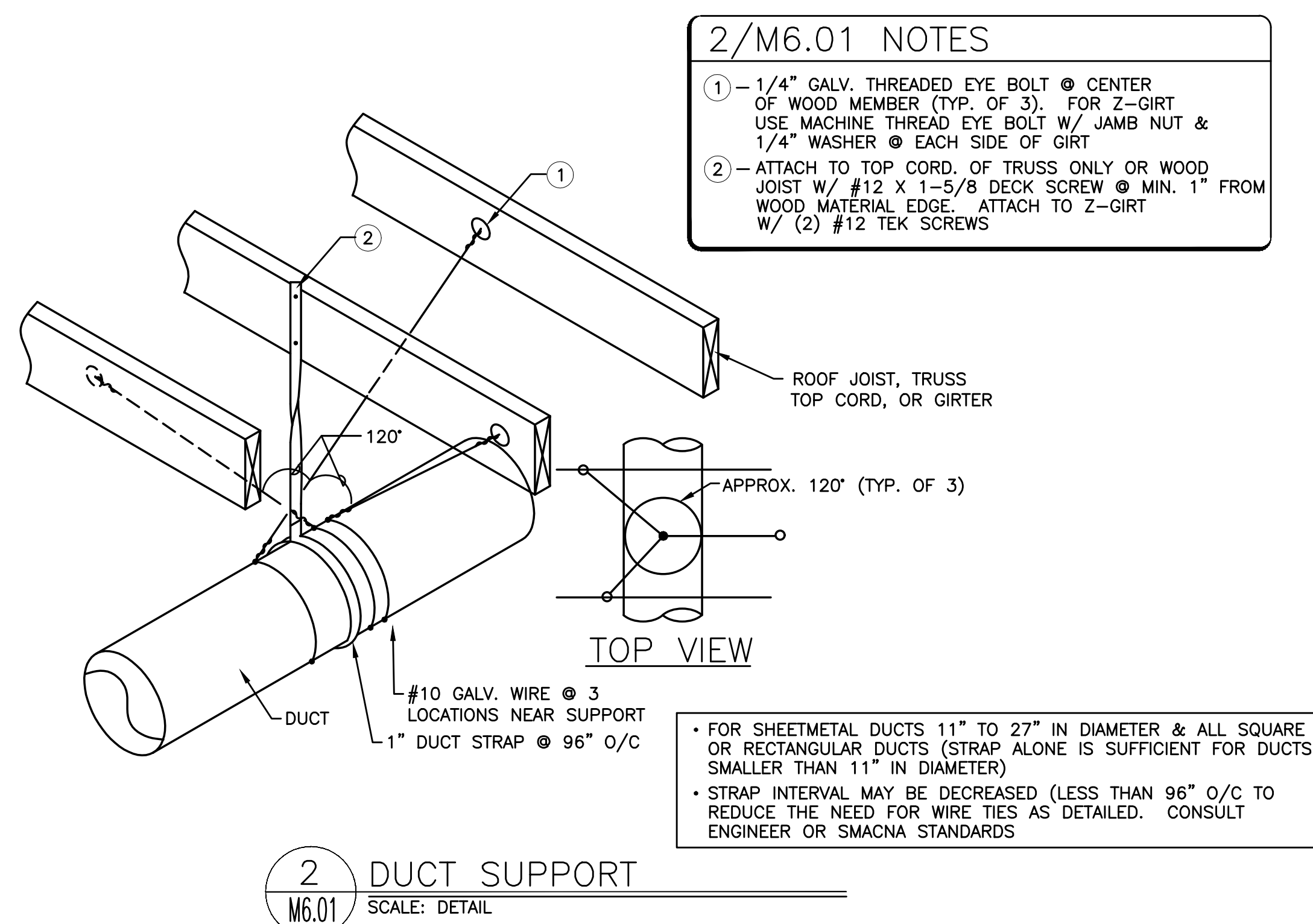
(*) MINIMUM POINTS TO BE MAPPED TO GRAPHIC

CONTROLS FOR EXHAUST FANS, SEE 2/M5.00

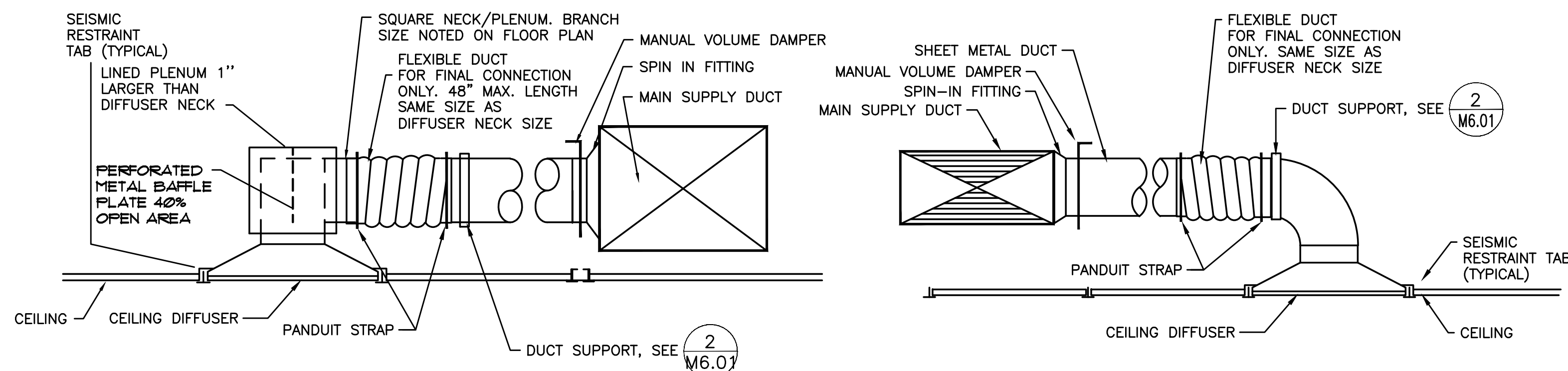
POINT DESCRIPTION	DIGITAL	ANALOG	DIGITAL	ANALOG	ALARM
START/STOP TYP OF ALL			X		
STATUS	X				

CONTROLS FOR VAV TERMINAL UNIT, SEE 1/M5.00

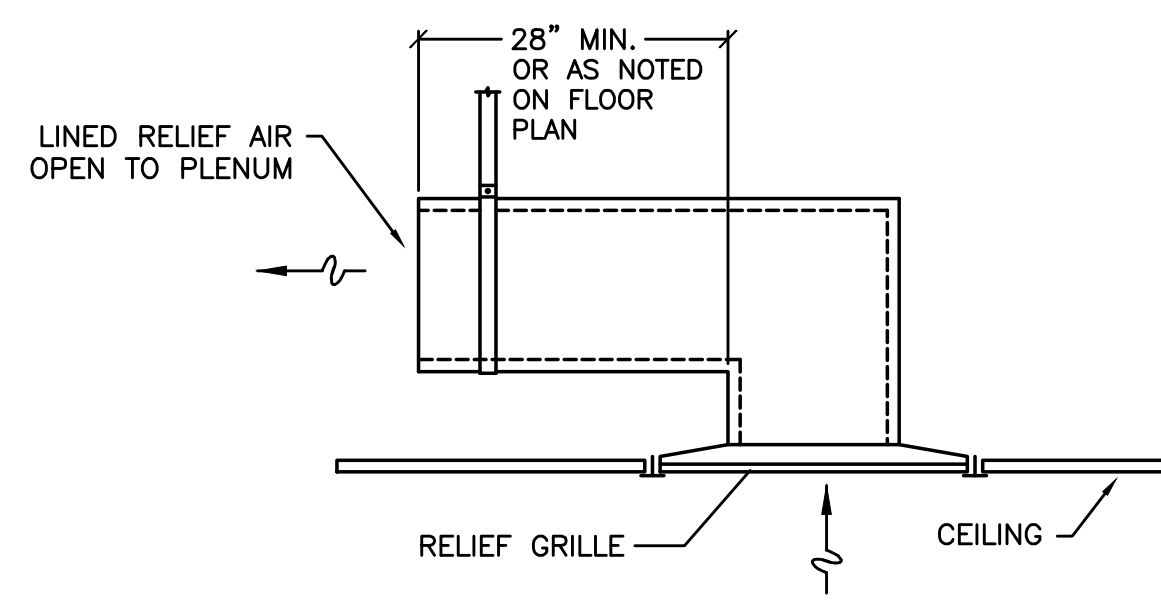
POINT DESCRIPTION	DIGITAL	ANALOG	DIGITAL	ANALOG	ALARM
SPACE TEMP		X			
AIR FLOW		X			
DAMPER POSITION				X	
DISCHARGE TEMPERATURE		X			
ELECTRIC HEATER			X		
ECONO ON/OFF			X		
SPACE OCCUPANCY	X				
SPACE CO2		X			



2 DUCT SUPPORT
M6.01 SCALE: DETAIL



1 CEILING DIFFUSER DETAIL
M6.01 NONE



3 PLENUM RA DETAIL
M6.01 DETAIL

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)	EX-HAUST AIR (CFM)	Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS
	Az			Pz	Rp	Ra	Vbz	Ex	Voz	Vpz	Zp					Evz		
C104 PRINCIPAL	165	5		1	5	0.06	15	1.0	15	310	0.05	310	0	1.00			15.54	RTU-1
C103 CONFERENCE	220	50		11	5	0.06	68	1.0	68	450	0.15	450	0	1.08			71.11	RTU-1
C105 HEALTH	170	5		1	5	0.06	15	1.0	15	165	0.09	165	0	0.96			15.85	RTU-1
C107 WORK ROOM	350	5		2	5	0.06	31	1.0	31	250	0.12	250	0	0.98			32.32	RTU-1
C108 STAFF LOUNGE	300	50		15	5	0.06	93	1.0	93	275	0.34	275	0	0.97			96.97	RTU-1
C102 RECEPTION ADMIN	665	10		7	5	0.06	75	1.0	75	700	0.11	700	0	1.15			78.10	RTU-1
C108 TOILET	85	0	1	0	50		0		0			0	75					RTU-1, EF-
TOTAL				37			297		297	2150		2150	75	0.96			310	
									Vou	Vps						Ev		
CORRECTED TOTAL OUTDOOR AIR FLOW RATE													340	CFM	Corrected OSA Fraction	Zs =	0.14	
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)	EX-HAUST AIR (CFM)	Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS
	Az			Pz	Rp	Ra	Vbz	Ex	Voz	Vpz	Zp					Evz		
C100 VESIBULE	200	0		0	0	0.06	12	1.0	12	300	0.04		0	0	0.98		13.44	EXIST.
C 101 LOBBY	450	30		14	5	0.06	97	1.0	97	500	0.19	500	0	0.98			108.63	EXIST.
C111 COUNSELING	135	5		1	5	0.06	13	1.0	13	100	0.13	100	0	0.98			14.67	EXIST.
C112 OFFICE	105	5		1	5	0.06	11	1.0	11	100	0.11	100	0	0.91			12.65	EXIST.
C109 CLASSROOM	1110	25		28	10	0.12	413	1.0	413	1050	0.39	1050	0	1.36			462.73	EXIST.
TOTAL	2000			44			547		547	2050		2050	1150	100	0.89		490	
									Vou	Vps						Ev		

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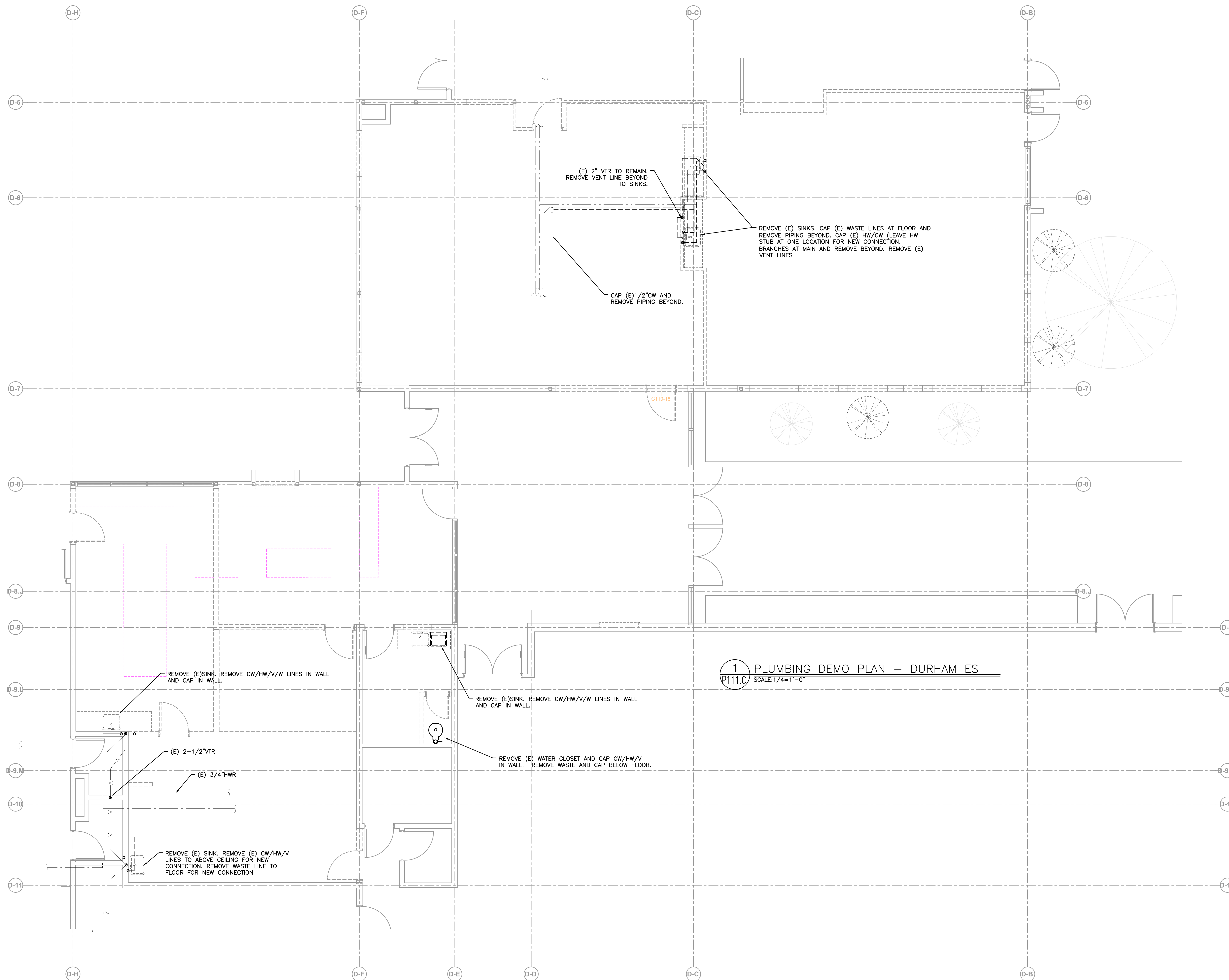
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PLUMBING DEMO PLAN
DURHAM ES

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10/16/2001 2:09:45: 54
AM



1 PLUMBING — DURHAM ES
P121.C SCALE: 1/4" = 1'-0"

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