FAN SCHEDULE

UNIT	CFM	S.P.	RPM	MOTOR			SELECTION BASED ON GREENHECK	CONTROL	NOTES
				WATTS	VOLTS	PH			
EF-1	300	0.25	1120	80	120	1	CSP-A390	RUN DURING OCCUPANCY	1
EF-2	225	0.25	830	132	120	1	CSP-A200	RUN DURING OCCUPANCY	1
EF-3	600	0.50	1288	1/4 HP	120	1	CUBE-099	INTERLOCK WITH HOOD	2
EF-4	200	0.375	989	57	120	1	CSP-A250	WALL SWITCH	1
EF-5	200	0.375	989	57	120	1	CSP-A250	WALL SWITCH	1
EF-6	150	0.25	1250	33	120	1	SP-A190	RUN DURING OCCUPANCY	1
EF-7	1525	0.25	1380	1/4 HP	120	1	GB-120	RUN DURING OCCUPANCY	3
EF-8	250	0.25	1010	82	120	1	CSP-A290	RUN DURING OCCUPANCY	1
EF-9	1200	0.25	1140	82	120	1	GB-120	RUN DURING OCCUPANCY	3
EF-10	275	0.25	1050	93	120	1	CSP-A290	WALL SWITCH	1
EF-WELD	5250	2.5	1485	5 HP	460	3	TCBRU-2-22	WALL SWITCH	4
EF-VE	2500	4.0	2400	3 HP	460	3	MONOXIVENT BI-150	WALL SWITCH	4
EF-KH	10928	2.0	794	7.5 HP	460	3	CUBE-360HP-VGD	INTERLOCK WITH HOOD	3
EF-BH	2350	1.6	1349	1.5 HP	460	3	CUBE-180HP-VGD	INTERLOCK WITH HOOD	3
EF-SH	1125	0.50	1608	1/4 HP	120	1	CUBE-100	WALL SWITCH	3

REQUIREMENTS. EQUALS SHALL BE ACCEPTEDSCHEDULE NOTES:

1. PROVIDE WITH SPEED CONTROLLER, ELECTRICAL DISCONNECT AND WALL CAP. CONTROL AS INDICATED IN SCHEDULE.
2. PROVIDE WITH DISCONNECT, MOTOR OPERATED DAMPER, CONFIGURED FOR SIDEWALL MOUNTING.
3. PROVIDE WITH DISCONNECT, MOTOR OPERATED DAMPER, ROOF CURB.
4. PROVIDE WITH DISCONNECT, NO LOSS STACK HEAD, VIBRATION ISOLATION.
5. MODEL NUMBERS ARE USED TO ESTABLISH PERFORMANCE REQUIREMENTS. EQUALS SHALL BE ACCEPTED

ELECTRIC WALL HEATER SCHEDULE

MARK	MANUFACTURER & MODEL NO.	MBH	CFM	KW	VOLT/PH
WH-1	MARKEL E3323TTD-RP	5.1	400	1.5	120/1

NOTES:
- PROVIDE WITH DISCONNECT SWITCH & IN-BUILT THERMOSTAT
- MODEL NUMBERS ARE USED TO ESTABLISH PERFORMANCE REQUIREMENTS. EQUALS SHALL BE ACCEPTED

DUST COLLECTOR

DONALDSON UNIMASTER UMA450, 3350 CFM, 15 HP, 460/3ø
MODEL NUMBERS ARE USED TO ESTABLISH PERFORMANCE REQUIREMENTS. EQUALS SHALL BE ACCEPTED

MAKE-UP AIR UNIT SCHEDULE

MARK	MANUFACTURER & MODEL NO.	CFM	EVAP. FAN HP	VOLTS ø	S.P. IN WG EXT.	HEATING CAP		MCA/MOCP	WEIGHT
						INPUT, MBH	OUTPUT, MBH		
MAU-KH	GREENHECK DGX-118-H32	8742	7.5	460/3	0.75	572.6	526.8	14.6/25	1840 LBS.
MAU-KH	GREENHECK DGX-109-H12	1878	1.5	460/3	0.7	123.0	113.2	4.1/15	840 LBS.

NOTES:
- INCLUDE DISCHARGE AIR TEMPERATURE CONTROL KIT
- MODEL NUMBERS ARE USED TO ESTABLISH PERFORMANCE REQUIREMENTS. EQUALS SHALL BE ACCEPTED

GRILLES, REGISTERS AND DIFFUSERS SCHEDULE

MARK	MANUFACTURER & MODEL NO.	DESCRIPTION	MATERIAL	FINISH	ACCESSORIES & FEATURES
SUPPLY DIFFUSERS					
CD-1	METALAIRE 5700-6	24"X24" CEILING DIFFUSER WITH 6"ø NECK FOR LAY-IN CEILING	STEEL	WHITE	MODEL BDS DAMPER
CD-2	METALAIRE 5700-6	24"X24" CEILING DIFFUSER WITH 8"ø NECK FOR LAY-IN CEILING	STEEL	WHITE	MODEL BDS DAMPER
CD-3	METALAIRE 5700-6	24"X24" CEILING DIFFUSER WITH 10"ø NECK FOR LAY-IN CEILING	STEEL	WHITE	MODEL BDS DAMPER
CD-4	METALAIRE 5000-1	9"X9" DIRECTIONAL DIFFUSER FOR SURFACE MOUNTING	STEEL	WHITE	MODEL D5 DAMPER
SD-1	METALAIRE 6675-12-1	LINEAR SLOT DIFFUSER, 3'-0" LONG, 1 SLOT @ 3/4" WIDE EACH, 6"ø	ALUMINUM	WHITE	INSULATED BOOT PLENUM
SD-2	METALAIRE 6675-12-1	LINEAR SLOT DIFFUSER, 6'-0" LONG, 2 SLOTS @ 3/4" WIDE EACH, 10"ø	ALUMINUM	WHITE	INSULATED BOOT PLENUM
GRILLES & REGISTERS					
TR-1	METALAIRE V4004-1	6"X4" SIDEWALL SUPPLY REGISTER	STEEL	WHITE	MODEL OBD DAMPER
TR-2	METALAIRE V4004-1	10"X6" SIDEWALL SUPPLY REGISTER	STEEL	WHITE	MODEL OBD DAMPER
TR-3	METALAIRE V4004-1	6"X6" SIDEWALL SUPPLY REGISTER	STEEL	WHITE	MODEL OBD DAMPER
TR-4	METALAIRE V4004-1	10"X8" SIDEWALL SUPPLY REGISTER	STEEL	WHITE	MODEL OBD DAMPER
TR-5	METALAIRE V4004-1	12"X8" SIDEWALL SUPPLY REGISTER	STEEL	WHITE	MODEL OBD DAMPER
TR-6	METALAIRE V4004-1	14"X8" SIDEWALL SUPPLY REGISTER	STEEL	WHITE	MODEL OBD DAMPER
CR-1	METALAIRE 7500R-6	24"X24" CEILING GRILLE WITH 6"ø NECK FOR LAY-IN CEILING	STEEL	WHITE	--
CR-2	METALAIRE SRH-1	12"X8" CEILING EXHAUST REGISTER	STEEL	WHITE	OPPOSED BLADE DAMPER
CR-3	METALAIRE 7500R-6	24"X24" CEILING GRILLE WITH 8"ø NECK FOR LAY-IN CEILING	STEEL	WHITE	--
FCG-1	METALAIRE SRHF-6	24"X24" FILTER CLG GRILLE WITH 12"X12" NECK FOR LAY-IN CLG	STEEL	WHITE	1" MERV 13 FILTER
FCG-2	METALAIRE SRHF-6	24"X24" FILTER CLG GRILLE WITH 22"X22" NECK FOR LAY-IN CLG	STEEL	WHITE	1" MERV 13 FILTER

NOTES:
- MODEL NUMBERS ARE USED TO ESTABLISH PERFORMANCE REQUIREMENTS. EQUALS SHALL BE ACCEPTED

DUCTLESS SPLIT AIR CONDITIONING SYSTEM

MODEL NUMBERS ARE USED TO ESTABLISH PERFORMANCE REQUIREMENTS. EQUALS SHALL BE ACCEPTED

DSS-1: INDOOR WALL MOUNTED UNIT – MITSUBISHI PKA-A36KA7, OUTDOOR CONDENSING UNIT – MITSUBISHI PUY-A36NKA7
A. 36,000 BTU/HR COOLING, 920 CFM, 18.8 SEER, R-410A.
B. 208 VOLTS, SINGLE PHASE, 31A MOCP, FEED TO OUTDOOR UNIT.
C. DC INVERTER COMPRESSOR.
D. WALL MOUNTED, HARD WIRED CONTROLLER.
E. PROVIDE LOW AMBIENT CONTROL TO 0 DEGREES F.
F. PROVIDE CONDENSATE PUMP AS REQUIRED.
G. AUTO RESTART ON POWER FAILURE.
H. COORDINATE INDOOR UNIT LOCATION WITH EQUIPMENT.

DSS-2: INDOOR WALL MOUNTED UNIT – MITSUBISHI PKA-A18HA, OUTDOOR CONDENSING UNIT – MITSUBISHI PUY-A18NHA3
A. 18,000 BTU/HR COOLING, 425 CFM, 15.3 SEER, R-410A.
B. 208 VOLTS, SINGLE PHASE, 15A MOCP, FEED TO OUTDOOR UNIT.
C. DC INVERTER COMPRESSOR.
D. WALL MOUNTED, HARD WIRED CONTROLLER.
E. PROVIDE LOW AMBIENT CONTROL TO 0 DEGREES F.
F. PROVIDE CONDENSATE PUMP AS REQUIRED.
G. AUTO RESTART ON POWER FAILURE.
H. COORDINATE INDOOR UNIT LOCATION WITH EQUIPMENT.

DSS-3: INDOOR WALL MOUNTED UNIT – MITSUBISHI PKA-A18HA, OUTDOOR CONDENSING UNIT – MITSUBISHI PUY-A18NHA3
A. 18,000 BTU/HR COOLING, 425 CFM, 15.3 SEER, R-410A.
B. 208 VOLTS, SINGLE PHASE, 15A MOCP, FEED TO OUTDOOR UNIT.
C. DC INVERTER COMPRESSOR.
D. WALL MOUNTED, HARD WIRED CONTROLLER.
E. PROVIDE LOW AMBIENT CONTROL TO 0 DEGREES F.
F. PROVIDE CONDENSATE PUMP AS REQUIRED.
G. AUTO RESTART ON POWER FAILURE.
H. COORDINATE INDOOR UNIT LOCATION WITH EQUIPMENT.

LEGEND

Symbol	Description
R	REFRIGERANT
12 x 6	RECTANGULAR DUCT
	FLEXIBLE CONNECTION
VD	VOLUME DAMPER
D	DROP IN DIRECTION OF AIRFLOW
R	RISE IN DIRECTION OF AIRFLOW
	SUPPLY DUCT UP (OR FROM ABOVE)
	SUPPLY DUCT DOWN (OR FROM BELOW)
	RETURN OR EXHAUST DUCT UP
	RETURN OR EXHAUST DUCT DOWN
	FLEXIBLE DUCT
MOD	MOTOR OPERATED DAMPER
	REDUCER
SDR	SMOKE DETECTOR, DUCT MOUNTED
T	THERMOSTAT OR TEMPERATURE SENSOR

ABBREVIATIONS

BTU	BRITISH THERMAL UNIT
CD	CEILING DIFFUSER
CFD	CEILING FIRE DAMPER
CFM	CUBIC FEET PER MINUTE
CG	CEILING GRILLE
COP	COEFFICIENT OF PERFORMANCE
CR	CEILING REGISTER
DB	DRY BULB TEMPERATURE
EAT	ENTERING AIR TEMPERATURE
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
EXT	EXTERNAL
F	DEGREES FAHRENHEIT
FPM	FEET PER MINUTE
FT	FEET
HP	HORSEPOWER
IN	INCH, INCHES
LAT	LEAVING AIR TEMPERATURE
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
VD	VOLUME DAMPER
MH	MOUNTING HEIGHT
MIN	MINIMUM
MOD	MOTOR OPERATED DAMPER
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
OA	OUTSIDE AIR
PD	PRESSURE DROP
PS	PRESSURE SENSOR
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAGE
RA	RETURN AIR
SP	STATIC PRESSURE
TEMP	TEMPERATURE
TG	TOP GRILLE
TR	TOP REGISTER
TYP	TYPICAL
WB	WET BULB TEMPERATURE
WC, WG	WATER COLUMN
AFF	ABOVE FINISHED FLOOR
ABV	ABOVE
AD	ACCESS DOOR
BEL	BELOW
BET	BETWEEN
CLG	CEILING
CONN	CONNECT, CONNECTION
CONT	CONTINUED
DN	DOWN
EA	EACH
FL	FLOOR
FLEX	FLEXIBLE
FR	FROM
GALV	GALVANIZED
REQD	REQUIRED
SH	SHEET
SDR	DUCT MOUNTED SMOKE DETECTOR

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ARCHITECTURE INTERIORS PLANNING

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ROANOKE, VIRGINIA

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REVISIONS

No.	DATE	DESCRIPTION
X	X	X

DRAWN BY:	MDR
REV'D BY:	MDR
DATE:	6/17/22
SCALE:	AS SHOWN

MECHANICAL LEGEND & SCHEDULES

M0.1

SHEET ______ of X

PACKAGED AIR CONDITIONING UNIT SCHEDULE

MARK	MANUFACTURER & MODEL NO.	SA CFM	OA CFM	EVAP. FAN HP	VOLTS ø	S.P. IN WG	COOLING SECTION			HEATING SECTION		MCA	MOCP	WEIGHT (LBS)
						EXT.	TOTAL CAP, MBH	SENS CAP, MBH	EAT	INPUT, MBH	OUTPUT, MBH			
RTU-20	TRANE RF0503342	18000	7050	30.0	480/3	2.0	622.9	484.8	81.0/67.6	850	688.5	155.4	175	9730
RTU-21	TRANE RF0303342	11105	3955	15.0	480/3	2.5	397.6	321.2	81.7/66.4	500	410.0	97.1	110	7230
RTU-22	TRANE RF0303342	12175	2890	15.0	480/3	2.5	397.7	310.0	79.1/65.9	500	410.0	97.1	100	7300
RTU-23	TRANE RF0202342	8025	1900	10.0	480/3	2.5	294.8	215.0	79.1/65.9	350	283.5	76.7	90	6950
RTU-24	TRANE RF0302342	10125	2950	15.0	480/3	2.5	402.7	314.3	80.1/66.6	350	283.5	97.1	110	7200
RTU-25	TRANE RF0202342	8050	2545	10.0	480/3	2.5	297.5	211.6	80.8/67.0	350	283.5	76.7	90	6950

1. UNITS TO HAVE ONE YEAR MANUFACTURER'S WARRANTY INCLUDING PARTS, LABOR AND REFRIGERANT, FIVE YEAR MANUFACTURER'S WARRANTY FOR COMPRESSORS.
2. UNIT TO HAVE HINGED ACCESS DOORS, NON-FUSED DISCONNECT SWITCH, CONDENSER COIL GUARDS, LOW AMBIENT CONTROL, LOW LEAKAGE OUTDOOR AIR DAMPERS, ECONOMIZER WITH DIFFERENTIAL ENTHALPY, MERV 14 FILTERS. THROUGH THE BASE ELECTRICAL, RELIEF FAN WITH FRESH AIR TRACKING, 120 V SERVICE RECEPTACLE, SMOKE DETECTOR, VAV WITH VFD WITH BYPASS WITH ACCESSORIES/CONTROLS, HOT GAS REHEAT, ADAPT-A-CURB, VIBRATION ISOLATION.
3. UNITS TO BE OWNER PROVIDED FOR CONTRACTOR COMPLETE, OPERABLE INSTALLATION.

FAN POWERED VAV BOX SCHEDULE

MARK	BOX SIZE	PD IN H20	PRIMARY AIR		UNIT FAN				HEATING COIL					ELECTRICAL		MODEL
			MAX CFM	MIN CFM	CFM	SP IN H20	HP	FAN SIZE	ENT AIR ° F	MBH	KW	STAGES	VOLT/ PHASE	MCA	MOCP	
FP-20-1	14	0.36	2500	850	2500	0.26	0.5	06SQ	64.9	68.3	20.0	3	460/3	34.8	35	VSEF
FP-20-2	08	0.40	800	430	800	0.25	0.33	03SQ	62.0	25.6	7.5	3	460/3	13.3	15	VSEF
FP-20-3	14	0.40	2500	850	2500	0.25	0.5	06SQ	64.9	68.3	20.0	3	460/3	34.8	35	VSEF
FP-20-4	10	0.39	1190	400	1190	0.25	0.33	04SQ	65.0	34.2	10.0	3	460/3	17.5	20	VSEF
FP-20-5	14	0.40	2500	850	2500	0.25	0.5	06SQ	64.9	68.3	20.0	3	460/3	34.8	35	VSEF
FP-20-6	10	0.32	1010	480	1010	0.25	0.33	03SQ	62.9	30.7	9.0	3	460/3	15.5	20	VSEF
FP-20-7	10	0.35	1050	480	1050	0.25	0.33	03SQ	63.1	30.7	9.0	3	460/3	15.5	20	VSEF
FP-20-8	14	0.36	2480	690	2480	0.26	0.5	06SQ	65.8	68.3	20.0	3	460/3	34.8	35	VSEF
FP-20-9	14	0.40	2500	850	2500	0.25	0.5	06SQ	64.9	68.3	20.0	3	460/3	34.8	35	VSEF
FP-20-10	10	0.25	870	350	870	0.25	0.33	03SQ	64.0	25.6	7.5	3	460/3	13.3	15	VSEF
FP-21-1	12	0.21	1850	590	1850	0.26	0.5	06SQ	65.2	51.2	15.0	3	460/3	27.3	30	VSEF
FP-21-2	12	0.13	1620	570	1620	0.25	0.5	06SQ	64.7	47.8	15.0	3	460/3	25.8	30	VSEF
FP-21-3	10	0.39	1190	570	1190	0.25	0.33	04SQ	62.8	37.6	11.0	3	460/3	19.4	20	VSEF
FP-21-4	10	0.31	980	465	980	0.25	0.33	03SQ	62.9	30.7	9.0	3	460/3	15.5	20	VSEF
FP-21-5	10	0.31	980	465	980	0.25	0.33	03SQ	62.9	30.7	9.0	3	460/3	15.5	20	VSEF
FP-21-6	12	0.39	1600	560	1600	0.25	0.5	05SQ	64.8	44.4	13.0	3	460/3	22.6	25	VSEF
FP-21-7	12	0.27	2000	590	2000	0.26	0.5	06SQ	65.6	54.6	16.0	3	460/3	28.8	30	VSEF
FP-22-1	12	0.36	1540	690	1540	0.25	0.5	05SQ	63.3	47.8	14.0	3	460/3	24.1	25	VSEF
FP-22-2	10	0.33	1290	540	1290	0.25	0.5	05SQ	63.7	37.6	11.0	3	460/3	19.5	20	VSEF
FP-22-3	14	0.36	2500	750	2500	0.25	0.5	06SQ	65.5	68.3	20.0	3	460/3	34.8	35	VSEF
FP-22-4	14	0.37	2500	320	2500	0.25	0.5	06SQ	68.1	61.5	18.0	3	460/3	31.8	35	VSEF
FP-22-5	08	0.33	730	105	730	0.25	0.33	03SQ	67.8	18.8	5.5	3	460/3	10.3	15	VSEF
FP-22-6	14	0.37	2500	320	2500	0.25	0.5	06SQ	68.1	61.5	18.0	3	460/3	31.8	35	VSEF
FP-22-7	06	0.13	425	60	425	0.25	0.125	02SQ	67.9	10.2	3.0	1	277/1	14.4	15	VSEF

NOTES:
1. UNITS TO BE OWNER PROVIDED FOR CONTRACTOR COMPLETE, OPERABLE INSTALLATION.

FAN POWERED VAV BOX SCHEDULE

MARK	BOX SIZE	PD IN H20	PRIMARY AIR		UNIT FAN				HEATING COIL					ELECTRICAL		MODEL
			MAX CFM	MIN CFM	CFM	SP IN H20	HP	FAN SIZE	ENT AIR ° F	MBH	KW	STAGES	VOLT/ PHASE	MCA	MOCP	
FP-23-1	14	0.36	2500	760	2500	0.25	0.5	06SQ	65.4	68.3	20.0	3	460/3	34.8	35	VSEF
FP-23-2	08	0.16	580	110	580	0.25	0.33	04SQ	67.2	15.4	4.5	3	460/3	9.3	15	VSEF
FP-23-3	10	0.32	1000	100	1000	0.25	0.33	03SQ	67.5	25.6	7.5	3	460/3	13.3	15	VSEF
FP-23-4	14	0.2	2040	585	2040	0.25	0.5	06SQ	65.7	54.6	16.0	3	460/3	28.8	30	VSEF
FP-23-5	06	0.14	440	80	440	0.25	0.125	02SQ	67.3	12.0	3.5	1	277/1	16.7	20	VSEF
FP-23-6	08	0.32	715	110	715	0.25	0.33	03SQ	67.7	18.8	5.5	3	460/3	10.3	15	VSEF
FP-24-1	14	0.35	2475	885	2475	0.25	0.5	06SQ	64.6	68.3	20.0	3	460/3	34.8	35	VSEF
FP-24-2	12	0.35	1520	600	1520	0.25	0.5	05SQ	64.1	44.4	13.0	3	460/3	22.6	25	VSEF
FP-24-3	10	0.37	1365	580	1365	0.25	0.5	05SQ	63.6	41.0	12.0	3	460/3	21.0	25	VSEF
FP-24-4	14	0.36	2500	670	2500	0.25	0.5	06SQ	66.0	68.3	20.0	3	460/3	34.8	35	VSEF
FP-24-5	06	0.14	430	90	430	0.25	0.125	02SQ	66.9	12.0	3.5	1	277/1	16.7	20	VSEF
FP-25-1	12	0.27	2000	995	2000	0.25	0.5	06SQ	64.8	58.0	17.0	3	460/3	30.3	35	VSEF
FP-25-2	05	0.07	310	45	310	0.25	0.125	02SQ	67.8	8.5	2.5	1	277/1	12.2	15	VSEF
FP-25-3	10	0.34	1310	405	1310	0.25	0.5	05SQ	65.4	37.5	11.0	3	460/3	19.5	20	VSEF
FP-25-4	12	0.33	1485	580	1485	0.25	0.5	05SQ	64.1	44.4	13.0	3	460/3	22.6	25	VSEF
FP-25-5	06	0.16	470	110	470	0.25	0.125	02SQ	66.5	13.7	4.0	3	460/3	8.5	15	VSEF
FP-25-6	06	0.10	360	110	360	0.25	0.125	02SQ	65.4	10.2	3.0	1	277/1	14.4	15	VSEF
FP-25-7	05	0.06	280	85	280	0.25	0.125	02SQ	65.4	8.5	2.5	1	277/1	12.2	15	VSEF
FP-25-8	06	0.18	485	130	485	0.25	0.125	02SQ	66.0	13.7	4.0	3	460/3	6.9	15	VSEF
FP-25-9	06	0.11	380	85	380	0.25	0.125	02SQ	66.6	10.2	3.0	1	277/1	14.4	15	VSEF
FP-25-10	04	0.03	200	80	200	0.25	0.125	02SQ	64.0	6.8	2.0	1	277/1	9.9	15	VSEF

NOTES:
1. UNITS TO BE OWNER PROVIDED FOR CONTRACTOR COMPLETE, OPERABLE INSTALLATION.

VAV TERMINAL UNIT SCHEDULE

MARK	COOLING		INLET SIZE, IN.	MIN SP. IN. WG	HEATING COIL					MODEL
	MAX CFM	MIN CFM			CFM	MBH	KW	VOLT/ PHASE	CONTROL STEPS	
VAV-20-1	820	135	08	0.1	135	3.4	1.0	277/1	1	VCEF
VAV-20-2	340	90	05	0.1	90	3.4	1.0	277/1	1	VCEF
VAV-21-1	885	135	08	0.1	135	3.4	1.0	277/1	1	VCEF
VAV-22-1	690	105	08	0.1	105	6.8	2.0	277/1	1	VCEF
VAV-23-1	300	90	05	0.1	90	3.4	1.0	277/1	1	VCEF
VAV-23-2	150	90	04	0.1	100	3.4	1.0	277/1	1	VCEF
VAV-23-3	300	90	05	0.1	90	3.4	1.0	277/1	1	VCEF
VAV-24-1	1835	600	12	0.1	600	23.9	7.0	480/3	1	VCEF
VAV-25-1	190	100	04	0.1	100	3.4	1.0	277/1	1	VCEF
VAV-25-2	410	90	06	0.1	90	3.4	1.0	277/1	1	VCEF
VAV-25-3	170	90	04	0.1	90	3.4	1.0	277/1	1	VCEF

NOTES:
1. UNITS TO BE OWNER PROVIDED FOR CONTRACTOR COMPLETE, OPERABLE INSTALLATION.

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No.	DATE	DESCRIPTION
x	x	x

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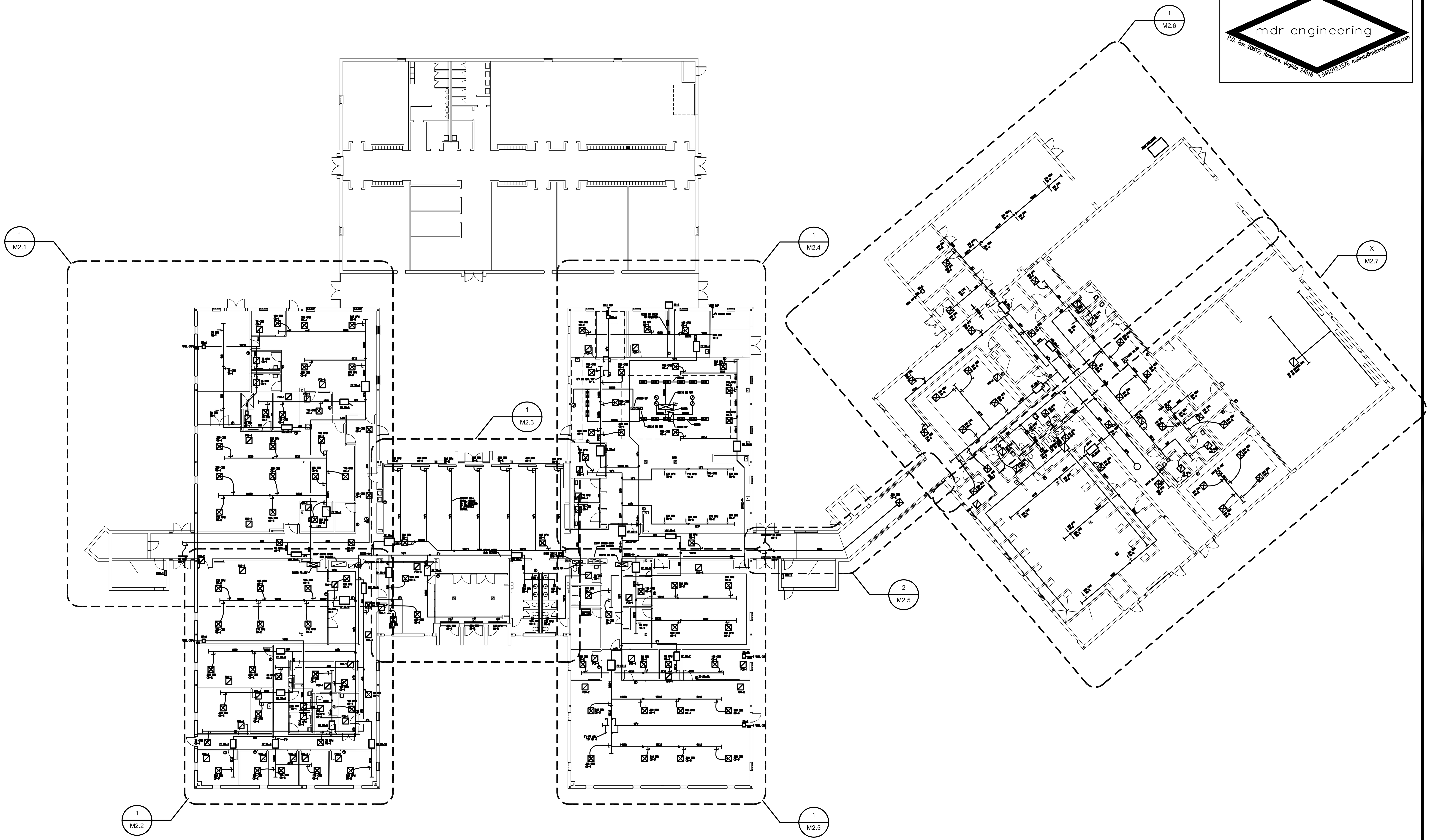
REV'D BY:	MDR
DATE:	6/17/22
SCALE:	AS SHOWN

MECHANICAL SCHEDULES

M0.2

SHEET ______ of X



GROUND FLOOR OVERALL MECHANICAL NEW WORK PLAN

1 / M1.1

SCALE: 1/16" = 1'-0"

0 8' 16' 32'

PLAN NORTH

TRUE NORTH

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No. 028163
06.17.2022
PROFESSIONAL ENGINEER

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No.	DATE	DESCRIPTION
X	X	X

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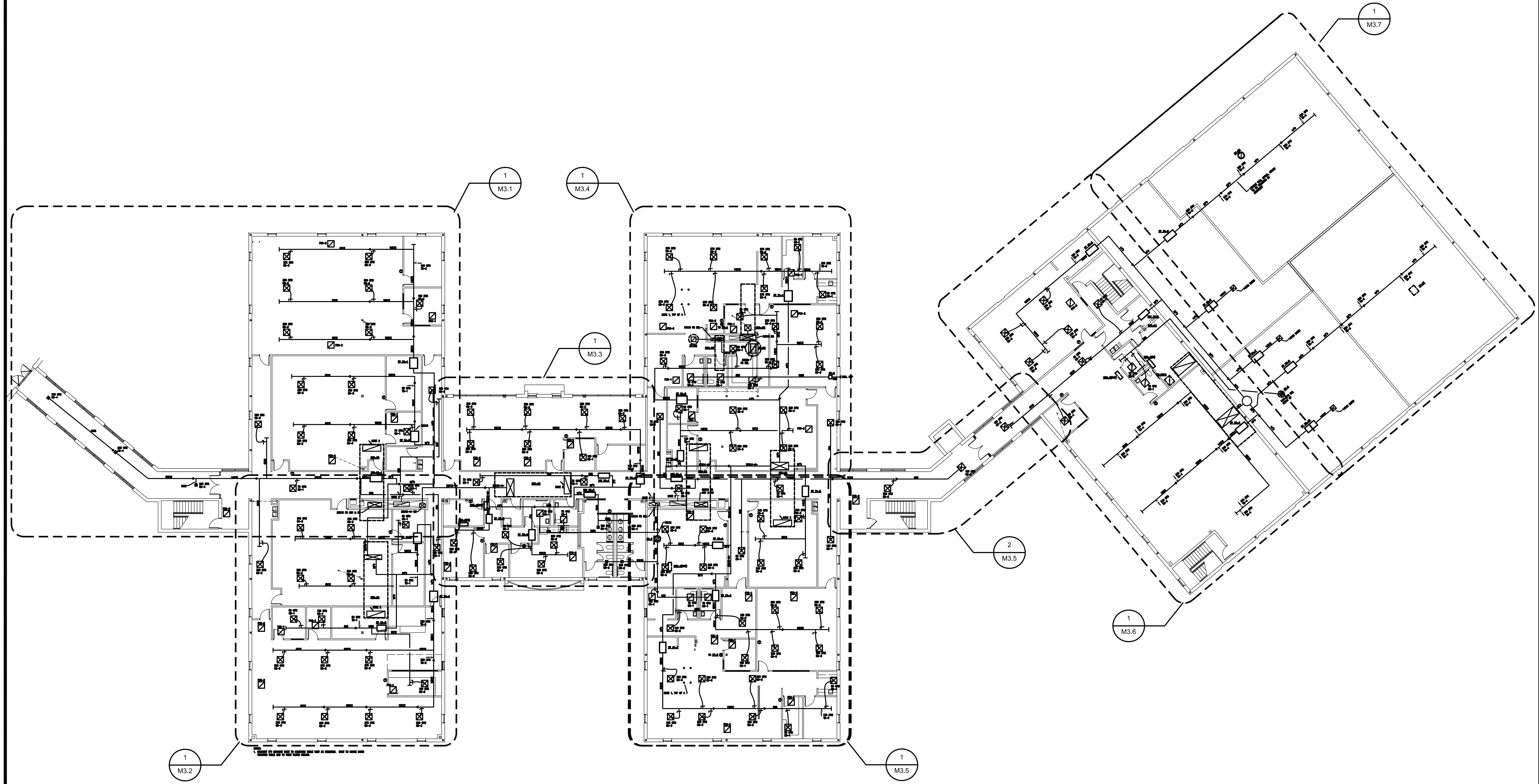
DATE:	6/17/22
SCALE:	AS SHOWN

GROUND FLOOR OVERALL MECHANICALNEW WORK PLAN

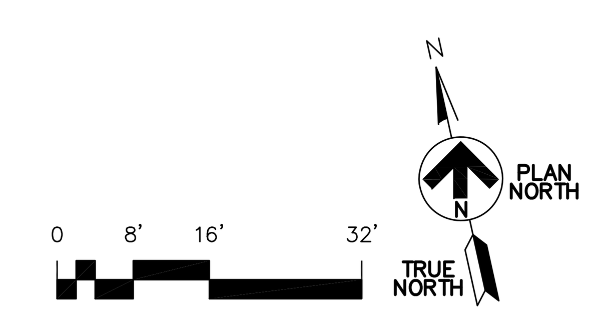
M1.1

SHEET ______ of X



1 M1.2 SECOND FLOOR OVERALL MECHANICAL NEW WORK PLAN

SCALE: 1/16" = 1'-0"



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No.	DATE	DESCRIPTION
X	X	X

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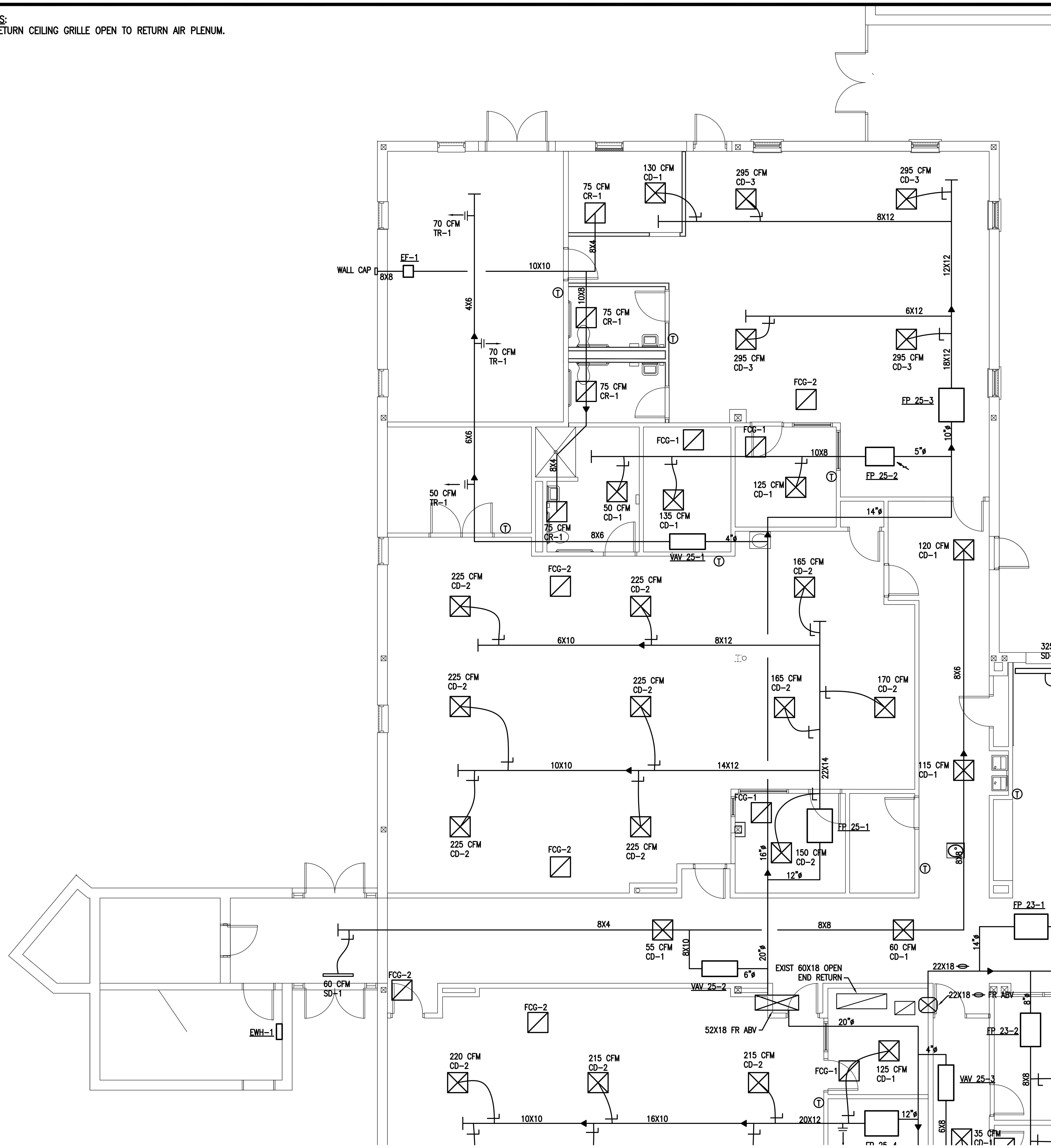
REV'D BY:	MDR
DATE:	6/17/22
SCALE:	AS SHOWN

SECOND FLOOR OVERALL MECHANICAL NEW WORK PLAN

M1.2

SHEET ______ of __X__

NOTES:
1. RETURN CEILING GRILLE OPEN TO RETURN AIR PLENUM.



1 M2.1 GROUND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA A
SCALE: 3/16" = 1'-0"

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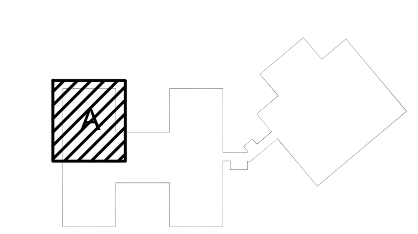


KEYPLAN

PLAN NORTH
TRUE NORTH
0 3' 6' 12'

REVISIONS

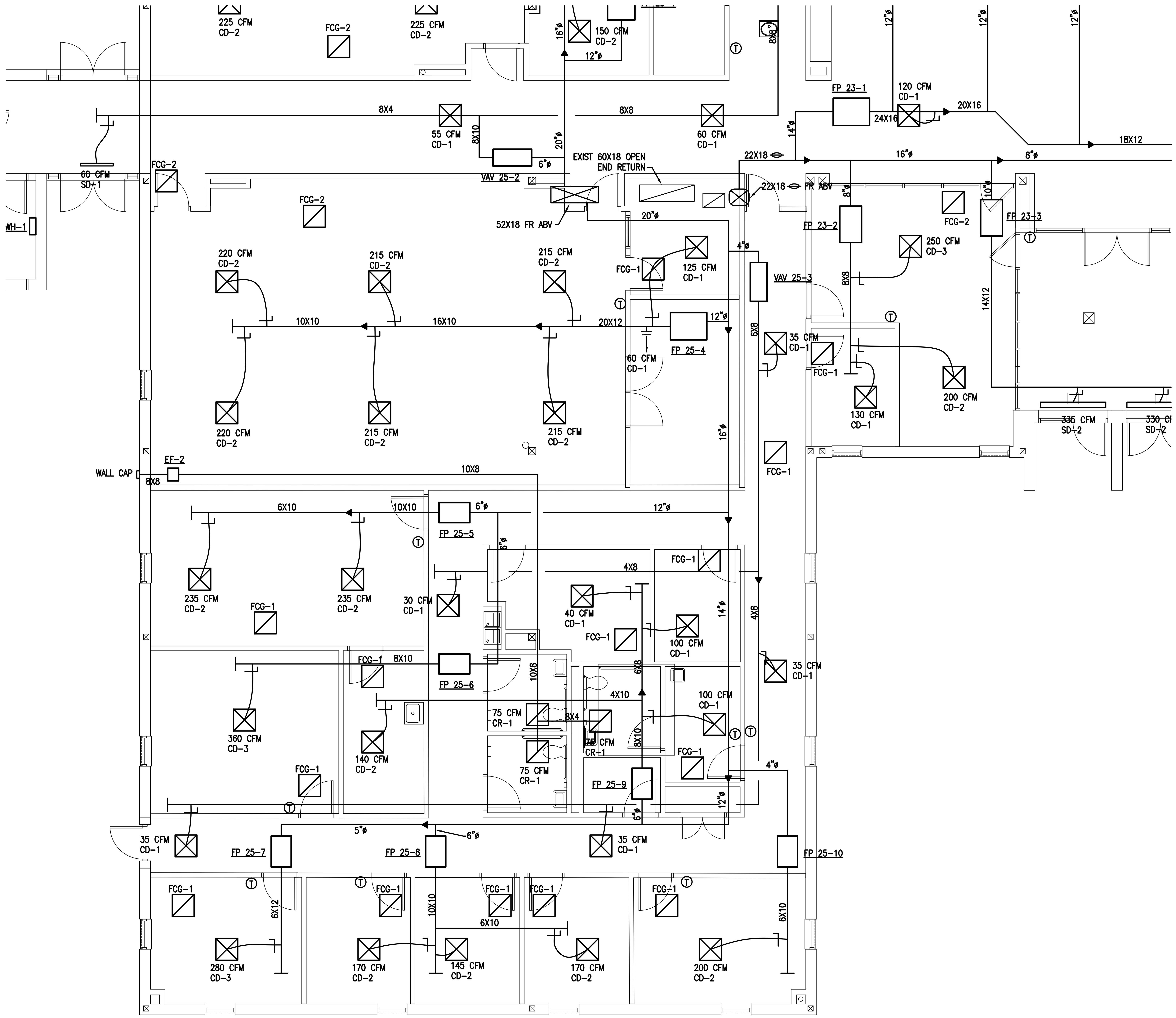
No.	DATE	DESCRIPTION
X	X	X

DRAWN BY:	MDR
REV'D BY:	MDR
DATE:	6/17/22
SCALE:	AS SHOWN

GROUND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA A

M2.1

SHEET ______ of X



1 M2.2 GROUND FLOOR ENLARGED PARTIAL MECHANICAL NEW WORK PLAN

SCALE: 3/16" = 1'-0"

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REVISIONS

No.	DATE	DESCRIPTION
X	X	X

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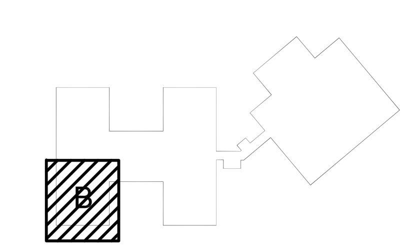
REV'D BY:	MDR
DATE:	6/17/22
SCALE:	AS SHOWN

GROUND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA B

M2.2

SHEET ______ of X

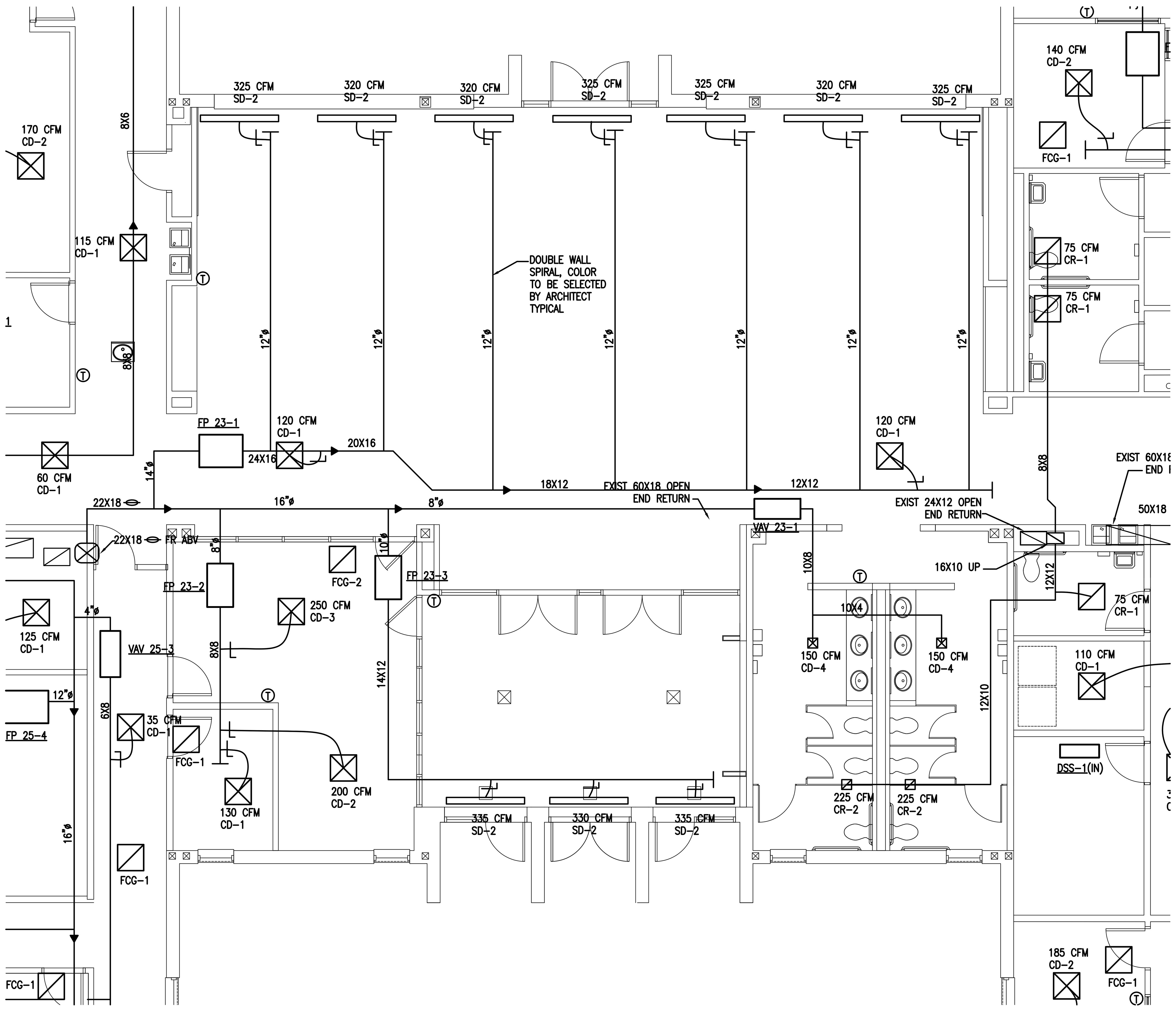


KEYPLAN

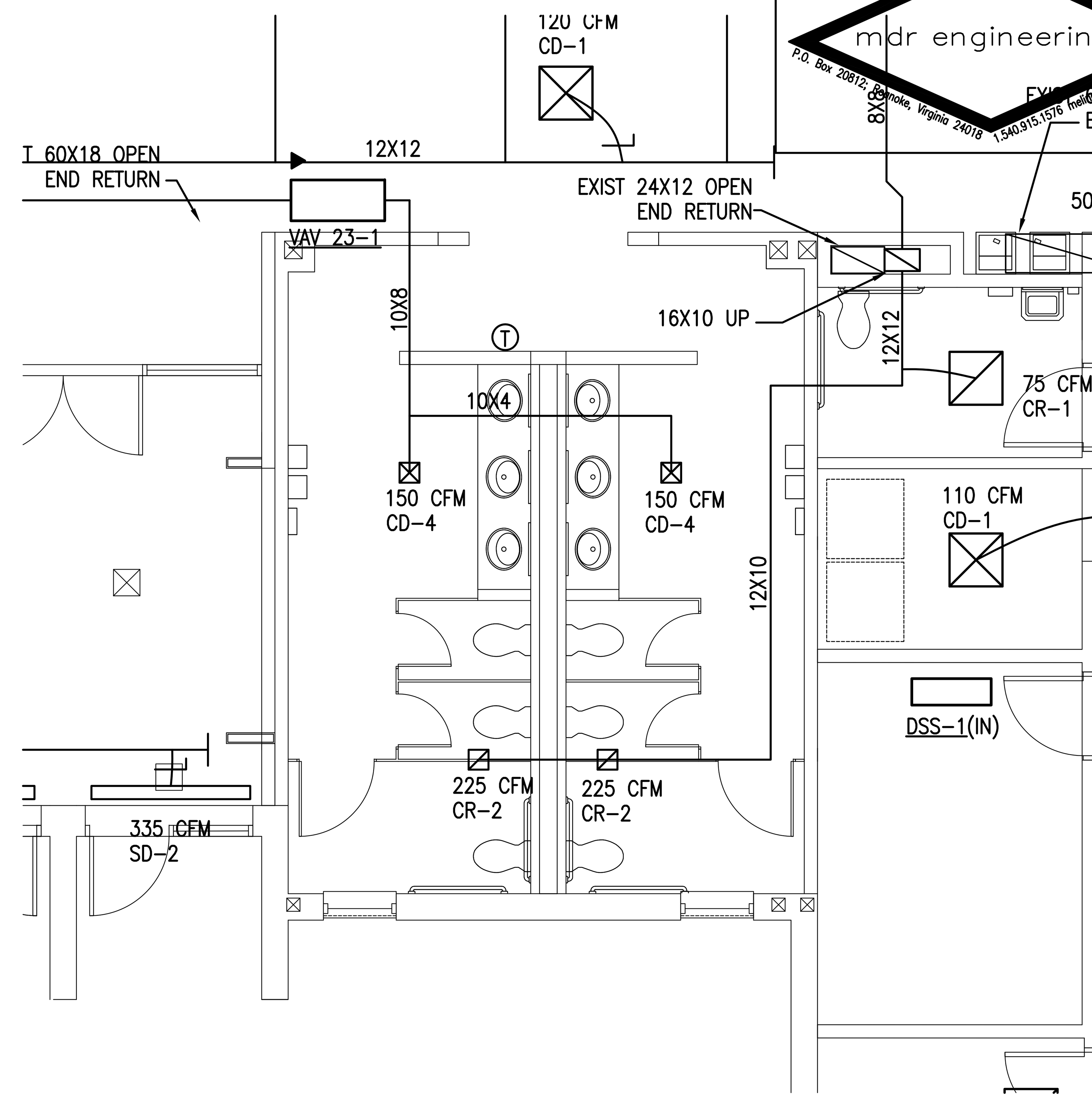
0 3' 6' 12'

N PLAN NORTH

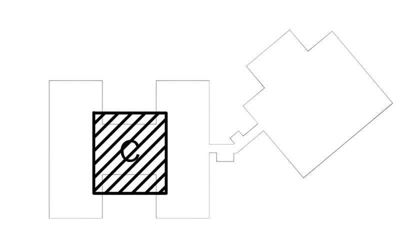
TRUE NORTH



1 GROUND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA C
M2.3 SCALE: 3/16" = 1'-0"



2 TOILET ROOM ENLARGED NEW WORK PLAN
M2.3 SCALE: 1/4" = 1'-0"



KEYPLAN

PLAN NORTH
TRUE NORTH

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No.	DATE	DESCRIPTION
X	X	X

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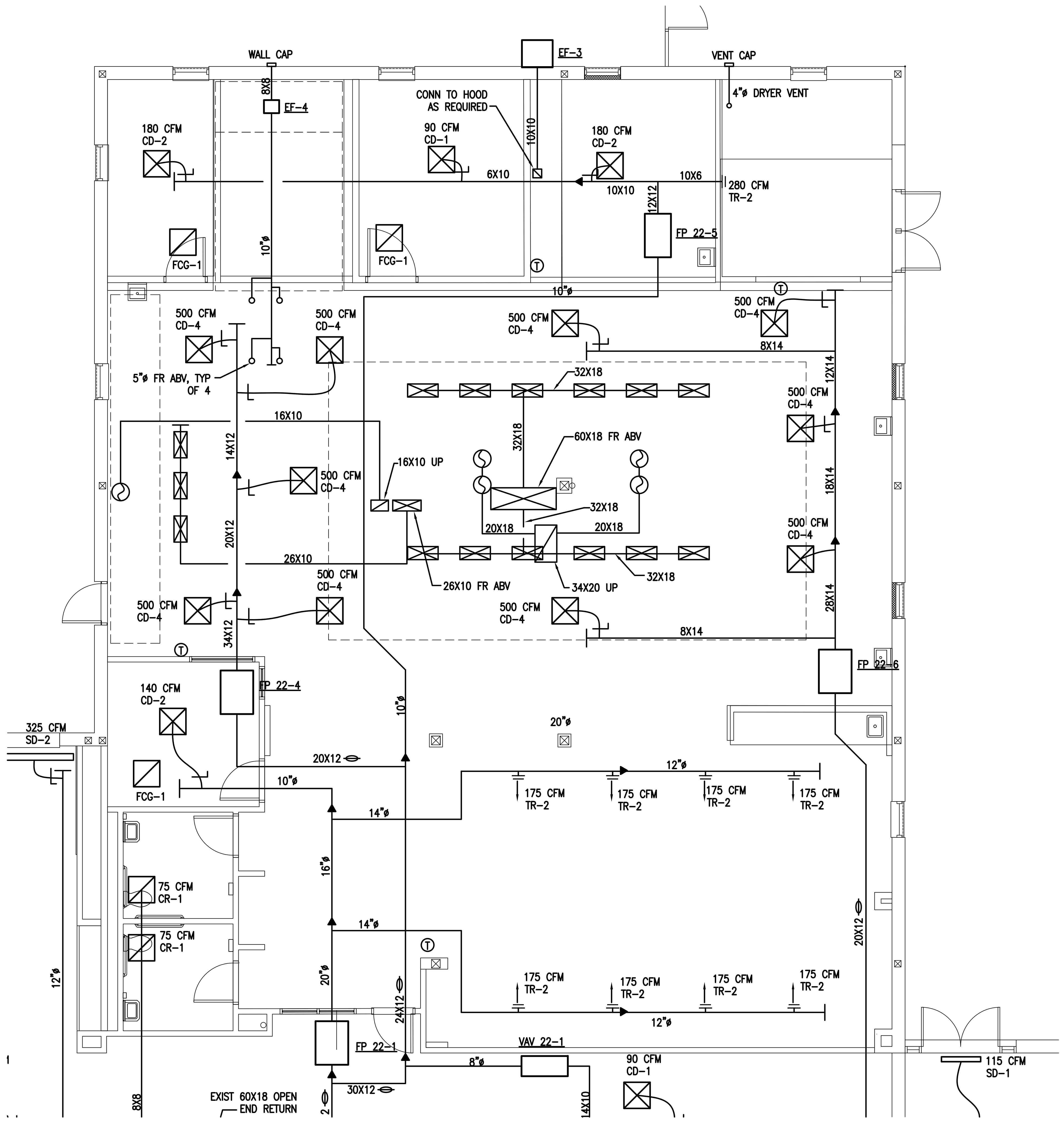
DATE:	6/17/22
SCALE:	AS SHOWN

GROUND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA C

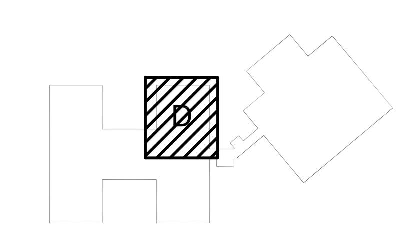
M2.3

SHEET _____ of X



GROUND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA D

1
M2.4
SCALE: 3/16" = 1'-0"



KEYPLAN

0 3' 6' 12'

PLAN NORTH
TRUE NORTH

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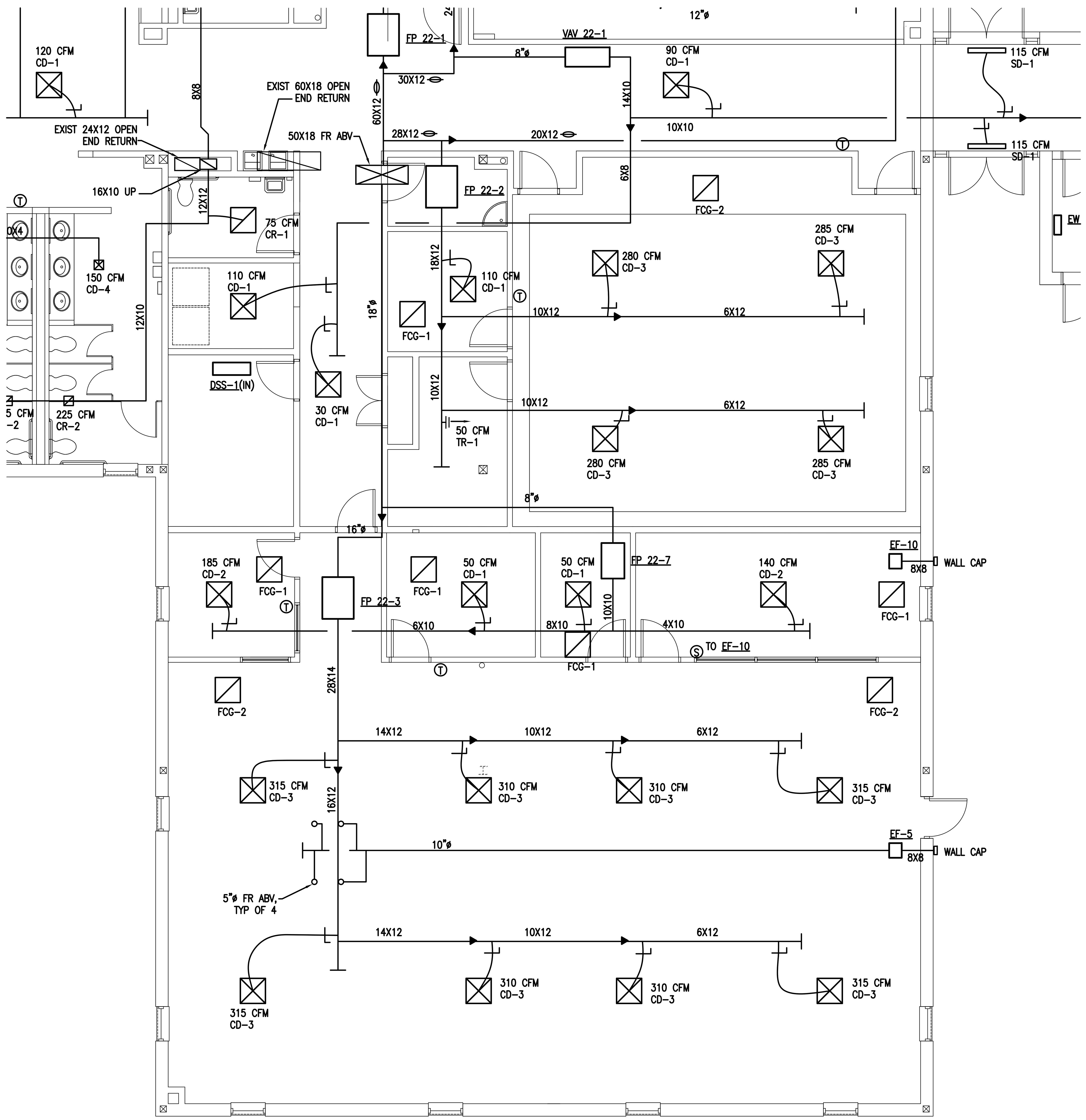
DATE:	6/17/22
SCALE:	AS SHOWN

GROUND FLOOR PARTIAL NEW WORK PLAN - AREA D

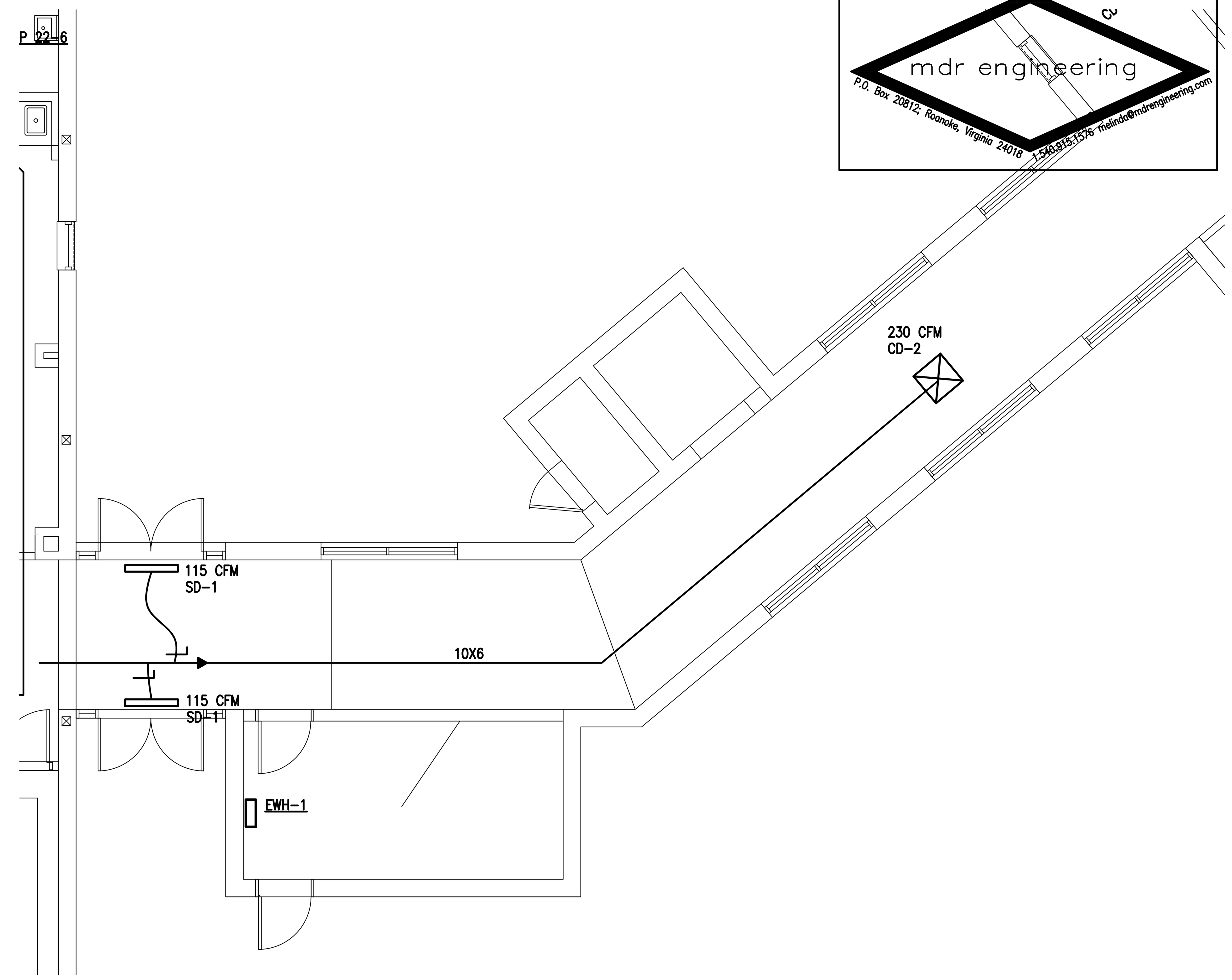
M2.4

SHEET ______ of X



GROUND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA E

2
M2.5
SCALE: 3/16" = 1'-0"



GROUND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA E

2
M2.5
SCALE: 1/4" = 1'-0"

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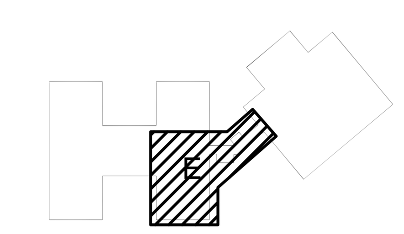

KEYPLAN

0 4' 8' 16'
0 3' 6' 12'
PLAN NORTH
TRUE NORTH

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DATE:	6/17/22
SCALE:	AS SHOWN

GROUND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA E

M2.5

SHEET ______ of __X__

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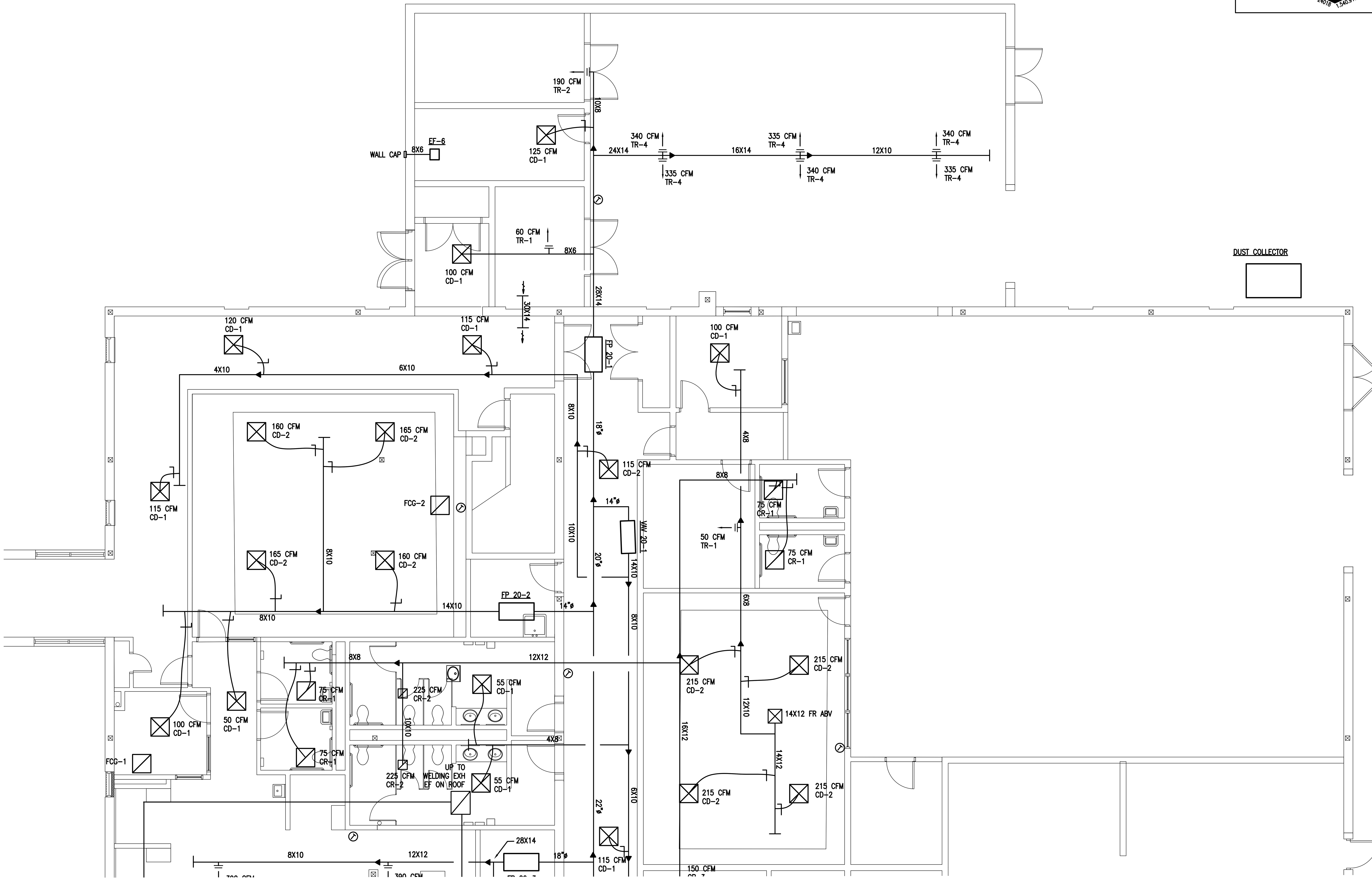
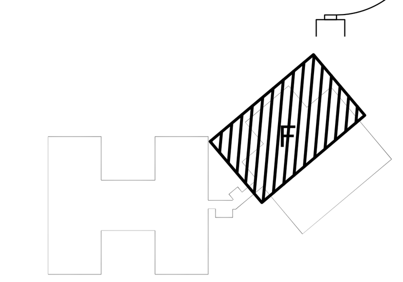


1
M2.6

GROUND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA F

SCALE: 3/16" = 1'-0"



KEYPLAN

0 3' 6' 12'

N
PLAN NORTH
TRUE NORTH

REVISIONS

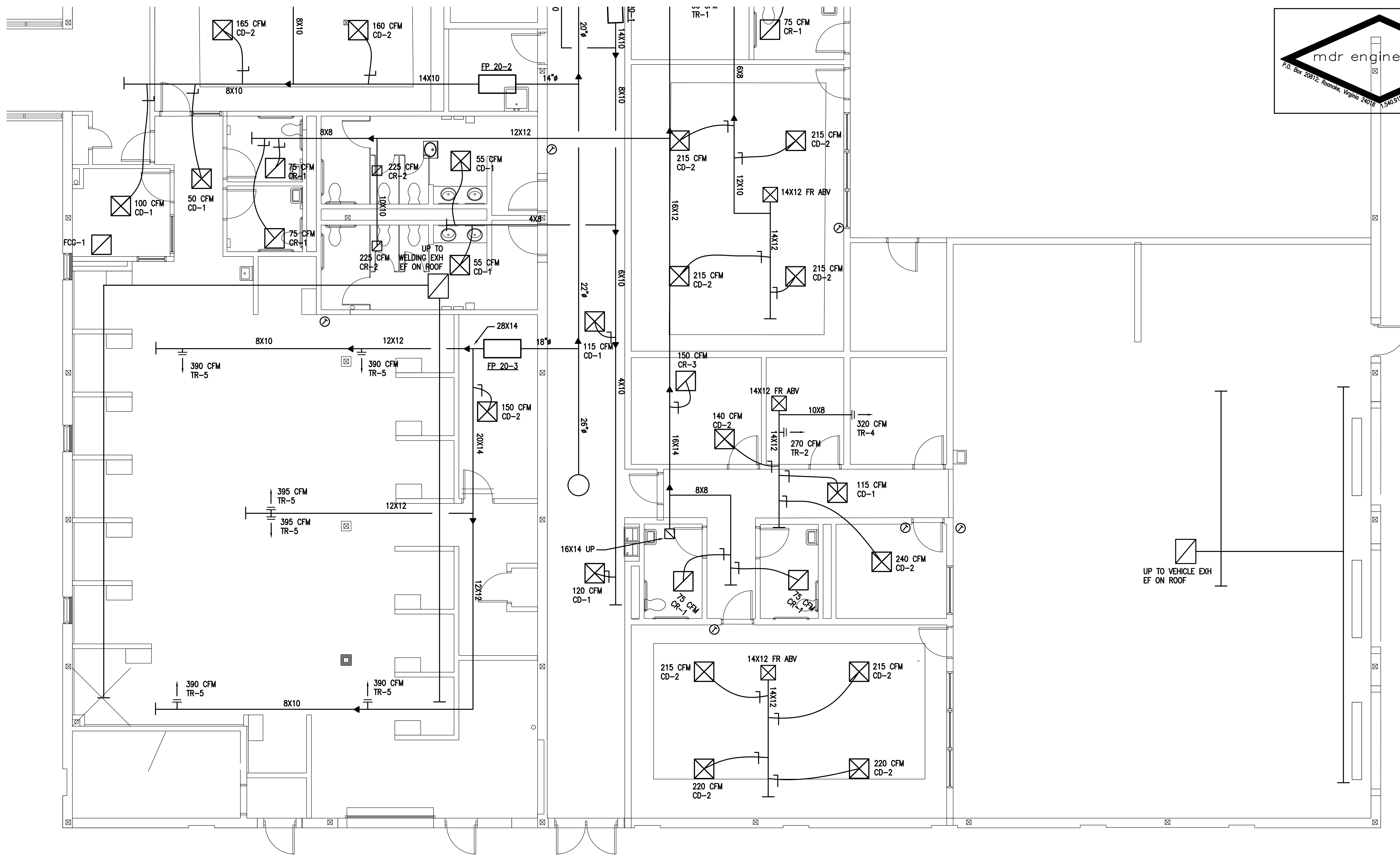
No.	DATE	DESCRIPTION
X	X	X

DRAWN BY:	MDR
REV'D BY:	MDR
DATE:	6/17/22
SCALE:	AS SHOWN

GROUND FLOOR PARTIAL NEW WORK PLAN - AREA F

M2.6

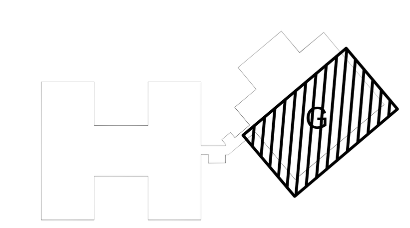
SHEET ______ of __X__



1
M2.7

GROUND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA G

SCALE: 3/16" = 1'-0"



KEYPLAN

0 3' 6' 12'

PLAN NORTH

TRUE NORTH

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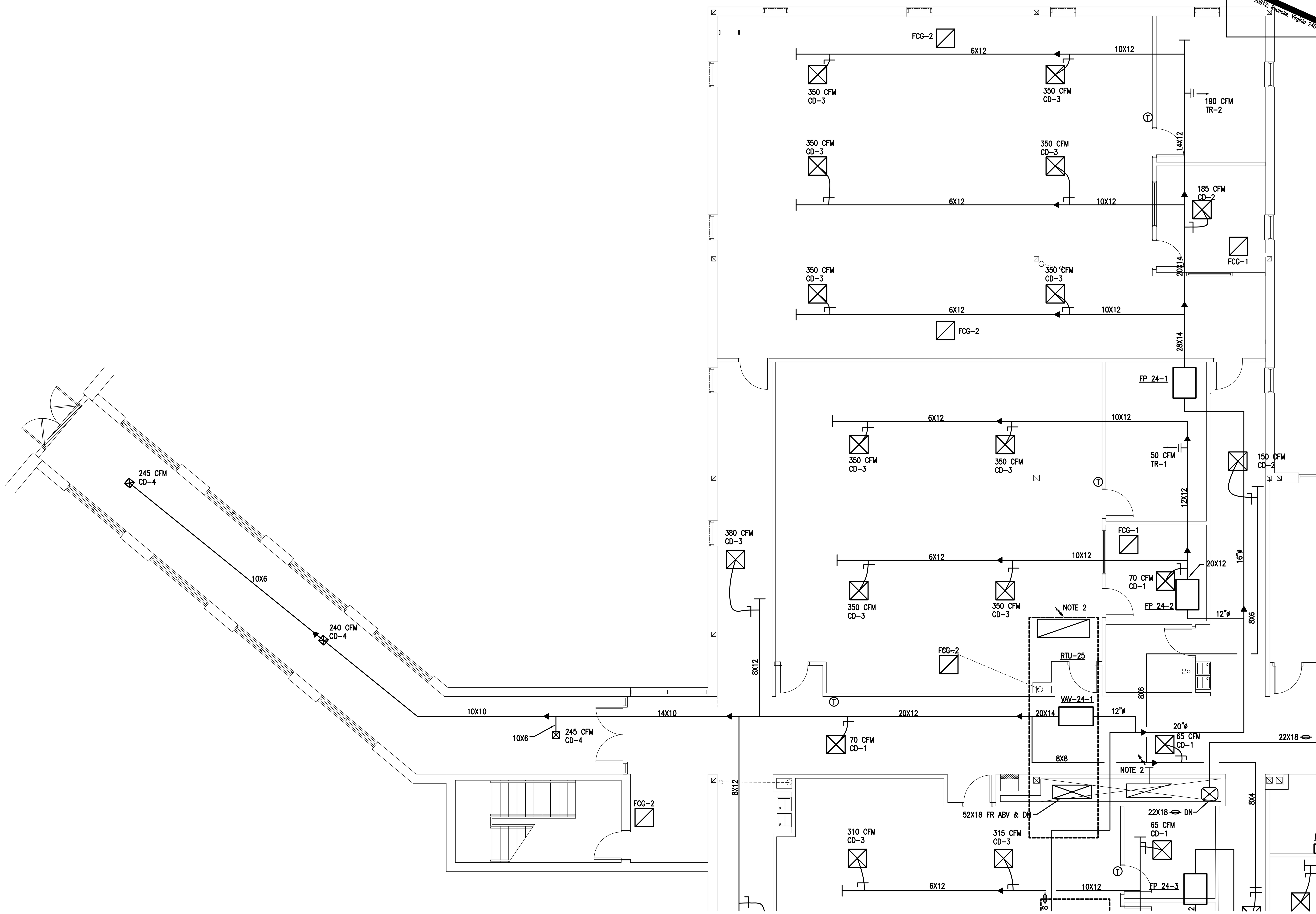
DATE:	6/17/22
SCALE:	AS SHOWN

GROUND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA G

M2.7

SHEET ______ of X

NOTES:
1. RETURN CEILING GRILLE OPEN TO RETURN AIR PLENUM.
2. OPEN END RETURN DUCT ABOVE CEILING. COVER WITH 1/2" WIRE MESH.



1 M3.1 SECOND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA A

SCALE: 3/16" = 1'-0"

KEYPLAN

0 3' 6' 12'

TRUE NORTH PLAN NORTH

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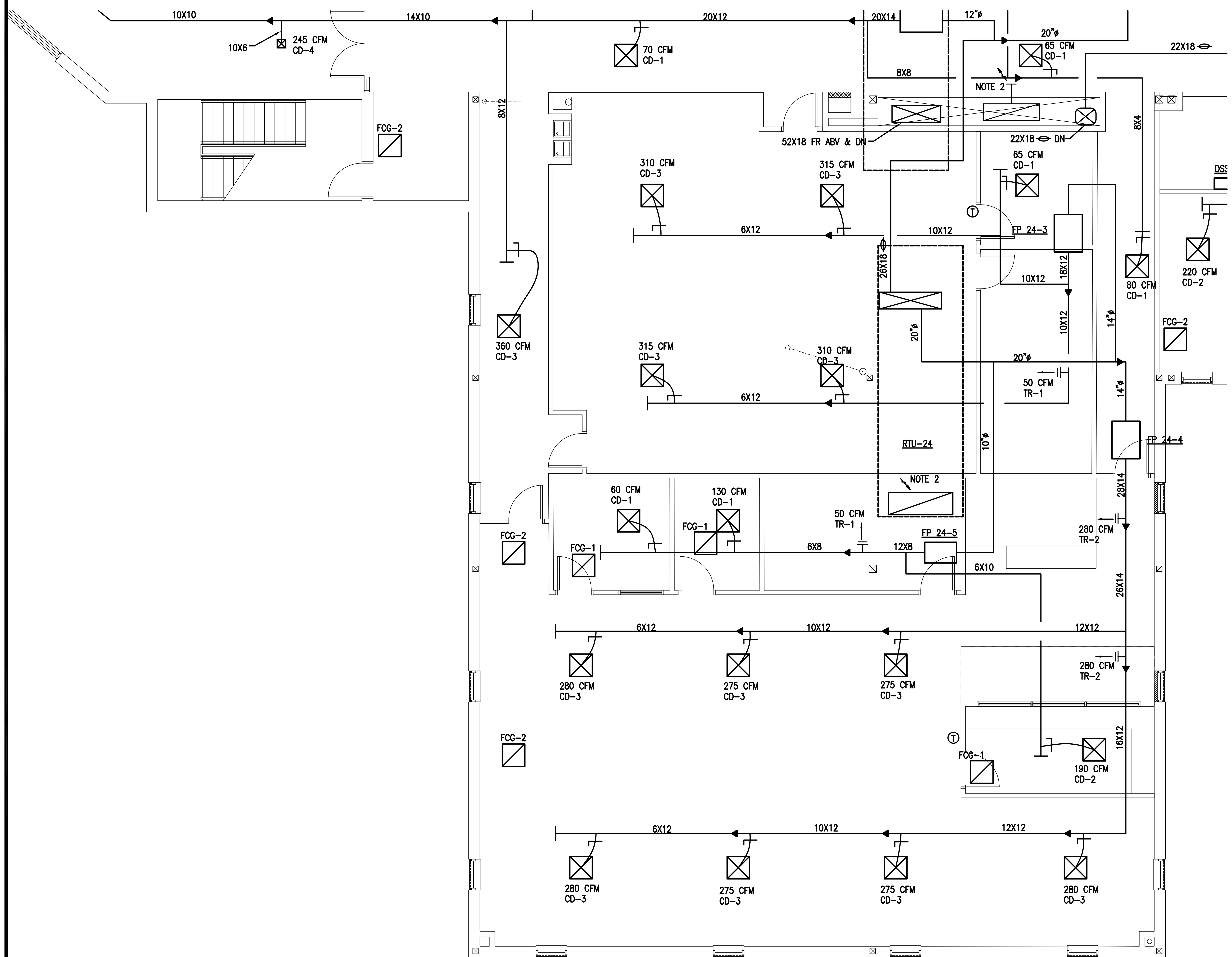
DATE:	6/17/22
SCALE:	AS SHOWN

SECOND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA A

M3.1

SHEET ______ of X



NOTES:

1. CONNECT 5"ø EXHAUST DUCT TO MANICURE TABLE VENT AS REQUIRED. DUCT TO ROUTE DOWN THROUGH TABLE AND TO FIRST FLOOR CEILING.

1 / M3.2 SECOND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA B

SCALE: 3/16" = 1'-0"

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REVISIONS		
No.	DATE	DESCRIPTION
X	X	X

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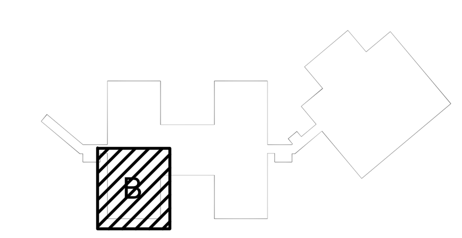
REV'D BY:	MDR
DATE:	6/17/22
SCALE:	AS SHOWN

SECOND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA B

M3.2

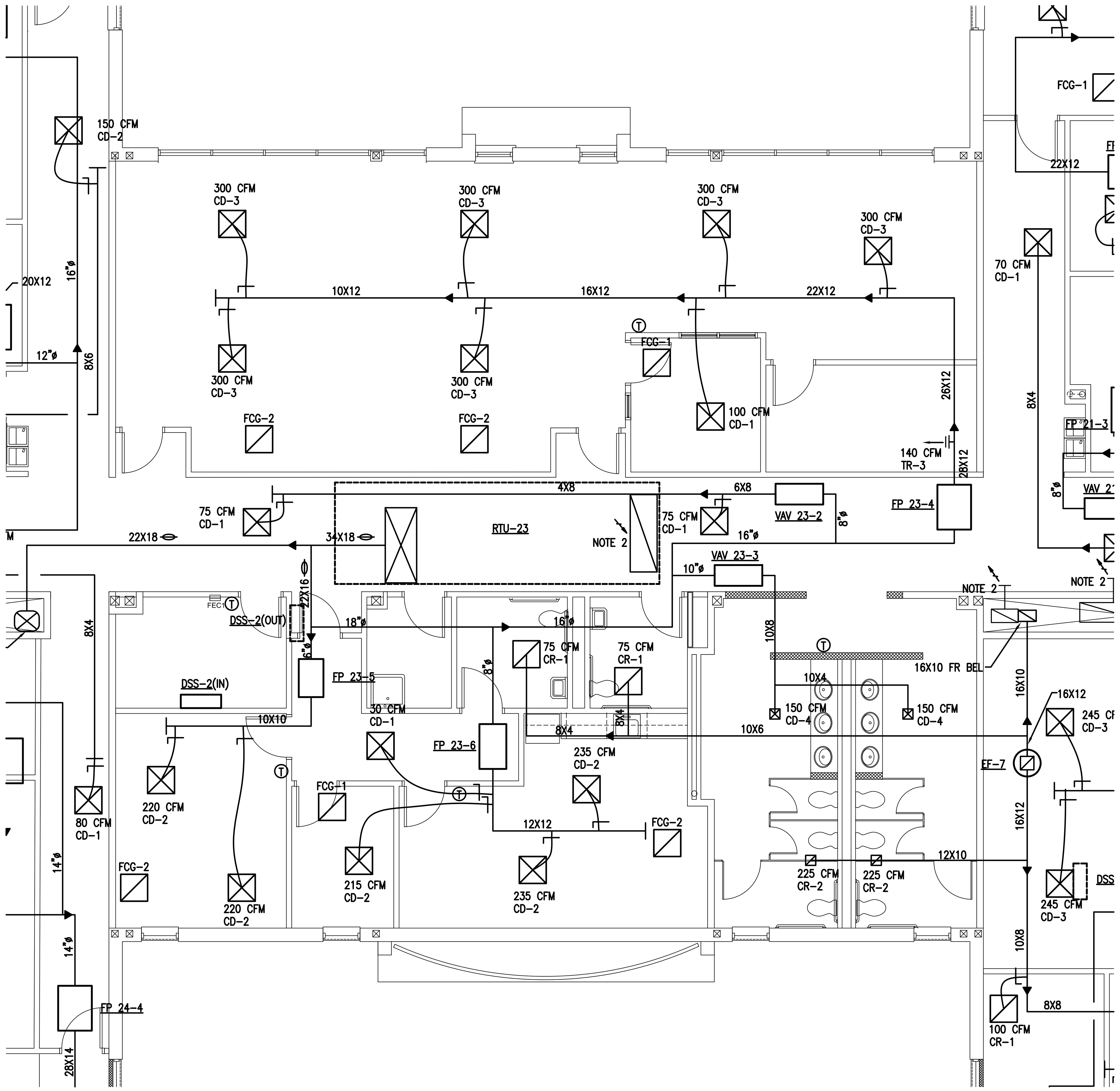
SHEET ______ of __X__



KEYPLAN

0 3' 6' 12'

TRUE NORTH
PLAN NORTH



1
M3.3

SECOND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA C

SCALE: 3/16" = 1'-0"

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x	x	x

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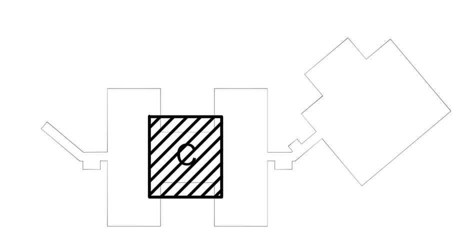
DATE:	6/17/22
SCALE:	AS SHOWN

SECOND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA C

M3.3

SHEET ______ of X

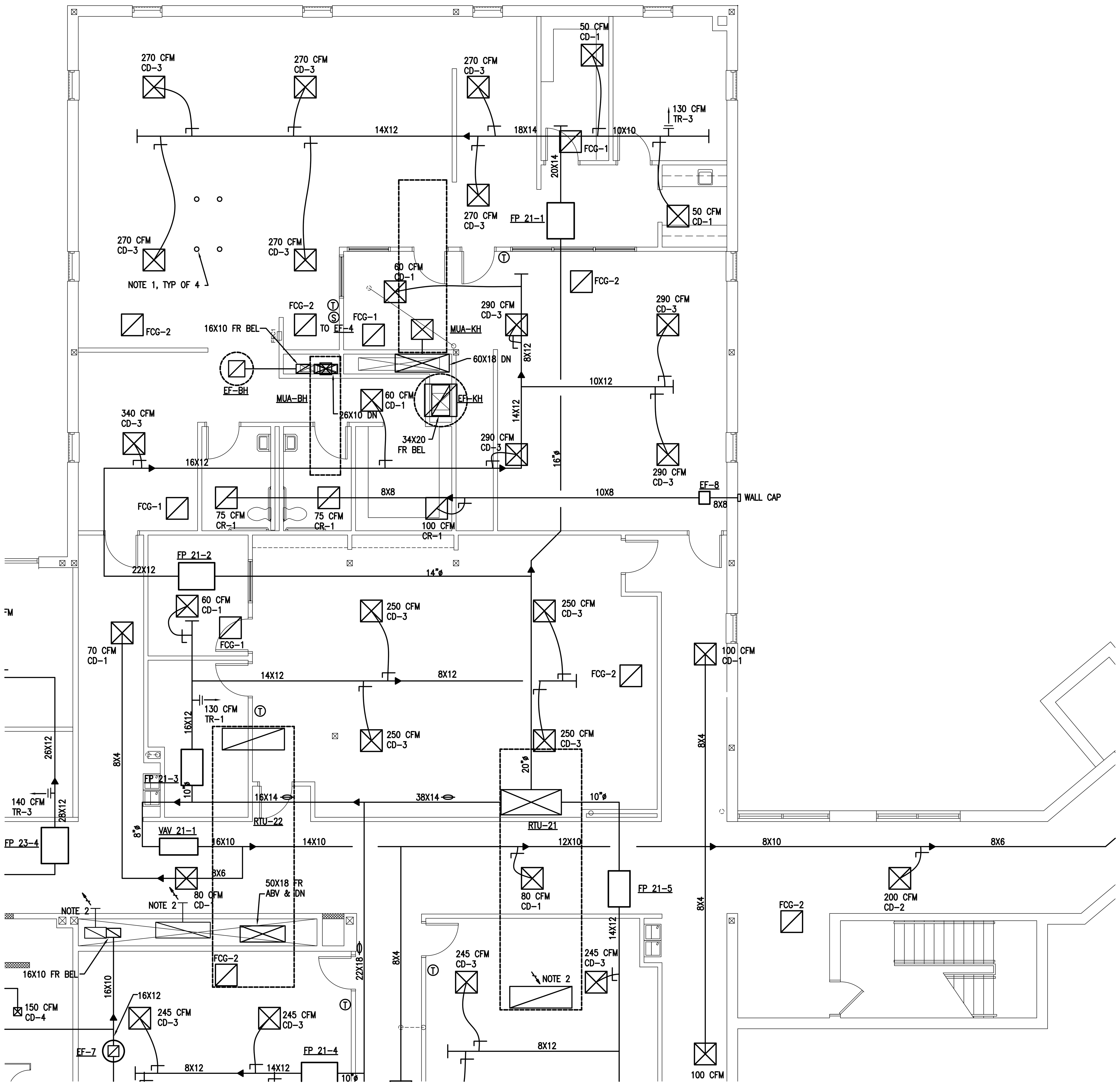


KEYPLAN

0 3' 6' 12'

TRUE NORTH

PLAN NORTH



1 M3.4 SECOND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA D

SCALE: 3/16" = 1'-0"

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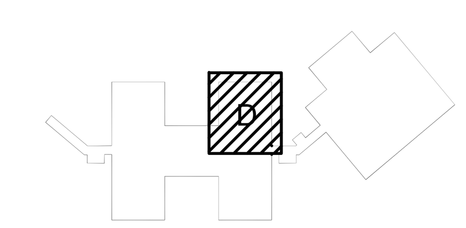


KEYPLAN

0 3' 6' 12'

TRUE NORTH

PLAN NORTH

N

REVISIONS

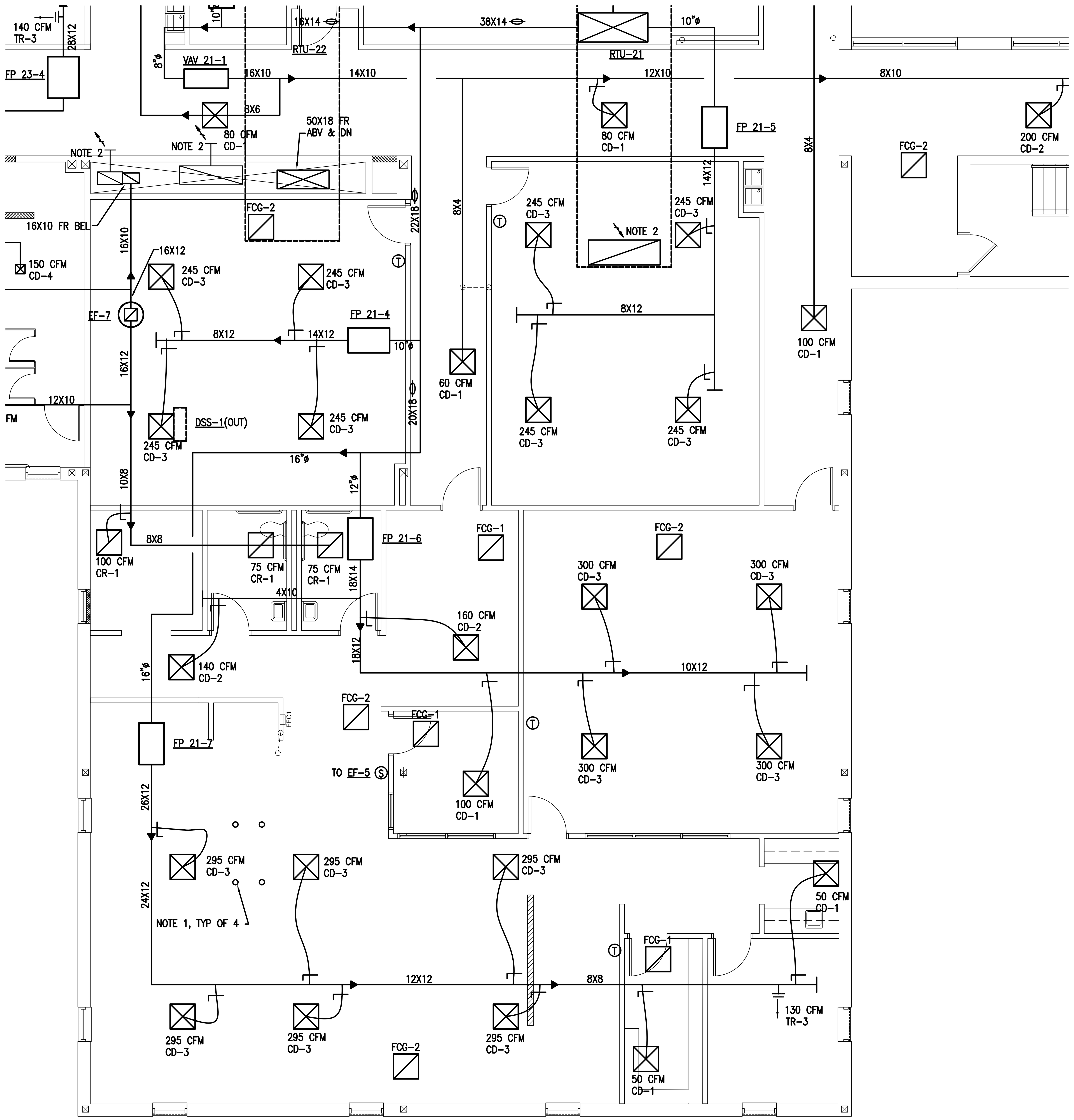
No.	DATE	DESCRIPTION
X	X	X

DRAWN BY:	MDR
REV'D BY:	MDR
DATE:	6/17/22
SCALE:	AS SHOWN

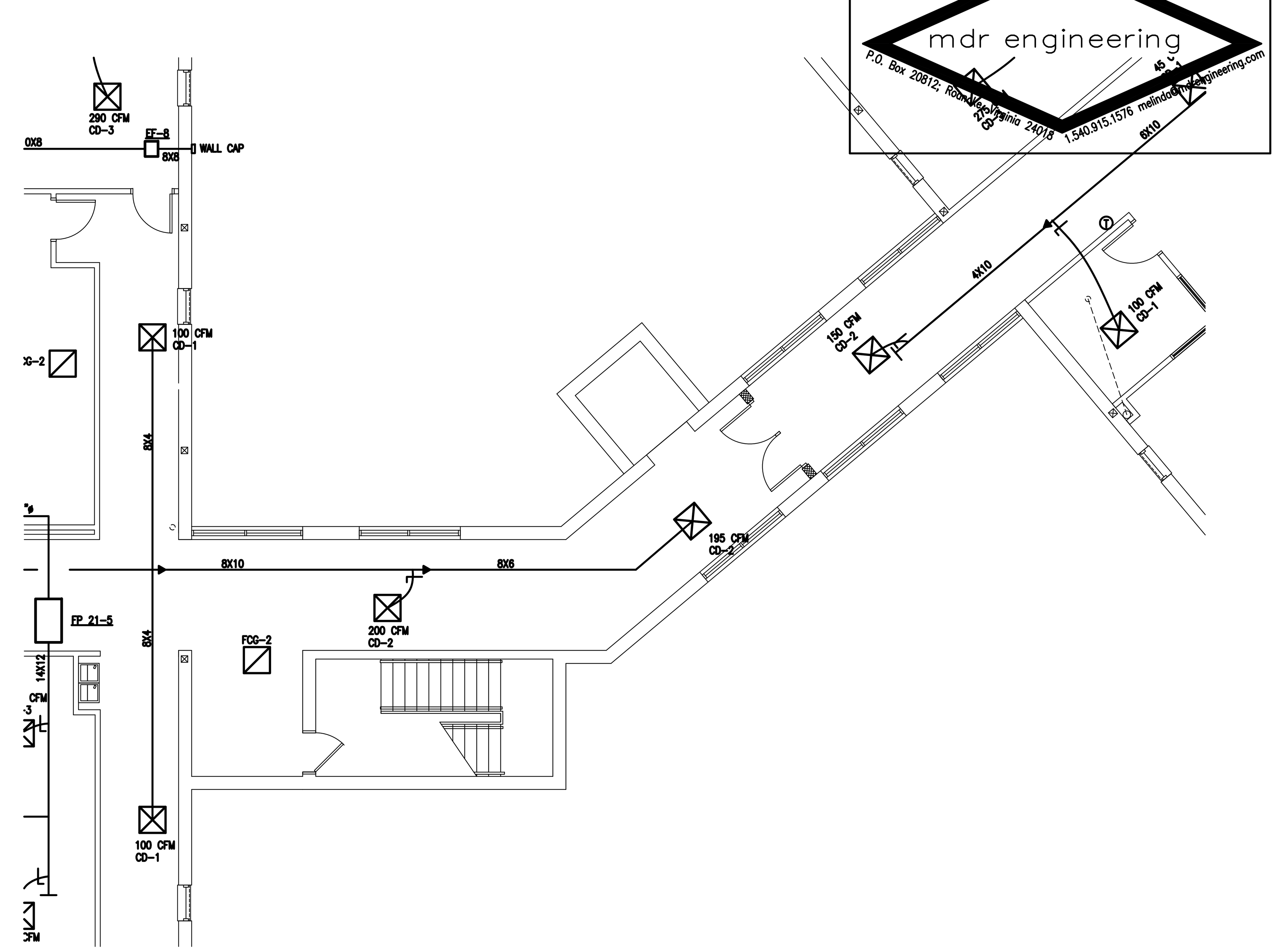
SECOND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA D

M3.4

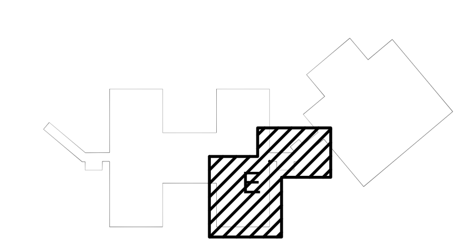
SHEET ______ of __X__



1 M3.5 SECOND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA E
SCALE: 3/16" = 1'-0"



2 M3.5 SECOND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA E
SCALE: 3/16" = 1'-0"



KEYPLAN

0 3' 6' 12'

TRUE NORTH

PLAN NORTH

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REV'D BY:	MDR
DATE:	6/17/22
SCALE:	AS SHOWN

SECOND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA E

M3.5

SHEET ______ of __X__

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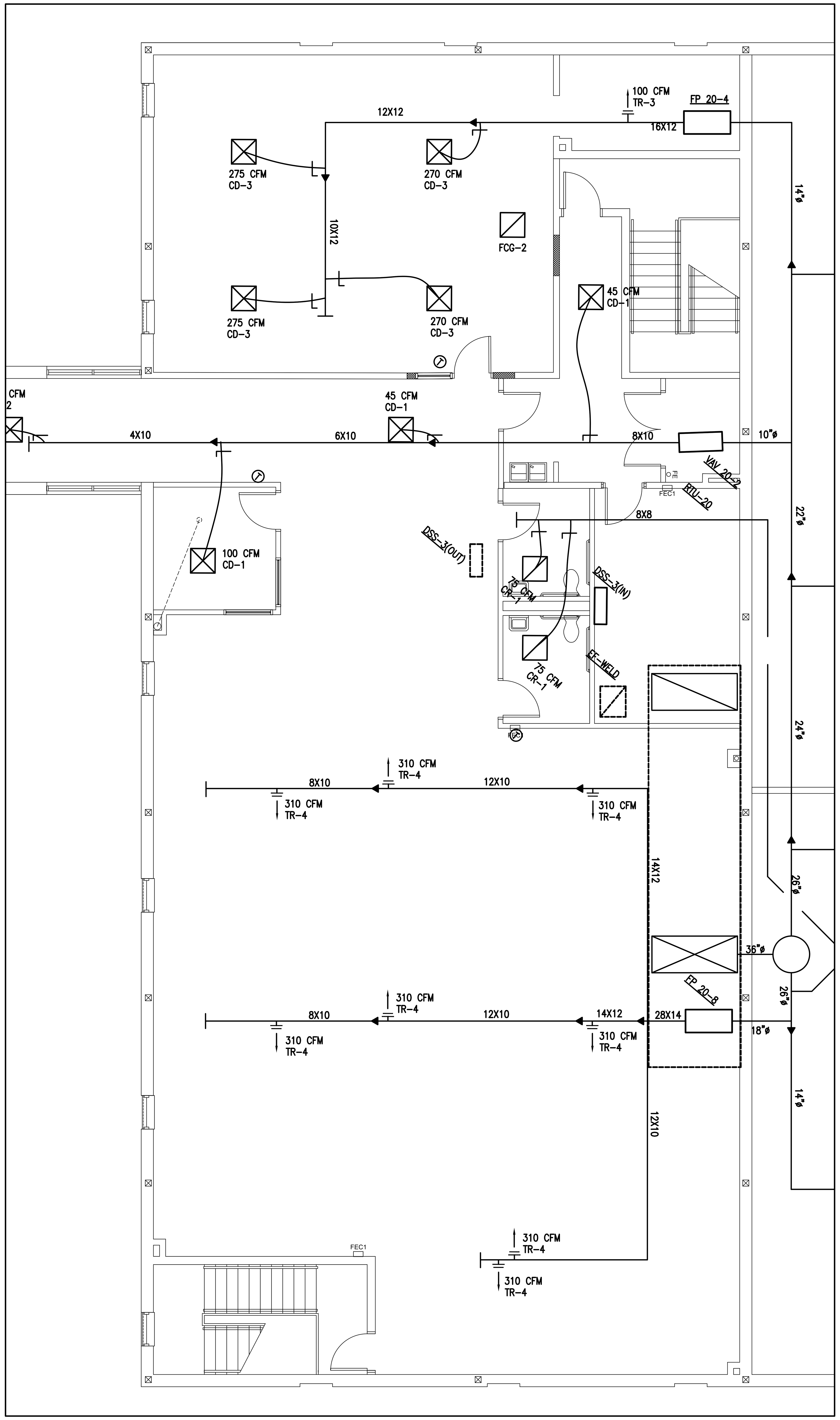
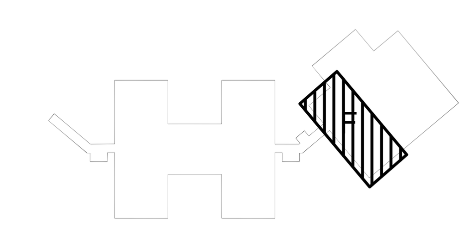


1
M3.6

SECOND FLOOR PARTIAL NEW WORK PLAN - AREA F

SCALE: 3/16" = 1'-0"



KEYPLAN

0 3' 6' 12'

TRUE NORTH
PLAN NORTH
N

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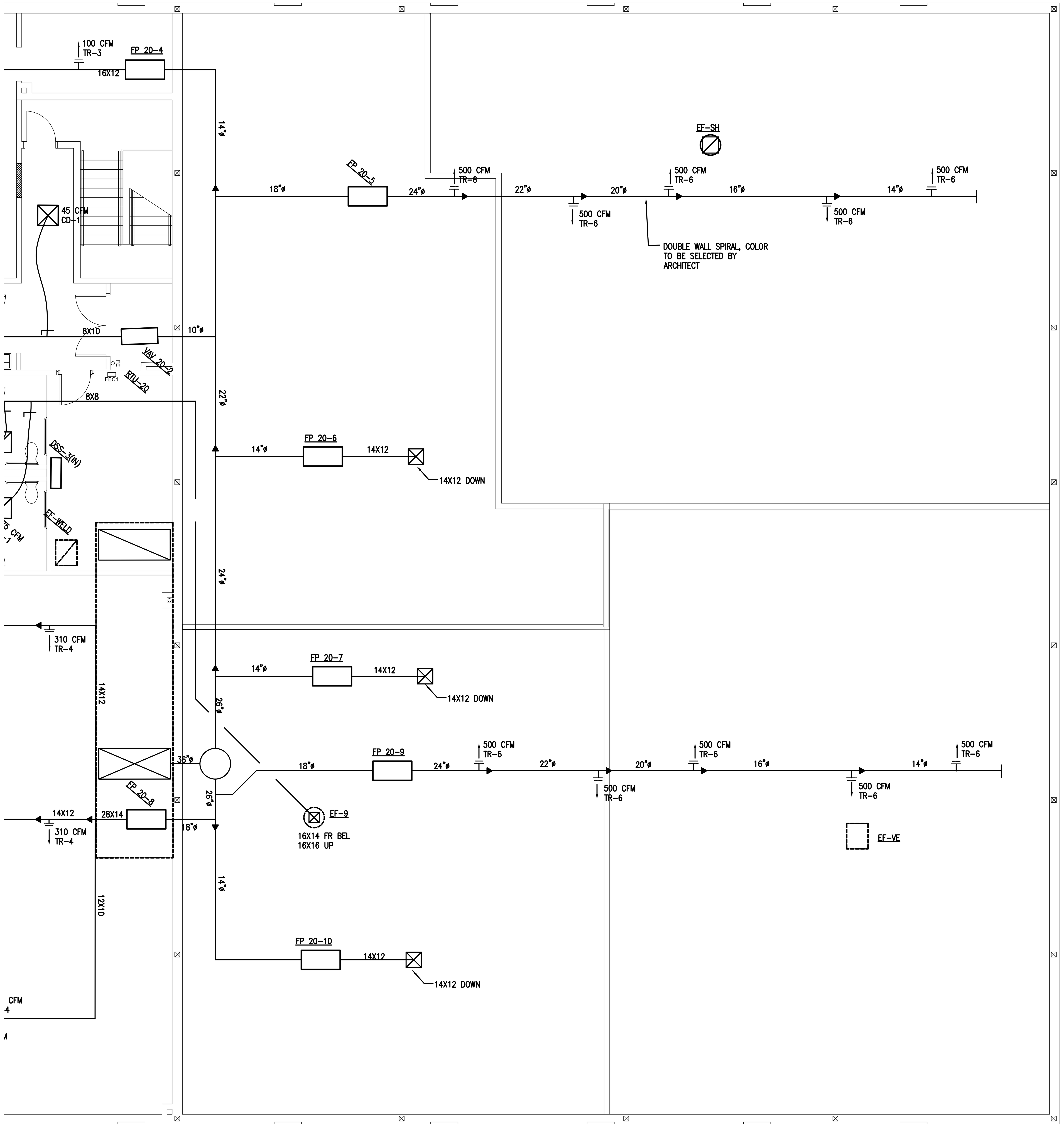
SCALE:	AS SHOWN

SECOND FLOOR PARTIAL MECHANICAL NEW WORK PLAN - AREA F

M3.6

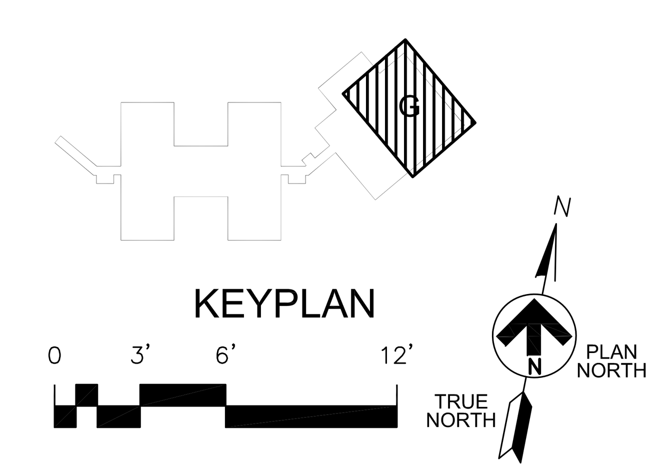
SHEET ______ of X



1
M3.7

SECOND FLOOR PARTIAL NEW WORK PLAN - AREA G

SCALE: 3/16" = 1'-0"



KEYPLAN

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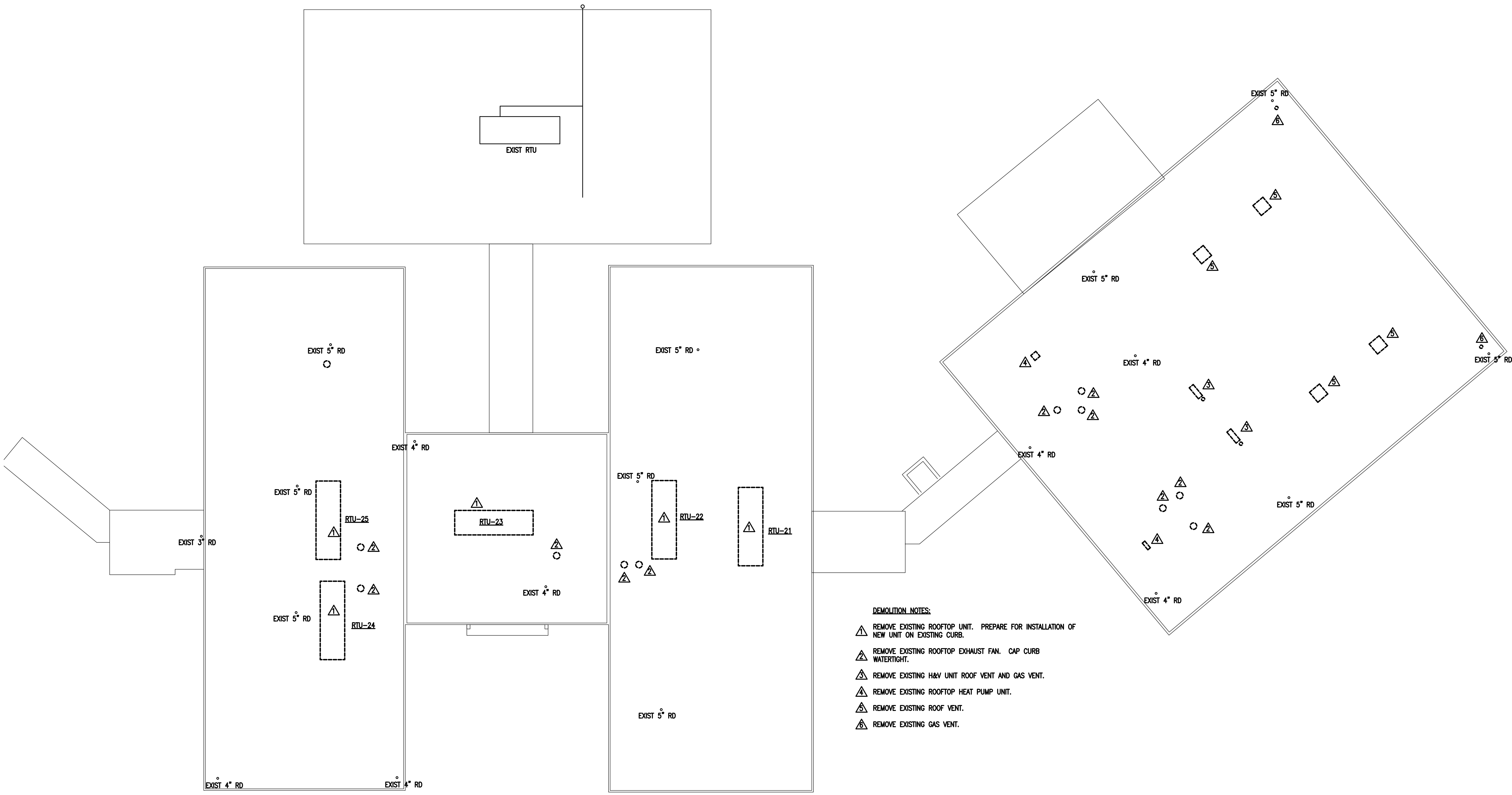
SECOND FLOOR PARTIAL NEW WORK PLAN - AREA G

M3.7

SHEET _____ of X



DEMOLITION NOTES:

1. REMOVE EXISTING ROOFTOP UNIT. PREPARE FOR INSTALLATION OF NEW UNIT ON EXISTING CURB.
2. REMOVE EXISTING ROOFTOP EXHAUST FAN. CAP CURB WATERTIGHT.
3. REMOVE EXISTING H&V UNIT ROOF VENT AND GAS VENT.
4. REMOVE EXISTING ROOFTOP HEAT PUMP UNIT.
5. REMOVE EXISTING ROOF VENT.
6. REMOVE EXISTING GAS VENT.

1 / M4.1 MECHANICAL DEMOLITION ROOF PLAN
SCALE: 1/16" = 1'-0"

0 3' 6' 12'

TRUE NORTH
PLAN NORTH

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MECHANICAL DEMOLITION ROOF PLAN

M4.1

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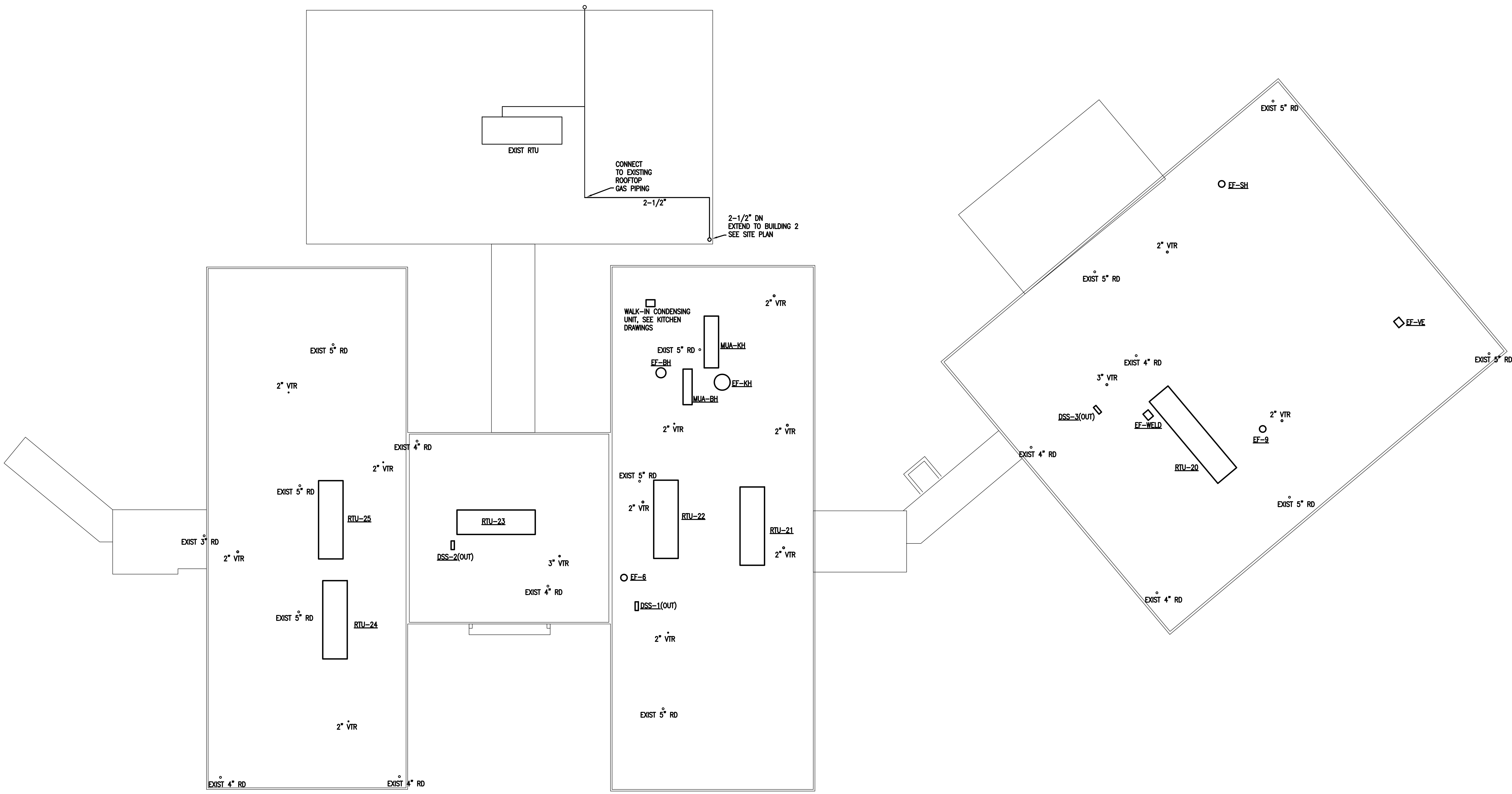

1 M4.1 MECHANICAL NEW WORK ROOF PLAN
SCALE: 1/16" = 1'-0"

0 3' 6' 12'

N
TRUE NORTH
PLAN NORTH

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MECHANICAL NEW WORK ROOF PLAN

M4.2

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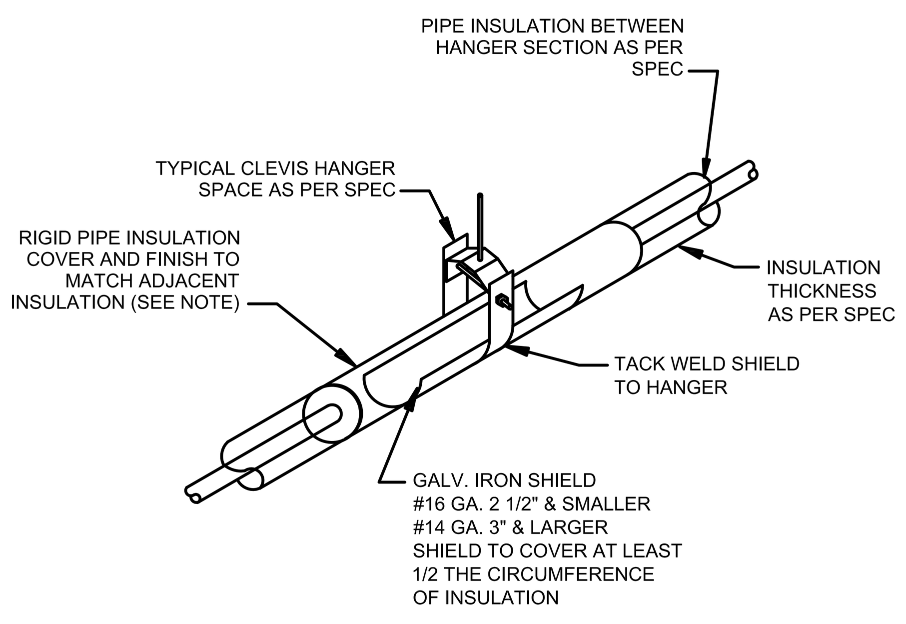
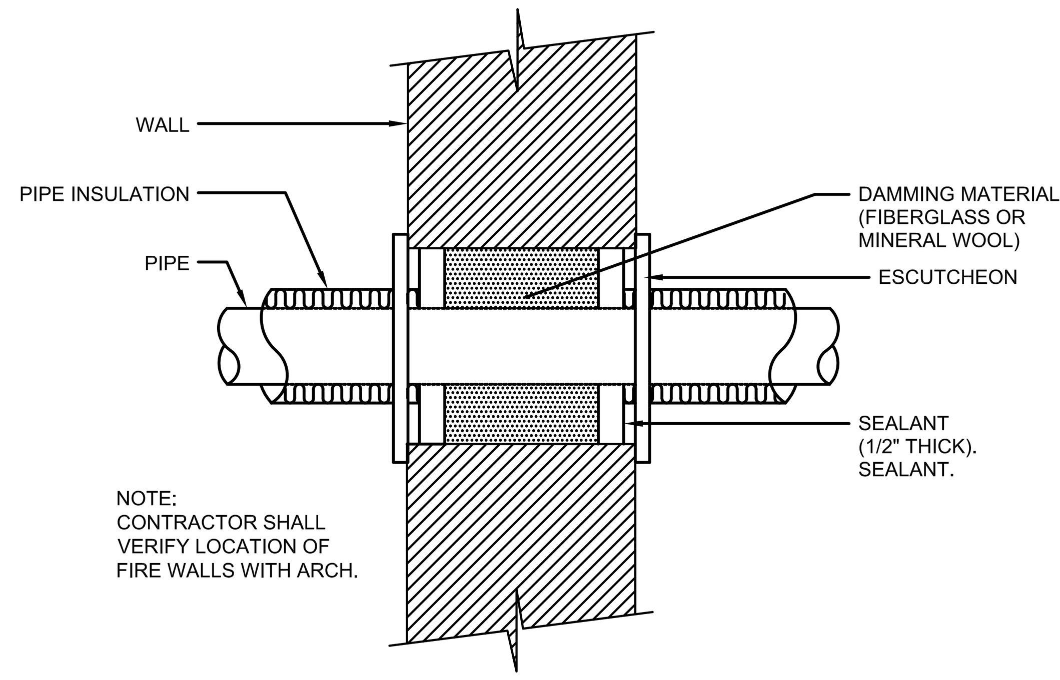


NOTE:
WHERE THIS DETAIL IS USED FOR COLD PIPING, RIGID INSULATION AND COVERING SHALL BE SEALED TO PROVIDE CONTINUOUS VAPOR BARRIER

INSULATED PIPE HANGER DETAIL

NO SCALE



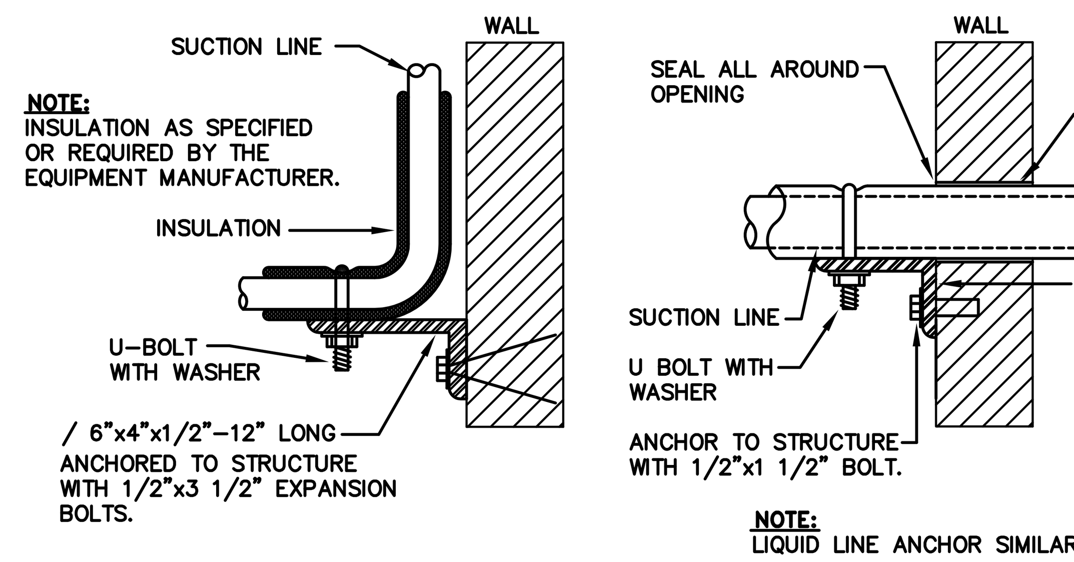
NOTE:
CONTRACTOR SHALL VERIFY LOCATION OF FIRE WALLS WITH ARCH.

PIPE PENETRATION DETAIL

NOT TO SCALE

MISC. NOTES:

1. CONTRACTOR TO COORDINATE PENETRATION DETAILS WITH ARCHITECTURAL DRAWINGS AS APPLICABLE.



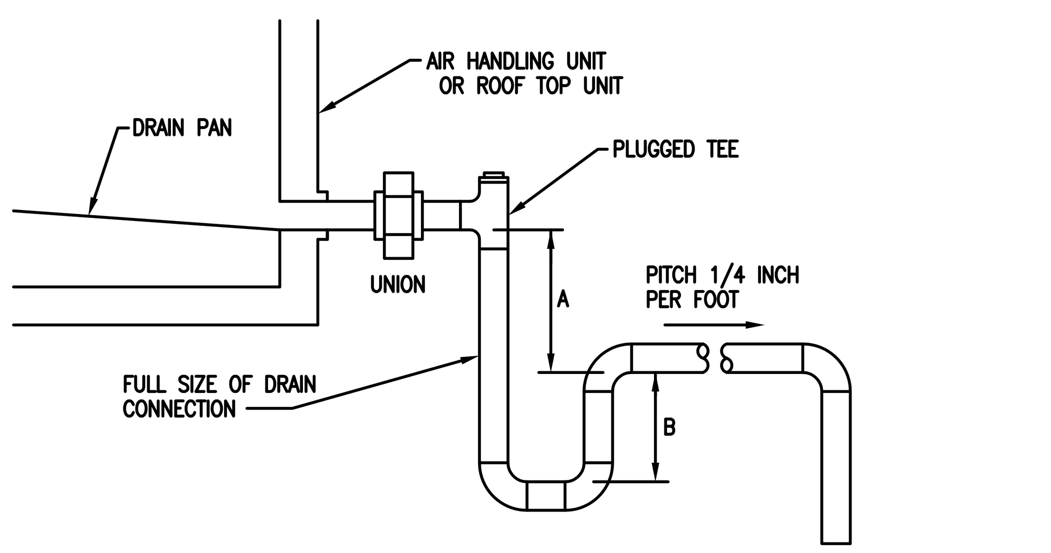
REFRIGERANT PIPE SUPPORTS AT WALL

NO SCALE

HANGER SIZES FOR RECTANGULAR DUCT			
MAX. SIDE	HANGER	HORIZONTAL SUPPORT ANGLE	MAXIMUM SPACING
30"	1"X18" GAGE STRAP	NONE REQUIRED	10'-0"

NOTE:
ALL SUPPLY AIR DUCT SHALL BE WRAPPED EXTERNALLY AS PER SPECIFICATIONS

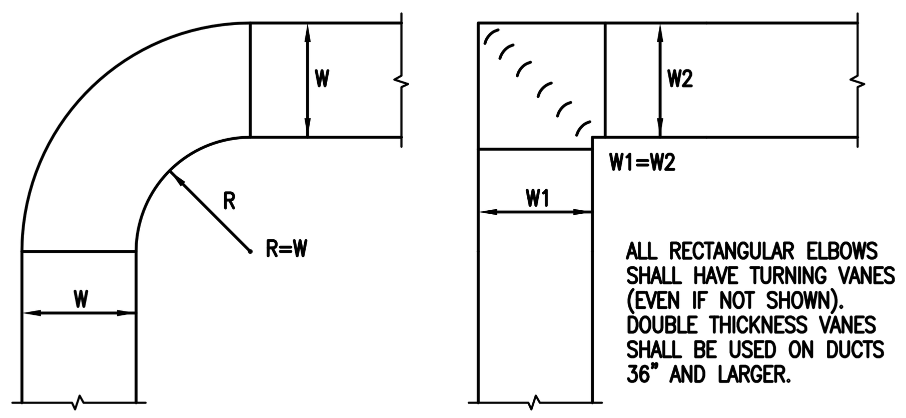
NO POP RIVETS ALLOWED



DRAW THROUGH UNITS (NEGATIVE CASING PRESSURE) A = 1 INCH PLUS MAXIMUM CASING STATIC PRESSURE B = A/2	BLOW THROUGH UNITS (POSITIVE CASING PRESSURE) A = 1 INCH MINIMUM B = 1 INCH PLUS MAXIMUM CASING STATIC PRESSURE

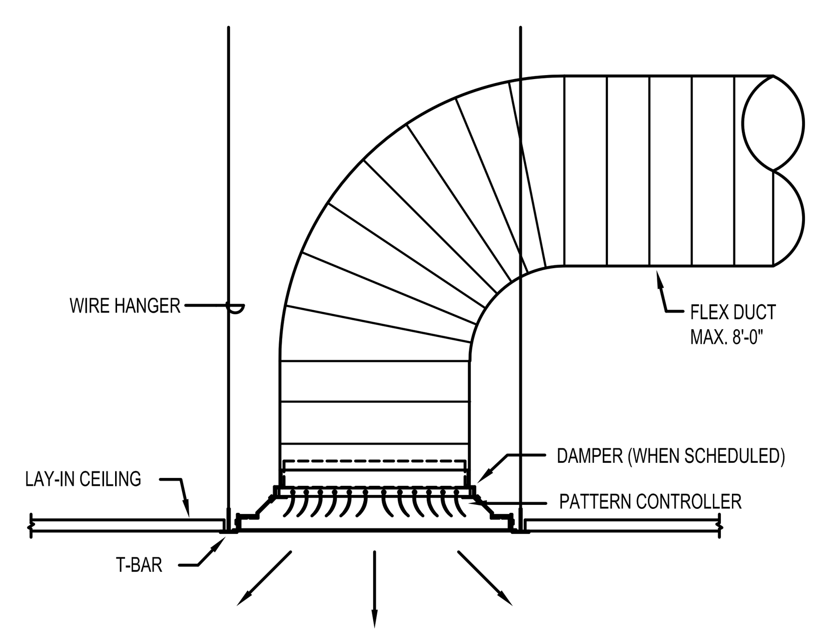
DETAIL – CONDENSATE DRAIN

NO SCALE



DETAIL – DUCT ELBOWS

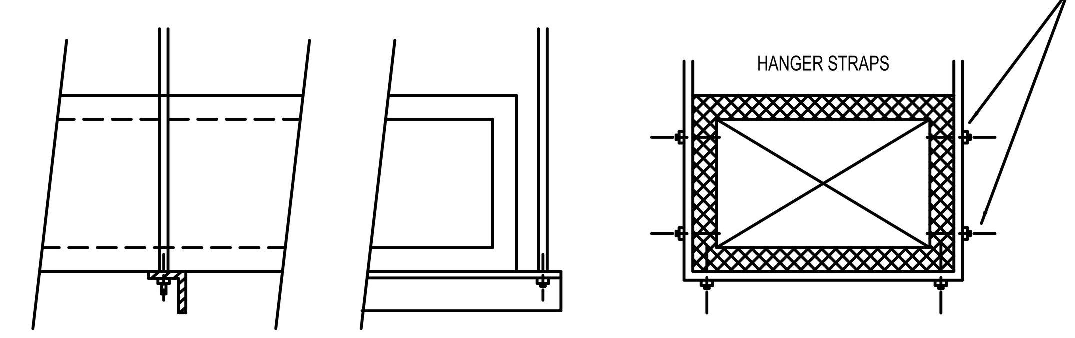
NO SCALE



LAY–IN CEILING DIFFUSER DETAIL

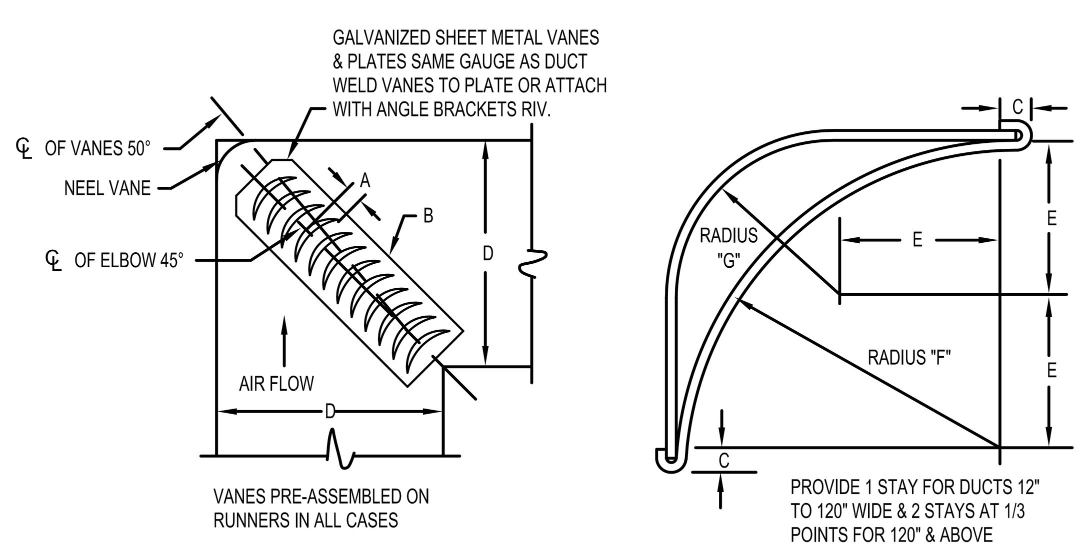
NOT TO SCALE

SELF TAPPING CADMIUM PLATED HEX HEAD SHEET METAL SCREW STRAPS TO BE TIGHT AGAINST DUCT.



DUCT STRAP HANGER DETAIL

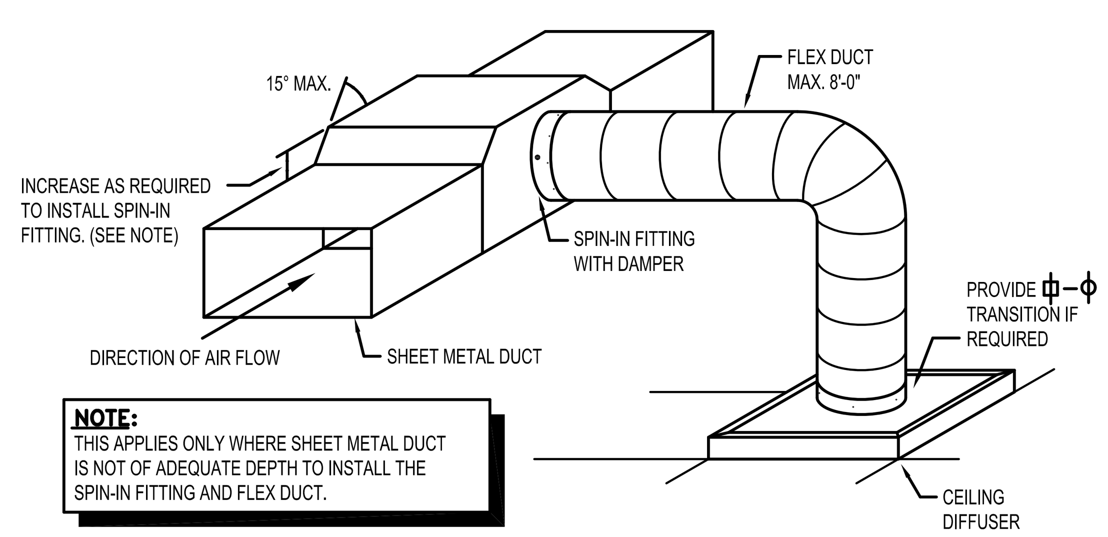
NOT TO SCALE



D & D UP TO 24"	A = 1-1/2"	B = 5"	TYPE "B" VANES
D & D OVER 24"	A = 3-1/4"	B = 9"	TYPE "A" VANES
TYPE "A" VANES	C = 1/2"	E = 2-1/4"	RADIUS "F" = 4-1/2" RADIUS "G" = 2-1/4"
TYPE "B" VANES	C = 1/4"	E = 1"	RADIUS "F" = 2" RADIUS "G" = 1"

SQUARE ELBOW DETAIL

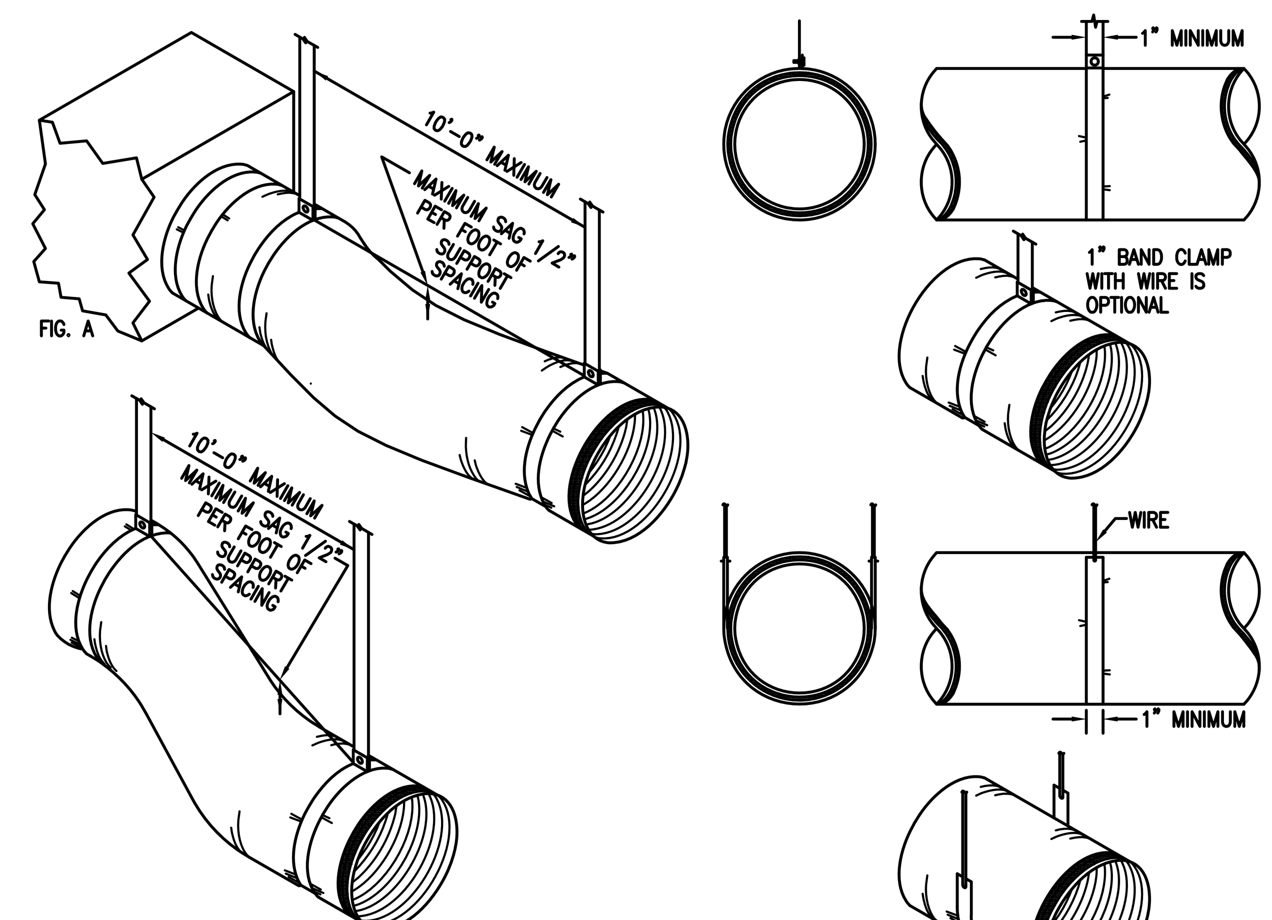
NOT TO SCALE



NOTE:
THIS APPLIES ONLY WHERE SHEET METAL DUCT IS NOT OF ADEQUATE DEPTH TO INSTALL THE SPIN-IN FITTING AND FLEX DUCT.

FLEX DUCT TAKE–OFF @ SHEET METAL DUCT DETAIL

NOT TO SCALE



SUPPORT SYSTEM MUST NOT DAMAGE DUCT OR CAUSE OUT OF ROUND SHAPE.

DETAIL – FLEXIBLE DUCT SUPPORTS

NO SCALE

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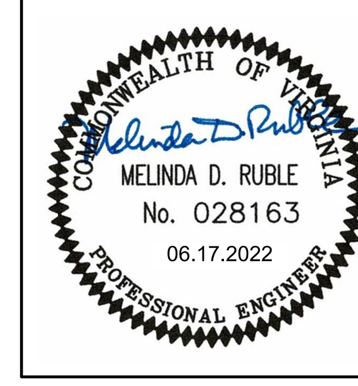

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MECHANICAL DETAILS

M5.1

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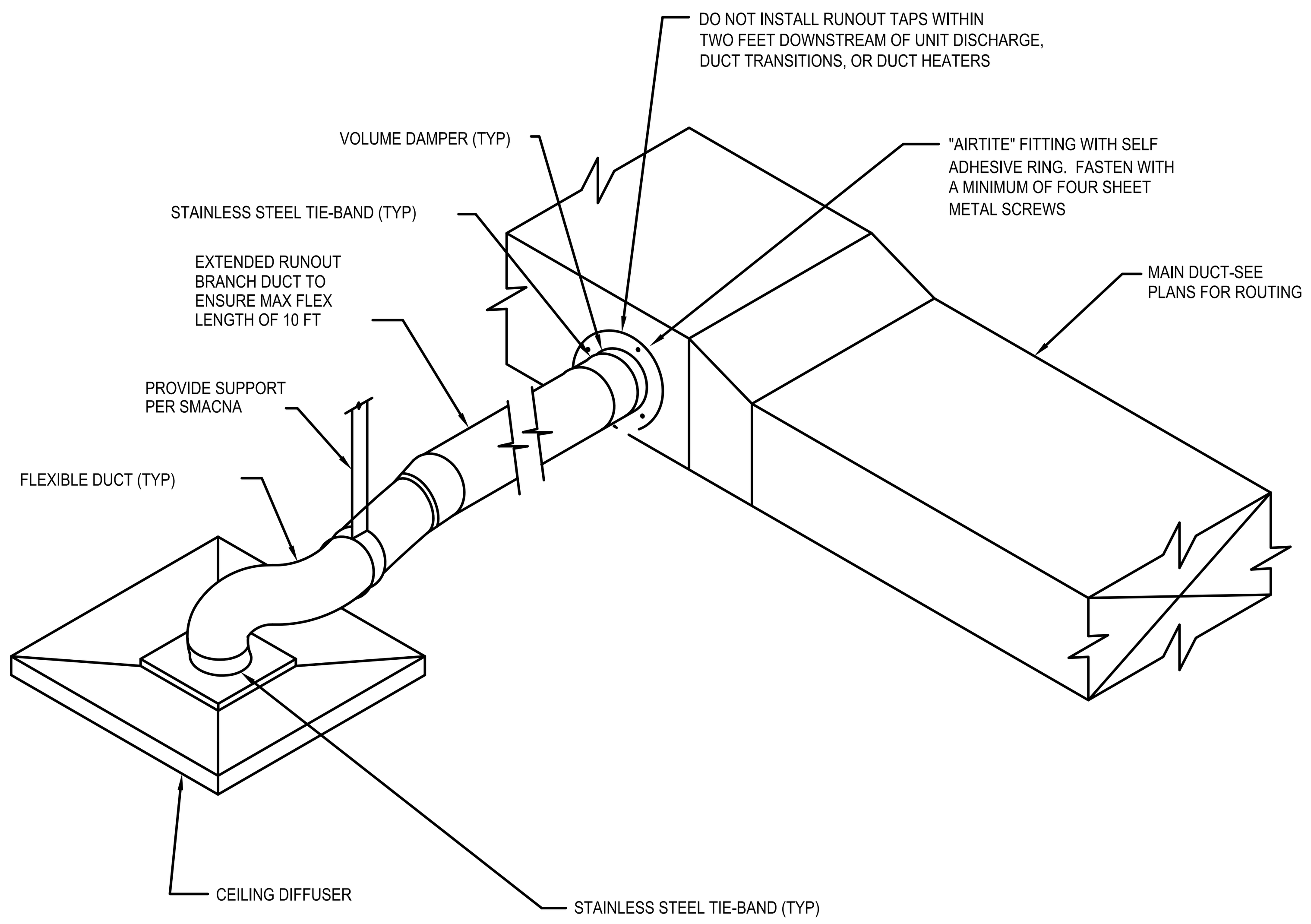
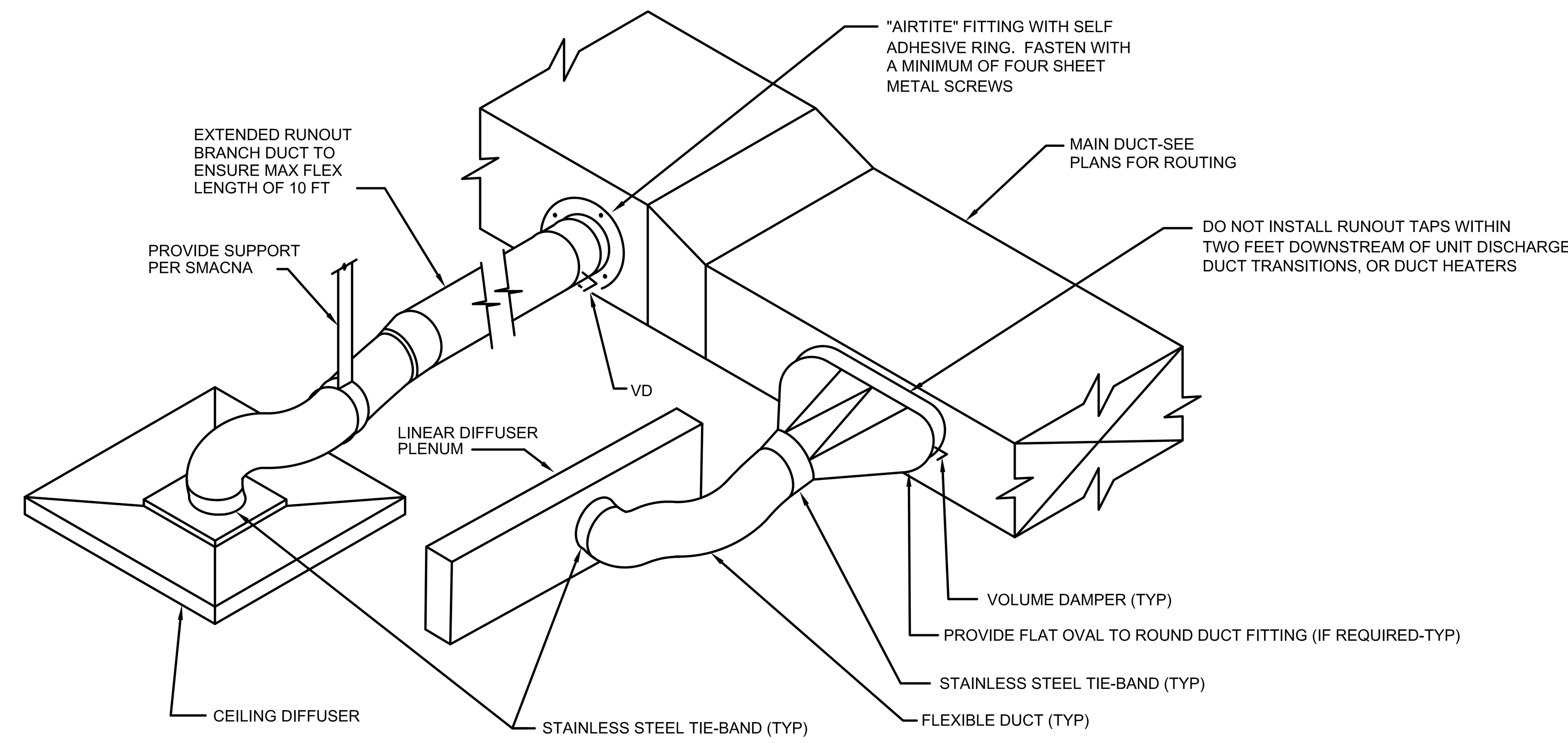


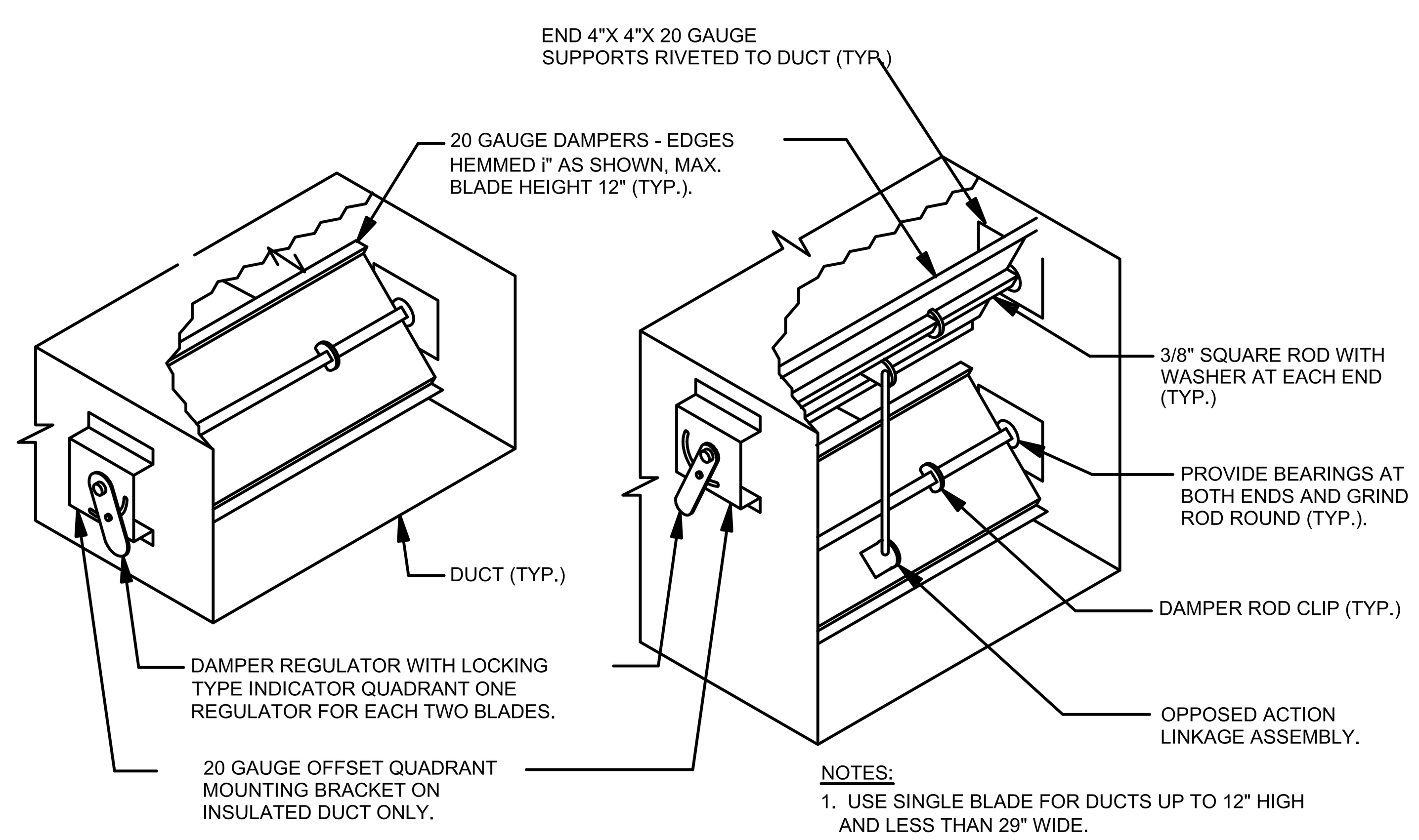
CEILING DIFFUSER HOOK-UP DETAIL

NO SCALE



CEILING DIFFUSER CONNECTION DETAIL

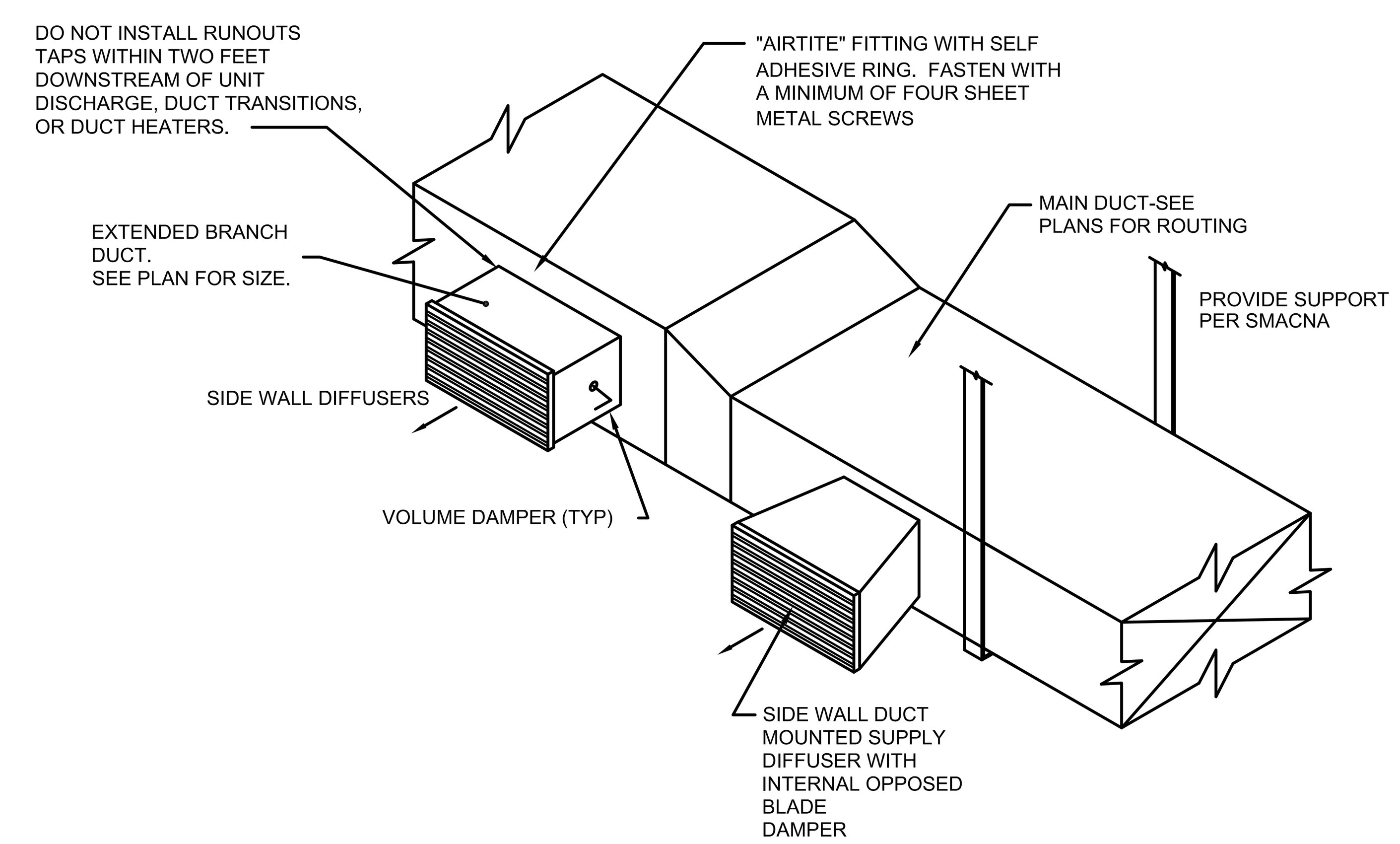
NO SCALE



NOTES:
1. USE SINGLE BLADE FOR DUCTS UP TO 12" HIGH AND LESS THAN 29" WIDE.
2. USE MULTIPLE BLADES FOR DUCTS GREATER THAN OR EQUAL TO 29" AND/OR OVER 12" HIGH.

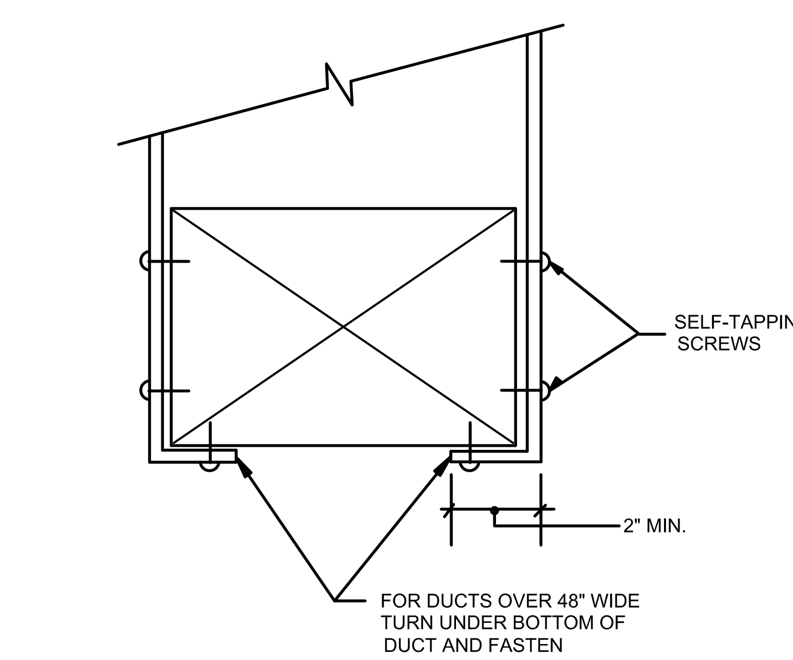
LOW PRESSURE BALANCING DAMPER

NO SCALE



DIFFUSER CONNECTION DETAIL

NO SCALE



DUCT SIZE	HANGER SIZE	MAX. SPACING
UP THRU 2 SQ. FT.	1" X 1/16"	8' - 0"
2 THRU 4 SQ. FT.	1" X 1/8"	8' - 0"
4 THRU 10 SQ. FT.	1" X 1/8"	6' - 0"
OVER 10 SQ. FT.	1" X 1/8"	4' - 0"

DUCT HANGING DETAIL AND SCHEDULE OF SUPPORTS

NO SCALE

NOTE: ALL PIPE HANGER AND SUPPORT DESIGN IS DELEGATE TO THE CONTRACTOR

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MECHANICAL DETAILS

M5.2

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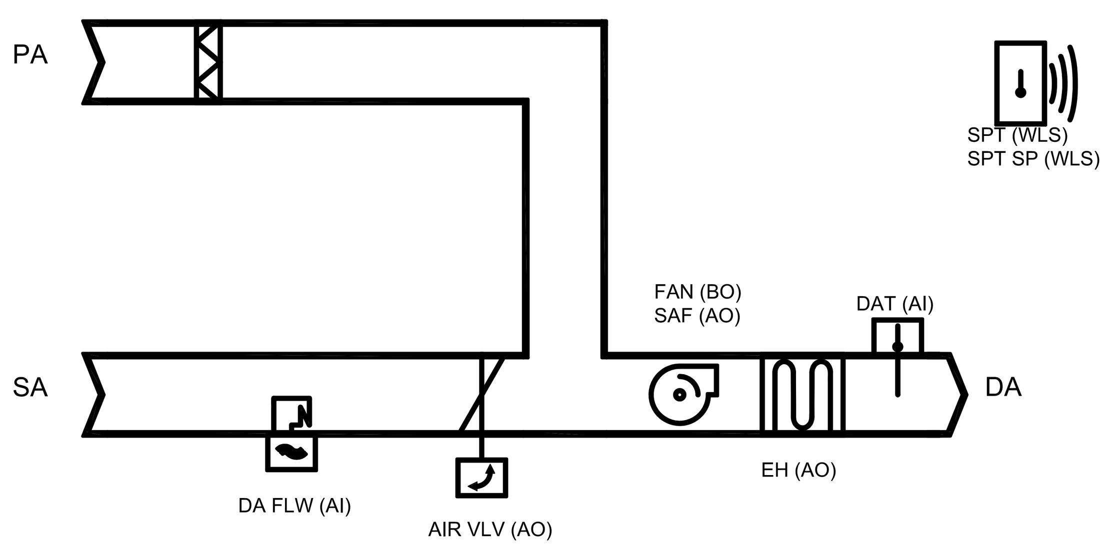
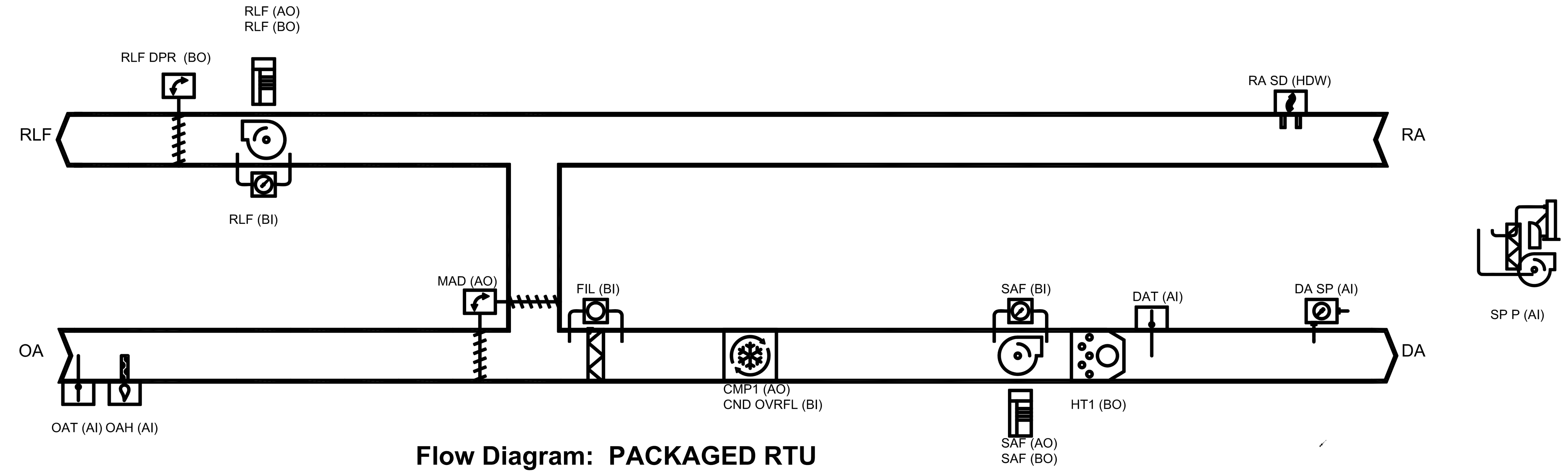
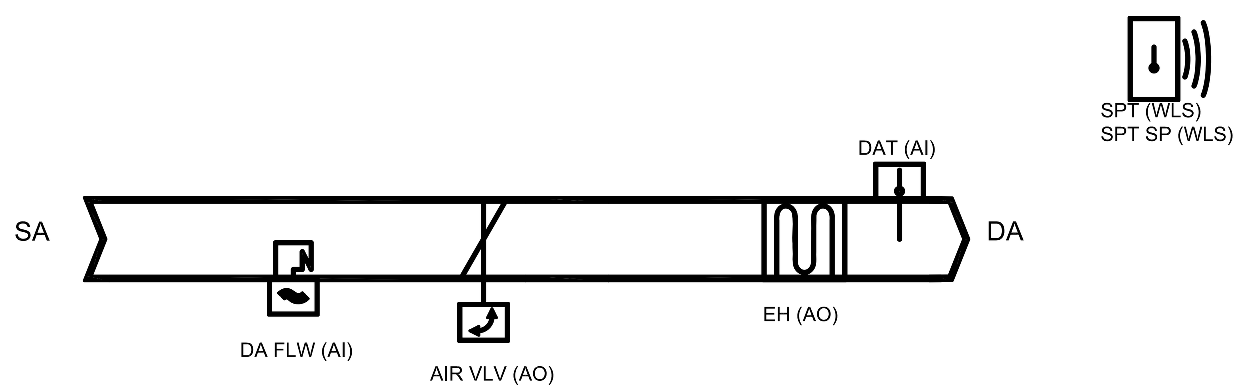


Flow Diagram: FAN POWERED VAV TERMINAL UNIT

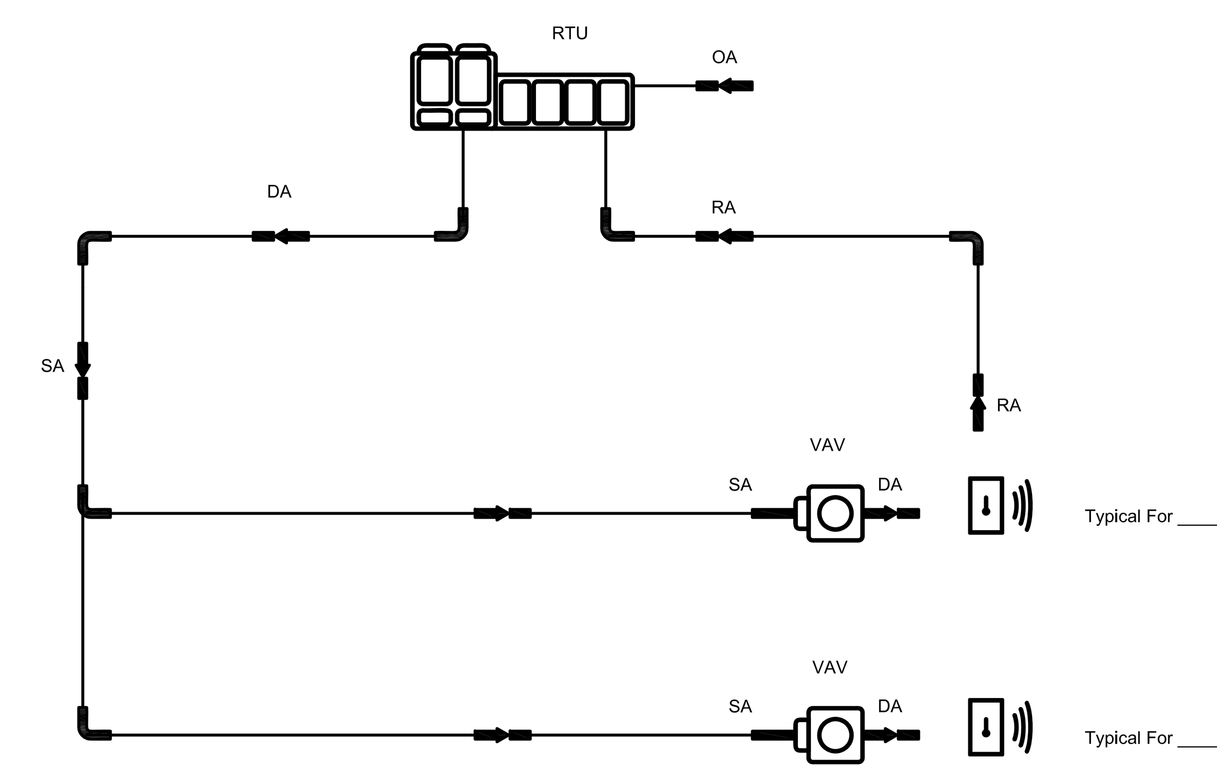
CONTROLS TO BE PROVIDED BY TRANE



Flow Diagram: PACKAGED RTU



Flow Diagram: VAV TERMINAL UNIT



Flow Diagram: VARIABLE AIR VOLUME SYSTEM

Multizone VAV Units

Optimal Start:
The BAS shall monitor the scheduled occupied time, occupied space setpoints and average space temperature to calculate when the optimal start occurs.

Morning Warm-Up Mode:
During optimal start, if the average space temperature is below the occupied heating setpoint a morning warm-up mode shall be activated. When morning warm-up is initiated the supply fan shall energize and the gas heat shall modulate fully open. Outside and exhaust air dampers shall remain closed. Exhaust fans shall remain off. When the average space temperature reaches the occupied heating setpoint, the unit shall transition to the occupied mode.

Pre-Cool Mode:
During optimal start, if the average space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the supply fan shall energize. The DX cooling shall be at maximum output, unless economizing. Outside and exhaust air dampers shall remain closed, and the exhaust fan shall remain off, unless economizing. When the average space temperature reaches occupied cooling setpoint, the unit shall transition to the occupied mode.

Occupied:
During occupied periods (Temperature Schedule), the supply fan shall run continuously and its speed shall be modulated to maintain a maximum duct static pressure setpoint of 2.0 in wg (adj). If all VAV boxes are less than 80% open, the setpoint shall be reset downward in 0.1 in wg increments every three minutes (adj.) until at least one box is greater than 85% open or the minimum setpoint (0.5 in wg, adj) is reached. If a VAV box becomes more than 95% open, the setpoint shall be reset upwards in 0.1 in wg increments until all boxes are less than 90% open.

Discharge Air Temperature Control:
The discharge air temperature setpoint shall be reset between 55-65 Deg F based on a linear drop in outdoor air temperature from 80-65 Deg F. When the outside air dew point exceeds 58 Deg F, the discharge air temperature setpoint shall be overridden to 55 Deg F. Once the outside air dew point drops below 56 Deg F, this humidity override shall be disabled.

Ventilation Control:
The ventilation shall be on the separate Ventilation Schedule. When ventilation is enabled, the outside air damper shall open to its minimum position.

Economizer:
The controller will compare outside air humidity and temperature (global points) to return air humidity and return air temperature. Whenever the outside air enthalpy is less than the return air enthalpy, the controller will use the economizer cycle to satisfy a call for cooling. If the outside air damper is full open and the discharge air temperature remains above setpoint then mechanical cooling should engage as well.

Exhaust Fan:
Maintain Statitrac operation using 0.1 in wc as the setpoint.

Optimal Stop:
The BAS shall monitor the scheduled unoccupied time, occupied setpoints and average space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the average space temperature to the space temperature offset setpoint.

Unoccupied Mode

The individual VAV boxes shall control their respective rooms to the unoccupied heating setpoint.

When the average space temperature rises above the unoccupied cooling setpoint, the supply fan shall turn on. The DX cooling shall turn on to 100%, unless economizing conditions are favorable. The outside and exhaust air dampers shall remain closed, unless economizing. The exhaust fan shall remain off, unless economizing. When the average space temperature falls below the unoccupied cooling setpoint minus the unoccupied differential of 4.0 deg. F, the supply fan and DX cooling shall turn off, the outside and exhaust air dampers shall close, and the exhaust fan shall turn off.

Occupied Bypass:
The BAS shall monitor the status of the "on" and "cancel" buttons of the space temperature sensors. When an occupied bypass request is received, the unit shall enter occupied mode for 2 hours. The OA damper shall remain closed unless economizing.

Series Fan Powered Terminal Units – Electric Reheat

Optimal Start: When their respective AHU enters optimal start, the VAV damper shall open 100%, the VAV fan shall energize, and the electric heat shall be disabled until the unit transitions to occupied mode.

Occupied Mode: When their respective RTU is in occupied mode, the VAV fans shall be on continuously.

Cooling Mode:
The VAV controller shall maintain the space temperature at the occupied cooling setpoint by modulating the airflow between the minimum and maximum cooling airflow setpoints.

Heating Mode:
The VAV controller shall maintain the space temperature at the occupied heating setpoint by engaging the electric heat while maintaining the airflow at the heating airflow setpoint.

Optimal Stop:
When their respective rooftop unit enters optimal stop, the VAV fans shall be on and the electric heat shall be off.

Unoccupied Mode:
When the space drops below the unoccupied heating setpoint, the VAV fan shall energize and the electric heat shall energize to maintain the unoccupied setpoint.

When the respective AHU is energized to maintain the unoccupied cooling setpoint, the VAV damper shall open to 100% until the average space temperature falls 4.0 degrees below the unoccupied cooling setpoint and the AHU is de-energized.

Shutoff VAV Boxes – Electric Reheat

Optimal Start: When their respective RTU enters optimal start, the VAV damper shall open 100%, the VAV fan shall energize (where applicable), and the electric heat shall remain off during morning warmup.

Occupied Mode: The controller shall modulate the air valve and electric heat in the boxes and local convectors (if applicable).

Cooling Mode:
The VAV controller shall maintain the space temperature at the occupied cooling setpoint by modulating the airflow between the minimum and maximum cooling airflow setpoints.

Heating Mode:
With the VAV airflow at it's heating setpoint, the system shall stage the electric heat in the boxes to maintain the heating setpoint.

Unoccupied Mode:
When the respective RTU is energized to maintain the unoccupied heating setpoint, the VAV damper shall open to 100% and the electric heat shall remain off until the average space temperature rises 4.0 degrees above the unoccupied heating setpoint and the RTU is de-energized.

When the respective RTU is energized to maintain the unoccupied cooling setpoint, the VAV damper shall open to 100% until the average space temperature falls 4.0 degrees below the unoccupied cooling setpoint and the RTU is de-energized.

Split System (DSS-1, 2, 3)

Occupied:
During occupied periods, the supply fan shall be on. The DX cooling shall cycle to maintain the occupied cooling setpoint. The BAS shall monitor unit operation.

Electric Heaters

Units	Occupied Mode	Occupied Setpoint
WH-1, ECH-1	7 AM – 4 PM, M-F August – 1st week of June	70°

The BAS shall enable the wall heaters and electric ceiling heaters via electric panel RIBs according to the occupancy schedule. The heaters shall be controlled utilizing their internal thermostat.

Exhaust Fans

Toilet Exhaust Fans shall energize according to the building ventilation schedule.

All other fans shall be controlled by local switches and monitored by the BAS.

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MECHANICAL CONTROLS

M6.1

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