

DODGEN RESEARCH FACILITY (0074)

NUCLEAR SCIENCE CENTER HVAC RENEWAL

PROJECT 1687-2022

Washington State University



PROJECT LOCATION MAP

SCALE: N.T.S.

GENERAL NOTES

- NOTE THAT THIS IS A SECURE FACILITY AND THAT IT IS GOVERNED AND MANAGED UNDER STRICT REGULATIONS. WASHINGTON STATE UNIVERSITY FACILITIES SERVICES AND THE NUCLEAR SCIENCE CENTER DEPARTMENT WILL PROVIDE ACCESS IN REFERENCE TO THE REQUIRED SYSTEM AND EQUIPMENT REPLACEMENT TO FACILITATE A REVISED DESIGN OF THE POOL ROOM HVAC, CONTROL AND ANNUNCIATOR SYSTEMS. ACCESS WILL BE LIMITED TO THOSE AREAS AND WILL BE SUPERVISED BASED UPON GUIDANCE BY THE NUCLEAR SCIENCE CENTER DEPARTMENT.
- THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO EXECUTING ANY WORK AND SHALL NOTIFY THE DEPARTMENT OF FACILITIES OPERATIONS IN WRITING OF ANYTHING DIFFERING FROM THAT SHOWN ON THE DRAWINGS. FAILURE TO DO SO WILL CONSTITUTE THE CONTRACTOR'S ACCEPTANCE OF THE WORK AS SHOWN.
- COMPLY WITH ALL CODES, ORDINANCES AND REQUIREMENTS.
- DO NOT SCALE DRAWINGS; WRITTEN DIMENSIONS PREVAIL.
- THE CONTRACTOR SHALL OBTAIN ALL PERMITS REQUIRED PRIOR TO ANY PHASE OF CONSTRUCTION. FEES AND ANY RELATED COSTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- EXISTING BUILDINGS, UTILITIES, ETC. OR PORTIONS THEREOF, WHICH ARE DAMAGED BY CONSTRUCTION OPERATIONS SHALL BE REPAIRED OR REPLACED TO THEIR ORIGINAL CONDITION, UNLESS OTHERWISE NOTED TO BE REMODELED PER THE CONTRACT DOCUMENTS.
- EXACT LOCATIONS OF EXISTING UTILITIES ARE TO BE VERIFIED BY THE CONTRACTOR.
- THE DUTIES OF THE OWNER/WASHINGTON STATE UNIVERSITY, ITS ENGINEER, AND ITS DESIGNATED CONSULTING ENGINEER DOES NOT INCLUDE DESIGN AND CONSTRUCTION REVIEW SERVICES RELATING TO THE CONTRACTORS SAFETY PRECAUTIONS OR TO THE MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED FOR THE CONTRACTOR TO PERFORM HIS WORK.
- SEE THE PROJECT CONTACTS LIST. ADDITIONALLY THE WSU FACILITIES, LIFE AND SAFETY SHOP MAY BE CONTACTED AT (509) 335-9000 AS NEEDED DURING THE CONSTRUCTION PHASE.
- THE PLANS ARE DIAGRAMMATIC AND DO NOT ATTEMPT TO SHOW ALL DETAILS OF CONSTRUCTION.
- THE CONTRACTOR SHALL THOROUGHLY EXAMINE THE PROJECT SITE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS, CONNECTION POINTS, ACCESS LIMITATIONS, AND OVERALL CONDITION OF THE EXISTING SYSTEMS PRIOR TO COMMENCEMENT OF WORK.
- CONTRACTOR SHALL COORDINATE AND COMMUNICATE THEIR WORK WITH THE OCCUPANTS AND WSU PROJECT MANAGER WITH REGARD TO SCHEDULE
- COORDINATE SHUT DOWN OF UTILITIES WITH THE OWNER A MINIMUM OF 14 DAYS IN ADVANCE.
- ALL WORK SHALL CONFORM TO ALL APPLICABLE CODES AND STANDARDS.
- ALL MATERIALS REMOVED DURING DEMOLITION SHALL BE SALVAGED TO SURPLUS OR PROPERLY DISPOSED UNLESS OTHERWISE NOTED.
- COORDINATE WITH SPECIFICATIONS. IN CASE OF CONFLICT BETWEEN SPECIFICATIONS AND DRAWINGS THE MORE STRINGENT SHALL APPLY.

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E-603	SEQUENCE OF OPERATION AND 'CP-1' SCHEMATIC

PROJECT CONTACTS

WSU FACILITIES SERVICES PHIL JOHNSON 509-335-9029 PHILRJOHNSON@WSU.EDU	WSU EH&S SHAWN RINGO 509-335-6251 SRINGO@WSU.EDU
ROY SENTER 509-335-9352 SENTER@WSU.EDU	MSI ENGINEERS AARON DONNELLY, PE MECHANICAL 509-624-1050 AARON@MSI-ENGINEERS.COM
DODGEN FACILITY COREY HINES 509-335-8317 CCHINES@WSU.EDU	BEN JENNINGS, PE ELECTRICAL 509-624-1050 BEN@MSI-ENGINEERS.COM

BUILDING INFORMATION

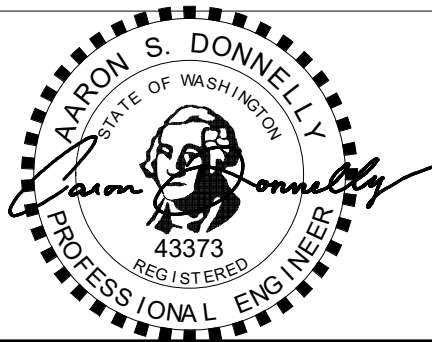
ADDRESS 2480 NE ROUNDTOP, PULLMAN, WA	APPLICABLE BUILDING CODES: 2018 INTERNATIONAL BUILDING CODE 2018 NATIONAL ELECTRICAL CODE 2018 WASHINGTON STATE ENERGY CODE 2018 INTERNATIONAL EXISTING BUILDING CODE 2018 INTERNATIONAL MECHANICAL CODE 2018 UNIFORM PLUMBING CODE
CODE SUMMARY CONSTRUCTION TYPE: II-B OCCUPANCY GROUP: B - RESEARCH FULLY SPRINKLED: NO	

DESIGN FIRM:



CONSULTANTS:

PROVISIONAL STAMP:



Facilities Services PH 509-335-5571
2425 E. Grimes Way FAX 509-335-9304
Pullman, Wa. 99164-1150

DODGEN RESEARCH
FACILITY (0074)

NUCLEAR SCIENCE CENTER HVAC
RENEWAL

1687-2022

MARK	DATE	DESCRIPTION
	10/25/22	REVISED BID SET

CAD DWG FILE:

DESIGNED BY: ASD

DRAWN BY: RID

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SHEET TITLE

PROJECT TITLE SHEET

T-001

SHEET 1 OF 27 SHEETS

SUPPLY FAN SCHEDULE

#	MFR	MODEL	TYPE	SERVICE	CFM	OSA	SUPPLY FAN				HEATING								COOLING								WEIGHT (LBS)	ELECTRICAL			NOTES	
							DRIVE	ESP IN.W.C.	RPM	BHP	MOTOR HP	TYPE	MBH	ROWS/ FPI	EAT	LAT	STEAM LBS/HR	STEAM PSIG	APD (IN.W.C)	TYPE	TOTAL MBH	SENS MBH	EAT (DB)	EAT (WB)	LAT (DB)	APD (IN.W.C)		ROWS/ FPI	V/PH	MCA		MOPP
F-4	JCI	XTI	AIR HANDLING UNIT	POOL RM SUPPLY	4350	100%	DIRECT	1.5	1976	3.7	7.5	VERTICAL TUBE INTEGRAL F&B STEAM COIL	400	4/9	0	90	422	15	-	SPLIT DX	113	112	100	68	74	0.16	2/9	2,900	208/3	24	50	

NOTES:

- ① PROVIDE WITH THE FOLLOWING FEATURES, OPTIONS AND ACCESSORIES:
- FACTORY MOUNTED VFD WITH INTEGRAL ELECTRONIC BYPASS. VFD TO BE MOUNTED WITHIN LOCKABLE VENTILATED ENCLOSURE. VFD IS FOR SOFT START AND SPEED ADJUSTMENTS FOR TAB ONLY.
 - SINGLE POINT POWER CONNECTION WITH FACTORY DISCONNECT.
 - MERV 8 PREFILTER WITH MERV 13 FINAL FILTER SECTIONS
 - COPPER HEADER ON F&B COIL.
 - ELECTRIC 2-10V ACTUATOR ON F&B COIL.
 - 2" INSULATED DOUBLE WALLED CASING
 - COIL CONNECTION LEFT/RIGHT HAND AS SHOWN ON THE PLANS. COORDINATE WITH CONTRACTOR.
 - DETAILS AND CONFIGURATIONS AS SHOWN ON DETAIL 1/M-401.
 - PROVIDE WITH SPARE VFD IN ORIGINAL MANUFACTURERS PACKAGING.
 - SHIPPING SPLIT IN CASING AT APPROX MIDPOINT TO ACCOMMODATE INSTALLTION THROUGH ROOF OPENING. COORDINATE WITH CONTRACTOR.

CONDENSING UNIT SCHEDULE

#	MFR	MODEL	UNIT SERVED	COOLING				REFRIG	WEIGHT (LBS)	ELECTRICAL			NOTES
				TOTAL MBH	NET MBH	AMBIANT TEMP. °F	SEER/EER			V/PH	MCA	MOPP	
CU-4	JCI	12.5 TON J12YD	SUPPLY FAN F-4 SPLIT DX COIL	120	120	105	11.0/12.4	R410A	500	208/3	62	80	①

NOTES:

- ① PROVIDE WITH THE FOLLOWING FEATURES, OPTIONS AND ACCESSORIES:
- WIND BAFFLES
 - FACTORY PRE-CHARGED, INSULATED REFRIGERANT LINE SET.
 - SINGLE POINT POWER CONNECTION WITH FACTORY DISCONNECT.
 - SKA SCOR.
 - TO BE MOUNTED ON ROOFTOP EQUIPMENT PLATFORM. SEE DETAIL 2/M-401.
 - BACNET MSTP INTERFACE

EXHAUST FAN SCHEDULE

#	MFR	MODEL/SIZE	TYPE	SERVICE	CFM	DRIVE	ESP (")	FAN RPM	WEIGHT (LBS)	ELECTRICAL V/PH		NOTES
F-1	TWIN CITY	DSI 165A	SQUARE INLINE DIRECT DRIVE	POOL RM EXHAUST	4500	DIRECT	1.5	1750	160	208/3	3.0	①
F-2	TWIN CITY	DSI 165ANE	SQUARE INLINE DIRECT DRIVE	BEAM RM EXHAUST	2000	DIRECT	2.0	1681	150	208/3	2.0	①
F-3	TWIN CITY	DSI 165ANE	SQUARE INLINE DIRECT DRIVE	DILUTE MODE EXHAUST	2000	DIRECT	2.0	1681	150	208/3	2.0	①

NOTES:

- | | |
|---|--|
| ① | <p>PROVIDE WITH THE FOLLOWING FEATURES, OPTIONS AND ACCESSORIES:</p> <ul style="list-style-type: none"> - EC MOTOR WITH MOTOR MOUNTED SPEED ADJUSTMENT DIAL. - INLET/OUTLET CONFIGURATION AS INDICATED ON THE PLANS - FACTORY DISCONNECT. - INTEGRAL GRAVITY BACK DRAFT DAMPER - QTY: 1 SPARE EC MOTOR FOR EACH FAN. <p>PROVIDE WITH SUPPORT BRACKETS SUITABLE FOR HANGING FROM OVERHEAD STRUCTURE.</p> <p>SEE PLANS AND SECTIONS FOR FAN INLET AND OUTLET ARRANGEMENTS. CONFIRM WITH CONTRACTOR PRIOR TO ORDERING.</p> |
|---|--|

HEPA FILTER HOUSING

#	MFR	MODEL/SIZE	TYPE	SERVICE	CFM	FILTERS	DIMENSIONS	NOTES
HEPA-1	CAMFIL	CAMCONTAIN GB HOUSING _CF-2X1-012	BAG-IN / BAG-OUT	BEAM RM EXHAUST _FAN F-2	2000	HEPA QTY(2) 24X24X12	60H X 27L X 26D	①

NOTES:

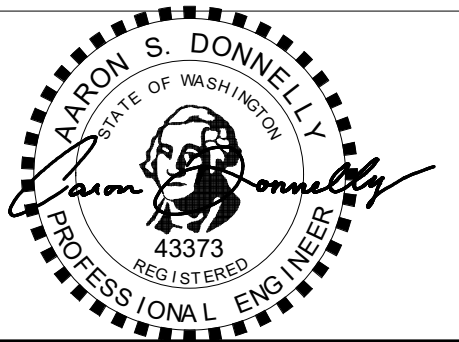
- ① PROVIDE WITH THE FOLLOWING FEATURES, OPTIONS AND ACCESSORIES:
- STAINLESS STEEL HOUSING
 - 12" DEEP PARTICULATE FILTER
 - GASKET SEAL BAG-IN BAG-OUT
 - SINGLE ACCESS DOOR, RIGHT/LEFT SIDE AS SHOWN ON PLANS. COORDINATE WITH CONTRACTOR.
 - PROVIDE ONE SPARE SET OF FILTERS.

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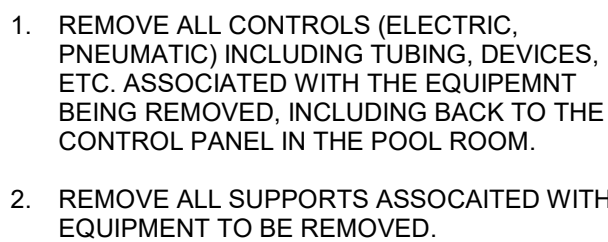
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SHEET TITLE

MECHANICAL EQUIPMENT SCHEDULES

M-002

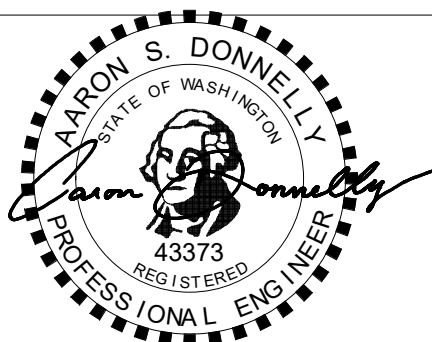
SHEET 3 OF 27 SHEETS



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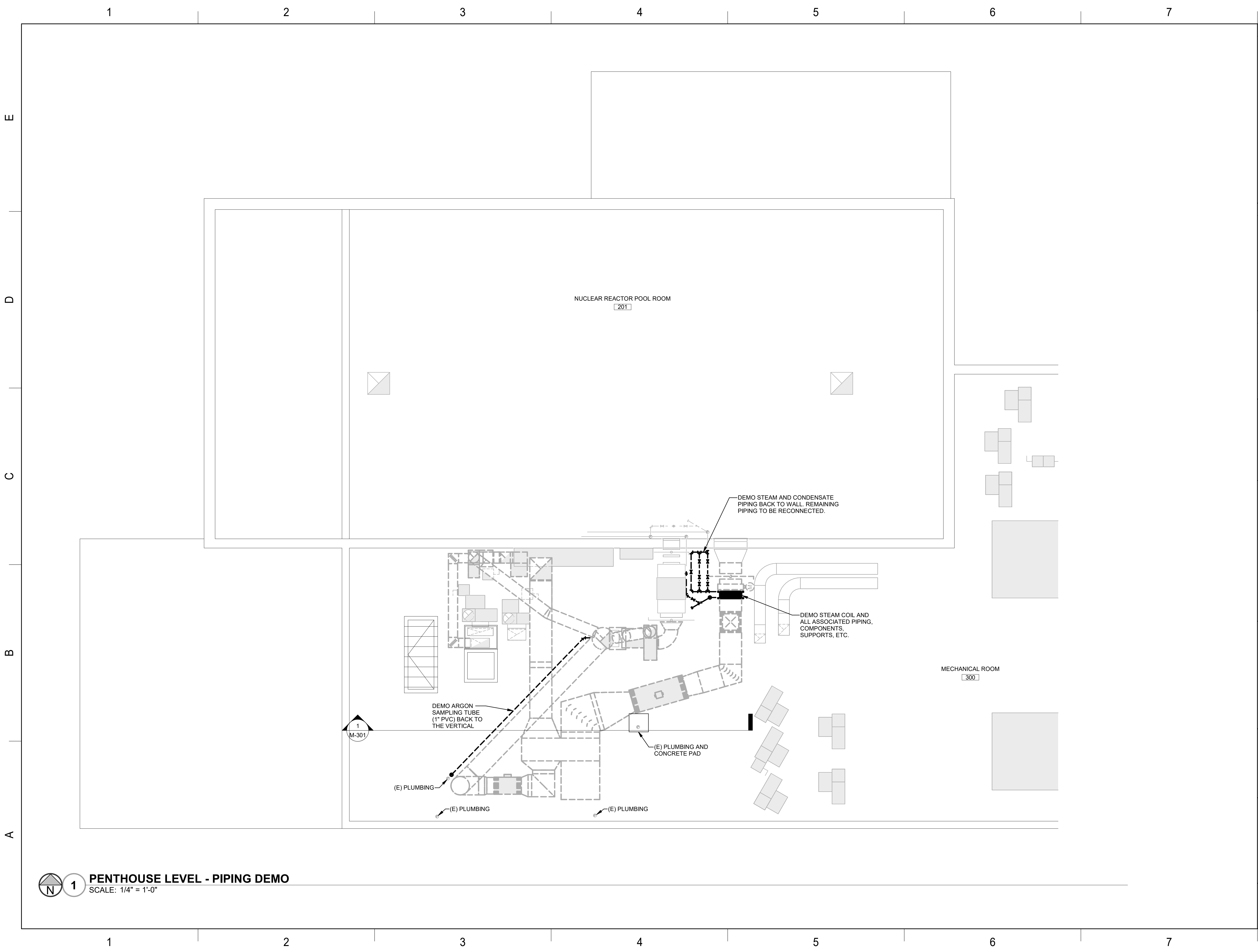
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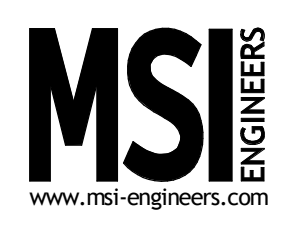
PENTHOUSE LEVEL - HVAC - DEMO

M-102

SHEET 5 OF 27 SHEETS

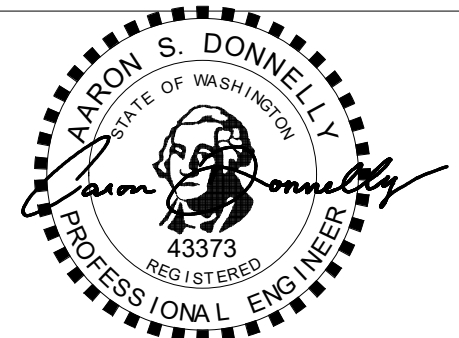


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SHEET TITLE

PENTHOUSE LEVEL - PIPING - DEMO

M-103

SHEET 6 OF 27 SHEETS

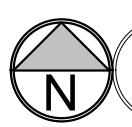


SHEET 7 OF 27 SHEETS



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

SHEET 8 OF 27 SHEETS

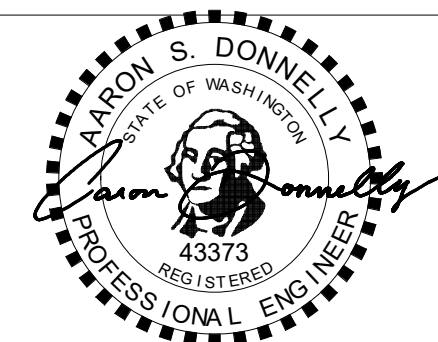


SCALE: 1/4" = 1'-0"

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RENEWAL

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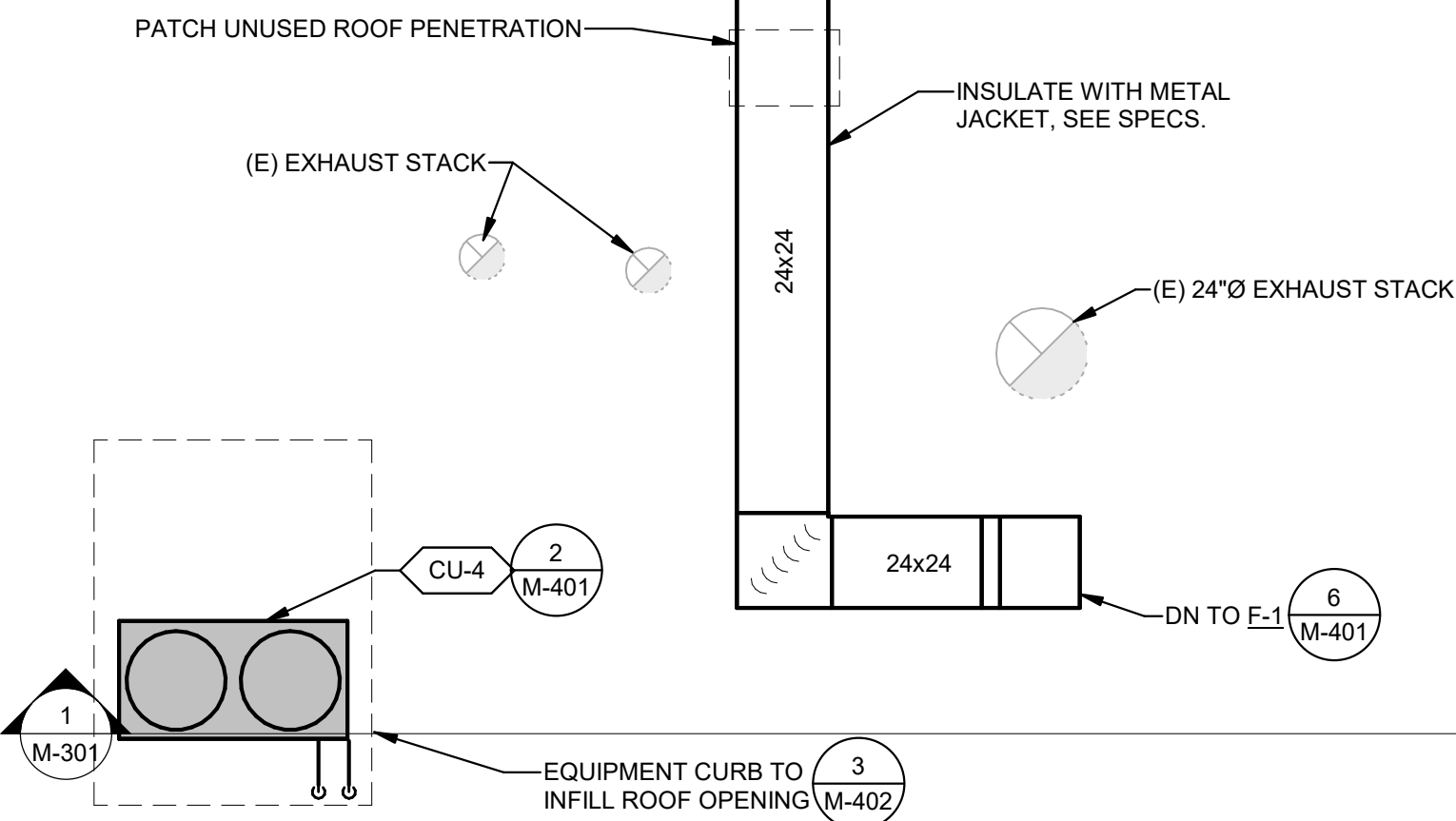
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SHEET TITLE

PENTHOUSE LEVEL - HVAC - NEW

M-202

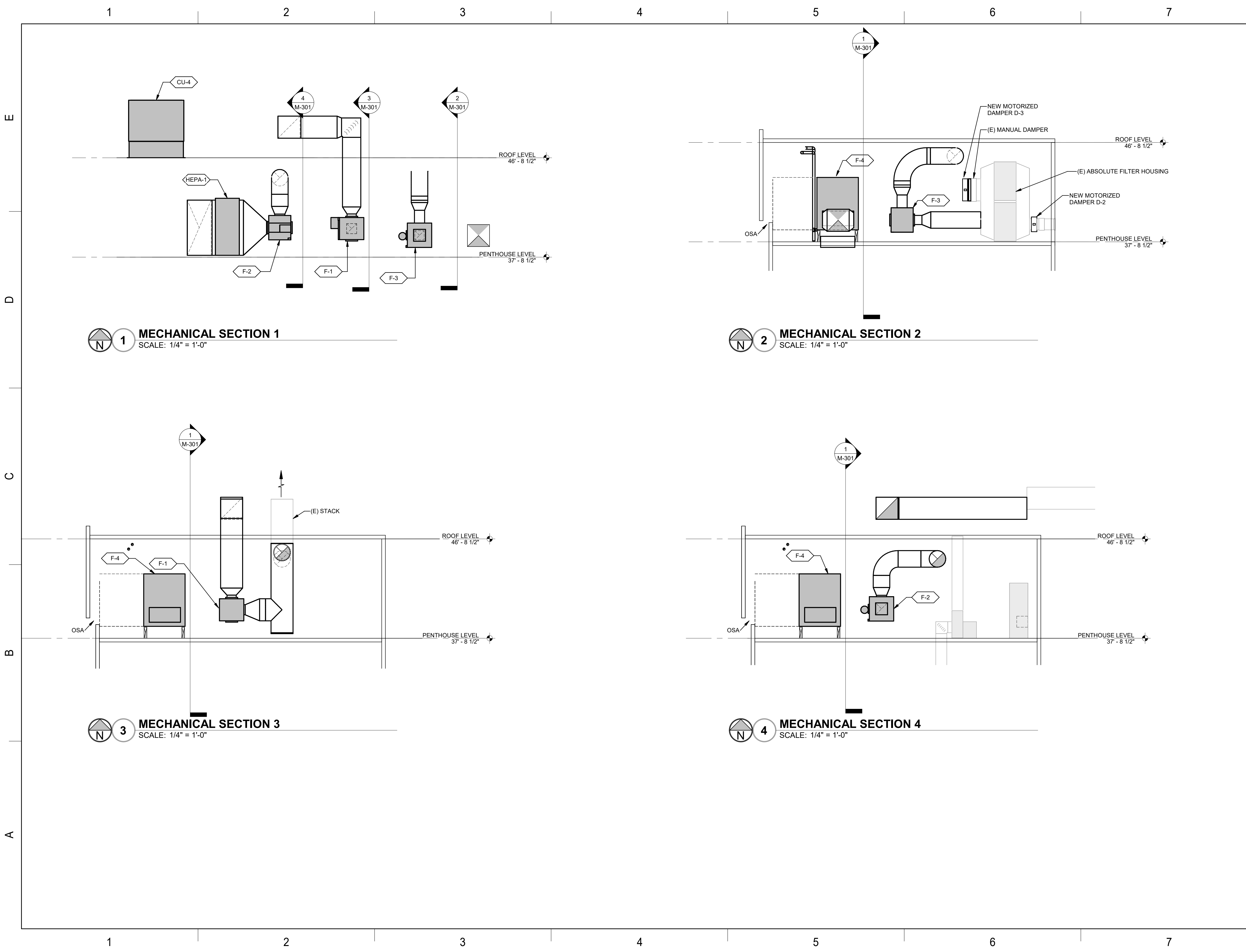
SHEET 9 OF 27 SHEETS



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

SHEET 11 OF 27 SHEETS

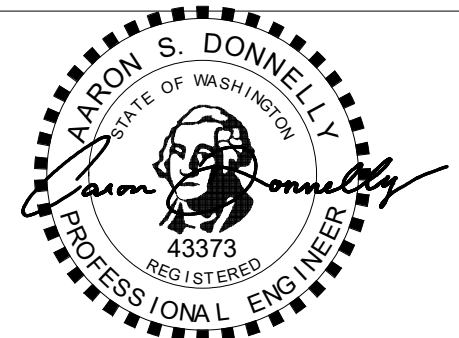


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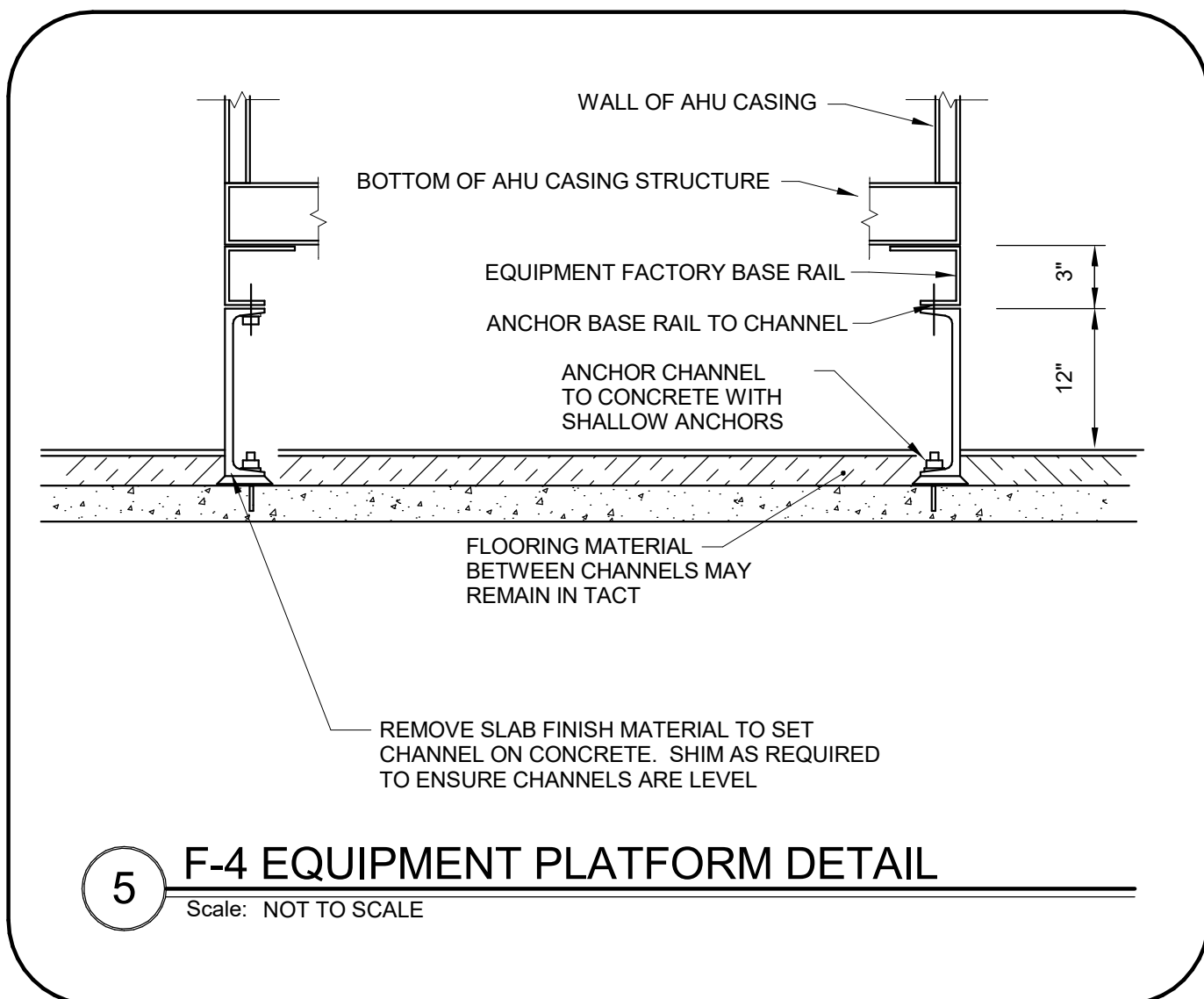
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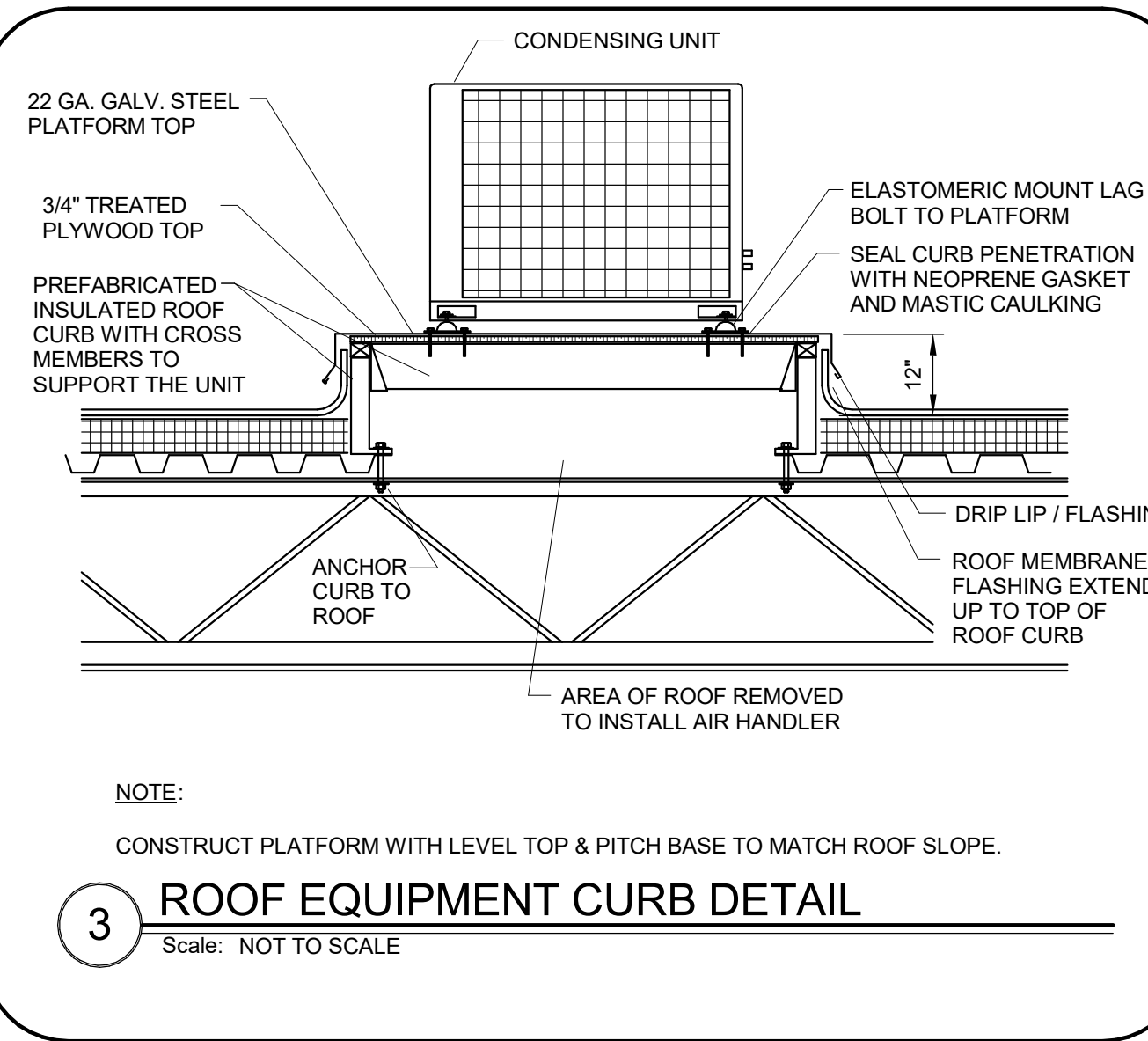
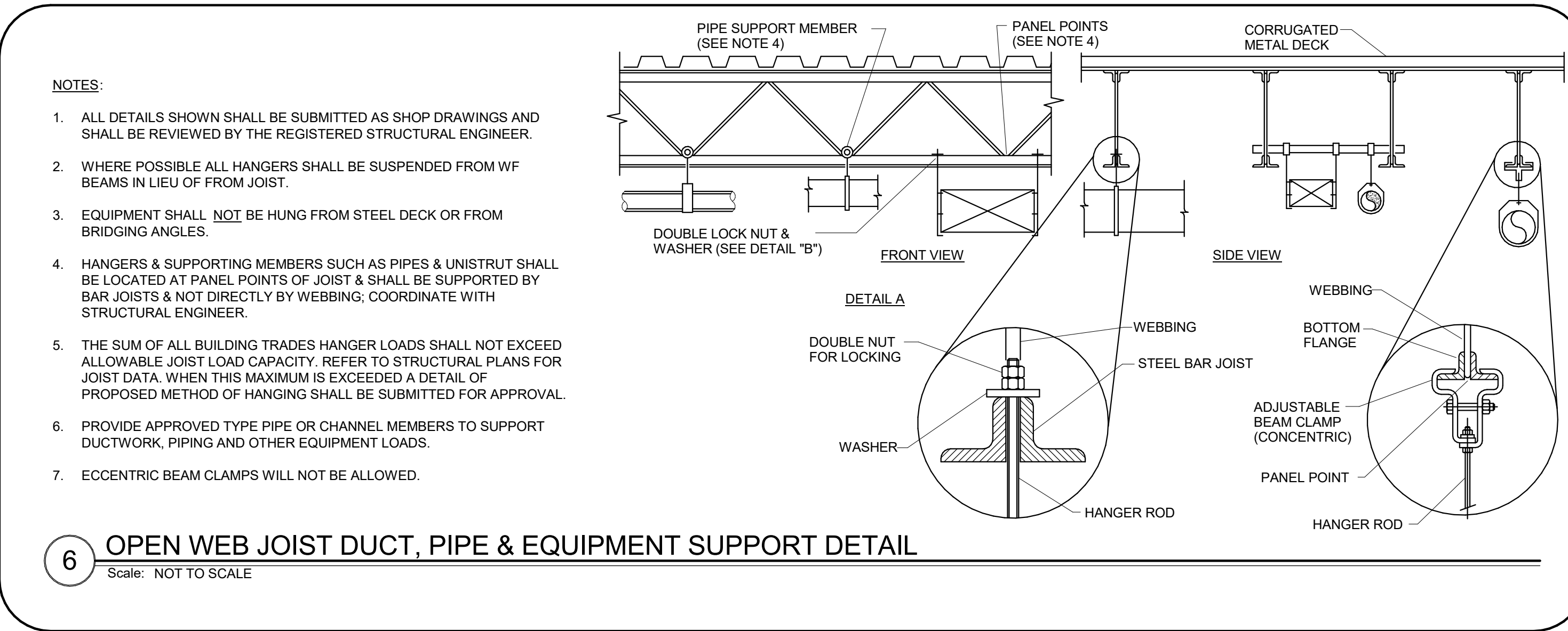
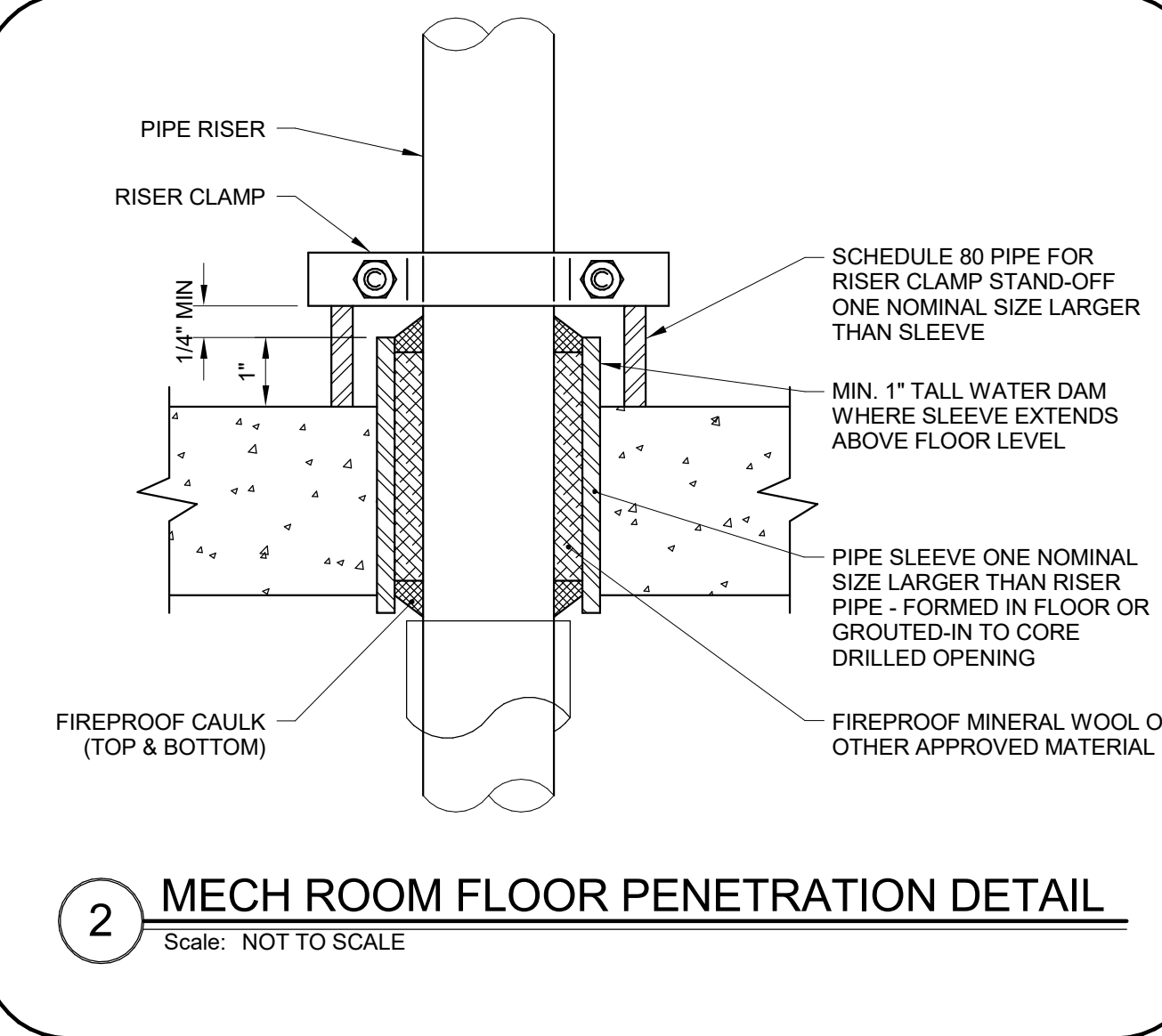
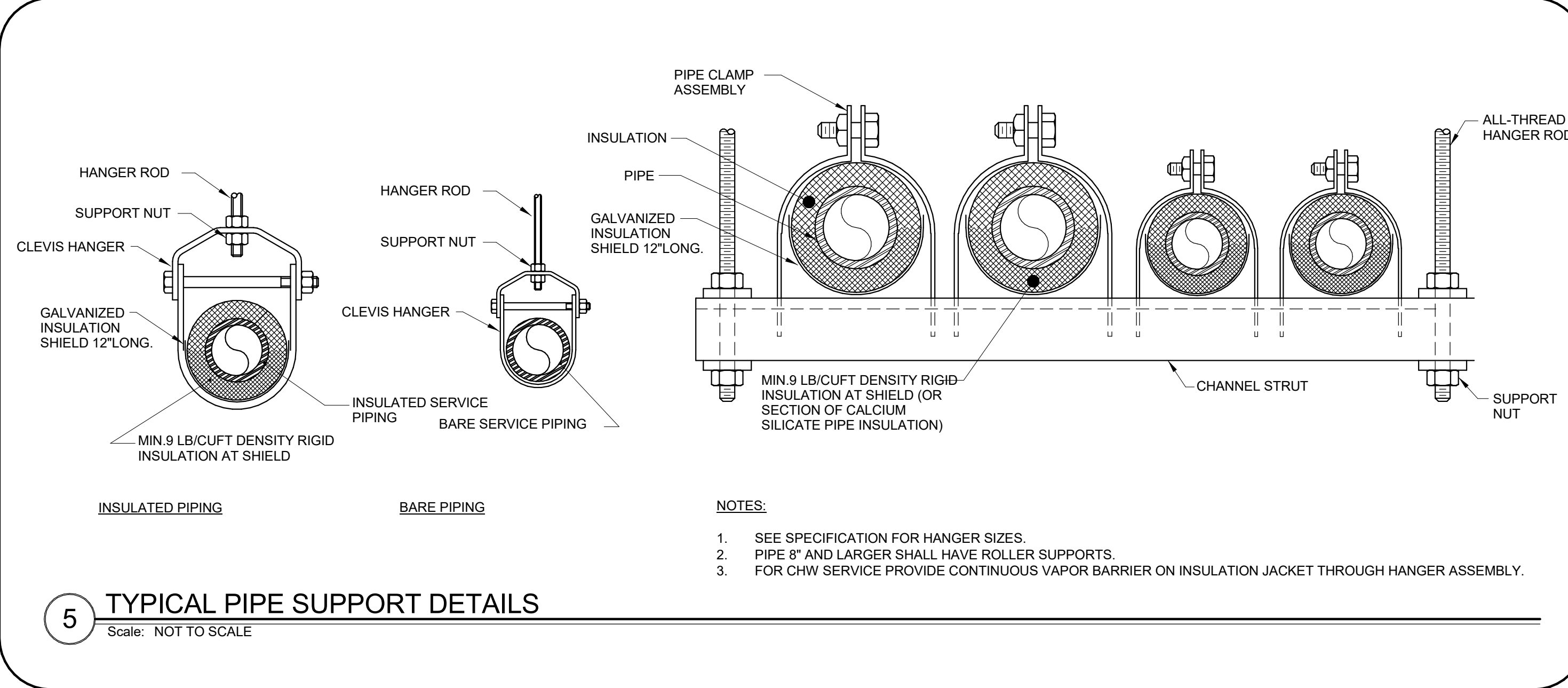
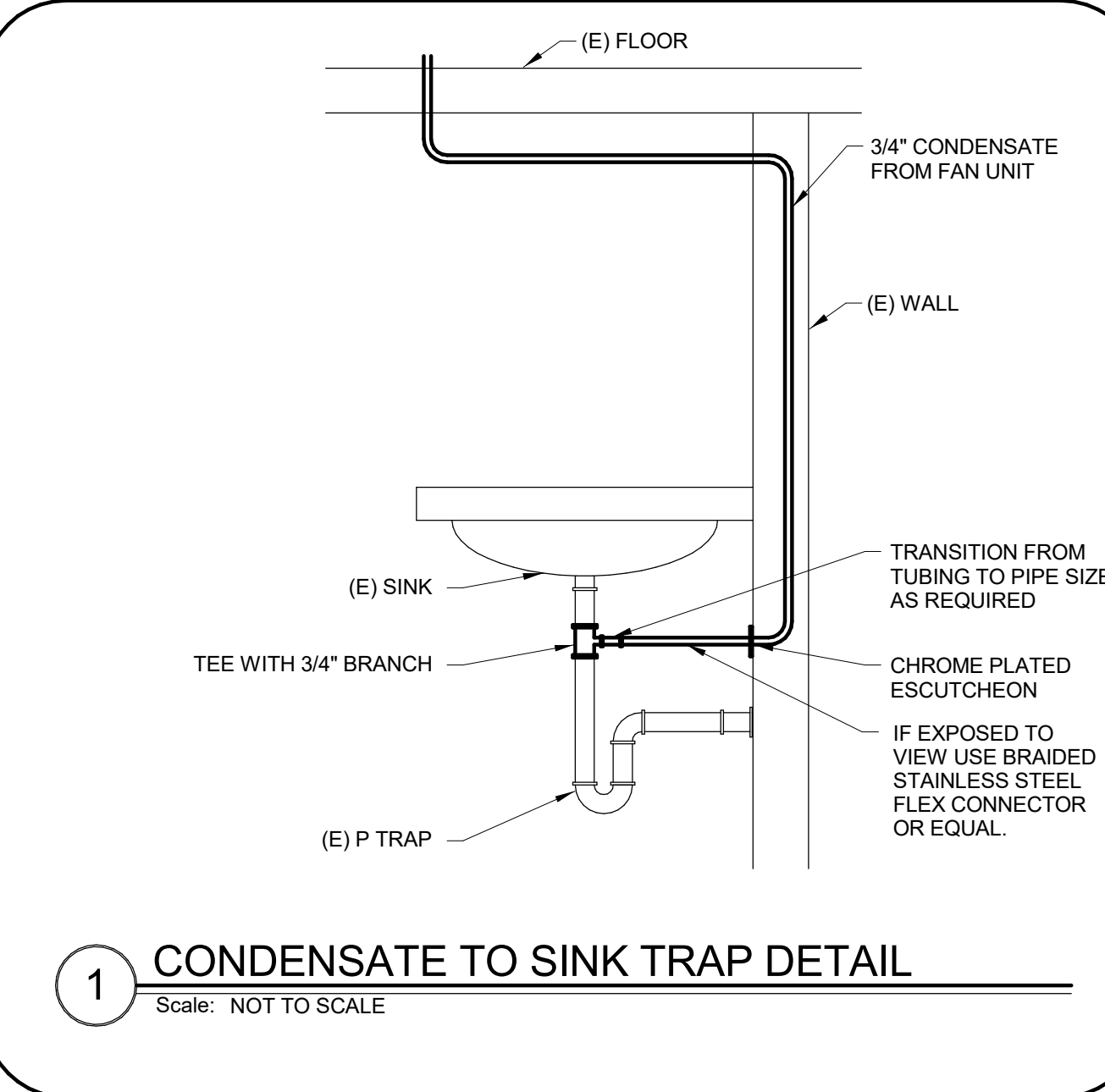
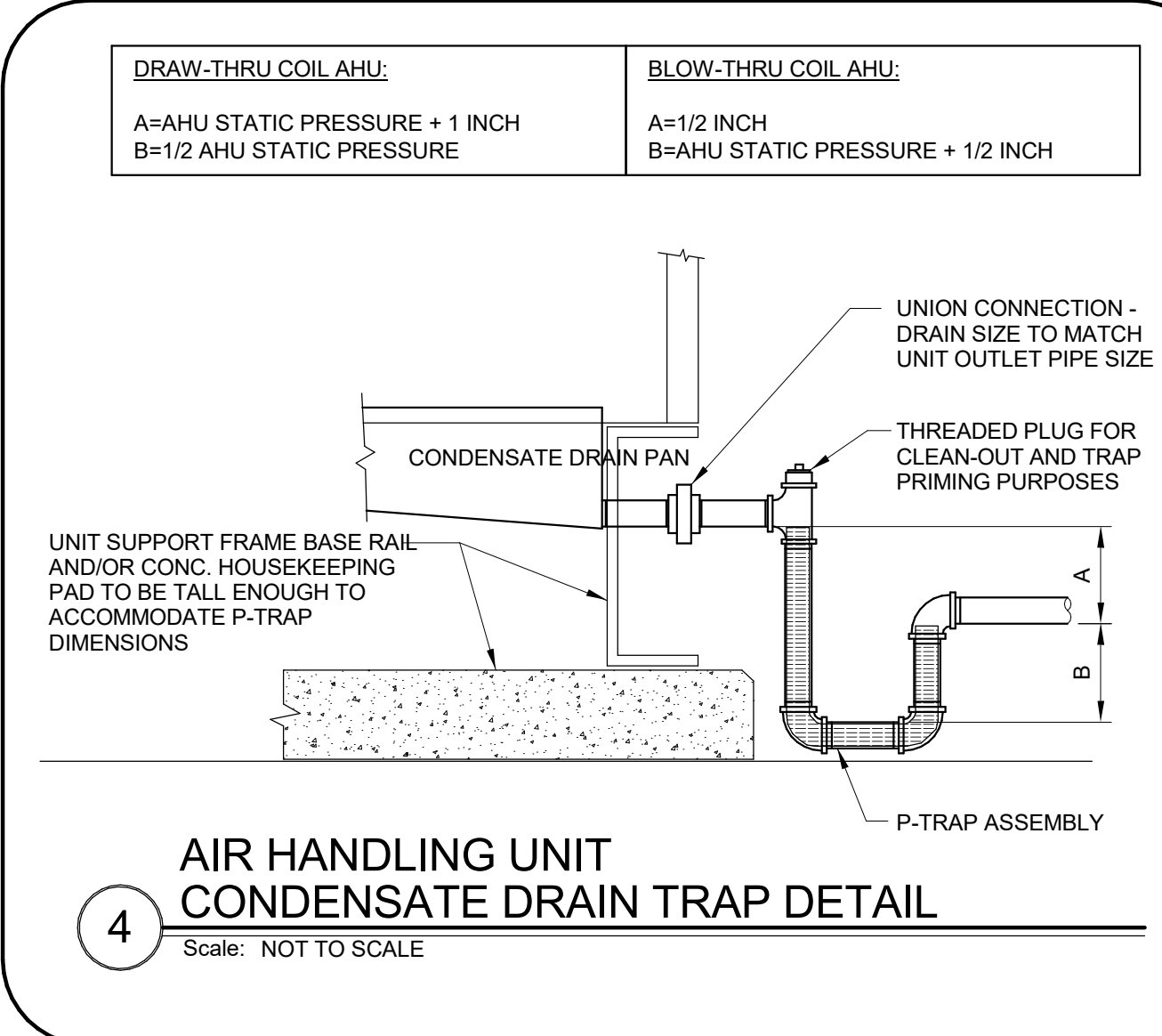
MECHANICAL SECTIONS

M-301



E
D
C
B
A

1234567



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SHEET TITLE
MECHANICAL DETAILS

M-402
SHEET 14 OF 27 SHEETS

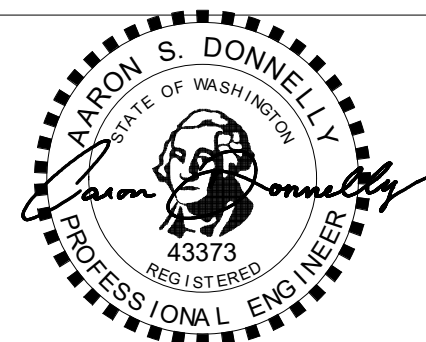
1234567

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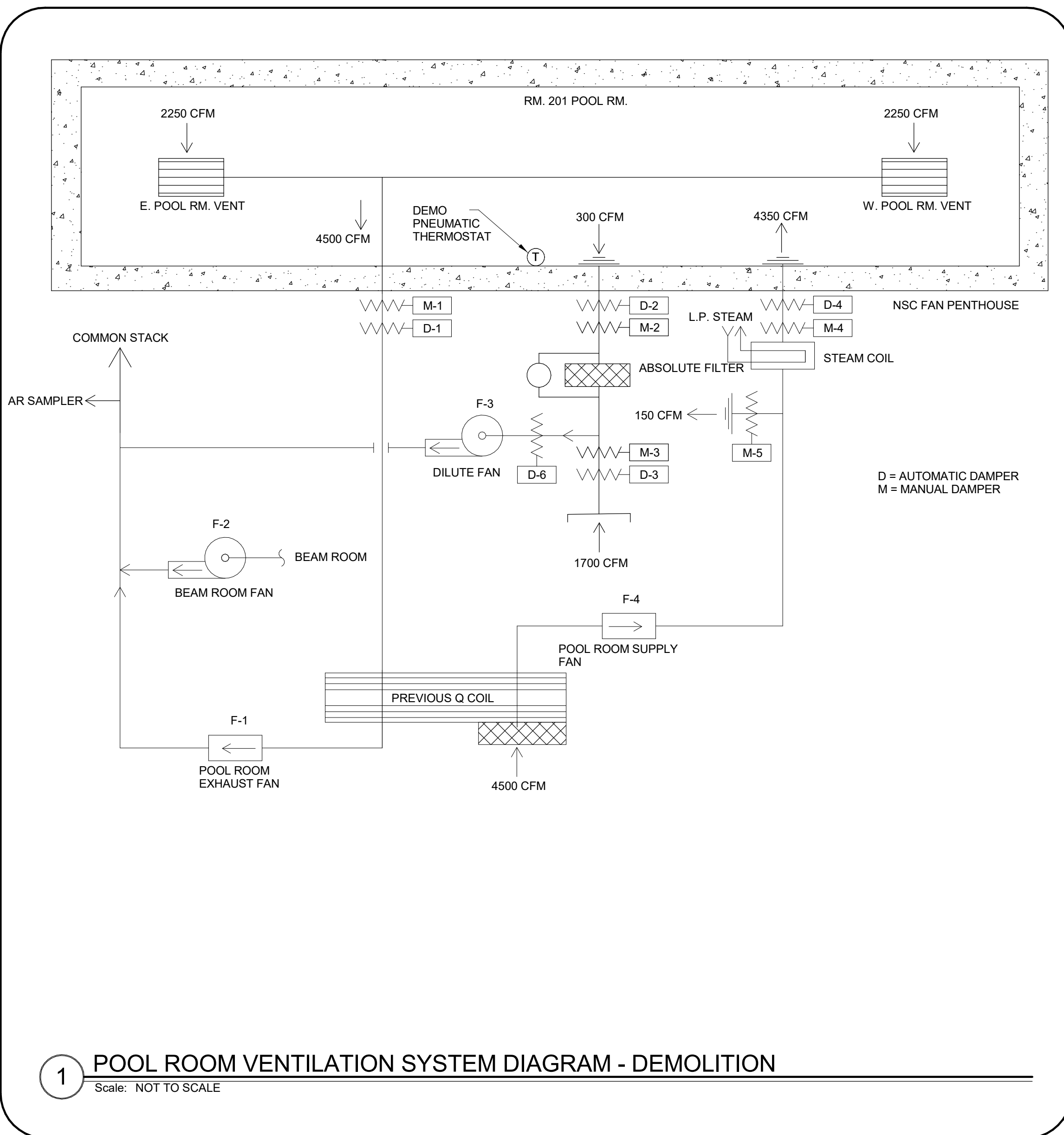
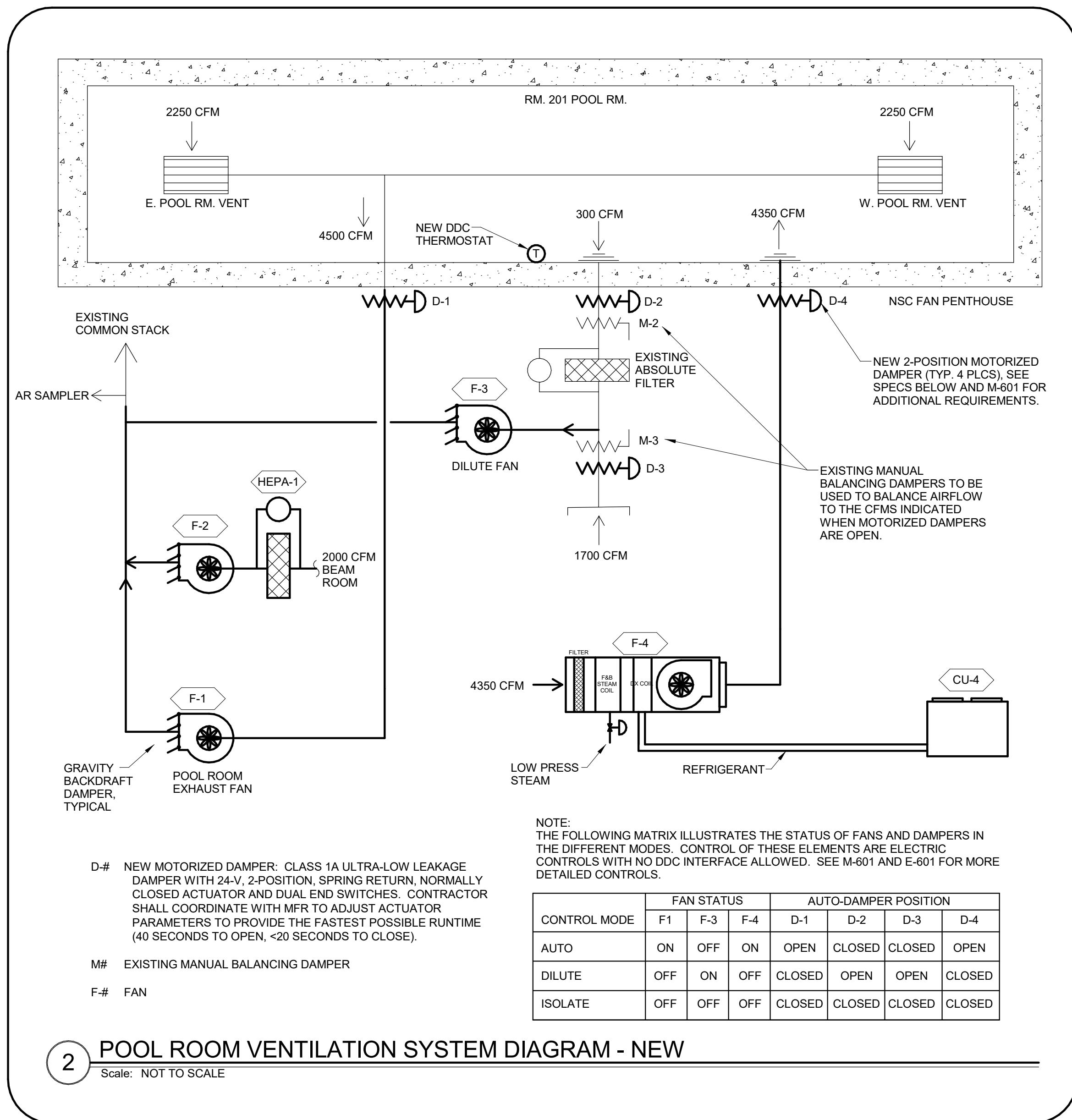
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SHEET TITLE

SYSTEM DIAGRAMS

M-501

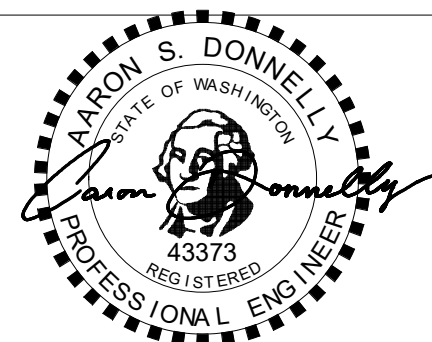
SHEET 15 OF 27 SHEETS



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SHEET TITLE

CONTROL DIAGRAMS

M-601

SHEET 16 OF 27 SHEETS

GENERAL NOTES:

DDC AND ELECTRICAL CONTROL CONTRACTORS SHALL REVIEW BOTH MECHANICAL AND ELECTRICAL DRAWINGS AND COORDINATE CLOSELY TO ENSURE A THOROUGH UNDERSTANDING OF WHAT ELEMENTS ARE CONTROLLED BY DDC (HEATING AND COOLING FUNCTIONS ONLY) AND WHICH ARE ELECTRICALLY CONTROLLED (FANS AND DAMPERS).

KEY NOTES:

- ① ELECTRICAL CONTROL/FEEDBACK SIGNALS. NO DDC INTERFACE ALLOWED. SEE E-601 THRU E-603 FOR ELECTRICAL CONTROLS.
- ② RECONNECT EXISTING PNEUMATIC DIFFERENTIAL PRESSURE FEEDBACK TO GAUGE IN CONSOLE ROOM CONTROL PANEL.
- ③ VFD/ECM IN LOCKABLE ENCLOSURE FOR LOCAL MANUAL SPEED ADJUSTMENT ONLY. NO DDC CONTROL INTERFACE ALLOWED. SEE ELECTRICAL PLANS FOR START/STOP CONTROL.
- ④ AIRFLOW MONITORING STATION FOR LOCAL MONITORING PURPOSES ONLY. READOUT / DISPLAY TO BE LOCATED BEHIND NORMALLY CLOSED / LOCKABLE ENCLOSURE. NO DDC INTERFACE ALLOWED.
- ⑤ 2-POSITION ULTRA LOW LEAKAGE DAMPER WITH NORMALLY CLOSED / SPRING RETURN 24V FAST ACTING ACTUATOR WITH DUAL END SWITCHES. SEE E-601 THRU E-603 FOR ELECTRICAL CONTROLS INCLUDING CONTROL OF DAMPER POSITION AND END SWITCH FEEDBACK. NO DDC INTERFACE ALLOWED.
- ⑥ DIFFERENTIAL AIR PRESSURE SWITCH FOR FAN PROOF. OUTPUT TO THE ELECTRICAL CONTROL SYSTEM. NO DDC INTERFACE ALLOWED.

SEQUENCE OF OPERATION

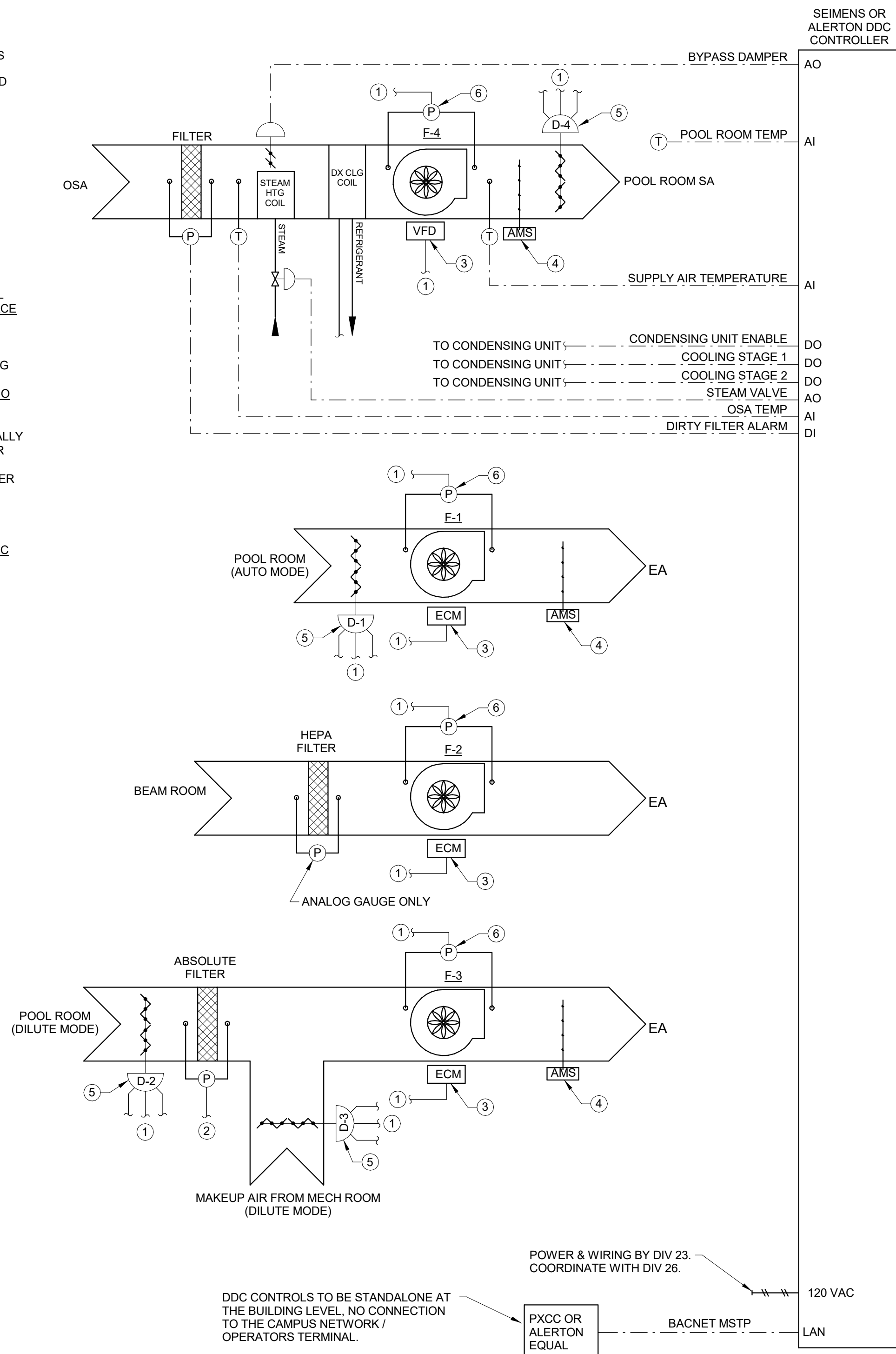
DDC CONTROLS SHALL BE LIMITED TO TEMPERATURE CONTROL OF THE POOL ROOM ONLY. ALL OTHER FAN AND DAMPER CONTROL SHALL BE THROUGH THE ELECTRIC CONTROL SYSTEM WITH NO DDC INTERFACE ALLOWED. SEE ELECTRICAL DRAWINGS E-601, E-602 AND E-603 FOR BOTH ELECTRICAL CONTROL DIAGRAMS AND DETAILS ON THE DIFFERENT MODES OF OPERATIONS AND HOW EACH MODE IS ENGAGED.

TEMPERATURE CONTROL:

UPON A CALL FOR HEAT FROM THE SPACE, THE STEAM COIL VALVE SHALL MODULATE TO MAINTAIN SPACE TEMP AT SETPOINT (65 DEGREES, OR AS SET) AND THE BYPASS DAMPER SHALL BE OPEN TO THE COILS. IF THE OUTDOOR AIR TEMP FALLS BELOW 42 DEGREES, THE STEAM VALVE SHALL BE 100% OPEN AND THE FACE DAMPER SHALL MODULATE TO MAINTAIN SPACE TEMP.

IF THE SUPPLY AIR TEMP FALLS BELOW 50 DEGREES (ADJ), A LOW TEMP ALARM SHALL BE GENERATED, THE BYPASS DAMPER SHALL OPEN TO BYPASS THE COIL, AND THE STEAM VALVE SHALL OPEN 100%.

UPON A CALL FOR COOLING, THE CONDENSING UNIT SHALL BE ENABLED. COOLING SHALL BE STAGED TO MAINTAIN ROOM TEMP AT SETPOINT (80-DEGREES, OR AS SET).



1 POOL ROOM HVAC SYSTEM CONTROL DIAGRAM

Scale: NOT TO SCALE

SHEET TITLE

ELECTRICAL LEGEND (LEGEND IS GENERAL IN NATURE. NOT ALL OF THE SYMBOLS SHOWN ARE USED IN THIS PROJECT.)

GENERAL NOTES

(RE: ALL ELECTRICAL SHEETS)

2. ALL ELECTRICAL EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, INTERNATIONAL FIRE CODE, AND ALL OTHER STATE AND LOCAL CODES. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER IN WRITING IF PORTIONS OF THE DESIGN SET OR FIELD CONDITIONS DO NOT MEET REQUIRED CODES.
3. PROVIDE FIRESTOPPING FOR ALL FLOOR AND FIREWALL PENETRATIONS FROM ELECTRICAL DEVICE, RACEWAY, AND CABLE PENETRATIONS. SEE ARCHITECTURAL DRAWINGS FOR FIREWALL LOCATIONS.
4. ALL WIRING DEVICES SHALL BE OF THE SAME MANUFACTURER AND SHALL MATCH THROUGHOUT. COVER PLATES SHALL BE STAINLESS AND DEVICES SHALL BE WHITE.
5. DESIGN OF ELECTRICAL REQUIREMENTS IS BASED ON MECHANICAL EQUIPMENT SPECIFIED. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH MECHANICAL CONTRACTOR IF EQUIPMENT PURCHASED IS DIFFERENT FROM THAT SPECIFIED STILL MEETS DESIGN INTENT, INCLUDING BUT NOT LIMITED TO OVER-CURRENT PROTECTION, LOCAL DISCONNECTING MEANS, AND WIRE SIZING.
6. ALL COMMUNICATION CONDUIT SHALL BE 3/4" UNO.
7. COLOR CODE WIRES AS FOLLOWS:

<u>CONDUCTORS</u>	<u>120/208V</u>
PHASE A	BLACK
PHASE B	RED
PHASE C	BLUE
NEUTRAL	WHITE
GROUND	GREEN
8. ALL WIRE SHALL BE STRANDED TYPE THHN/THWN, MINIMUM SIZE #12 UNLESS OTHERWISE INDICATED.
9. CONTRACTOR SHALL PROVIDE #10 AWG CONDUCTORS FOR ALL CIRCUITS OF 100' OR MORE UNLESS SHOWN LARGER.
10. ALL HOMERUN JUNCTION BOXES SHALL BE A MINIMUM OF 4" SQUARE, 2-1/8" DEEP.
11. FURNISH AND INSTALL A COMPLETE ELECTRICAL SYSTEM AS DERIVED FROM THE PLANS AND SPECIFICATIONS. COMPLETE AS NOTED OR IMPLIED, NOT LIMITED TO WHAT IS SHOWN.
12. ALL DRAWINGS ARE SCHEMATIC IN NATURE AND ALL APPURTENANCES NOT INDICATED TO MAKE A WORKING SYSTEM MUST BE INCLUDED IN THE CONTRACTOR'S BID.
13. IF THERE APPEARS TO BE ANY ITEMS IN CONFLICT WITH THE DRAWINGS, INCONSISTENCIES WITH DESIGN OR INTENT, OR NEED FOR CLARIFICATION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CLARIFY THESE ITEMS PRIOR TO BID IN WRITING WITH THE ENGINEER. IF THE CONTRACTOR FAILS TO CLARIFY ANY QUESTIONS OR INCONSISTENCY, HE ACCEPTS RESPONSIBILITY TO CORRECT AT HIS COST ANY SUCH ITEM TO MEET INTENT AS DEFINED BY THE ENGINEER.
14. ALL MOUNTING HEIGHTS OF EQUIPMENT SHALL MEET ADA REQUIREMENTS UNLESS OTHERWISE NOTED.
15. ALL CONDUIT IN WALLS TO BE RUN VERTICAL, MINIMUM SIZE 3/4".
16. COORDINATE ALL DEVICE/FIXTURE LOCATIONS AND SPECIFIC REQUIREMENTS WITH OWNER/ARCHITECT PRIOR TO ROUGH-IN.
17. SEE MECHANICAL PLANS FOR EXACT LOCATION OF ALL MECHANICAL EQUIPMENT.
18. ALL CONDUIT RUNS USING PVC CONDUIT SHALL USE RGD OR IMC FOR ANY BEND OVER 45 DEGREES AND ALL 90 DEGREE ELBOWS.
19. ALL CONDUIT PENETRATING SLAB IN EXPOSED LOCATIONS SHALL BE RIGID STEEL.
20. EACH TRADE SUB-CONTRACTOR IS RESPONSIBLE FOR SUSPENDED SUPPORTS NOT SHOWN ON STRUCTURAL DRAWINGS. ALL SUB-CONTRACTORS SHALL COORDINATE WITH EACH-OTHER FOR ELEVATION, EQUIPMENT, PLACEMENT OF GRADED PIPES, LARGE DUCTWORK, EQUIPMENT, CONDUIT, FIRE PROTECTION, AND LIGHTING.
21. OVER-CURRENT PROTECTION FOR THE HVAC ELECTRICAL SHALL BE PER THE MANUFACTURER'S NAMEPLATE, FUSE, OR HACR TYPE BREAKER.

ABBREVIATIONS

(E)	EXISTING
(R)	RELOCATED
(RE)	REPLACED
A	AMPERES
AC	ABOVE COUNTER
AF	AMPERE FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AT	AMP TRIP
AWG	AMERICAN WIRE GAUGE
BMS	BUILDING MANAGEMENT SYSTEM
BW	BLANKET WARMER
C	CONDUIT
CB	CIRCUIT BREAKER
CC	CRASH CART
CKT	CIRCUIT
CL	CRITICAL LOAD
CM	CEILING MOUNTED
CO	CONDUIT ONLY, PROVIDE PULL-LINE
D	MECHANICAL DUCT-MOUNTED DEVICE
DC	DIRECT CURRENT
DET	DETAIL
E	EMERGENCY/CRITICAL CARE
EF	EXHAUST FAN
EL	EMERGENCY LIGHT
EW	ELECTRIC WATER COOLER
EW	ELECTRIC WATER HEATER
F	FUSE
FACP	FIRE ALARM CONTROL PANEL
FVNR	FULL VOLTAGE NON-REVERSING
G/GND	GROUND
GFI	GROUND FAULT INTERRUPTION
GFP	GROUND FAULT PROTECTION
H	HEAT
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND OFF AUTO
HP	HOUSE PHONE
HVAC	HEATING, VENTILATING, & AIR CONDITIONING
I	IONIZATION
IC	INTERRUPTING CAPACITY
ID	IN-DUCT
IG	ISOLATED GROUND
J/JB	JUNCTION BOX
KW	KILOWATT
KWH	KILOWATT HOUR
M	MAGNETIC CONTACTOR COIL
MB	MAIN BREAKER
MCC	MOTOR CONTROL CENTER
MH	MANHOLE
MLO	MAIN LUGS ONLY
MS	MOTOR STARTER
MW	MICROWAVE
N	NEUTRAL
NCL	NORMALLY CLOSED
NCL	NON CRITICAL LOAD
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OL	OVERLOAD
OS	OCCUPANCY SENSOR
P	PHOTO
PC	PHOTOCELL
PVC	POLYVINYL CHLORIDE
RCPT	RECEPTACLE
REF	REFRIGERATOR
SPST	SINGLE POLE SINGLE THROW
TC	TIME CLOCK
TDR	TIME DELAY RELAY
TJB	TERMINAL JUNCTION BOX
TSP	TWISTED SHIELDED PAIR
TTB	TELEPHONE TERMINAL BOARD
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
V	VOLT
VA	VOLT AMPERE
WG	PROVIDE PROTECTIVE WIRE GUARD
WP	WEATHER PROOF/NEMA 3R
XFMR	TRANSFORMER

POWER

- | | |
|---|--|
|  | SPECIAL PURPOSE OUTLET. VERIFY SIZE AND TYPE WITH EQUIPMENT SUPPLIER. |
|  | CONNECTION POINT TO EQUIPMENT SPECIFIED, FURNISHED, AND INSTALLED UNDER OTHER SECTIONS. ELECTRICAL CONTRACTOR TO SUPPLY RACEWAY AND CONDUCTORS AND MAKE FINAL CONNECTION TO EQUIPMENT UNDER THIS SECTION, UNO. |
|  | MOTOR CONNECTION. RE: MECHANICAL EQUIPMENT SCHEDULE |
|  | MOTOR STARTER/CONTACTOR. |
|  | COMBINATION STARTER AND DISCONNECT. |
|  | NON-FUSED DISCONNECT SWITCH, SIZE AS INDICATED, NEMA 1 UNO, 3 POLE UNO. |
|  | FUSED DISCONNECT SWITCH, SIZE AS INDICATED, NEMA 1 UNO, 3 POLE UNO. |

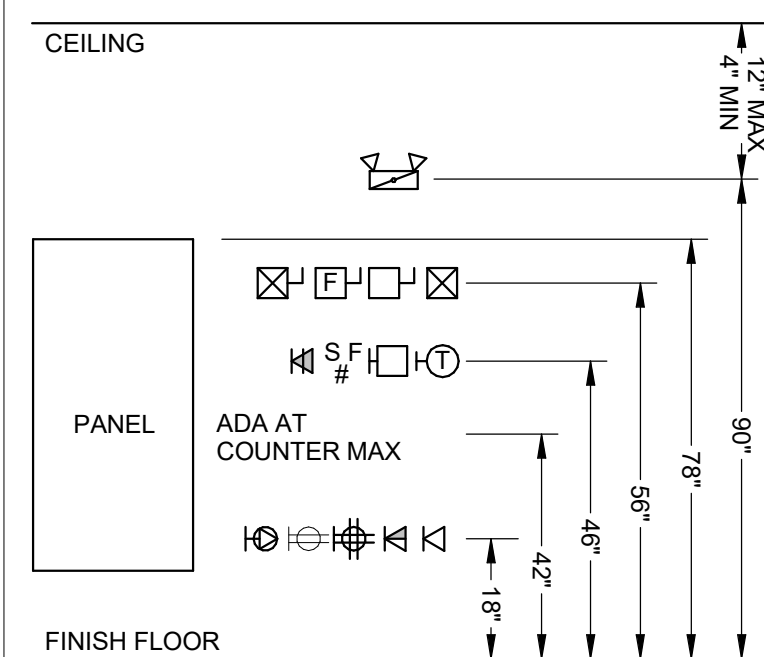
CIRCUITING SYMBOLS

-
- [Symbol: Conduit stubbed, capped, and marked with pull cord.] CONDUIT STUBBED, CAPPED, AND MARKED WITH PULL CORD.
 [Symbol: Arrow pointing right.] X # HOMERUN, PANEL AND CIRCUIT AS INDICATED.
 [Symbol: Solid line.] CIRCUIT CONCEALED IN CEILING OR WALL.
 [Symbol: Dashed line.] CIRCUIT CONCEALED IN FLOOR OR UNDERGROUND.
 [Symbol: Line with a bracket.] RACEWAY SIZE
 [Symbol: Line with a bracket.] CONDUCTOR SIZE
 [Symbol: Line with a bracket.] PANEL & CIRCUIT
 [Symbol: Line with a bracket.] 3/4" C, P-1
 [Symbol: Line with a bracket.] 2#12' 1#12G
 [Symbol: Line with a bracket.] CONDUCTOR QUANTITY
 [Symbol: Line with a bracket.] GROUNDING CONDUCTOR SIZE
- CIRCUIT SHALL CONSIST OF 3/4"-2#12, 1#12G UNLESS NOTED OTHERWISE.
 CONTRACTOR SHALL ROUTE CIRCUIT HOMERUN FROM DEVICE NEARST THE PANEL.

MISCELLANEOUS

- | | |
|---|--|
|  | JUNCTION BOX. |
|  | JUNCTION BOX, WALL MOUNTED. |
|  | SURFACE MOUNTED PANELBOARD/ENCLOSURE
SEE SCHEDULE FOR TYPE. |
|  | MECHANICAL EQUIPMENT SYMBOL (RE:
MECHANICAL DRAWINGS FOR EXACT LOCATION
OF UNITS). |

MOUNTING HEIGHT DETAIL



ONE LINE

- | | |
|--|---|
|  | <p>BRANCH PANEL.</p> |
|  <p>A</p> | <p>CIRCUIT BREAKER. SIZE AND TYPE AS SPECIFIED.</p> |
|  <p>30AF
30AT</p> | <p>CIRCUIT BREAKER. FRAME SIZE (AF) AND TRIP PLUG/RATING (AT), 3 POLE, UNO.</p> |
|  <p>15A</p> | <p>FUSE. SIZE AND TYPE AS SPECIFIED. PROVIDE FUSE FOR EACH POLE, 3 POLE, UNO.</p> |
|  <p>30A</p> | <p>INTERRUPTER SWITCH. SIZE AS INDICATED, 3 POLE, UNO.</p> |
|  <p>30AS
30AF</p> | <p>FUSED SWITCH. SWITCH SIZE (AS) & FUSE SIZE (AF) AS INDICATED, 3 POLE, UNO.</p> |

DESIGN FIRM:



CONSULTANTS:

PROVISIONAL STAMP:



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Pullman, Wa. 99164-1150

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FACILITY (0074)

NUCLEAR SCIENCE CENTER HVAC
RENEWAL

1687-2022

[illegible]

CAD DWG FILE:

DESIGNED BY: BMJ

DRAWN BY: RD

CHECKED BY: BMJ

PROJECT No. 1687-2022	FILE No: 17-M-0
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SHEET TITLE

LEGENDS, ABBREVIATIONS, GENERAL NOTES

E-001

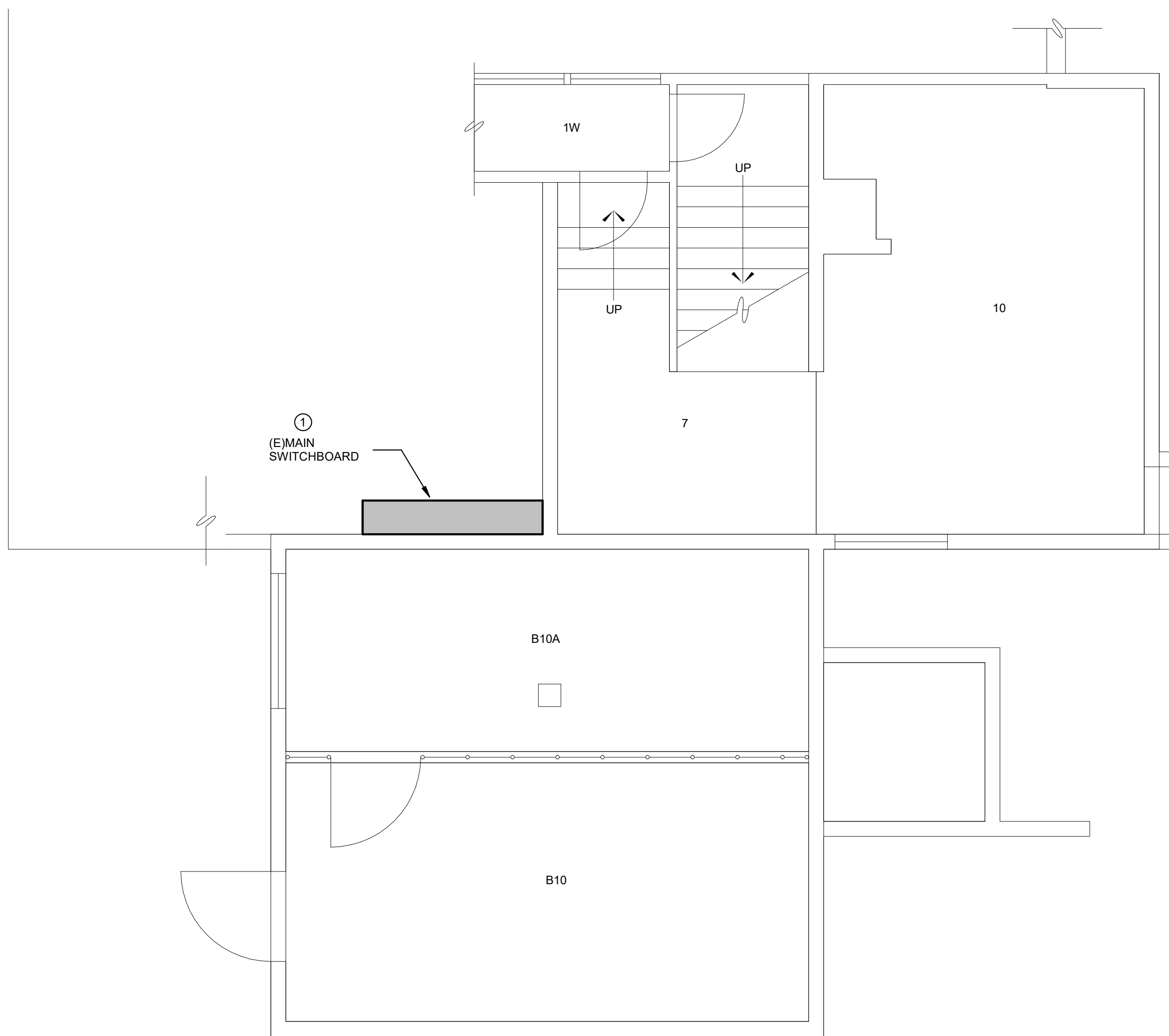
SHEET 17 OF 27 SHEETS



- ① EXISTING MECHANICAL UNIT TO BE REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATE WIRING, CONDUIT, DISCONNECTS, ETC.
- ② EXISTING TO REMAIN EQUIPMENT TO BE RE- FENCED FROM (E) MCC TO NEW PANEL 'M1'. CONTACTOR TO REMOVE/DEMOLISH ALL CONDUIT/CONDUCTORS ONCE SWITCH OVER IS COMPLETE IF NOT REUSED. SEE E-202.
- ③ EXISTING 'MCC' TO BE REMOVED ONCE ALL LOADS HAVE BEEN SWITCHED OVER TO NEW PANEL 'M1'.

SHEET 18 OF 27 SHEETS

1 2 3 4 5 6 7



① RE-USE EXISTING 500A 3-POLE BREAKER IN EXISTING SWITCHBOARD 'MSB'. RE:E-401

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E-201

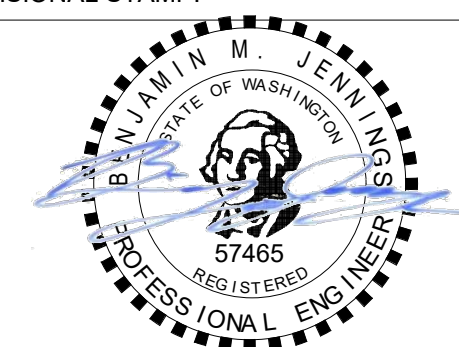
SHEET 19 OF 27 SHEETS



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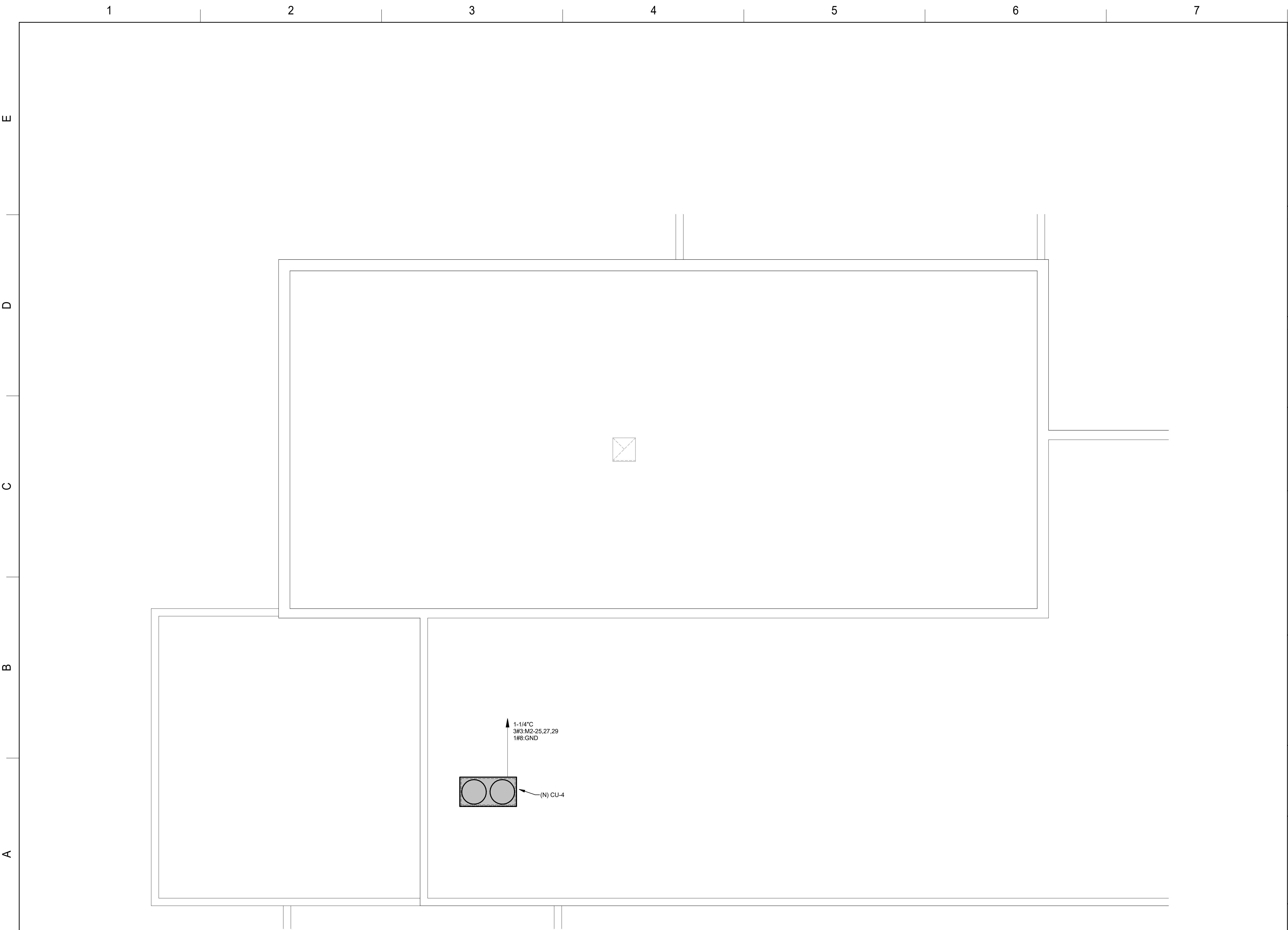
2ND FLOOR LEVEL -
POWER - NEW

E-202

SHEET 20 OF 27 SHEETS

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

SHEET 21 OF 27 SHEETS

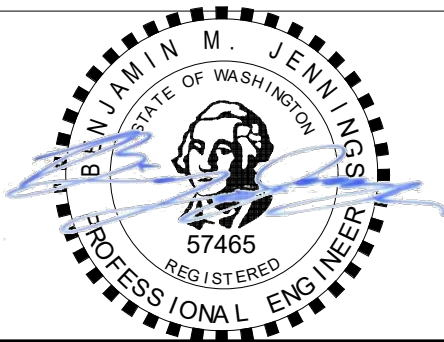


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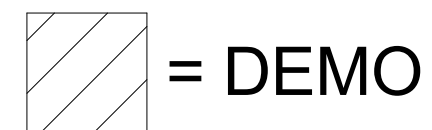
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SHEET TITLE

ROOF PLAN - POWER -
NEW

E-204

SHEET 22 OF 27 SHEETS



- SHEET 23 OF 27 SHEETS



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SHEET TITLE

ELECTRICAL SCHEDULES AND DETAILS

E-402

SHEET 24 OF 27 SHEETS

[illegible]

(N)PANEL: M2

VOLTAGE: 208/120V

AMPERE RATING:

PHASE: 3

600A

WIRE: 4

ENCLOSURE RATING:

NEMA 1

MINIMUM AIC RATING:

MATCH AIC RATING OF UPSTREAM SWITCHBOARD

CKT NO	LOAD NO	(VA)	LOAD SERVED	NOTE	LOAD TYPE	AMPS/ POLES	A	PHASE B	C	AMPS/ POLES	LOAD TYPE	NOTE	LOAD SERVED	LOAD (VA)	CKT NO
1	1320		EXHAUST FAN-F-1 3HP		MT	20	3	2320		20	1	MC	AC-1 DUCT HEATER	1000	2
3	1320		EXHAUST FAN-F-1 3HP		MT	**	*	2320		20	1	MC	AC-2 DUCT HEATER	1000	4
5	1320		EXHAUST FAN-F-1 3HP		MT	**	*		2320	20	1	MC	AC-3 DUCT HEATER	1000	6
7	936		EXHAUST FAN-F-2 2HP		MT	20	3	1296		20	1	MC	CONTROL AC-1 & AC-2	360	8
9	936		EXHAUST FAN-F-2 2HP		MT	**	*	1436		20	1	R G	REC - HEAT TAPE	500	10
11	936		EXHAUST FAN-F-2 2HP		MT	**	*		1436	20	1	R G	REC - HEAT TAPE	500	12
13	936		EXHAUST FAN-F-3 2HP		MT	20	3	1936		20	1	L	PENTHOUSE RECEPTACLES AND LIGHTS	1000	14
15	936		EXHAUST FAN-F-3 2HP		MT	**	*	1936		20	1	L	PENTHOUSE RECEPTACLES AND LIGHTS	1000	16
17	936		EXHAUST FAN-F-3 2HP		MT	**	*		1686	20	1	MT	EXHAUST FANS EF-14 & EF-16	750	18
19	2880		EXHAUST FAN-F-4 7.5HP		MT	50	3	2880		20	1		SPARE	20	20
21	2880		EXHAUST FAN-F-4 7.5HP		MT	**	*		3380	20	1	MC	RELAY PANEL "RP-1"	500	22
23	2880		EXHAUST FAN-F-4 7.5HP		MT	**	*		2880	20	1		SPARE	24	24
25	7440		CONDENSING UNIT CU-4		MT	80	3	7440					SPACE	26	26
27	7440		CONDENSING UNIT CU-4		MT	**	*	7440					SPACE	28	28
29	7440		CONDENSING UNIT CU-4		MT	**	*		7440				SPACE	30	30
31			SPARE			20	3	0					SPACE	32	32
33			SPARE			**	*	0					SPACE	34	34
35			SPARE			**	*		0				SPACE	36	36
37			SPARE			20	3	0					SPACE	38	38
39			SPARE			**	*	0					SPACE	40	40
41			SPARE			**	*		0				SPACE	42	42

CONNECTED LOADS:

PHASE A:13215872

PHASE B:13816512

PHASE C:13115762

TOTAL:48146

LOAD TYPES:

L = LIGHTING

R = RECEPTACLES

MC = MISC

MT = MOTOR

K = KITCHEN

LARGEST MOTOR = 22320.0

OF KITCHEN =

NOTES:

G-GFCI BREAKER

LOADING BY TYPE

DEMAND FACTOR

DEMAND

NEC CODE

L

25%

2560 VA

210-19

R

10kVA @ 100%, REM @ 50%

1000 VA

220-44

MC

100%

3960 VA

220-60

MO

100% + LARGEST x 25%

46866 VA

220-50

K

0 VA

220-56

TOTAL

54226 VA

151



	10/25/22	REVISED BID SET
MARK	DATE	DESCRIPTION

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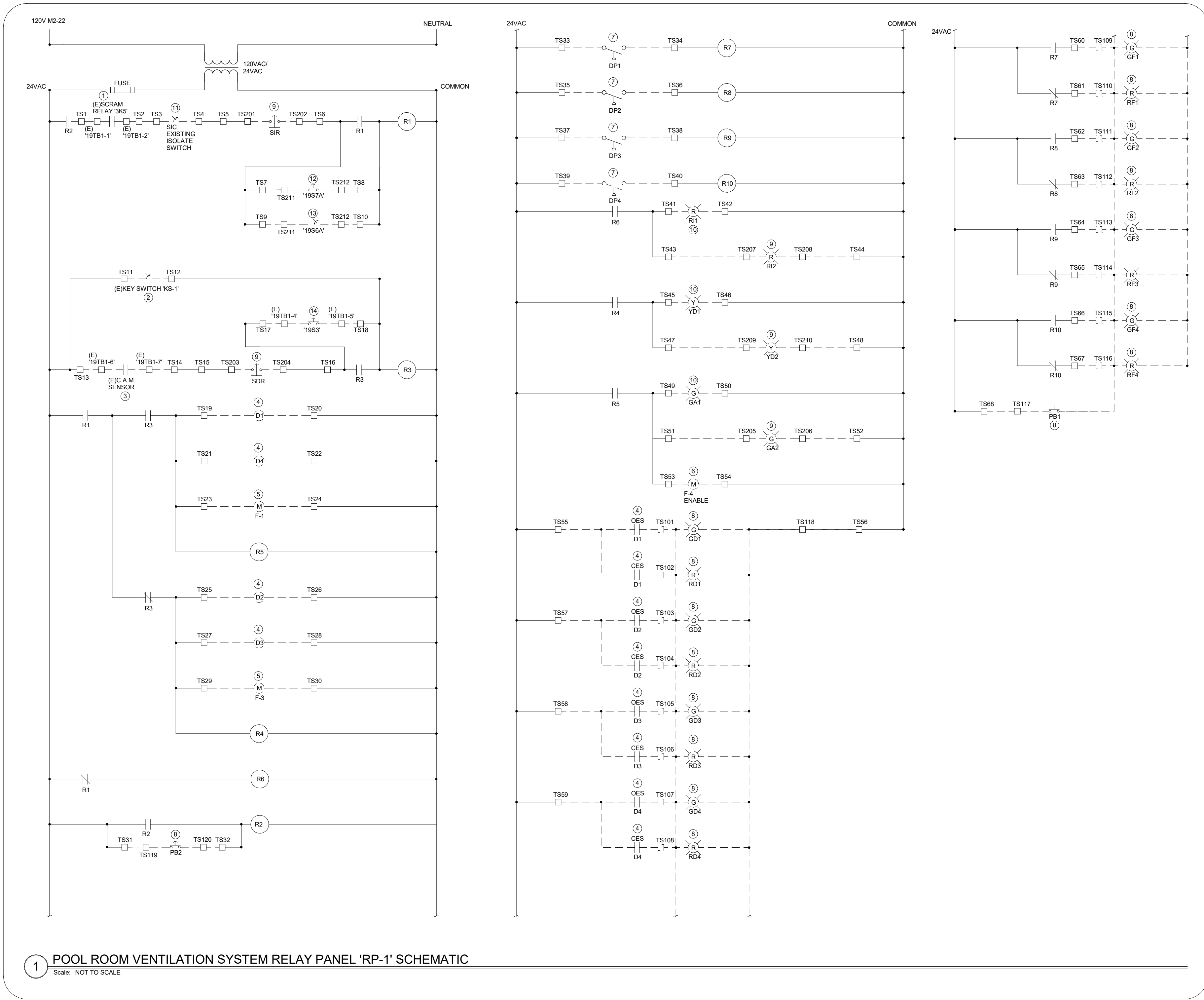
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SHEET TITLE

CONTROL SCHEMATIC - RELAY PANEL 'RP-1'

E-601

SHEET 25 OF 27 SHEETS



GENERAL NOTES

1. CONTRACTOR PROVIDE AND INSTALL ALL VOLTAGE WIRING/CABLING, CONTROL PANELS, POWER SUPPLIES, TERMINATIONS, CONDUIT, INDICATION, RELAYS, ETC. FOR A COMPLETE AND OPERATIONAL SYSTEM.
2. VERY CLOSE COORDINATION WITH SITE OPERATIONS PERSONNEL WILL BE REQUIRED TO IDENTIFY EXISTING SYSTEM(S) AND LOCATIONS.
3. PANELS AND WIRING SCHEMATICS ARE MEANT TO COVER OVERALL DESIGN INTENT AND DONT INDICATE ALL PARTIEPIECES REQUIRED FOR A FULLY OPERATIONAL SYSTEM. CONTRACTOR TO PROVIDE DETAIL SHOP DRAWINGS OF ALL PANELS AND COMPONENTS REQUIRED FOR A FULLY OPERATION SYSTEM.
4. REFER TO SHEET E-601, E-602, AND E-603 FOR ADDITIONAL CONTROL SYMBOLS/REQUIREMENTS.
5. REFER TO SHEET E-603 FOR SEQUENCE OF OPERATION, CONTROL SYMBOL LEGEND, AND NEW POOL ROOM VENTILATION SYSTEM CONTROL MATERIAL.

KEYED NOTES

- 1 INTERCEPT AND EXTEND EXISTING SCRAM RELAY CONTACT CABLEING. TERMINALS UTILIZED ARE "10B" AND "10B1-2". TERMINALS ARE LOCATED IN EXISTING POOL ROOM CONSOLE PANEL. EXTEND EXISTING SCRAM CONTACT CABLEING TO NEW RELAY INDICATED UPON SCRAM ALARM. RELAY "R1" TO LOSE POWER AND INITIATE "ISOLATE MODE". EXIST EXISTING SCRAM CABLEING TO BE VERIFIED/COORDINATE WITH SITE PERSONNEL PRIOR TO ANY WORK BEING COMPLETED.
- 2 INTERCEPT AND EXTEND EXISTING KEY SWITCH "K5-1" CONDUCTORS IN EXISTING POOL ROOM CONSOLE PANEL. KEY SWITCH IS LOCATED ON SCRAM. WHEN KEY IS INSERTED AND TURNED SWITCH IS OPEN.
- 3 INTERCEPT AND EXTEND EXISTING CAM RELAY CONTACT CABLEING. TERMINALS UTILIZED ARE "10B" AND "10B1-2". TERMINALS ARE LOCATED IN EXISTING POOL ROOM CONSOLE PANEL. EXTEND EXISTING C.A.M. CONTACT CABLEING TO NEW RELAY INDICATED UPON C.A.M. ALARM. RELAY "R3" TO LOSE POWER AND INITIATE "DILUTE MODE". EXIST EXISTING C.A.M. CABLEING TO BE VERIFIED/COORDINATE WITH SITE PERSONNEL PRIOR TO ANY WORK BEING COMPLETED.
- 4 DAMPER AND DAMPER END SWITCHES LOCATED ON MECHANICAL MEZZANINE. VERIFY EXACT LOCATION WITH DIV 23.
- 5 STARTER LOCATED ON MECHANICAL MEZZANINE. RE-E-202
- 6 CONNECT TO "F-4" VFD. ENABLE. RE-E-202
- 7 DIFFERENTIAL PRESSURE SWITCH LOCATED ON MECHANICAL MEZZANINE. VERIFY EXACT LOCATION WITH DIV 23.
- 8 LOCATED IN POOL ROOM VENTILATION SYSTEM DISPLAY. RE-E-602
- 9 LOCATED IN REMOTE CONTROL PANEL "CP-1" IN LOBBY. RE-E-201-1-E-603
- 10 DISCONNECT AND REMOVE EXISTING TO REMAIN INDICATION LIGHT LOCATED IN POOL ROOM CONSOLE. RECONNECT EXISTING LIGHT TO RELAY PANEL "RP-1" AS INDICATED.
- 11 SWITCH IS EXISTING AND IS LOCATED IN POOL ROOM CONSOLE. EXISTING SWITCH TO BE DISCONNECTED AND RECONNECTED TO "RP-1" AS INDICATED.
- 12 EXISTING ISOLATE RESET SWITCH "1957A" LOCATED IN POOL ROOM CONSOLE. RE-E-201-1-E-202
- 13 EXISTING ISOLATE RESET KEY SWITCH "1956A" LOCATED IN REMOTE CONTROL PANEL "CP-1" IN LOBBY. RE-E-201-1-E-603
- 14 EXISTING DILUTE RESET SWITCH LOCATED IN EXISTING POOL ROOM CONSOLE. INTERCEPT AND EXTEND EXISTING SWITCH CONDUCTOR TO NEW RELAY PANEL AS INDICATED.

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NUCLEAR SCIENCE CENTER HVAC
RENEWAL

1687-2022

[illegible]

CAD DWG FILE:

DESIGNED BY: BMJ

DRAWN BY: RID

CHECKED BY: BM.

PROJECT No. 1687-2022	FILE No: 17-M-0
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SHEET TITLE

CONTROL SCHEMATIC - CONSOLE GRAPHIC

E-602

SHEET 26 OF 27 SHEETS

