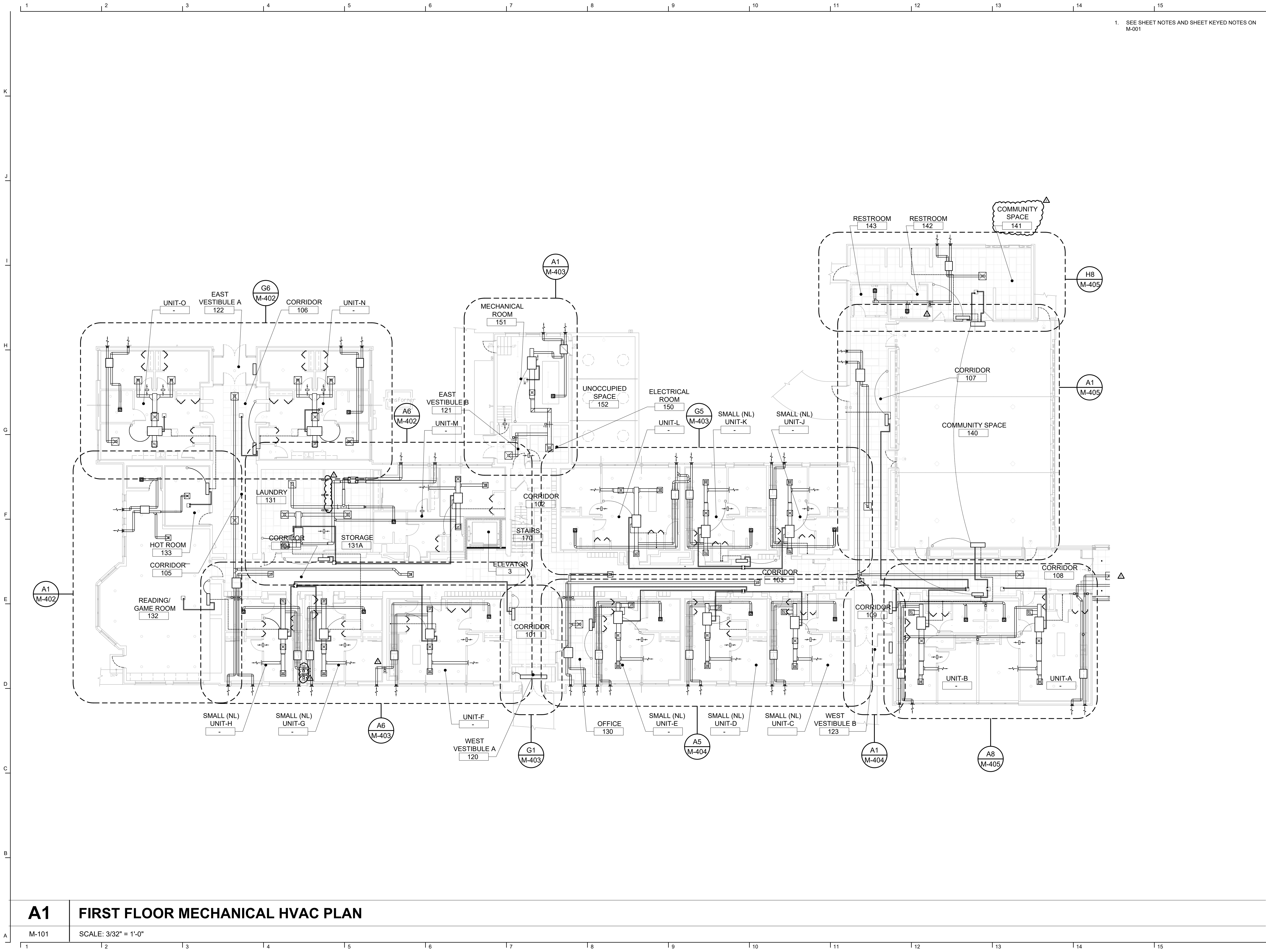


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1. SEE SHEET NOTES AND SHEET KEYED NOTES ON M-001

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REGISTRATION SEAL



KEY PLANS

SHEET TITLE
**FIRST FLOOR
MECHANICAL HVAC
PLAN**

SCALE: AS NOTED

ISSUED FOR	DATE
PERMIT	10.20.24
BULLETIN 2	3.05.25
BULLETIN 3	5.19.25

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21026.00

FILE NO.

M-101

SHEET NO.

A1 **FIRST FLOOR MECHANICAL HVAC PLAN**

M-101 SCALE: 3/32" = 1'-0"



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KEY PLANS

SHEET TITLE

SECOND FLOOR -
MECHANICAL HVAC
PLAN

SCALE: AS NOTED

ISSUED FOR	DATE
PERMIT	10.20.24
<u>Δ BULLETIN 3</u>	5.19.25

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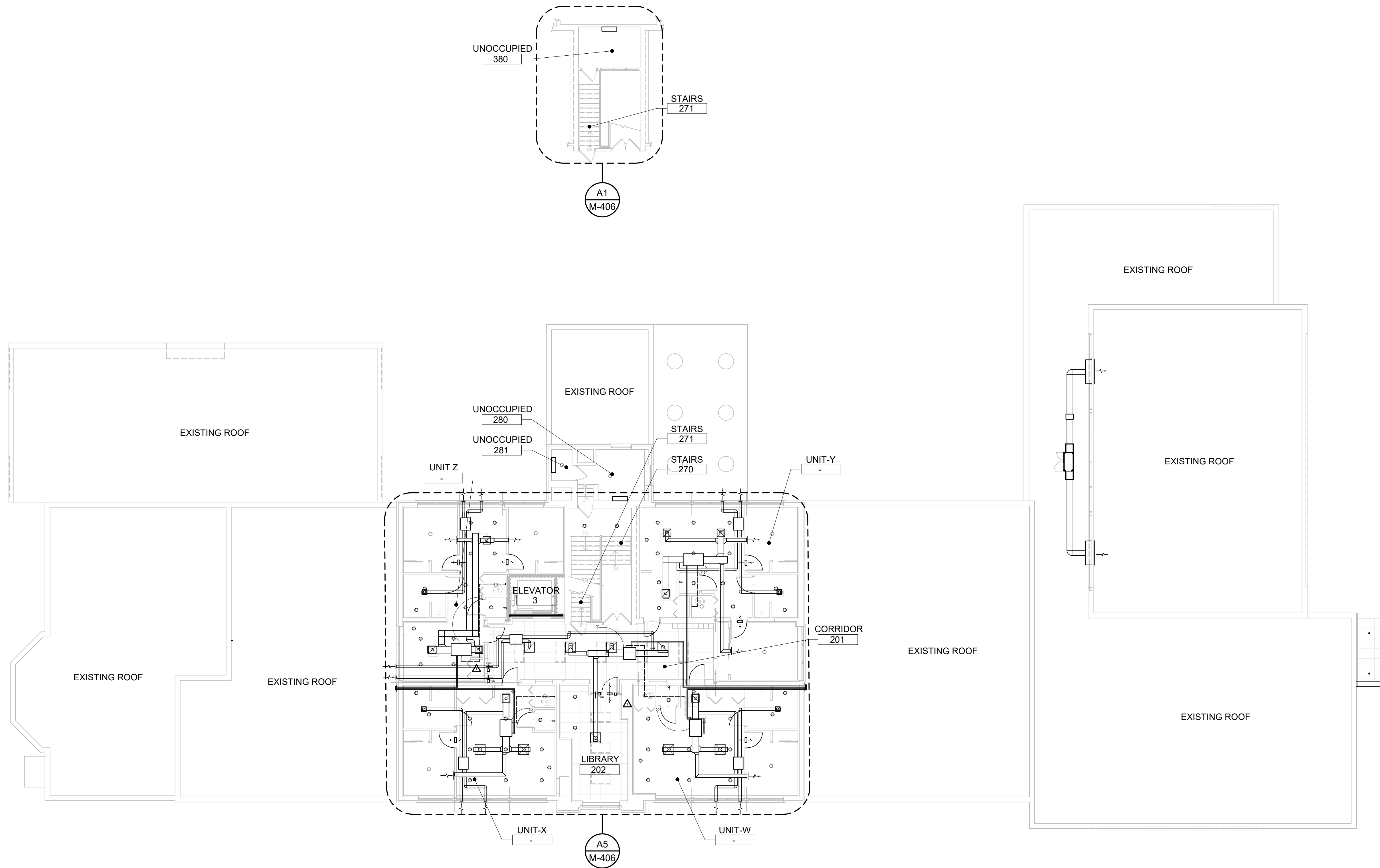
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FILE NO. _____

M-103

SHEET NO. _____



1. SEE SHEET NOTES AND SHEET KEYED NOTES ON M-001

A1 SECOND FLOOR - MECHANICAL HVAC PLAN

M-103	SCALE: 3/32" = 1'-0"
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SCALE: AS NOTED

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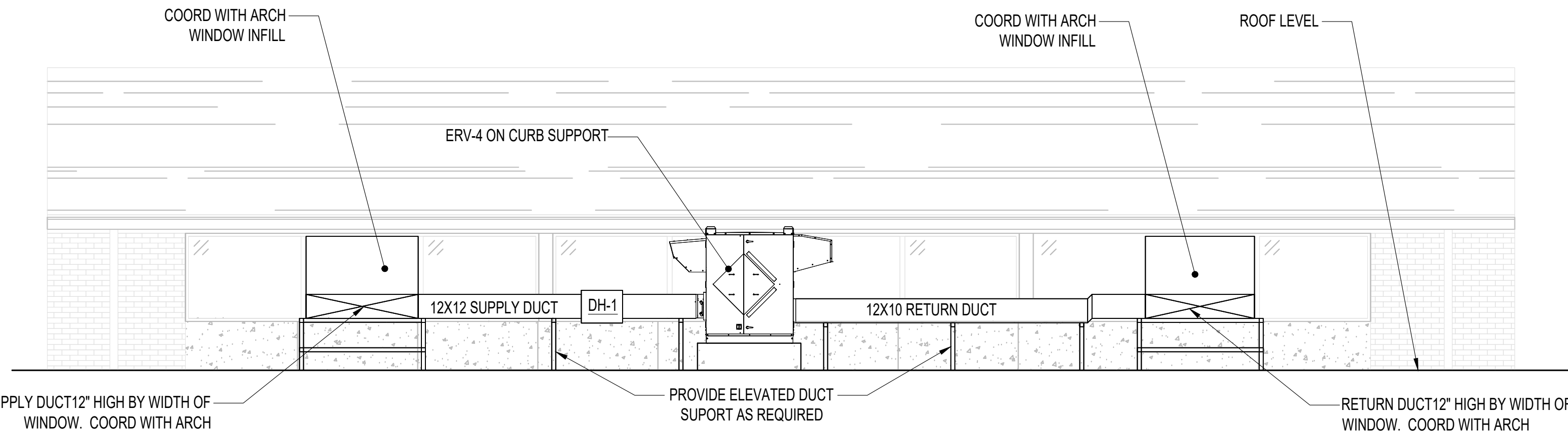
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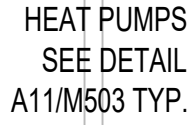
FILE NO. 21026.00

M-105

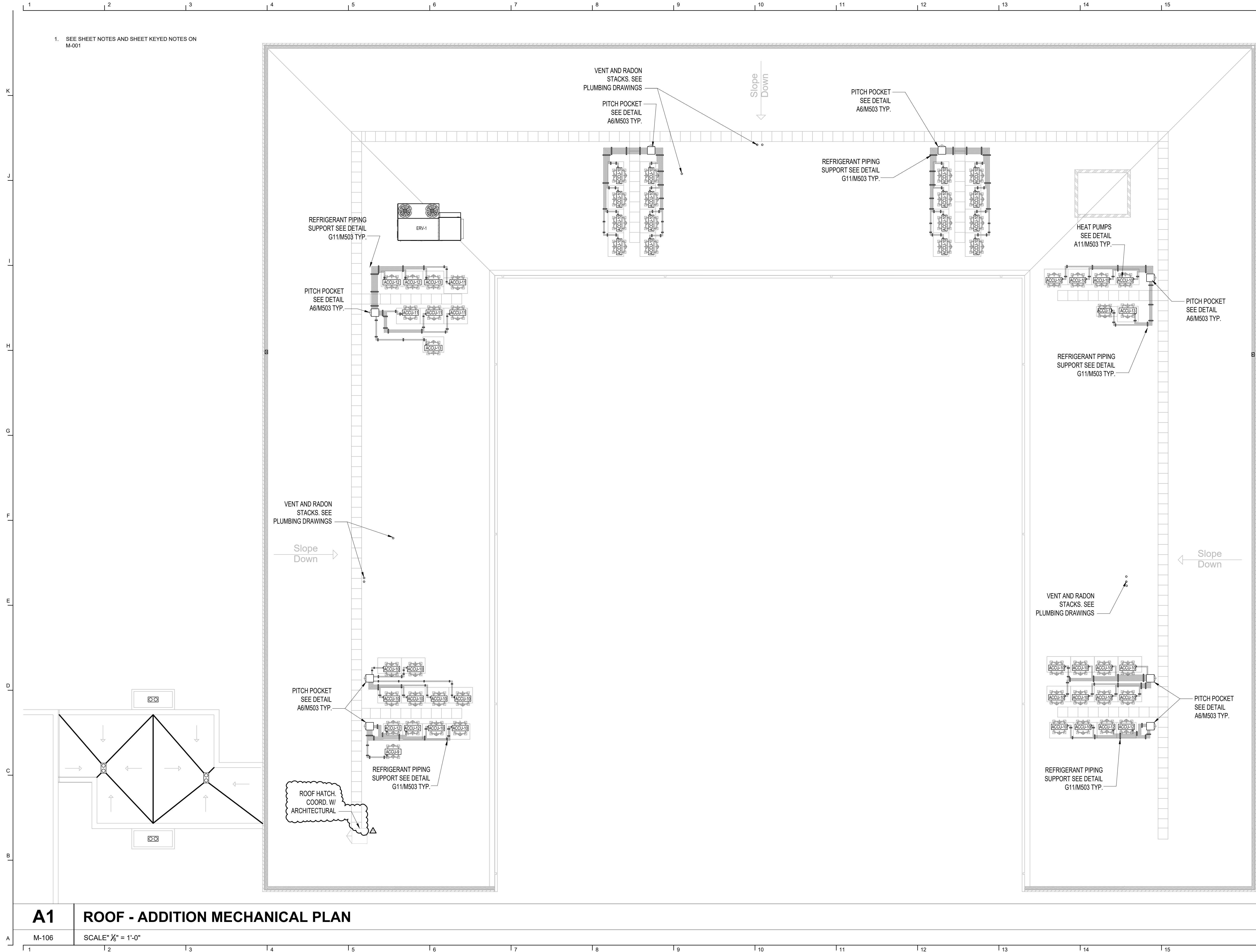
SHEET NO. _____



M-105 SCALE: 1/4" = 1'-0"



M-105 SCALE: $\frac{3}{32}" = 1'-0"$





SHEET TITLE

MECHANICAL HVAC
ENLARGED PLANS

SCALE: AS NOTED

ISSUED FOR	DATE
PERMIT	10.20.24
△ BULLETIN 1	2.19.25
△ BULLETIN 2	3.05.25
△ BULLETIN 3	5.19.25

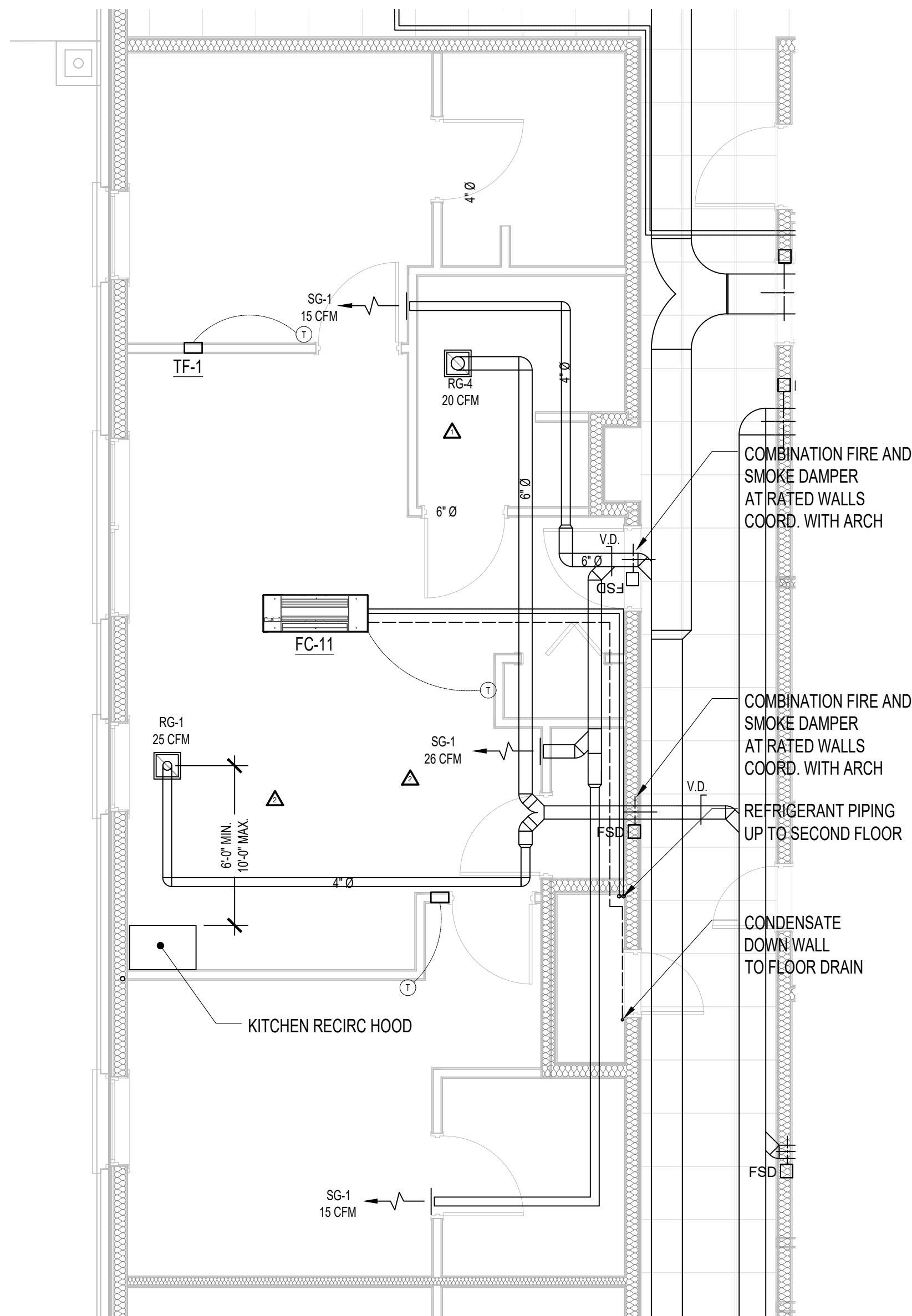
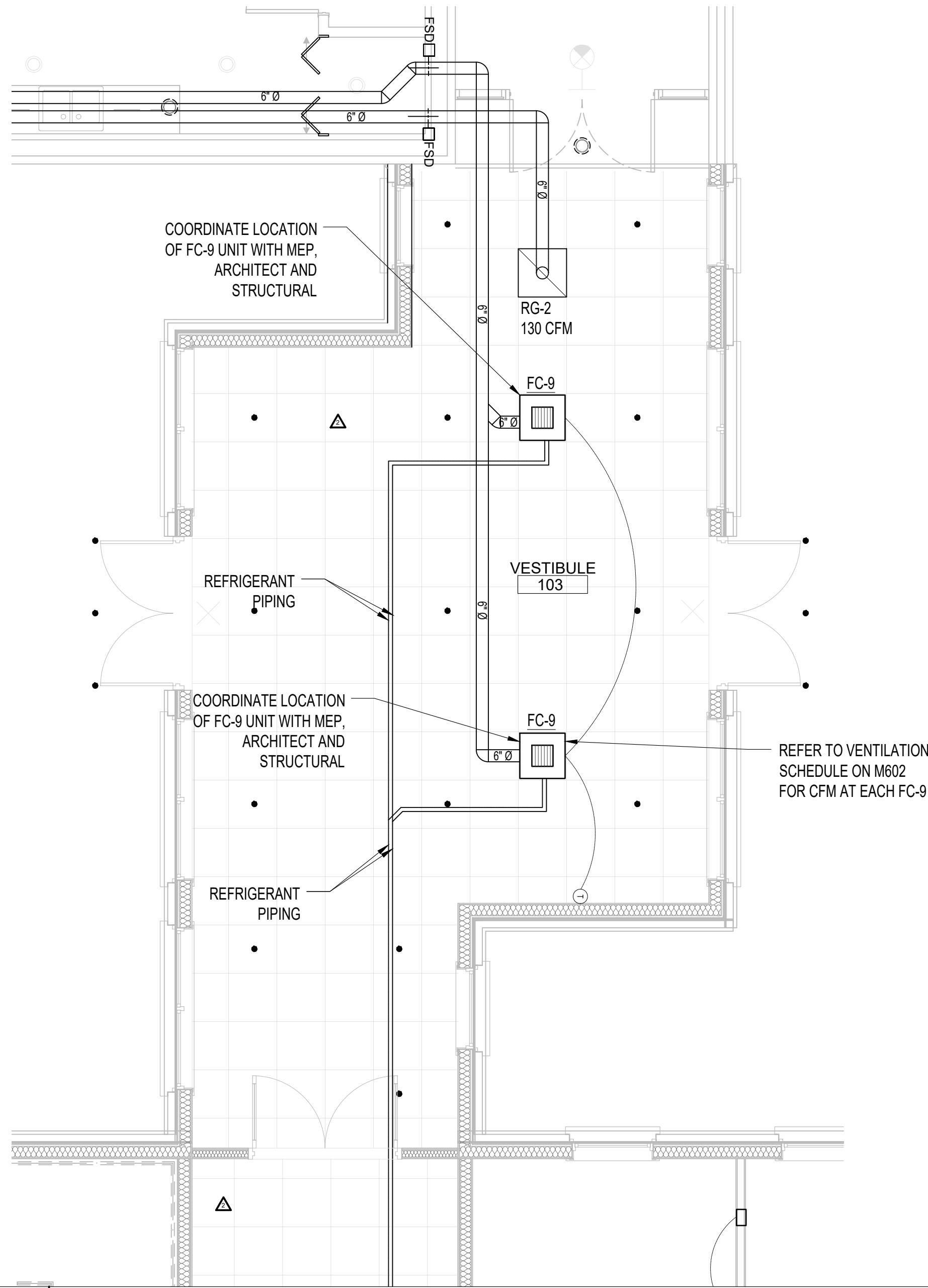
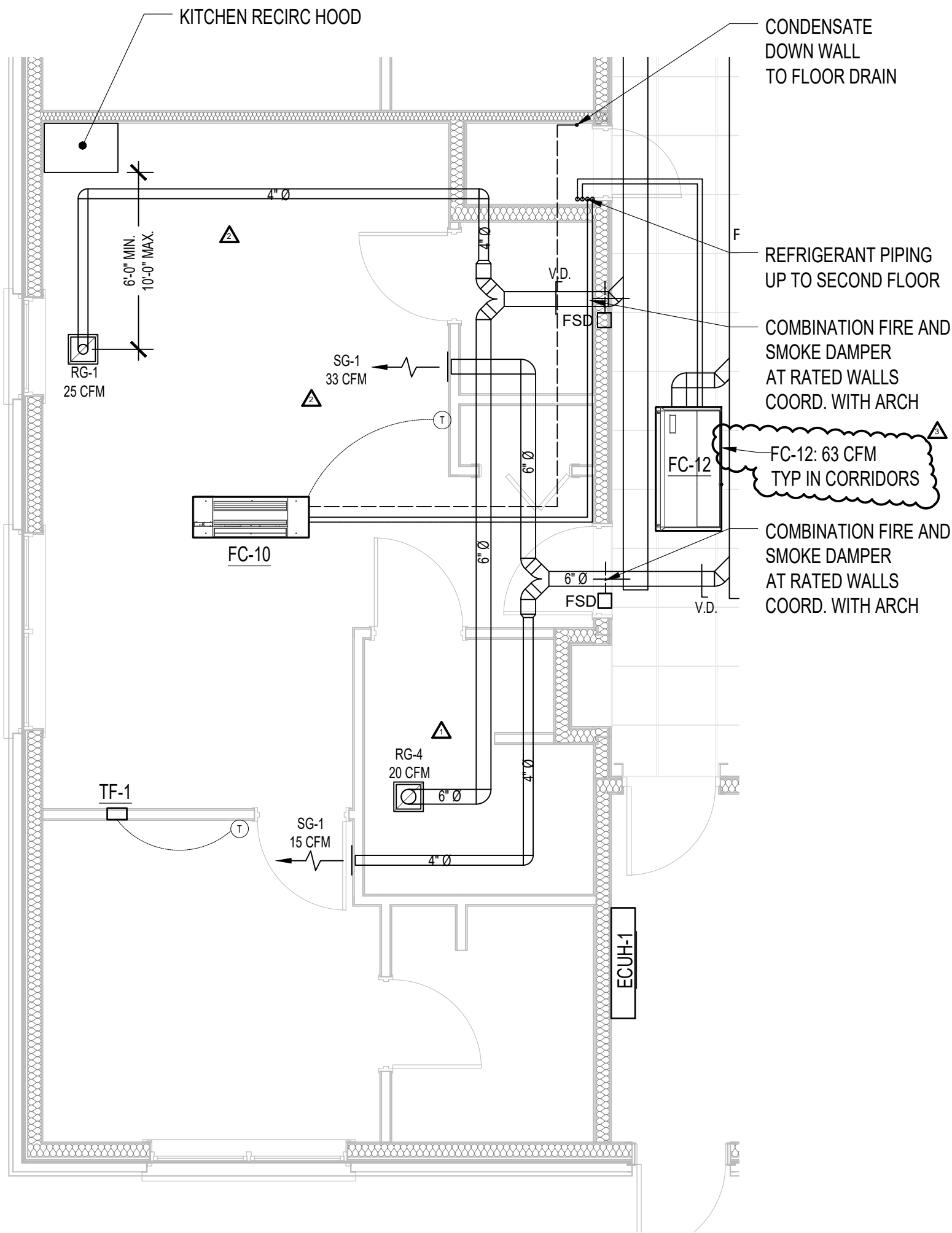
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FILE NO.

SHEET NO.

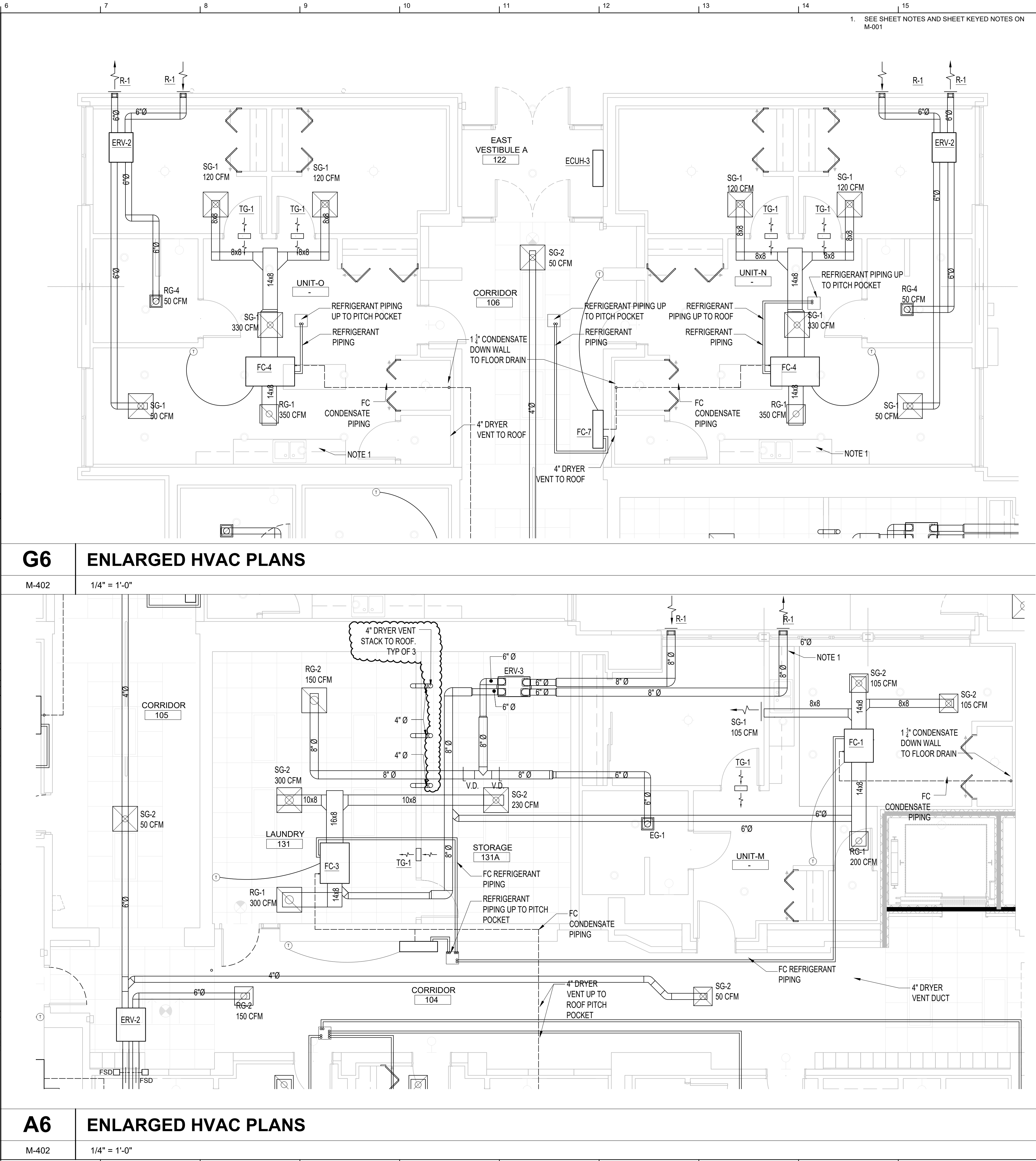
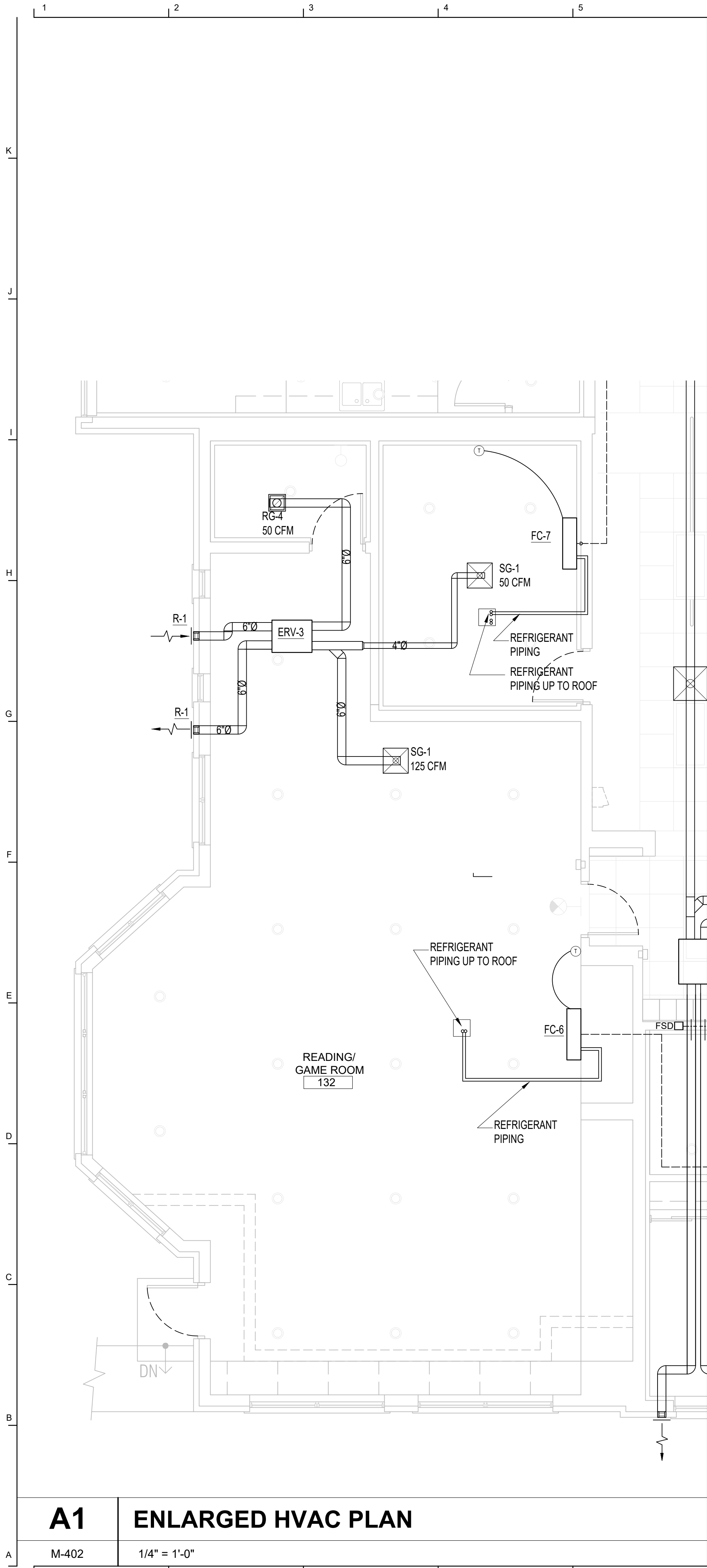


A6 | **1B UNIT A - HVAC PLAN**

A6 ENLARGED HVAC PLAN

A11 | 2B UNIT B (A SIM) - HVAC PLAN

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STEPHEN M. HENNARD
ENGINEER
No. 6201059975
LICENSED PROFESSIONAL ENGINEER

KEY PLANS

SHEET TITLE
MECHANICAL HVAC ENLARGED PLANS

SCALE: AS NOTED

ISSUED FOR	DATE
PERMIT	10.20.24
△ BULLETIN 3	5.19.25

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21026.00

FILE NO.

M-402

SHEET NO.

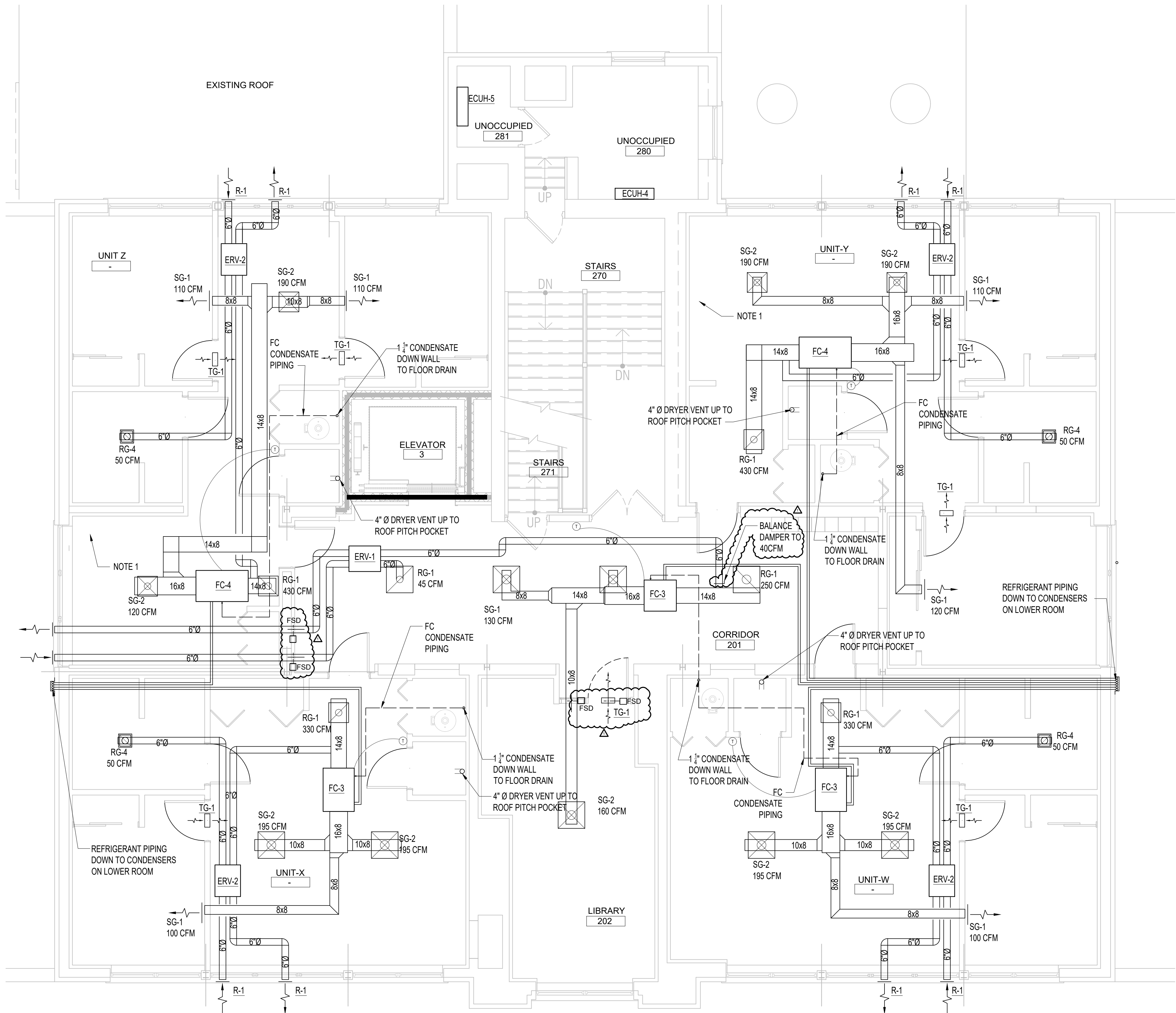
STATE OF MICHIGAN
 ★ ★
 STEPHEN M. HENNARD
 ENGINEER
 No. 6201059975
 LICENSED PROFESSIONAL ENGINEER

KEY PLANS

SCALE: AS NOTED

ISSUED FOR	DATE
PERMIT	10.20.24
<u>Δ BULLETIN 3</u>	5.19.25

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FILE NO.	21026.00 M-406
SHEET NO.	

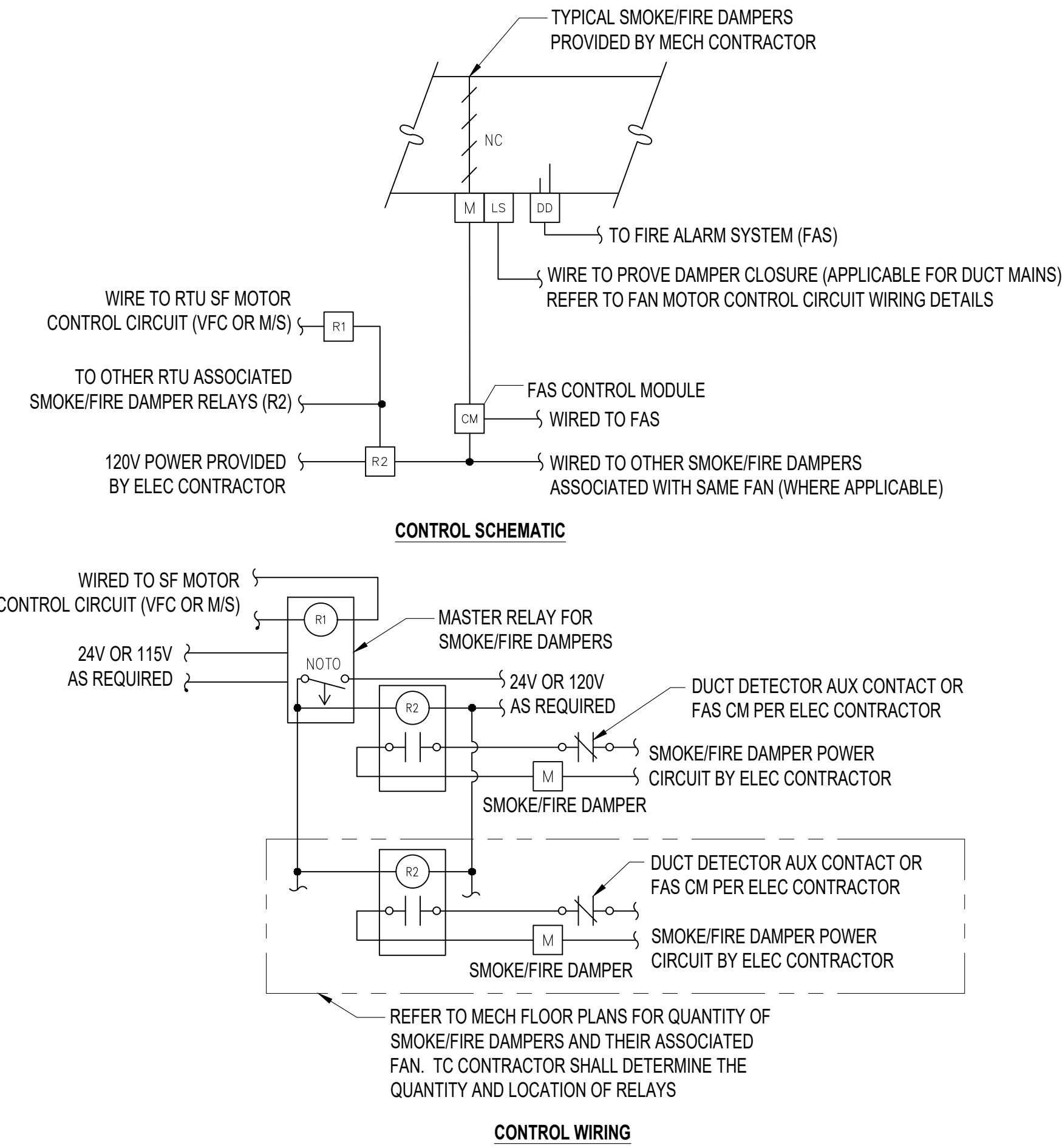


A5 ENLARGED HVAC PLANS

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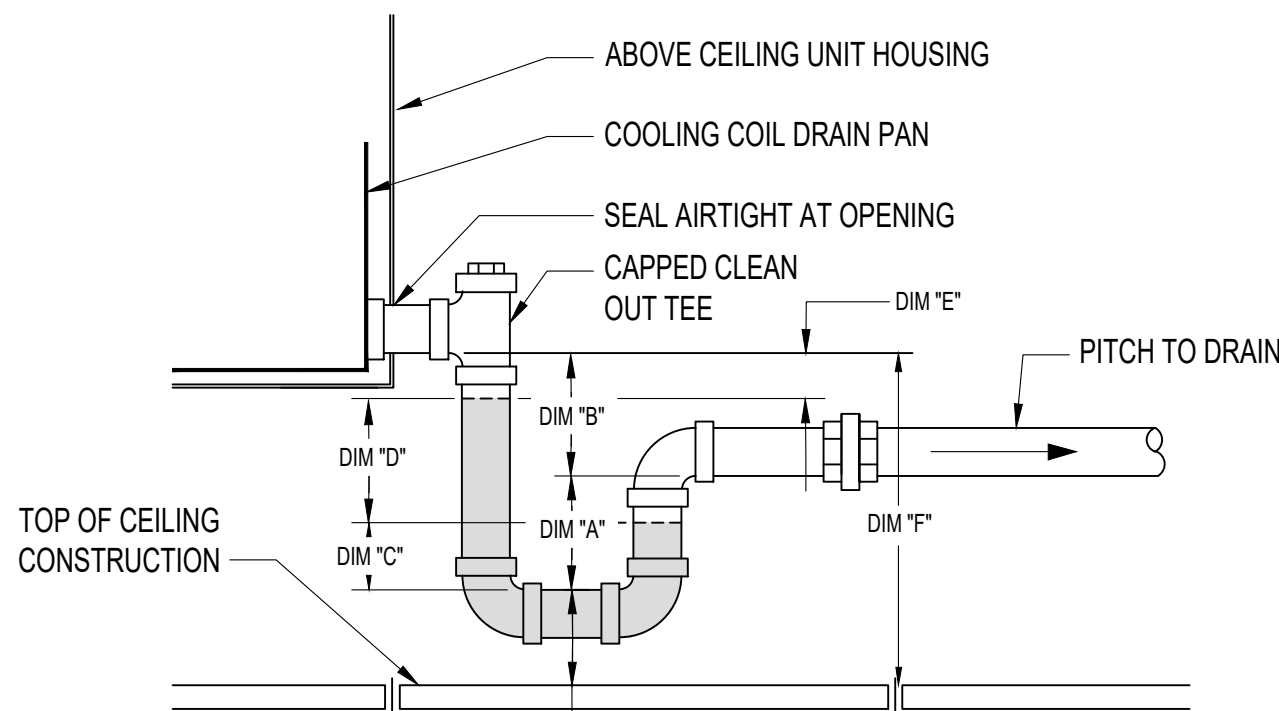
- NOTES:
- REFER TO FLOOR PLANS FOR QUANTITY 7 LOCATION OF THE SMOKE/FIRE DAMPERS AND ASSOCIATED HEAT PUMP UNIT
 - ELECTRICAL CONTRACT SHALL PROVIDE 120V POWER REQUIREMENT FOR SMOKE/FIRE DAMPER ACTUATOR(S)
 - TC CONTRACTOR SHALL PROVIDE CONTROL RELAY IN ENCLOSURE FOR SMOKE/FIRE DAMPER CONTROL. IF MULTIPLE POWER CIRCUITS ARE USED FOR SMOKE/FIRE DAMPERS ASSOCIATED WITH COMMON FAN, MULTIPLE CONTROL RELAYS SHALL BE USED AND WIRED IN PARALLEL.
 - SMOKE/FIRE DAMPERS SHALL BE SHIPPED AS AN ASSEMBLY FOR INSTALLATION ON SITE AND BEAR THE UL LISTING LABEL
- SEQUENCE OF OPERATION**
- SMOKE/FIRE DAMPERS SHALL BE HARDWIRE INTERLOCKED TO ASSOCIATE FAN CONTROLS AND SHALL OPEN WHEN FAN IS ACTIVATED AND CLOSE WHEN FAN IS DEACTIVATED.
 - WHEN PRODUCTS OF COMBUSTION ARE DETECTED AT DUCT SMOKE/FIRE DETECTOR, FIRE ALARM SYSTEM SHALL CLOSE RESPECTIVE SMOKE/FIRE DAMPERS AND DEACTIVATE ASSOCIATED FAN
 - WHERE APPLICABLE, FIRE/SMOKE/FIRE DAMPER LIMIT (ES) SWITCH SHALL BE HARDWIRE INTERLOCKED TO RESPECTIVE FAN CONTROL CIRCUIT TO PREVENT FAN FROM OPERATING UNTIL DAMPER(S) ARE PROVEN OPEN.

A1 DOAS 1 SMOKE/FIRE CONTROL WIRING

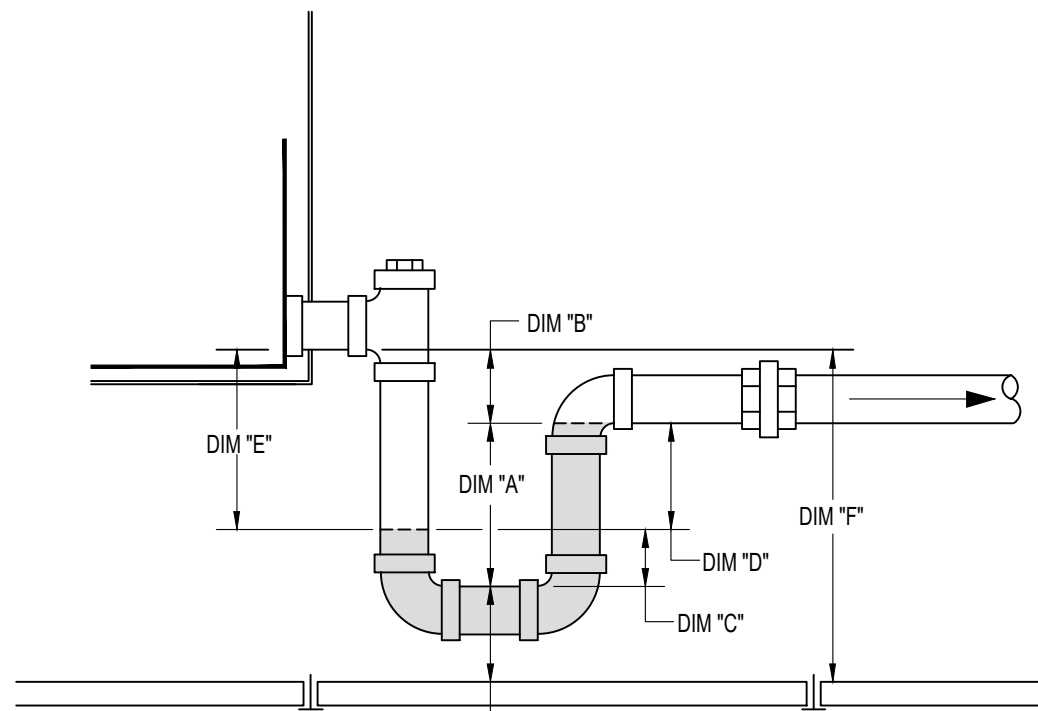
M-505 NTS

TRAP DIMENSION TABLE										
TYPE OF SYSTEM		DIMENSIONS "A" (INCHES) MIN.	DIMENSIONS "B" (INCHES)	DIMENSIONS "C" (INCHES) (TRAP SEAL)	DIMENSIONS "D" (INCHES)	DIMENSIONS "E" (INCHES)	DIMENSIONS "F" (INCHES) DRAIN PIPE SIZE (INCHES)			
							1 1/2"	2"	2 1/2", 3"	4"
DRAW THROUGH	-2.1 TO -3	3.5	3.5	2	3	2	10.0	11.0	12.0	13.0
	UP TO -2	3.0	3.0	2	2	2	9.0	10.0	11.0	12.0
BLOW THROUGH	UP TO +2	4.0	2.0	2	2	4	9.0	10.0	11.0	12.0
	+2.1 TO +3	5.0	2.0	2	3	5	10.0	11.0	12.0	13.0

- NOTES: A. REFER TO TERMINAL DEVICES USED FOR COOLING, COMPUTER ROOM AIR CONDITIONING UNITS, FAN COIL UNITS SPLIT SYSTEM AIR CONDITIONING UNIT ETC. FOR (-) OR (+) STATIC PRESSURE AT COIL DRAIN PAN
- B. DIMENSION "G" IS MIN: 3" FOR UP TO 1 1/2" DRAIN PIPE
4" FOR 2" DRAIN PIPE
5" FOR 2 1/2" OR 3" DRAIN PIPE
6" FOR 4" DRAIN PIPE



DRAW THROUGH

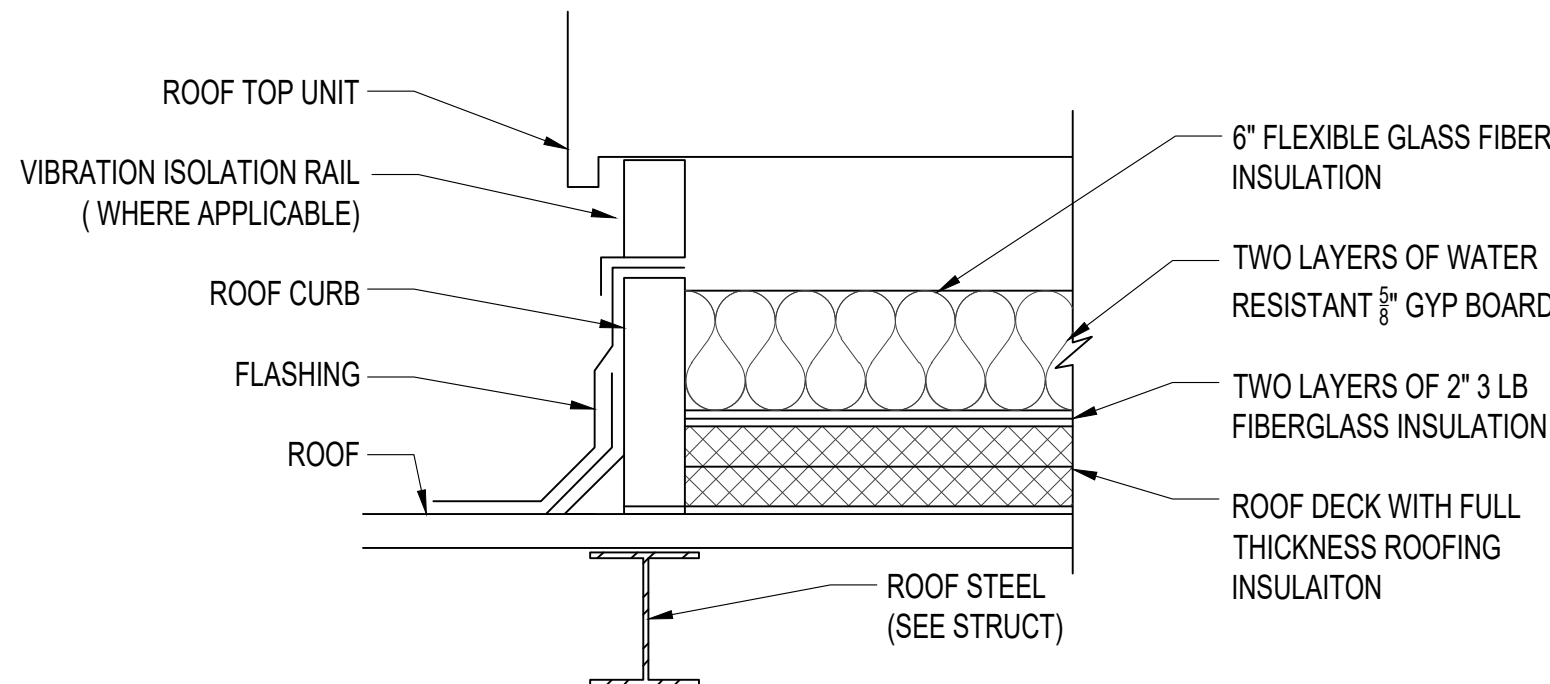


BLOW THROUGH

E6 CONDENSATE DRAIN PAN TRAP DETAIL (ABOVE CEILING UNITS)

M-505

NTS



NOTE: ALL DUCT, PIPING, OR ELECTRICAL CONNECTIONS TO UNIT BELOW CURB SHALL HAVE FLEXIBLE CONNECTIONS. CUT INSULATION, GYP BOARD, ROOFING INSULATION, AND METAL DECKING PENETRATIONS TIGHT TO ITEM PENETRATING ROOF. PACK ALL PENETRATION OPENINGS WITH FLEXIBLE GLASS FIBER

A6 ROOF TOP UNIT CURB DETAIL

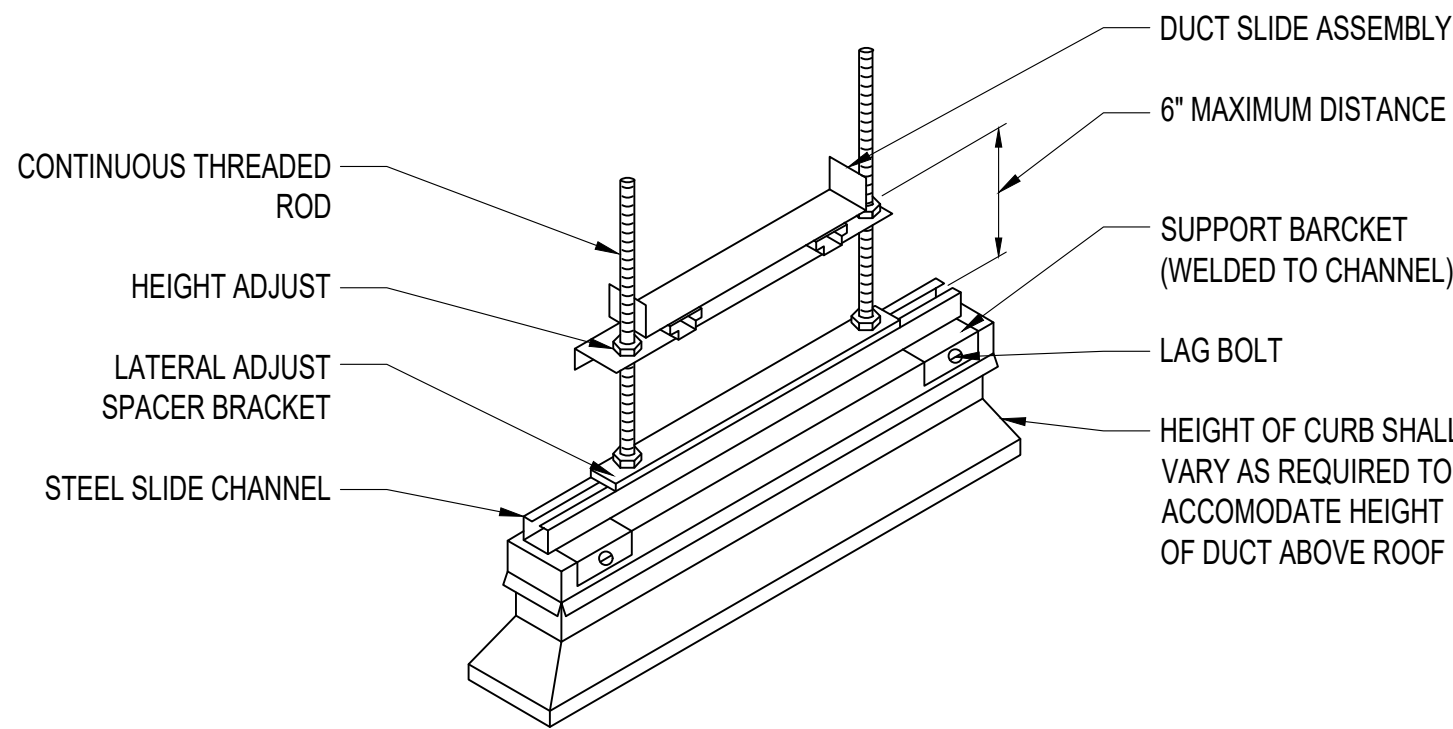
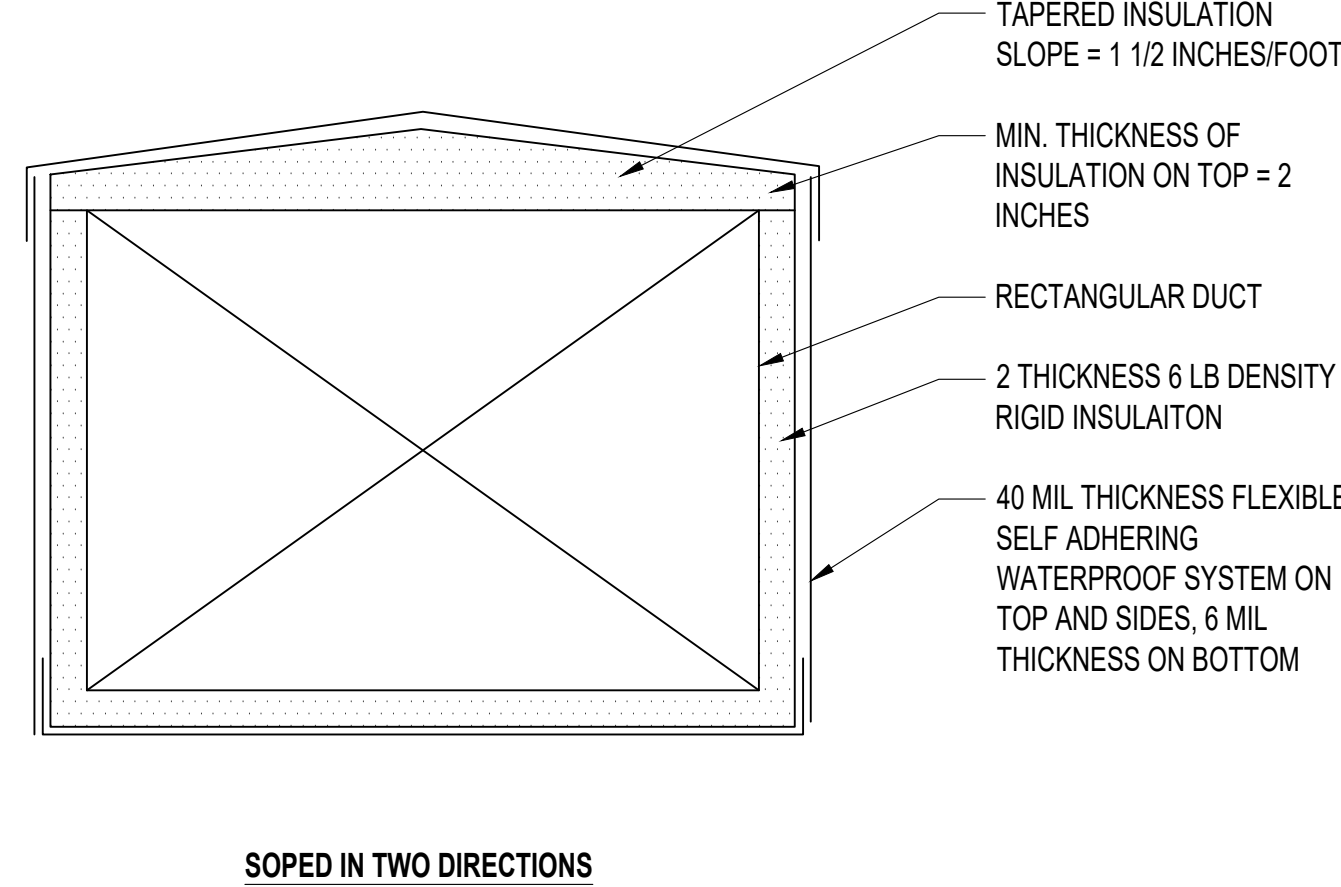
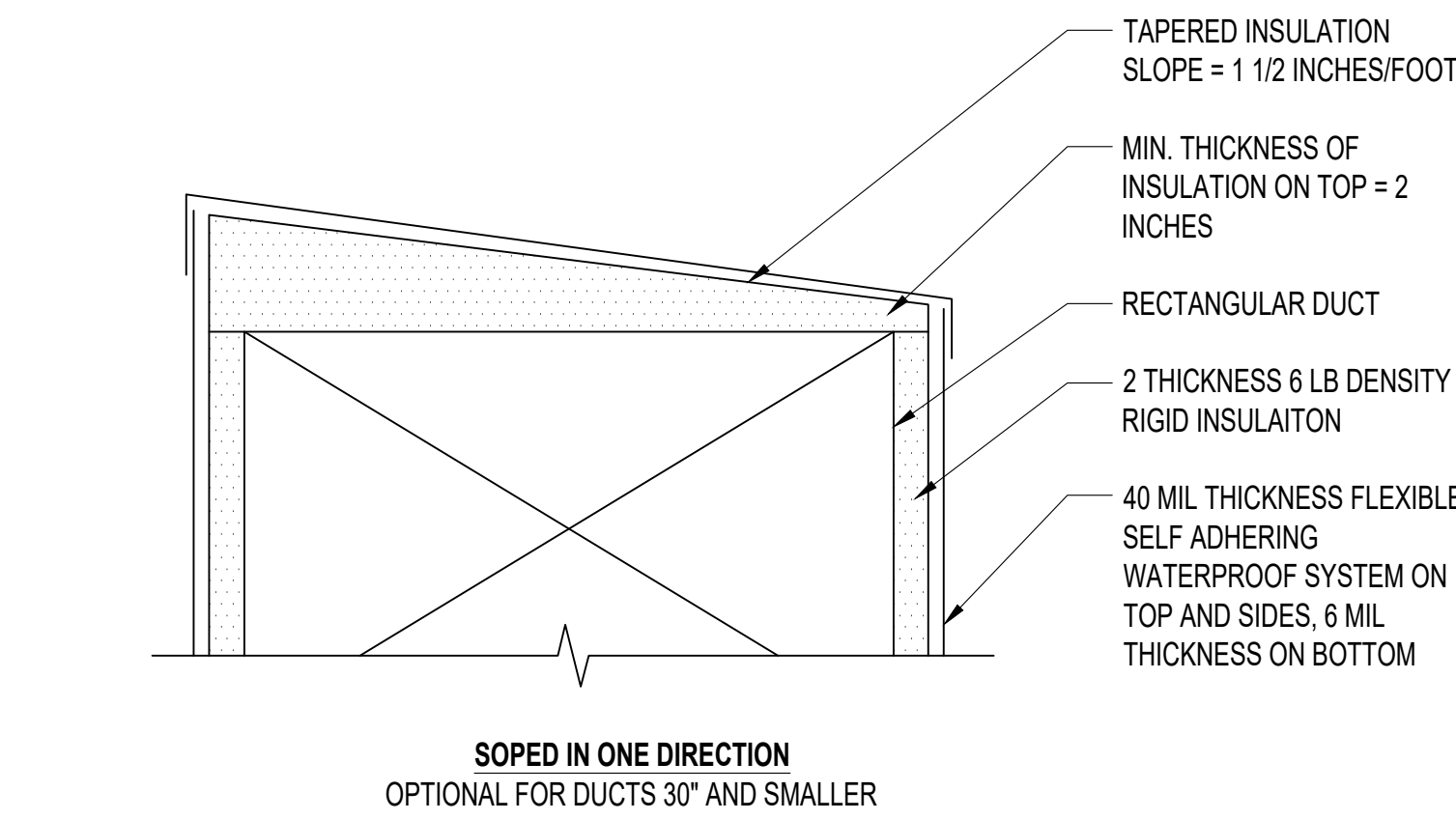
M-505

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E11 OUTDOOR DUCT INSULATION DETAIL

M-505

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A11 DUCT MOUNTING PEDESTAL DETAIL

M-505

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KEY PLANS

SHEET TITLE
**MECHANICAL
TYPICAL DETAILS**

SCALE: AS NOTED

ISSUED FOR: PERMIT DATE: 10.20.24
BULLETIN 3 5.19.25

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CHECKED: _____
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21026.00

FILE NO: M-505

SHEET NO.

Apartment/Room Notation	Occupancy Classification	Floor Area (SF)	Quantity	Code Occupent Density / 1000SF	Calculated Occupancy	Number of Plumbing Fixtures	TABLE 403.3 2015 Michigan Mech Code & ASHRE 62.2 Requirements					Design Air Balance					
							Outdoor Air			Calculated Min outdoor air required (cfm)	Zone Air Dist. Eff.	Calculated Min Exhaust Air (cfm)	Minimum room supply air (cfm)	Minimum exhaust air (cfm)	Minimum unit %OA	Outdoor ventilation air (cfm) delivered to space	Supply Air Units
							CFM/ SF	CFM/ PERSON	CFM/ FIXTURE OF SF								
H	Private Dwelling - 1 bedroom, 1 bathroom, living areas	462	1		2			15		38	0.8	0	see plan	50		50	FC 1
G	Private Dwelling - 1 bedroom, 1 bathroom, living areas	469	1		2			15		38	0.8	0	see plan	50		50	FC 1
F	Private Dwelling - 1 bedroom, 1 bathroom, living areas	682	1		2			15		56	0.8	0	see plan	50		60	FC 3
M	Private Dwelling - 1 bedroom, 1 bathroom, living areas	678	1		2			15		56	0.8	0	see plan	50		60	FC 3
C	Private Dwelling - 1 bedroom, 1 bathroom, living areas	484	1		2			15		38	0.8	0	see plan	50		50	FC 1
D	Private Dwelling - 1 bedroom, 1 bathroom, living areas	487	1		2			15		38	0.8	0	see plan	50		50	FC 1
E	Private Dwelling - 1 bedroom, 1 bathroom, living areas	500	1		2			15		38	0.8	0	see plan	50		50	FC 2
B	Private Dwelling - 1 bedroom, 1 bathroom, living areas	607	1		2			15		56	0.8	0	see plan	50		60	FC 3
A	Private Dwelling - 1 bedroom, 1 bathroom, living areas	800	1		2			15		56	0.8	0	see plan	50		60	FC 4
J	Private Dwelling - 1 bedroom, 1 bathroom, living areas	495	1		2			15		38	0.8	0	see plan	50		50	FC 1
K	Private Dwelling - 1 bedroom, 1 bathroom, living areas	513	1		2			15		38	0.8	0	see plan	50		50	FC 1
L	Private Dwelling - 1 bedroom, 1 bathroom, living areas	714	1		2			15		56	0.8	0	see plan	50		60	FC 3
X	Private Dwelling - 1 bedroom, 1 bathroom, living areas	660	1		2			15		56	0.8	0	see plan	50		60	FC 3
W	Private Dwelling - 1 bedroom, 1 bathroom, living areas	713	1		2			15		56	0.8	0	see plan	50		60	FC 3
N, O	Private Dwelling - 2 bedroom, 1 bathroom, living areas	812	1		3			15		56	0.8	0	see plan	50		60	FC 4
Y	Private Dwelling - 2 bedroom, 1 bathroom, living areas	876	1		3			15		56	0.8	0	see plan	50		60	FC 4
Z	Private Dwelling - 2 bedroom, 1 bathroom, living areas	795	1		3			15		56	0.8	0	see plan	50		60	FC 4
141	Breakroom	487	1	25	13	1		0.06	5	110	0.8		701			100	FC 5
131 / 131A	Laundry	628	1	20	13	1		0.06	7.5	160			529	150		150	FC 3
133	Storage	178	1					0.06					437			50	FC 7
132	Breakroom	1096	1	25	28			0.06	5	241			775	175		250	FC 6
140	Conference/meeting	2377	1	50	119			0.06	5	886			1550		100	900	ERV 3, FC 6 (2)
130	Office	212	1	5	1			0.06	5	19			437			50	FC 7
150	Electrical Room	121	1		0												FC 3
151	Storage	414	1		0												FC 3
142, 143	Toilet	78	1		0	1				70		70	0				
101 - 110	Cooridor	3831	1					0.06		230	0.8	0	257	400		350	FC 8
202	Office	274	1	5	2			0.06	5	29			160		16	40	FC 3
201	Cooridor	528	1					0.06		32	0.8	0	260	45	18	40	FC 3
103	Lobby	1040	1	10	11			0.06	7.5	166			1040		18	175	FC 9
1B Unit A & C	Private Dwelling - 1 bedroom, 1 bathroom, living areas		19		2				15	38	0.8	0	See plan	45		48	FC 10 & FC 11
2B Unit A,B & C	Private Dwelling - 2 bedroom, 1 bathroom, living areas		2		3				15	56	0.8	0	See plan	45		△56	FC 10 & FC 11
Various	Cooridor	3156	1					0.06		189	0.8	0	900	200		190	FC 12
105	Electrical room		1														FC 13
113	Electrical room		1												△		FC 13
109	Storage		1														FC 13
115	Mechanical room		1														FC 13
108	Storage		1														FC 13
	Total For Floor 1													1145		1214	
1B Unit A & C	Private Dwelling - 1 bedroom, 1 bathroom, living areas		18		2				15	38	△ 0.8	0	See plan	45△		48	FC 10 & FC 11
2B Unit A,B & C	Private Dwelling - 2 bedroom, 1 bathroom, living areas		3		3				15	56	0.8	0	See plan	45		△56	FC 10 & FC 11
Various	Cooridor	2610	1		0			0.06		157	0.8	0	900	175		162	FC 12
203	Storage		1		0												FC 13
208	Storage		1		0										△		FC 13
211	Mechanical room		1		0												FC 13
207	Storage		1		0												FC 13
	Total For Floor 2										△			1120△		1194	

VIBRATION ISOLATOR APPLICATION SCHEDULE										
EQUIPMENT TYPE	EQUIPMENT CATEGORY	HORSEPOWER AND OTHER	RPM	EQUIPMENT LOCATION						KEYED NOTES
				SLAB ON GRADE			UP TO 40 FT (12M) FLOOR SPAN			
				BASE TYPE	ISOLATOR TYPE	MIN. DEF., IN. (MM)	BASE TYPE	ISOLATOR TYPE	MIN. DEF., IN. (MM)	
SUSPEND HEAT PUMPS, FAN COILS, LOCATED INDOORS	ALL	ALL	ALL				A OR B	8a or 8b	1.50 (38)	NOTES 1, 3, 4
BASE MOUNTED CONDENSING UNITS	ALL ALL	≤1HP >1HP	ALL ALL	A OR B A OR B	2 2	0.25 (6) 0.25 (6)	A OR B A OR B	2 4	.25 (64) 2.50 (64)	NOTES 3
SUSPEND DUCTED ROTATING EQUIP.	SMALL FANS, FAN-POWERED BOXES	≤600 CFM >600 CFM	ALL ALL				A A	8a or 8b 8a or 8b	0.50 (13) 0.75 (19)	NOTES 3, 4

NOTES:

1. THRUST RESTRAINTS: PROVIDE THRUST RESTRAINTS BETWEEN FAN DISCHARGE AND DUCT (IN PAIRS, LOCATED ON THE CENTER LINE OF THE DISCHARGE OUTLET OF THE FAN, BRIDGING THE FLEXIBLE DUCT CONNECTOR) FOR ALL FAN HEADS, FOR AXIAL AND CENTRIFUGAL FANS UNITS OPERATING AT 2 INCHES OR GREATER TOTAL STATIC PRESSURE AND AS SHOWN ON DRAWINGS. SPRING DEFLECTION SHALL BE LIMITED TO THE FOLLOWING TABLES:
2. PIPING RISER ISOLATION: PROVIDE PIPE RISER RESILIENT ANCHORS, SPRING MOUNTS AND RESILIENT PIPE GUIDES CAPABLE OF DISTRIBUTING THE LOADS WITHIN THE BUILDING DESIGN LIMITS AT THE SUPPORT POINTS.
3. HORIZONTAL PIPING VIBRATION ISOLATION: PROVIDE TYPE 8a OR 8b SPRING HANGERS AND SPRING MOUNTS FOR PIPING CONNECTED TO VIBRATION ISOLATED EQUIPMENT. FOR 2" TO 4" PIPING, PROVIDE SPRING HANGERS AND SPRING MOUNTS AT MINIMUM HORIZONTAL DISTANCES FROM THE ISOLATED EQUIPMENT: UP TO 6" - 50 FEET (1 1/2" MINIMUM DEFLECTION), 8" AND LARGER - 100 FEET (2 1/2" MINIMUM DEFLECTION), WHICHEVER IS GREATER; AND AS SHOWN ON DRAWINGS. THE FIRST 4 HANGERS FROM THE ISOLATED EQUIPMENT SHALL BE TYPE 8b.
4. DUCTWORK VIBRATION ISOLATION: PROVIDE TYPE 8a OR 8b SPRING HANGERS FOR DUCTWORK WITH A CROSS SECTION OF 2 SQUARE FEET OR GREATER. PROVIDE AIR HANDLING UNIT HANGERS AND SPRING MOUNTS FOR RELIEF FANS, AND VIBRATION ISOLATED EQUIPMENT, WHICHEVER IS GREATER; AND AS SHOWN ON DRAWINGS (3/4" MINIMUM DEFLECTION).

BASE TYPES:

BASE TYPE A - NO BASE, ISOLATORS ATTACHED DIRECTLY TO EQUIPMENT
 BASE TYPE B - STRUCTURAL, STEEL RAILS OR BASE
 BASE TYPE C - CONCRETE INERTIA BASE
 BASE TYPE D - CURB - MOUNTED ALUMINUM BASE WITH 1" DEFL. SPRING ISOLATORS
 BASE TYPE E - CURB - MOUNTED STEEL BASE WITH ADJUSTABLE 1", 2" OR 3" DEFL. SPRING ISOLATORS

ISOLATOR TYPES:

ISOLATOR TYPE 1a -	ELASTOMERIC ISOLATION PAD
ISOLATOR TYPE 1b -	ELASTOMERIC ISOLATION PAD WITH STEEL LOAD BEARING PLATE
ISOLATOR TYPE 2 -	ELASTOMERIC FLOOR ISOLATOR
ISOLATOR TYPE 3 -	FREE STANDING SPRING FLOOR ISOLATOR
ISOLATOR TYPE 4 -	RESTRAINED SPRING ISOLATOR
ISOLATOR TYPE 5 -	THRUST RESTRAINT
ISOLATOR TYPE 6 -	AIR SPRING
ISOLATOR TYPE 7 -	ELASTOMERIC HANGERS
ISOLATOR TYPE 8a -	SPRING HANGERS
ISOLATOR TYPE 8b -	SPRING HANGERS WITH VERTICAL - LIMIT STOP

DUCT SYSTEM INSULATION APPLICATION SCHEDULE												
	INSULATION MATERIAL & THICKNESS (INCHES)								FIELD APPLIED JACKET MATERIAL			
	FIBERGLASS BLANKET 75 LB/CU FT.	FIBERGLASS BLANKET 10 LB/CU FT.	FIBERGLASS BOARD 2.25 LB/CU FT.	FIBERGLASS BOARD 6.0 LB/CU FT.	FLEXIBLE ELASTOMERIC	ASTM E2338 2-HOUR FIRE RATED BLANKET	2-HOUR FIRE RATED BLANKET	ALUMINUM	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)			
DUCT SYSTEMS LOCATED INDOORS												
SUPPLY AIR, EXCEPT AS NOTED BELOW		1.5									a	
RECTANGULAR SUPPLY AIR IN MECHANICAL ROOMS			1.5									
OUTSIDE AIR AND MIXED AIR, EXCEPT AS NOTED BELOW		1.5										

GENERAL NOTES:

1. THE FOLLOWING PLENUMS, DUCTS AND DUCT ACCESSORIES NOT REQUIRING INSULATION

- a. DOUBLE WALL METAL DUCTS WITH SUFFICIENT INSULATION TO MEET ASHRAE 62.2
- b. EXPOSED SUPPLY DUCT IN CONDITIONED SPACE SERVED BY THAT SYSTEM
- c. FACTORY-INSULATED FLEXIBLE DUCTS
- d. FLEXIBLE CONNECTORS
- e. VIBRATION - CONTROL DEVICES
- f. FACTORY - INSULATED ACCESS PANELS AND DOORS.

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REGISTRATION SEAL



KEY PLANS

SHEET TITLE

MECHANICAL VENTILATION SCHEDULE

SCALE: AS NOTED

ISSUED FOR	DATE
PERMIT	10.20.24

<u>Δ BULLETIN 1</u>	<u>2.19.25</u>
<u>Δ BULLETIN 2</u>	<u>3.05.25</u>
<u>Δ BULLETIN 3</u>	<u>5.19.25</u>

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SHEET NO.