

GENERAL NOTES

3. ALL DIVISION 23 MECHANICAL WORK SHALL BE INSTALLED TO COMPLY WITH THE 2021 IBC, IECC, IMC, IFC, IPC AND ALL STATE AND LOCAL CODES AND ORDINANCES ENFORCED IN THE JURISDICTION IN WHICH THE WORK WILL PERMITTED AND CONSTRUCTION.
2. MECHANICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE AND SUBJECT TO REQUIREMENTS OF THE ARCHITECTURAL DRAWINGS AND FIELD CONDITIONS. THE MECHANICAL CONTRACTOR SHALL COORDINATE ALL MECHANICAL, DIVISION 23, WORK WITH ALL OTHER TRADES.
3. MECHANICAL DRAWINGS INDICATE GENERALLY THE LOCATION OF MECHANICAL COMPONENTS AND ARE NOT INTENDED TO SHOW ALL ALL FITTINGS, ASPECTS, ETC. OF THE WORK. THE MECHANICAL CONTRACTOR SHALL REFER TO BOTH THE PLANS AND SPECIFICATIONS FOR ALL INSTALLATION REQUIREMENTS.
4. THE MECHANICAL CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND COMPONENTS WHETHER IMPLIED OR SHOWN AND WHICH ARE NECESSARY TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM THAT COMPLIES WITH THE DESIGN INTENT.
5. THE MECHANICAL CONTRACTOR SHALL PROVIDE CONTROL SYSTEM, DUCTWORK AND PIPING SHOP DRAWINGS VERIFYING CLEARANCES, ROUTINGS, EQUIPMENT LOCATIONS, AND TIE-INS OF CONTROLS, PIPING, AND DUCTWORK PRIOR TO FABRICATION AND INSTALLATION OF NEW WORK. IN CONGESTED AREAS AND IN MECHANICAL ROOMS THE CONTRACTOR SHALL PROVIDE COORDINATION SHOP DRAWINGS.
6. NEW WORK IN EXISTING OR OCCUPIED FACILITIES SHALL BE CONSTRUCTED TO INSURE THAT NO INTERFERENCE WITH FACILITY OPERATIONS OR OPERATING EQUIPMENT OCCURS. ALL WORK TO BE COMPLETED IN CONCURRENT WORK AREAS SHALL BE FULLY COORDINATED WITH THE THE CONSTRUCTION MANAGER AND OTHER TRADES PRIOR TO COMMENCING WORK.
7. ALL DUCTWORK OPENINGS SHALL BE ISOLATED/COVERED TO INSURE NO DUST, DEBRIS, VAPORS, ETC. ENTER THE DUCTWORK DURING CONSTRUCTION.
8. MAKE NO CHANGES TO THE CONTRACT DOCUMENTS/DESIGN INTENT WITHOUT FIRST OBTAINING WRITTEN APPROVAL. THE CONTRACTOR SHALL ISSUE A REQUEST FOR INFORMATION (RFI) REQUESTING WHEN THE DOCUMENTS/DESIGN INTENT ARE UNCLEAR. THE ARCHITECT OR PRIME CONSULTANT SHALL ISSUE SUPPLEMENTAL INSTRUCTIONS CLARIFYING THE DESIGN INTENT. FAILURE TO FOLLOW THIS INSTRUCTION SHALL MAKE THE CONTRACTOR RESPONSIBLE FOR REMOVING, REPLACING, OR REPAIRING NON COMPLIANT WORK.
9. IF DIVISION 23 COMPONENTS, EQUIPMENT, WORK INTERFERE WITH OTHER TRADES, THE ARCHITECT AND ENGINEER SHALL DECIDE APPROPRIATE RESOLUTION REGARDLESS OF WHICH WORK WAS INSTALLED FIRST.
10. PROTECT MECHANICAL EQUIPMENT FROM DAMAGE DURING CONSTRUCTION, PROTECT AND STORE EQUIPMENT AND MATERIALS IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.
11. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AND PROVIDE NORMAL SERVICE ACCESS TO ALL COMPONENTS. IF MANUFACTURER'S INSTRUCTIONS CONFLICT WITH CONTRACT DOCUMENTS OBTAIN DIRECTION FROM THE ENGINEER OR PRIME CONSULTANT BEFORE PROCEEDING.
12. FIRE STOP ALL PENETRATIONS AT FIRE RATED WALLS WHERE DUCTWORK CONDUIT, OR PIPING ARE INSTALLED. FIRE STOPPING SHALL BE PERFORMED BY THE INSTALLING CONTRACTOR IMMEDIATELY AFTER THE WORK IS INSTALLED. DO NOT LEAVE PENETRATIONS UNPROTECTED OVERNIGHT.

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The Architect shall not have control or charge of, and shall not be responsible for construction Means and Methods, deviations, techniques, sequences, or procedures, or for safety programs and precautions in connection with the Work, for the acts or omissions of the Contractor, Subcontractors or any other persons performing any of the Work in accordance with the Contract Documents.



22.07.163
2/9/2024

USSRC - INSPIRATION 4 TRAINING FACILITY

OWNER
UNITED STATES SPACE AND ROCKET CENTER

PROJECT ADDRESS
1 Tranquility Base
Huntsville, AL 35805



PROJECT STATUS:	BID SET
ISSUED:	FOR CONSTRUCTION

ISSUE DATE: FEBRUARY 05, 2024

REVISIONS		
No.	Description	Date

HVAC ABBREVIATIONS, GENERAL NOTES AND LEGENDS

DRAWN BY:	MTG
CHECKED BY:	LJB

PROJECT NUMBER
225029-00

DRAWING NO.

MO.01

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ROOFTOP AC UNIT SCHEDULE- GAS HEAT														
MARK	SERVES	NOTES	CAPACITY TONS	SUPPLY FAN			OSA CFM	COOLING COIL			HEATING (NATURAL GAS)			ACCESSORIES
				CFM	ESP IN WG	HP		MBHT	MBHS	EAT °F DB	EAT °F WB	INPUT MBH	OUTPUT MBH	EAT °F
RTU-1	SECOND FLOOR ADMIN SPACES	A B C D F	10.0	3500	3.0	8.0	500	118.2	69.5	72.6	69.5	200	160	64
RTU-2	SECOND FLOOR OPEN OFFICE	A B C D E	7.5	3000	1.0	3.0	450	94.3	72.8	78.5	65.9	200	160	64
RTU-3	SECOND FLOOR OPEN OFFICE	A B C D E	7.5	3000	1.0	3.0	450	84.9	62.7	77.5	64.8	200	160	64
RTU-4	FIRST FLOOR RMS 121, 125, 127,128, 130, 133	A B C D F	25.0	9000	3.0	15.0	1100	312.3	127.5	72.3	69.4	300	240	64
RTU-5	DRONE FLIGHT RM 122	A B C D E	6.0	2400	1.0	1.5	300	83.2	63.6	74.2	63.2	200	160	64
RTU-6	ASTRO TRAINING SIM RM 118	A B C D E	25.0	10000	2.0	10	1140	282.3	206.2	75.1	63.9	300	240	64
RTU-7	MOCR RM 204, OFFICE RM 202 OVERLOOK ROM 203.	A B C D E	6.0	2400	1.0	3.0	430	78.8	56.6	77.7	65.5	200	160	64
RTU-8	CORRIDOR 208, BRIDGE 201, LOBBY 101	A B C D E	15.0	6000	1.2	3.0	560	153.9	126.6	75.1	62.9	300	240	64
RTU-9	MISSION CONTROL RM 105, MOCR 106, MOCR 108 TECH RM 111 SIM PREP 112	A B C D F	25.0	10000	3.0	15.0	1670	276.5	205.6	76.1	63.1	300	240	64
RTU-10	ROPES RM 103	A B C D E	15.0	6000	1.2	3.0	1040	198.5	153.2	76.1	64.7	300	240	64
RTU-11	CORRIDOR 102	A B C D E	6.0	2400	1.0	1.5	150	78.8	56.6	73.8	60.8	200	160	64

- NOTES:
- A. COOLING CAPACITY IS GROSS CAPACITY AT 95°F AMBIENT.
- B. EER AT ARI 2 10/240 CONDITIONS. ALL EQUIPMENT SHALL COMPLY WITH ASHRAE 90.1, 2013.
- C. DIRECT DRIVE 30 MOTORS SHALL BE HIGH EFFICIENCY, AND VARIABLE FREQUENCY DRIVE RATED.
- D. MINIMUM HEATING EFFICIENCY= 78% PER ANSI Z21.47-1978
- E. RTU SHALL BE EQUIPPED WITH CONTROLS TO OPERATE IN SINGLE ZONE VARIABLE AIR VOLUME MODE, WITH CONSTANT DAT AND MODULATING AIR VOLUME, BASED ON SPACE TEMPERATURE.
- F. RTU SHALL BE EQUIPPED WITH CONTROLS TO OPERATE IN VARIABLE AIR VOLUME MODE WITH CONSTANT DAT AND MODULATING AIR VOLUME BASED ON DUCT STATIC PRESSURE.

- ACCESSORIES
- [1] HOT GAS REHEAT, HUMIDITY SENSOR WITH DEHUMIDIFICATION CONTROL
- [2] HAIL GUARDS
- [3] CONVENIENCE OUTLET, POWERED FROM THE LINE SIDE OF THE DISCONNECT
- [4] MANUFACTURERS ROOF CURB, OR FACTORY FABRICATED THIRD PARTY ROOF CURB
- [5] DIRECT DRIVE SUPPLY FAN WALL WITH CONTROLLED BY ONE VARIABLE SPEED DRIVE
- [6] DRY BULB ECONOMIZER WITH POWERED EXHAUST CONTROLLED BY BUILDING PRESSURE
- [7] LOW AMBIENT CONTROL FOR OPERATION DOWN TO 0°F AMBIENT AIR CONDITIONS
- [8] OUTSIDE AIR FLOW MONITOR
- [9] MERV 13 FILTERS
- [10] DEMAND CONTROL VENTILATION CAPABLE (RETURN AIR CO2 OR ROOM MOUNTED CO2 SENSOR CONTROL)
- [11] GPS BIPOLAR IONIZATION UNIT

DUCTLESS SPLIT SYSTEM AC UNIT SCHEDULE - COOLING ONLY																
INDOOR UNIT MARK	OUTDOOR UNIT MARK	SERVES	TYPE	SUPPLY FAN CFM	WEIGHT INDOOR/ OUTDOOR UNITS	COOLING CAPACITY				HEATING CAPACITY		REFRIGERANT		ELECTRICAL		ACCESSORIES
						MBH	MBH MIN	ENT °F DB	ENT °F WB	MBH @47°F	MBH @17°F	TYPE	RS - RL	V/Ø/HZ	INDOOR UNIT MCA	
DS-1	DSO-1	FIBER SWITCH 114	[A]	920	46/214	36.0	16.0	80.0	67.0	38.0	22.4	R410A	5/8 - 3/8	208/1/60	2.0	25/31
DS-2	DSO-2	ELECT 124	[A]	920	46/214	36.0	16.0	80.0	67.0	38.0	22.4	R410A	5/8 - 3/8	208/1/60	2.0	25/31
DS-3	DSO-3	ELECT 221	[A]	920	46/214	25.2	36.0	80.0	67.0	38.0	22.4	R410A	5/8 - 3/8	208/1/60	2.0	25/31
DS-4	DSO-4	IT 220	[A]	920	46/214	25.2	36.0	80.0	67.0	38.0	22.4	R410A	5/8 - 3/8	208/1/60	2.0	25/31
DS-5	DSO-5	ELECT 221	[A]	920	46/214	25.2	36.0	80.0	67.0	38.0	22.4	R410A	5/8 - 3/8	208/1/60	2.0	25/31
DS-6	DSO-6	VESTIBULE 100	[B]	740	56/151	30.0	9.0	80.0	67.0	32.0	18.3	R410A	5/8 - 3/8	208/1/60	1.0	19/26
DS-7	DSO-7	VESTIBULE 100	[B]	740	56/151	30.0	9.0	80.0	67.0	32.0	18.3	R410A	5/8 - 3/8	208/1/60	1.0	19/26

- TYPE:
- [A] MINI-SPLIT WITH WALL MOUNTED DUCTLESS INDOOR UNIT AND AIR COOLED OUTDOOR UNIT.
- [B] MINI-SPLIT WIT CEILING CASSETTE INDOOR UNIT AND AIR COOLED OUTDOOR UNIT.
- NOTES:
1. CAPACITIES ARE MINIMUM GROSS CAPACITIES
2. OUTDOOR UNIT: CAPACITY TO BALANCE INDOOR COOLING AT 95°F AMBIENT
3. INDOOR UNIT POWERED FROM OUTDOOR UNIT

- ACCESSORIES
- [1] MICROPROCESSOR BASED CONTROLS WI WIRELESS REMOTE CONTROLLER WALL MOUNTED
- [2] MODULATING SUPPLY AIR VANES
- [3] CONDENSATE PUMP TO RAISE CONDENSATE 20 INCHES ABOVE PUMP
- [4] CONDENSING UNIT MOUNTING PAD OR RAILS
- [5] INTERCONNECT WIRING BETWEEN INDOOR AND OUTDOOR UNIT
- [6] LOW AMBIENT CONTROL - WIND BAFFLE
- [7] FACTORY INSULATED REFRIGERANT LINE SET

GRAVITY VENT							
MARK	SERVICE	TYPE	AIR FLOW CFM	NECK SIZE	MAX. ΔP IN W.G	ACCESSORIES	BASIS OF DESIGN (GREENHECK)
EH-1	R	A	240	12X12	0.1	[1][2]	GRSR-12
VENT TYPES							
[A] ROUND SPUN ALUMINUM							
SERVICE							
I = INTAKE							
R = RELIEF							
VENT ACCESSORIES							
[1] 12" HIGH ROOF CURB							
[2] FLAT FLASHING FLANGE							

FAN SCHEDULE												
MARK	SERVES	LOCATION	TYPE	CFM	E.S.P IN. W.G	LIMIT (SONES)	MOTOR HP (WATTS)	MOTOR V/Ø/HZ	ACCESSORIES	INTERLOCK	BASIS OF DESIGN (GREENHECK)	
EF-1	RR 117; CUST 116; ELEVATOR EQ 115	ROOF MOUNTED	A	320	0.4	5.6	1/10	120/1/60	[1]	2	G-90VG	
EF-2	CUST 222	CEILING MOUNTED	B	100	0.3	2.0	(28)	120/1/60	[1]	1	SP-A200	
EF-3	RR 221	CEILING MOUNTED	B	70	0.4	2.0	(21)	120/1/60	[1]	1	SP-A200	
EF-4	RR 220	CEILING MOUNTED	B	70	0.4	2.0	(21)	120/1/60	[1]	1	SP-A200	
EF-5	RR 128; RR 129; CUST 130	ABOVE CEILING	A	1360	0.5	7.2	1/2	208/3/60	[2]	2	G-140VG	
EF-6	MACHINE RM 113	ABOVE CEILING	C	170	0.4	6.0	1/15	120/1/60	[3]	2	SP-70VG	

FAN TYPES

- [A] CENTRIFUGAL ROOF EXHAUSTER DOWNBLAST, DIRECT DRIVE
- [B] CEILING MOUNTED EXHAUST FAN, DIRECT DRIVE
- [C] INLINE CENTRIFUGAL, BELT DRIVE

FAN ACCESSORIES

- [1] BACKDRAFT DAMPER; FLEXIBLE CONNECTORS; SOLID STATE SPEED CONTROLLER; ALUMINUM GRILLE; GRILLE MOUNTED MOTION DETECTOR; DISCONNECT SWITCH; ENERGY STAR RATED; ECM MOTOR
- [2] 16" HIGH ROOF CURB W/ DAMPER; MOTORIZED INLET DAMPER; PRE-WIRED DISCONNECT SWITCH; ECM MOTOR; SOLID STATE SPEED CONTROLLER
- [3] BACKDRAFT DAMPER; RUBBER ISOLATORS; MOTOR ACCESS DOOR; ECM MOTOR

ELECTRIC HEATERS (EH)										
MARK	SERVES	TYPE	WEIGHT (LBS.)	CAPACITY (KW)	AIRFLOW (CFM)	V/Ø/HZ	AMPS	THREMOSTAT	ACCESSORIES	BASIS OF DESIGN (MARKEL)
EW-1	VALVE 120	EW-1	41	3.0	245	208/3/60	8.3	UNIT MOUNTED	[1]	[A]

HEATER TYPES

EW-1 - ELECTRIC WALL HEATER; RECESSED WALL MOUNTED

ACCESSORIES

[1] WALL BOX FOR RECESSED INSTALLATION; 16 GA HEAVY DUTY GRILLE; CONTROL TRANSFORMER

REMARKS

[A] MOUNT 18" AFF.

AIR TERMINAL UNIT SCHEDULE-ELECTRIC HEAT										
MARK	TYPE	ROUND INLET	COOLING		HEATING CFM	ELECTRIC HEAT		ELECTRICAL V/Ø/HZ	NOTES	ACCESSORIES
			MAX CFM	MIN CFM		KW	STEPS			
RTU-1										
TU-1-1	VVR	7	400	80	175	2.7	SCR	480/3/60	A B	[1][2][3][4][5]
TU-1-2	VVR	7	600	80	350	4.4	SCR	480/3/60	A B	[1][2][3][4][5]
TU-1-3	VVR	8	700	80	450	5.5	SCR	480/3/60	A B	[1][2][3][4][5]
TU-1-4	VVR	7	600	80	375	4.6	SCR	480/3/60	A B	[1][2][3][4][5]
TU-1-5	VVR	6	300	80	200	2.7	SCR	480/3/60	A B	[1][2][3][4][5]
TU-1-6	VVR	9	900	140	600	7.9	SCR	480/3/60	A B	[1][2][3][4][5]
RTU-4										
TU-4-1	VVR	10	1100	110	650	7.8	SCR	480/3/60	A B	[1][2][3][4][5]
TU-4-2	VVR	12	1500	150	900	11.3	SCR	480/3/60	A B	[1][2][3][4][5]
TU-4-3	VVR	9	900	100	500	6.8	SCR	480/3/60	A B	[1][2][3][4][5]
TU-4-4	VVR	8	600	100	360	4.5	SCR	480/3/60	A B	[1][2][3][4][5]
TU-4-5	VVR	16	3600	750	1750	22.2	SCR	480/3/60	A B	[1][2][3][4][5]
TU-4-6	VVR	12	1400	140	840	11.6	SCR	480/3/60	A B	[1][2][3][4][5]
RTU-9										
TU-9-1	VVR	14	3000	200	1500	18.1	SCR	480/3/60	A B	[1][2][3][4][5]
TU-9-2	VVR	14	2500	200	1500	18.1	SCR	480/3/60	A B	[1][2][3][4][5]
TU-9-3	VVR	8	800	100	400	4.8	SCR	480/3/60	A B	[1][2][3][4][5]
TU-9-4	VVR	8	800	100	400	4.8	SCR	480/3/60	A B	[1][2][3][4][5]
TU-9-5	VVR	14	750	360	400	5.5	SCR	480/3/60	A B	[1][2][3][4][5]
TU-9-6	VVR	12	1500	100	800	8.1	SCR	480/3/60	A B	[1][2][3][4][5]

TYPE:

SINGLE DUCT TERMINAL UNITS:

V V R= VARIABLE VOLUME REHEAT

NOTES:

- A. PROVIDE MANUFACTURER SPECIFIED STRAIGHT RUN OF INLET DUCT, NO EXCEPTIONS.
- B. INCREASE THE DUCT SIZE SPECIFIED BETWEEN MAIN AND TERMINAL BY ONE DUCT DIAMETER IF THE LENGTH OF INLET DUCT BETWEEN THE MEDIUM PRESSURE DUCT AND TERMINAL UNIT EXCEEDS 10 FEET EQUIVALENT LENGTH.

ACCESSORIES/FEATURES:

- [1] REMOVABLE AIR FLOW MONITOR
- [2] DISCHARGE TEMPERATURE SENSOR
- [3] DOOR INTERLOCK DISCONNECT SWITCH
- [4] MAIN SUPPLY FUSE
- [5] CLASS II 24 VOLT TRANSFORMER



PROJECT STATUS:
ISSUED

BID SET
FOR CONSTRUCTION

ISSUE DATE: FEBRUARY 05, 2024

REVISIONS

No.	Description	Date
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DRAWING TITLE
HVAC DETAILS

DRAWN BY: MTG

CHECKED BY: UB

PROJECT NUMBER
225029-00

DRAWING NO.
M0.02

OWNER
UNITED STATES SPACE AND ROCKET CENTER

PROJECT ADDRESS
1 Tranquility Base
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1. Summary
Ventilation Sizing Method
Design Ventilation Airflow Rate

Sum of Space OA Airflows
498 CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
TU-1-3								
218 COPY	1	97.0	1.0	412.3	5.00	0.06	0.0	10.8
TU-1-2								
222 GUSTODIAL	1	82.0	0.0	61.5	0.00	0.12	0.0	9.8
218 STORAGE	1	88.0	0.0	89.7	0.00	0.12	0.0	10.6
221 RESTROOM	1	76.0	1.0	99.1	0.00	0.00	0.0	0.0
220 RESTROOM	1	76.0	1.0	99.1	0.00	0.00	0.0	0.0
217 CORRIDOR	1	271.0	0.0	225.9	0.00	0.06	0.0	16.3
TU-1-3								
223 CONFERENCE ROOM	1	704.0	14.0	586.7	5.00	0.06	0.0	112.2
TU-1-4								
213 OFFICE	1	120.0	0.6	121.7	5.00	0.06	0.0	10.2
214 OFFICE	1	120.0	0.6	121.7	5.00	0.06	0.0	10.2
215 OFFICE	1	120.0	0.6	121.7	5.00	0.06	0.0	10.2
TU-1-5								
212 KITCHENETTE	1	136.0	0.0	241.0	5.00	0.06	0.0	8.2
TU-1-6								
224 CLASS ROOM	1	603.0	21.1	567.7	10.00	0.12	0.0	263.2
209 CORRIDOR	1	280.0	0.0	210.0	0.00	0.06	0.0	16.8
Totals (incl. Space Multipliers)				2958.0				498.5

1. Summary
Ventilation Sizing Method
Design Ventilation Airflow Rate

Sum of Space OA Airflows
450 CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1								
210A OPEN OFFICE	1	2160.0	64.0	2507.0	5.00	0.06	0.0	449.6
Totals (incl. Space Multipliers)				2507.0				449.6

1. Summary
Ventilation Sizing Method
Design Ventilation Airflow Rate

Sum of Space OA Airflows
328 CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1								
210B OPEN OFFICE	1	1440.0	48.0	2490.4	5.00	0.06	0.0	326.4
Totals (incl. Space Multipliers)				2490.4				326.4

1. Summary
Ventilation Sizing Method
Design Ventilation Airflow Rate

Sum of Space OA Airflows
1919 CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
TU-4-1								
132 PARACHUTE SIM	1	900.0	22.5	633.9	7.50	0.06	0.0	222.8
TU-4-2								
133 BARANY CHAIR	1	1108.0	27.7	1130.5	7.50	0.06	0.0	274.2
TU-4-3								
131 CORRIDOR	1	576.0	0.0	384.0	0.00	0.06	0.0	34.6
123 CORRIDOR	1	392.0	0.0	235.2	0.00	0.06	0.0	23.5
128 WOMEN RR	1	389.0	0.0	290.2	0.00	0.00	0.0	0.0
129 MENS RR	1	389.0	0.0	290.2	0.00	0.00	0.0	0.0
TU-4-4								
134 SERVICE SPACE	1	448.0	3.7	413.3	5.00	0.06	0.0	45.5
TU-4-5								
135 CORRIDOR	1	1639.0	0.0	2654.0	0.00	0.06	0.0	98.3
TU-4-6								
124 NIGHT VS VR	1	1000.0	20.0	1000.0	10.00	0.12	0.0	320.0
Totals (incl. Space Multipliers)				7231.3				1018.9

1. Summary
Ventilation Sizing Method
Design Ventilation Airflow Rate

Sum of Space OA Airflows
300 CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1								
122 DRONE FLIGHT	1	1002.0	18.0	2004.0	10.00	0.12	0.0	300.2
Totals (incl. Space Multipliers)				2004.0				300.2

1. Summary
Ventilation Sizing Method
Design Ventilation Airflow Rate

Sum of Space OA Airflows
1140 CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1								
119 ASTRO TRNG SIM	1	4970.0	164.0	9940.0	0.00	0.00	1140.0	1140.0
Totals (incl. Space Multipliers)				9940.0				1140.0

1. Summary
Ventilation Sizing Method
Design Ventilation Airflow Rate

Sum of Space OA Airflows
426 CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1								
205 MOCR FULL	1	977.0	19.0	1328.9	10.00	0.12	0.0	307.2
206 OPEN OFFICE	1	630.0	3.5	557.9	5.00	0.06	0.0	55.3
203 OVERLOOK	1	1058.0	20.0	498.7	0.00	0.06	0.0	63.5
Totals (incl. Space Multipliers)				2385.5				426.0

1. Summary
Ventilation Sizing Method
Design Ventilation Airflow Rate

Sum of Space OA Airflows
557 CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1								
208 CORR EAST	1	1443.0	0.0	1430.8	0.00	0.06	0.0	86.6
101 LOBBY	1	2314.0	23.1	2425.7	5.00	0.06	0.0	254.5
200 CORR WEST	1	2042.0	0.0	1272.3	0.00	0.06	0.0	122.5
207 BRIDGE	1	851.0	8.5	811.4	5.00	0.06	0.0	93.6
Totals (incl. Space Multipliers)				5930.2				557.3

1. Summary
Ventilation Sizing Method
Design Ventilation Airflow Rate

Sum of Space OA Airflows
1469 CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
TU-9-1								
105 MISSION CONTROL CCMP	1	5111.0	22.0	4675.2	7.50	0.12	0.0	778.3
107 AIR LOCK	1	243.0	7.3	255.4	5.00	0.06	0.0	51.0
TU-9-3								
106 MOCR (A)	1	540.0	15.0	811.1	10.00	0.12	0.0	214.8
TU-9-4								
108 MOCR (B)	1	540.0	15.0	811.1	10.00	0.12	0.0	214.8
TU-9-5								
112 SIM PREP	1	490.0	14.4	684.8	5.00	0.06	0.0	100.8
114 CORRIDOR	1	59.0	0.0	8.6	0.00	0.06	0.0	3.5
117 RESTROOM	1	66.0	1.0	27.8	0.00	0.00	0.0	0.0
TU-9-6								
111 TECH WORK ROOM	1	1107.0	7.8	1588.4	5.00	0.06	0.0	105.4
Totals (incl. Space Multipliers)				8862.4				1468.7

1. Summary
Ventilation Sizing Method
Design Ventilation Airflow Rate

Sum of Space OA Airflows
1037 CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1								
103 KOPES	1	4950.0	37.0	6435.0	20.00	0.06	0.0	1037.0
Totals (incl. Space Multipliers)				6435.0				1037.0

1. Summary
Ventilation Sizing Method
Design Ventilation Airflow Rate

Sum of Space OA Airflows
122 CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1								
102 CORRIDOR	1	2031.0	0.0	2602.7	0.00	0.06	0.0	121.9
Totals (incl. Space Multipliers)				2602.7				121.9

K|P|S

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U.S. Space & Rocket Center.

PROJECT STATUS: BID SET
ISSUED: FOR CONSTRUCTION

ISSUE DATE: FEBRUARY 05, 2024

REVISIONS
No. Description Date

DRAWING TITLE
OUTSIDE AIRFLOW

DRAWN BY: MTG
CHECKED BY: UB

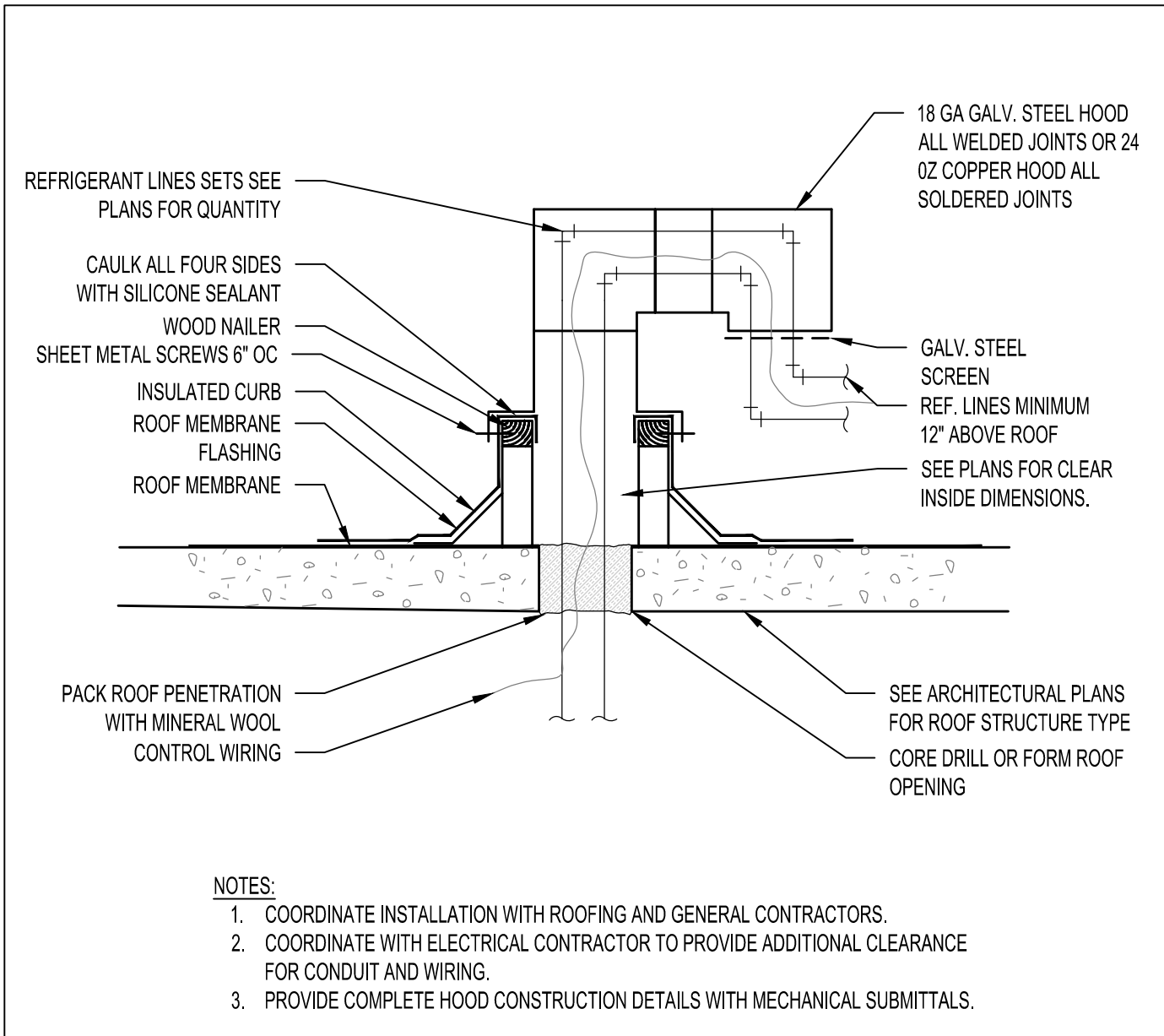
PROJECT NUMBER
225029-00

DRAWING NO.
M0.03

USSRC - INSPIRATION 4 TRAINING FACILITY

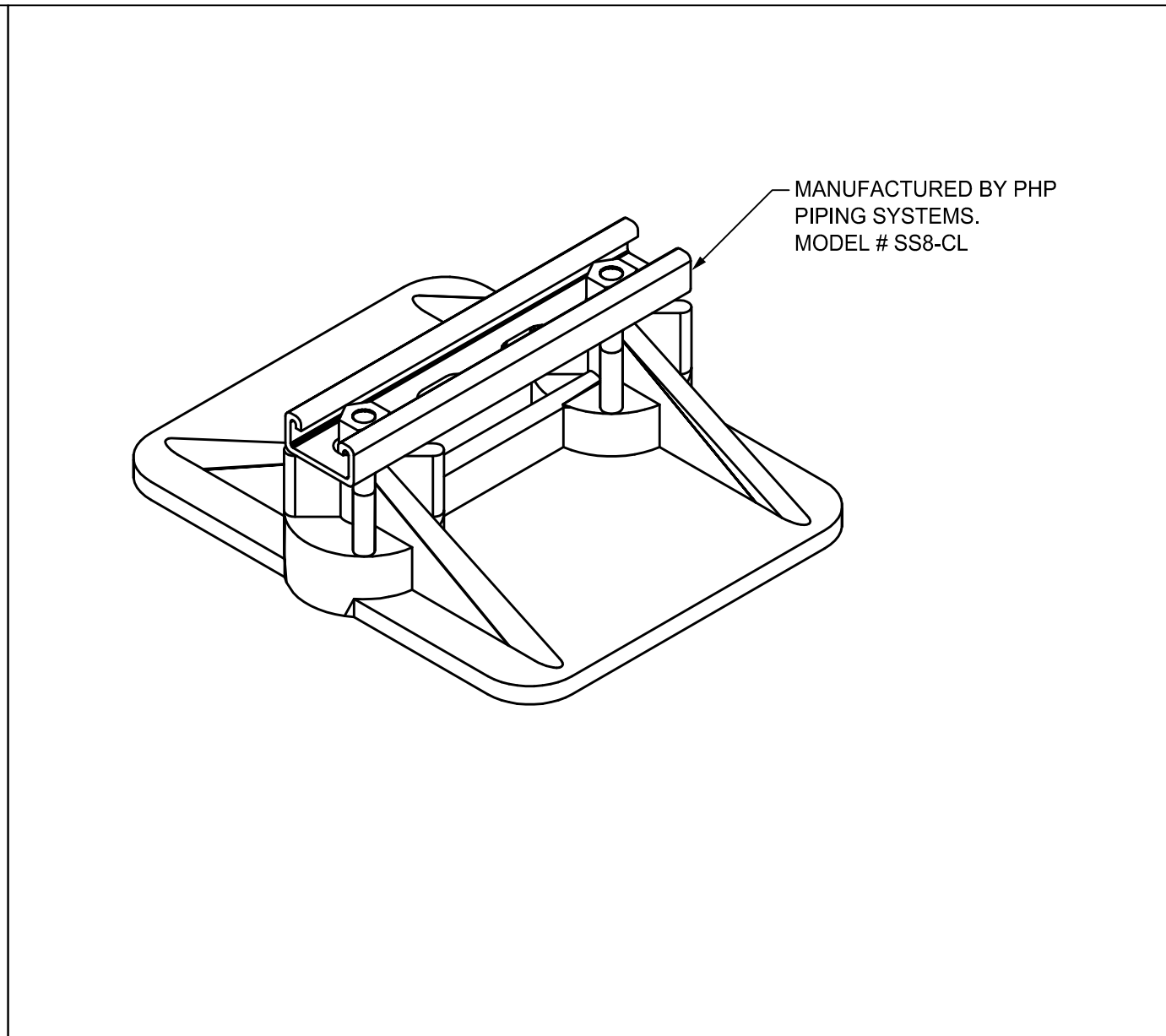


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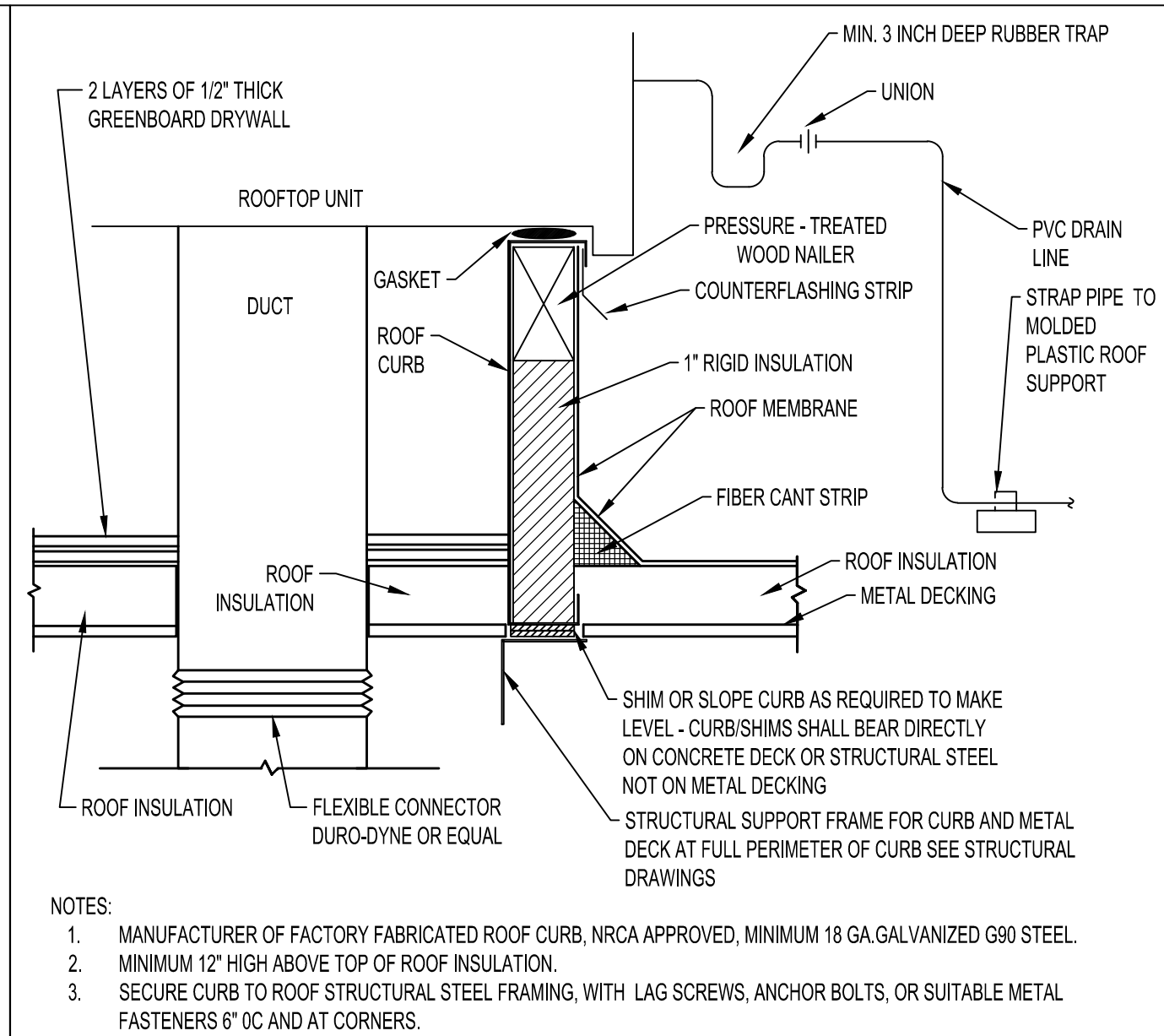
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DETAIL NO: 10



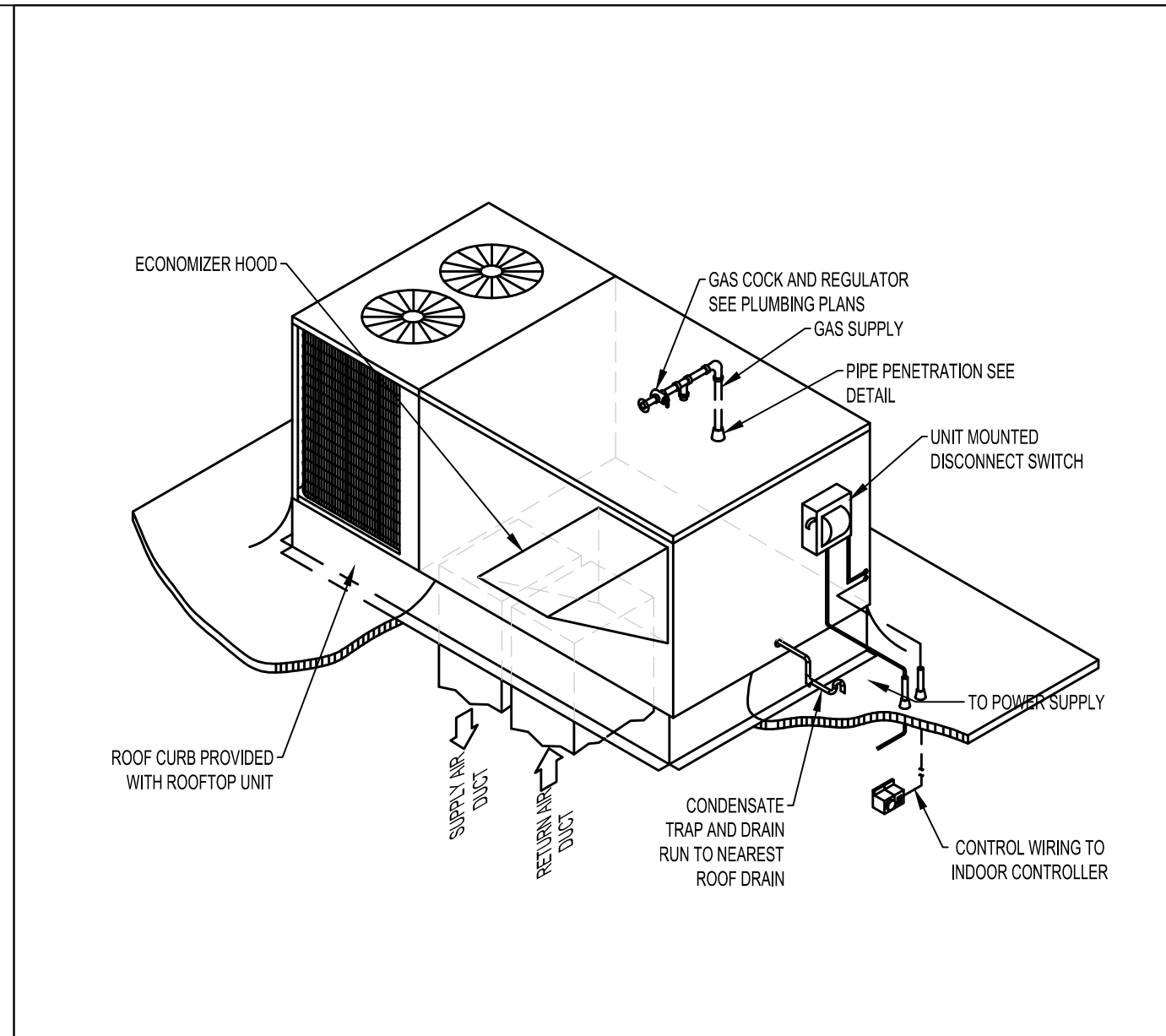
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DETAIL 9



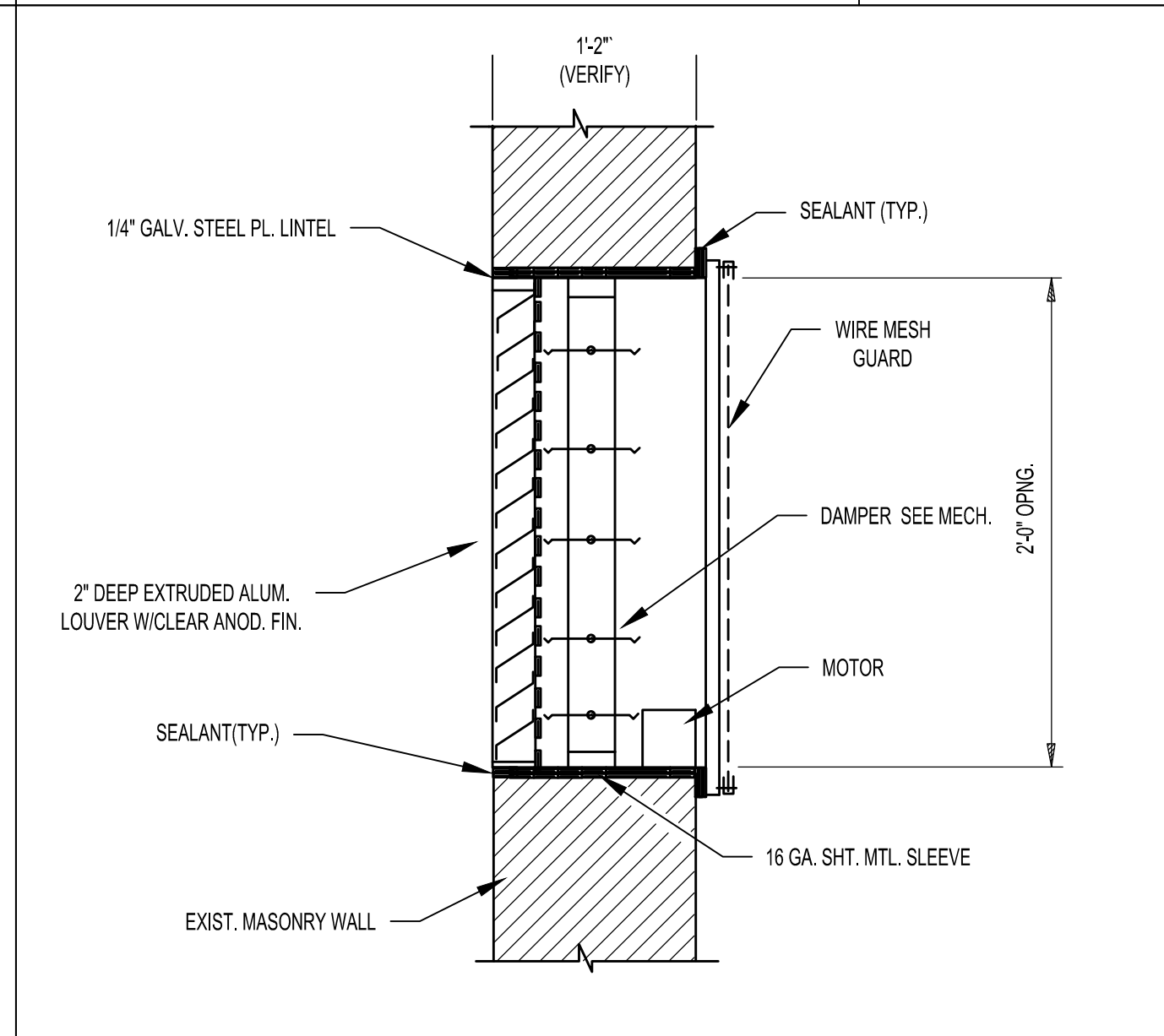
ROOFTOP UNIT CURB

DETAIL NO: 8



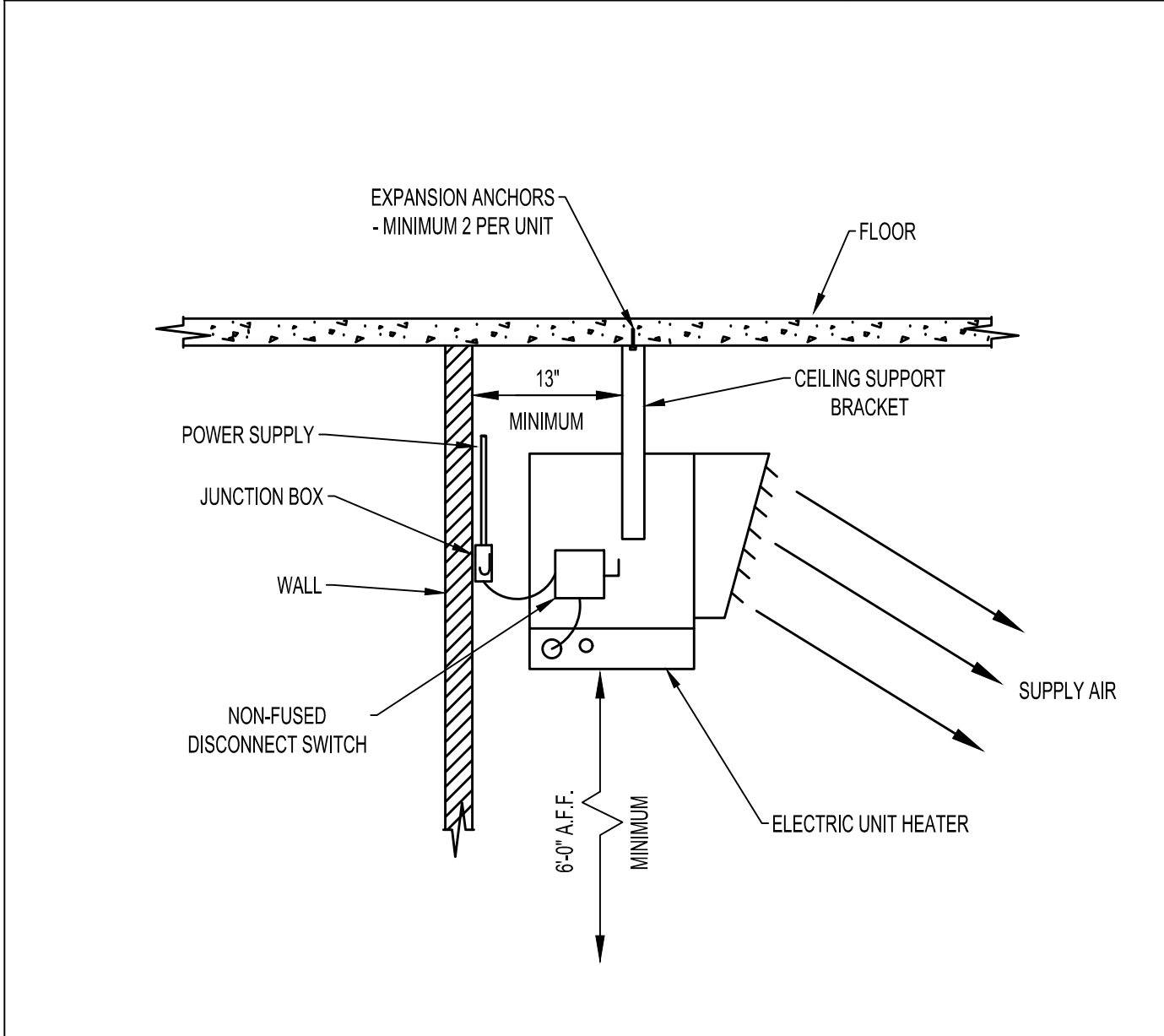
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DETAIL NO: 7



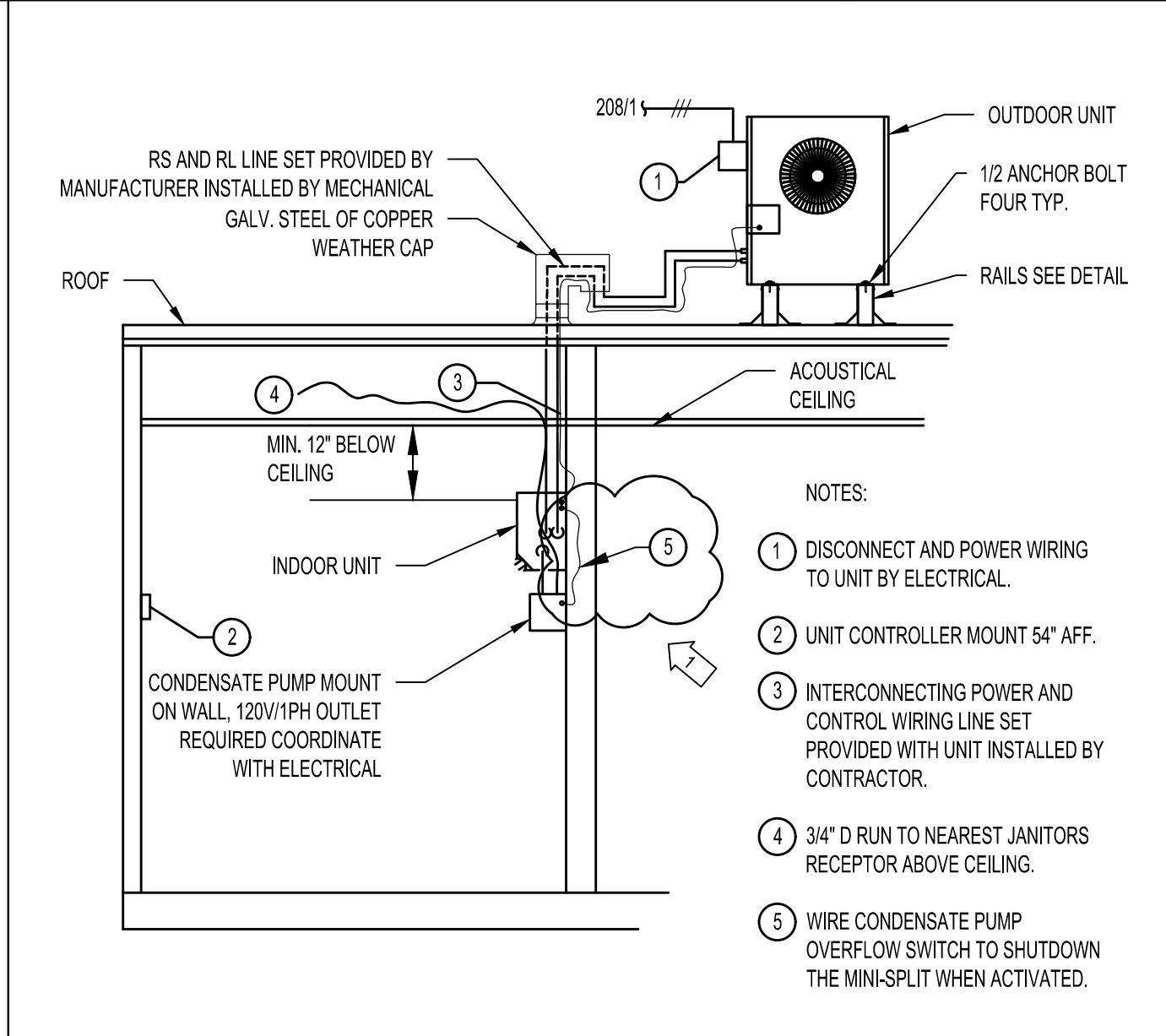
LOUVER WITH AUTO DAMPER DETAIL

DETAIL NO: 6



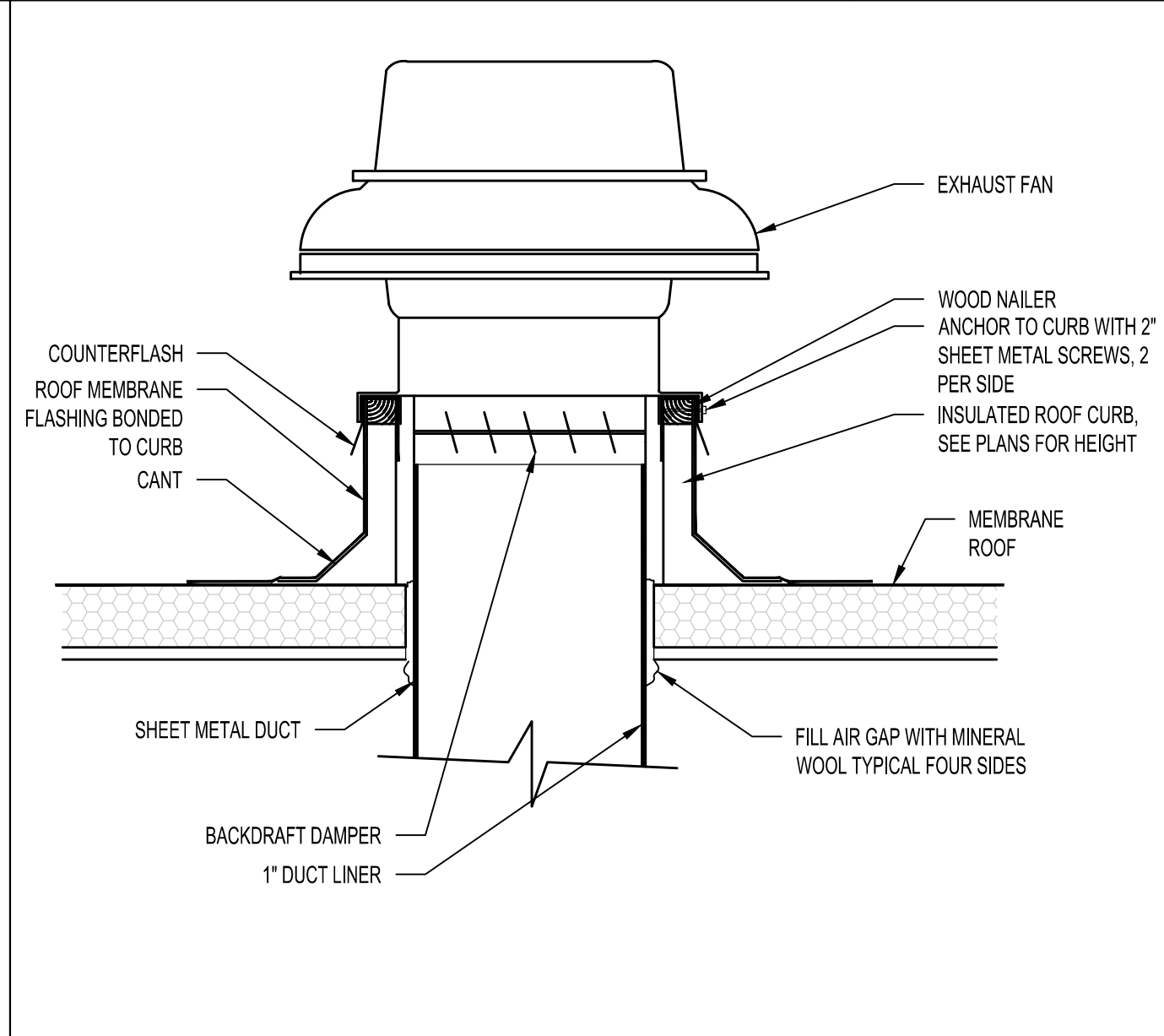
ELECTRIC UNIT HEATER MOUNTING

DETAIL NO: 5



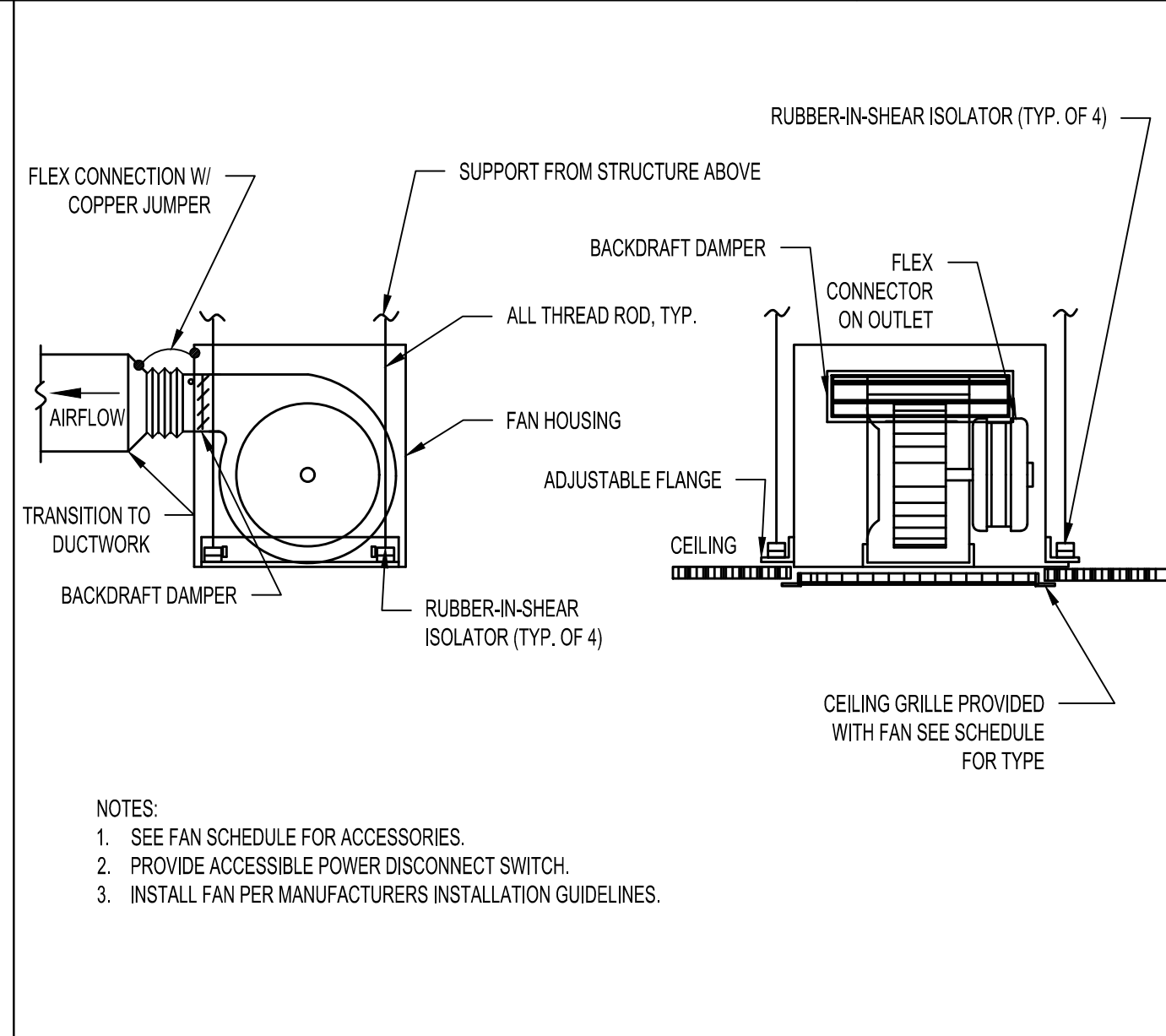
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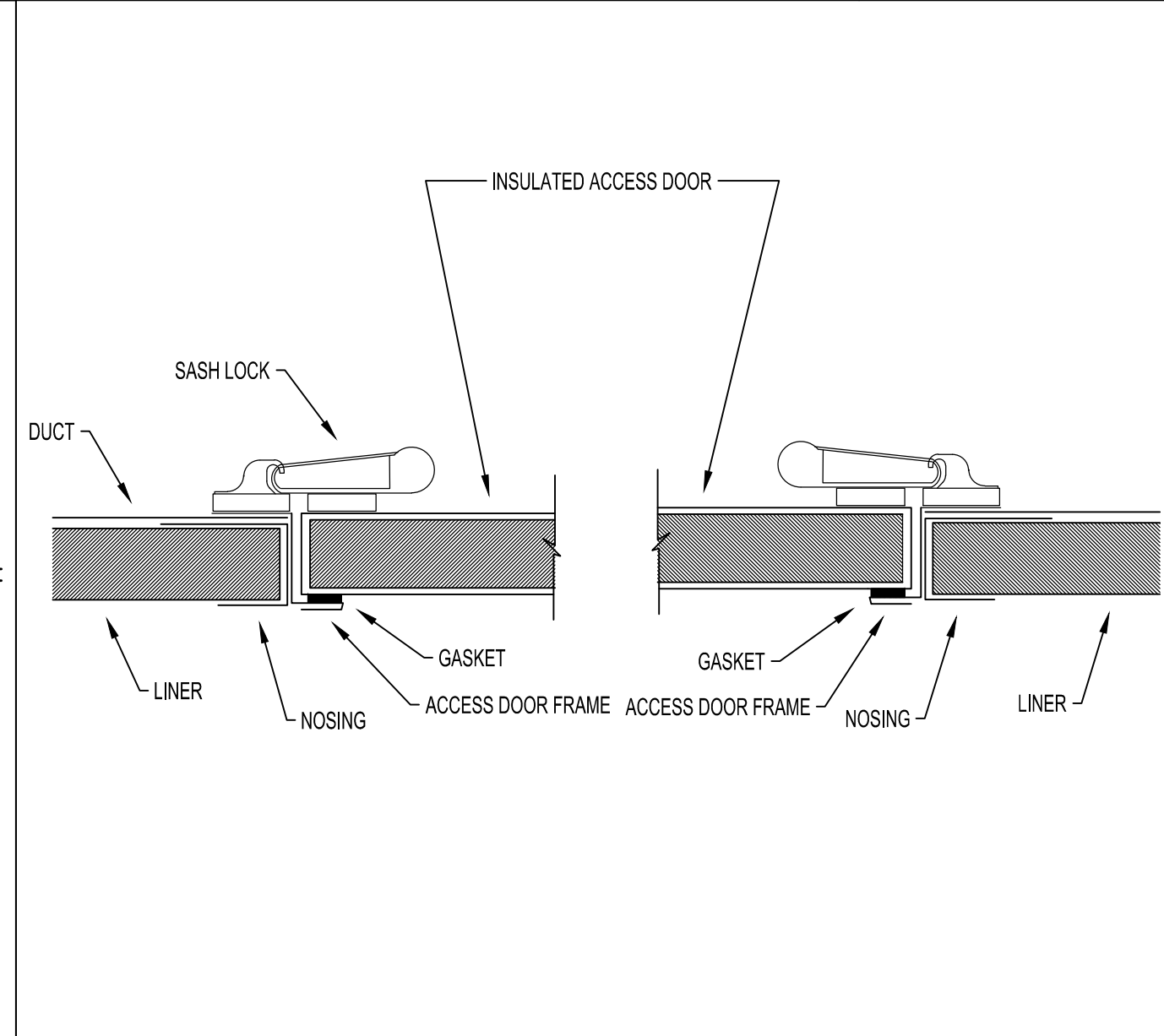
CENTRIFUGAL ROOF EXHAUSTER

DETAIL NO: 3



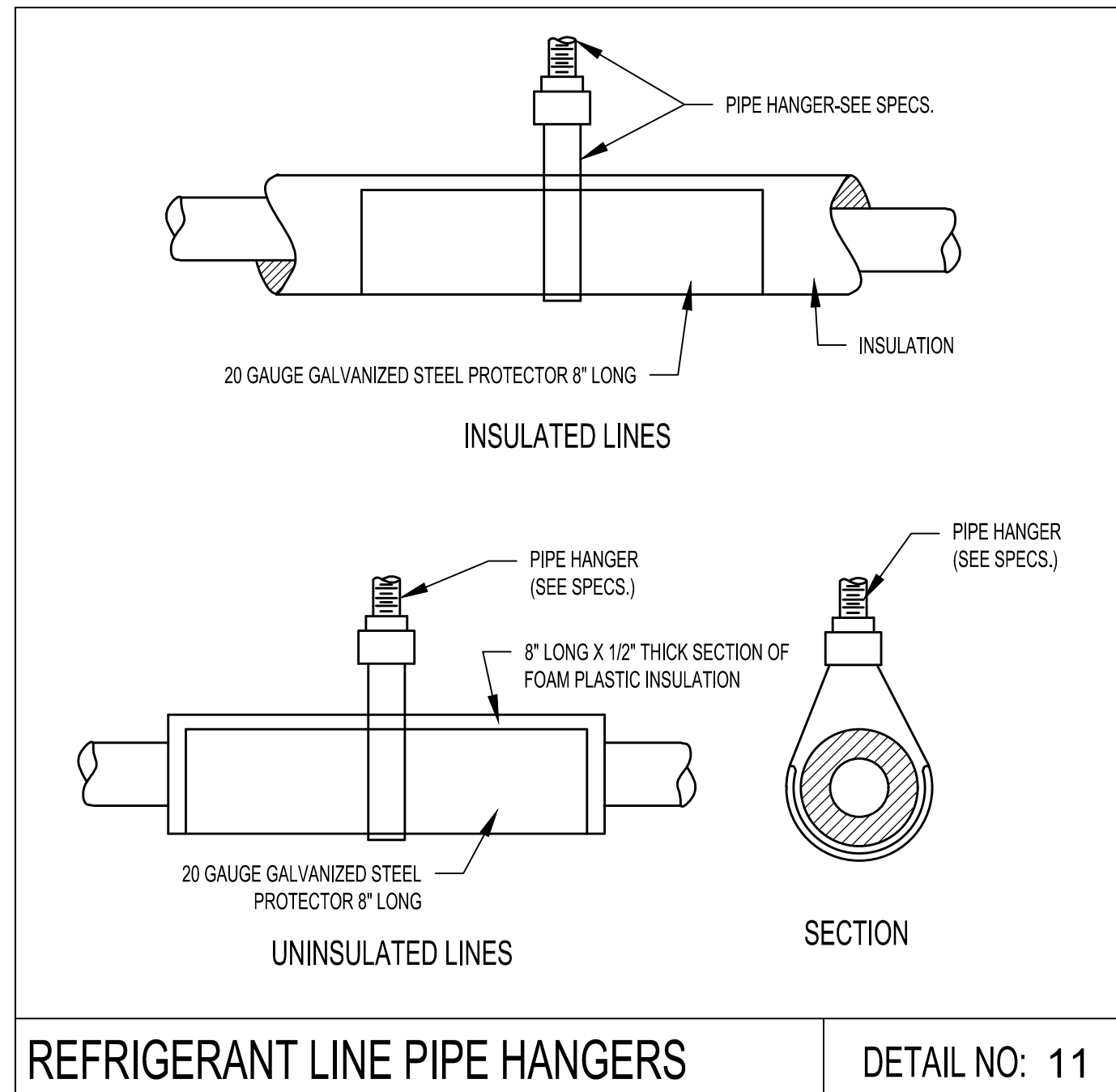
CEILING MOUNTED EXHAUST FAN

DETAIL NO: 2



DUCT LINER AT ACCESS DOOR

DETAIL NO: 1



REFRIGERANT LINE PIPE HANGERS

DETAIL NO: 11

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PROJECT STATUS:
ISSUED: BID SET FOR CONSTRUCTION

ISSUE DATE: FEBRUARY 05, 2024

REVISIONS		
No.	Description	Date

DRAWING TITLE
HVAC DETAILS

DRAWN BY: MTG
CHECKED BY: LIB

PROJECT NUMBER
225029-00

DRAWING NO.
M1.02

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22.07.163
2/9/2024

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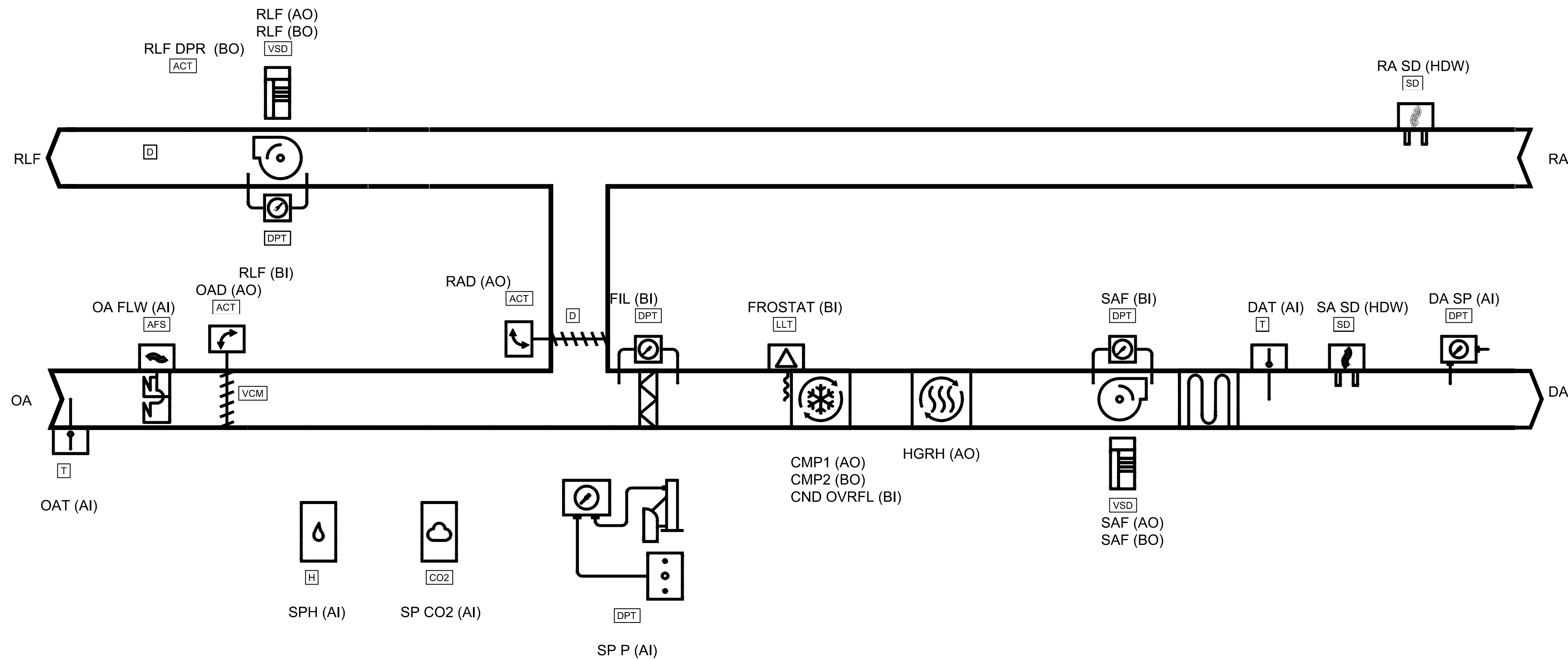
B

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F



SEQUENCE OF OPERATION

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. The BAS shall also send the discharge air temperature setpoint and the duct static pressure setpoint. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints.

Occupied:

During occupied periods, the supply fan shall run continuously and the mixed air dampers shall open to maintain minimum ventilation requirements. The unit controller shall control the supply fan speed to maintain the current supply duct static pressure setpoint (adj.). Upon a call for DX cooling, the unit controller shall enable the variable speed compressor. If the variable speed compressor cannot satisfy the load conditions, the unit controller shall start a fixed speed compressor. The variable speed compressor shall modulate to maintain the active discharge air temperature setpoint. This process shall repeat until all of the fixed speed compressors have been started or until the load conditions can be satisfied. If economizing is enabled, the outdoor air or mixed air dampers shall modulate to maintain the discharge air temperature setpoint and the relief air damper shall track the mixed air dampers. If the discharge air temperature sensor fails, the DX cooling and electric heat shall be disabled and an alarm shall annunciate at the BAS.

Unoccupied:

When the space temperature is below the unoccupied heating setpoint of 60.0 deg. F (adj.) the supply fan shall be commanded on, the outside air damper shall remain closed and the electric heat shall be enabled. When the space temperature rises above the unoccupied heating setpoint of 60.0 deg. F (adj.) plus the unoccupied differential of 4.0 deg. F (adj.) the supply fan shall stop and the electric heat shall be disabled. When the space temperature is above the unoccupied cooling setpoint of 85.0 deg. F (adj.) the supply fan shall be commanded on, the outside air damper shall open if economizing is enabled and remain closed if economizing is disabled and the DX cooling shall be enabled. When the space temperature falls below the unoccupied cooling setpoint of 85.0 deg. F minus the Unoccupied differential of 4.0 deg. F (adj.) the supply fan shall stop, the DX cooling shall be disabled and the outside air damper shall close.

Optimal Start:

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

Optimal Stop:

The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the space temperature to the space temperature offset setpoint. Outside air damper shall remain enabled to provide minimum ventilation.

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 unit shall enable the heating and fan(s). The outside air damper shall remain closed. When the space temperature reaches the occupied heating setpoint (adj.), 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 unit shall enable the fan and cooling or economizer. The outside air damper shall remain closed, unless economizing. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

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 from a space sensor, the unit shall transition from its current

occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Heat/Cool Mode:

COOLING: The unit controller shall use the discharge air temperature sensor and discharge air temperature cooling setpoint to determine when to initiate requests for cooling. Discharge air setpoint shall be maintained by controlling the cooling as required.

HEATING: The unit controller shall use the discharge air temperature sensor and discharge air temperature heating setpoint to determine when to initiate requests for heating. Discharge air setpoint shall be maintained by controlling the heating as required. During Unoccupied Heating or Morning Warm-Up Mode, the unit heat request shall be communicated to the system VAVs prior to commencing heating operation to allow VAV units to open. The variable speed drive shall be commanded to 100% and the heat shall be staged on and off to satisfy the zone temperature setpoint.

Discharge Air Temperature Reset Control:

The discharge air temperature setpoint, 55.0 deg. F - 65.0 deg. F (adj.) shall be reset based on either the outside air temperature or space average temperature (adj.). The minimum discharge air setpoint shall be set at 55.0 deg. F (adj.). The discharge temperature sensor shall prevent the discharge air temperature from falling below the minimum discharge air setpoint (adj.). If the discharge air temperature continues to fall, the discharge temperature sensor shall act as a low discharge temperature limit, a low temperature alarm shall annunciate, and the unit shall shut down. If the discharge temperature rises above the high limit setpoint the sensor shall act as a high discharge temperature limit and shall keep the unit running, a high temperature alarm shall annunciate.

OUTDOOR AIR TEMPERATURE RESET: The discharge air temperature setpoint shall be adjusted based on the outside air temperature and the cooling and heating load of the building.

SPACE TEMPERATURE RESET: The discharge air temperature setpoint shall be adjusted based on the temperature of the critical space(s).

Dehumidification:

The unit shall be in dehumidification mode if the space humidity is above the dehumidification setpoint. In the dehumidification mode, the supply air fan shall be enabled, the outside air damper shall be commanded to minimum position, and the unit controller shall energize mechanical cooling and the hot gas reheat coil shall modulate.

MULTI-CIRCUIT UNITS: During dehumidification mode the outside air temperature shall be monitored. If this temperature rises above the reheat capacity limit setpoint or falls below the reheat capacity limit setpoint - 3.0 deg. F (adj.), the unit shall stage down or stage up the compressors respectively to meet full or part load capacity requirements based on ambient temperature. Factory installed hot gas reheat shall allow application of dehumidification. Dehumidification shall be allowed only when the outside air temperature is above 40.0 deg. F and below 100.0 deg. F. The economizer outside air damper shall drive to minimum position during dehumidification.

MULTI-CIRCUIT UNITS: On a call for dehumidification, the hot gas reheat valve in circuit 1 shall energize and the compressor(s) shall enable. When the humidity control setpoint is satisfied, the valve shall be de-energized and the compressor(s) in circuit 1 shall be disabled. If there is a call for 1st stage cooling while in the dehumidification mode, no action shall take place. If there is a call for 2nd stage cooling, the hot gas reheat valve shall be de-energized, and the unit shall revert to the cooling mode. If 2nd stage cooling is satisfied and there is still a call for dehumidification, the hot gas reheat valve shall once again be energized.

Economizer:

ENABLE (Reference Dry Bulb): Outside air (OA) temperature shall be compared with a reference dry bulb setpoint. The economizer shall enable when the OA temperature is less than reference dry bulb setpoint. The economizer shall be disabled when OA temperature is greater than reference dry bulb setpoint + 2.0 deg. F.

OPERATION: The supply air sensor shall measure the dry bulb temperature of the air leaving the evaporator coil while economizing.

When economizing is enabled and the unit is operating in the cooling mode, the economizer damper shall be modulated between its minimum position and 100% to maintain the discharge air temperature setpoint. The economizer damper shall modulate toward minimum position in the event the discharge air temperature falls below the discharge low limit temperature setpoint. Compressors shall be delayed from operating until the economizer has opened to 100%.

Ventilation Control:

When the space CO2 level is greater than or equal to the Design Minimum CO2 Setpoint, the outdoor air damper shall open to the Design Minimum Outdoor Air Damper Setpoint. When the space CO2 level is less than or equal to the DCV Minimum CO2 Setpoint, the outdoor air damper shall close to the DCV Minimum Outdoor Air Damper Setpoint. If there is a call for economizer cooling, the damper shall be opened further to satisfy the cooling request.

Supply Fan:

The supply fan shall be enabled while in the occupied mode and cycled on during the unoccupied mode.

Supply Duct Static Pressure Control:

During the occupied mode the unit controller shall modulate the output to the variable speed drive as required to maintain the supply duct static pressure setpoint of 1.5 inches of W.C. (adj.). If the supply duct static pressure falls below 1.3 inches of W.C. (adj.) the unit controller shall increase the output to the variable speed drive to maintain setpoint. If the supply duct static pressure rises above 1.7 inches of W.C. (adj.) the unit controller shall decrease the output to the variable speed drive to maintain setpoint. Upon a call for heating or cooling in the unoccupied mode the unit controller shall modulate the speed of the variable speed drive to 100%.

Static Pressure High Limit:

If for any reason the supply air pressure exceeds the supply air pressure high limit, the supply fan shall shut down. The unit shall be allowed to restart three times after a 15 minute off period. If the overpressurization condition occurs on the fourth restart, the unit shall shut down and a manual reset diagnostic is displayed at the remote panel and/or the BAS system.

Relief Air and Building Pressure Control:

A differential pressure transducer shall actively monitor the difference in pressure between the building (indoors) and outdoors. If the building pressure increases above the differential pressure setpoint, the unit controller shall open the relief air damper, turn on the relief air fan and modulate the relief air fan variable speed drive to control building pressure to the differential pressure setpoint. If the building pressure decreases below the differential pressure setpoint, the associated controller shall deactivate the relief air fan variable speed drive.

A differential pressure switch shall monitor the differential pressure across the relief air fan. If the switch is detected to be open for 40 consecutive seconds after a request for relief fan operation a fan failure alarm shall annunciate at the BAS and the relief fan shall stop. A manual reset shall be required.

Filter Status:

A differential pressure switch shall monitor the differential pressure across the filter(s) when the fan is running. If the switch closes during normal operation a dirty filter alarm shall annunciate at the BAS.

Smoke Detector Shutdown:

The unit shall shut down in response to a signal from the smoke detector indicating the presence of smoke and an alarm shall annunciate at the BAS. The smoke detector shall be interlocked to the unit through the dry contacts of the smoke detector. A manual reset of the smoke detector shall be required to restart the unit.

Condensate Overflow Shutdown:

The unit shall shut down in response to a signal from the condensate overflow sensor. The sensor shall be interlocked to the unit cooling controller for immediate shutdown of cooling.

System Point Description	POINTS								ALARMS						
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT (AO)	BINARY HARDWARE OUTPUT (BO)	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
BUILDING STATIC PRESSURE LOCAL SP P	X	X							X	X				X	
COMPRESSOR 1 MODULATION COMMAND CMP1	X			X											
COMPRESSOR 2 COMMAND CMP2	X				X										
CONDENSATE OVERFLOW DETECTION LOCAL CND OVFL	X	X									X				
COOLING OUTPUT COMMAND CLG	X		X												
DISCHARGE AIR STATIC PRESSURE LOCAL DA SP		X							X	X		X			
DISCHARGE AIR TEMPERATURE DAT	X	X												X	
DX COIL FROST STAT FROSTAT	X	X									X				
HOT GAS REHEAT VALVE COMMAND HGRH	X			X											
MIXED AIR DAMPER MAD	X			X											
OUTSIDE AIR DAMPER COMMAND OAD	X			X											
OUTSIDE AIR FLOW LOCAL OA FLW	X	X													
OUTSIDE AIR TEMPERATURE LOCAL OAT	X	X												X	
PRIMARY FILTER STATUS LOCAL FIL	X	X										X			
RELIEF AIR DAMPER OPEN/CLOSE RLF DPR	X				X										
RELIEF AIR FAN SPEED RLF	X			X											
RELIEF AIR FAN START/STOP RLF	X				X										
RELIEF AIR FAN STATUS LOCAL RLF	X	X													
RETURN AIR DAMPER COMMAND RAD	X			X											
RETURN AIR SMOKE DETECTION LOCAL RA SD							X								
SPACE CO2 LOCAL (WIRED) SP CO2		X								X				X	
SPACE HUMIDITY LOCAL (WIRED) SPH	X	X								X				X	
SUPPLY AIR SMOKE DETECTION LOCAL SA SD							X								
SUPPLY FAN SPEED SAF				X											
SUPPLY FAN START/STOP SAF	X				X										
SUPPLY FAN STATUS LOCAL SAF	X	X													
APPLICATION MODE APP MODE						X									
BAS COMMUNICATION STATE BAS COM					X										X
COMPRESSOR ENABLE CMP ENA	X				X										
COMPRESSOR LOCKOUT STATUS CMP LCK						X									
COOL OUTPUT CLG						X									
DISCHARGE AIR STATIC PRESSURE SETPOINT DA SP SPT	X				X										
ECONOMIZER ENABLE ECON ENA						X									
ECONOMIZER MINIMUM POSITION SETPOINT ECON MIN POS SP	X				X										
FAN MODE COMMAND FAN MODE						X									
FILTER TIMER HOURS FIL HRS						X									
HEAT / COOL MODE REQUEST H/C REQ	X				X										
HEAT OUTPUT HTG						X									
OCCUPANCY OCC	X					X									
OCCUPIED COOLING SETPOINT OCC CLG SP	X	X				X									
SPACE CO2 HIGH LIMIT SP CO2 HL							X								
TIMED OVERRIDE STATUS TOV							X								
UNOCCUPIED COOLING SETPOINT UNOCC CLG SP	X					X									
UNOCCUPIED HEATING SETPOINT UNOCC HTG SP	X					X									

BUILDING AUTOMATION SYSTEM (BAS) GENERAL NOTES

- THE BAS SHALL MONITOR AND CONTROL ALL HVAC UNITS AS SHOWN ON THE PLANS AND OUTLINED IN THE HVAC SPECIFICATIONS. THESE GENERAL NOTES APPLY TO ALL CONTROL DRAWINGS AND SYSTEMS.
- OCCUPANCY:
 - THE BAS SHALL SCHEDULE HVAC EQUIPMENT TO OPERATE ON A SEVEN DAY PER WEEK TIME OF DAY SCHEDULE. ALL OCCUPANCY SCHEDULES SHALL BE OPERATOR ADJUSTABLE AND SHALL BE CONFIRMED WITH THE OWNERS REPRESENTATIVE. ALL OCCUPANCY SCHEDULES SHALL BE IMPLEMENTED AND ACTIVE PRIOR TO THE DATE SCHEDULED FOR SUBSTANTIAL COMPLETION.
 - OCCUPIED: THE BUILDING SHALL BE COMMANDED OCCUPIED MODE AT 7:00 AM TO 5:00 PM MON. - FRI. AND SAT. 7:00 AM - 12:00 PM.
 - UNOCCUPIED: THE BUILDING SHALL BE COMMANDED TO UNOCCUPIED MODE AT 5:00 PM TO 7:00 AM TU. - SAT., AND 12:00 PM TO 7:00 AM SAT. - MON.
 - UNOCCUPIED OVERRIDE: IN UNOCCUPIED MODE THE HEATING AND COOLING SYSTEM MAY BE OVERRIDDEN BY ENERGIZING THE TEMPERATURE SENSOR MOUNTED OVERRIDES BUTTON. WHEN ENGAGE THE UNIT SHALL OPERATE IN OCCUPIED MODE AND CONTROL TO OCCUPIED SETPOINT FOR 120 MINUTES. OVERRIDE MAY BE CANCELED AT THE SENSOR MOUNT OVERRIDE BUTTON.
 - HOLIDAYS: THE BAS CONTRACTOR SHALL OBTAIN AND IMPLEMENT OWNERS CURRENT HOLIDAY SCHEDULE.
- SETPOINTS:
 - OCCUPIED: 72°F (ADJ.)
 - UNOCCUPIED: 85°F SUMMER, 60°F WINTER.
- BAS SHALL BE INTEGRATED WITH THE WITH FIRE ALARM SYSTEM TO EFFECT EQUIPMENT SHUTDOWN THROUGH ALARM INTERLOCKS.
- MECHANICAL AND CONTROL CONTRACTORS SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR FOR EXACT QUANTITY AND LOCATIONS OF 120V CONTROL POWER CIRCUITS REQUIRED TO POWER ALL CONTROL DEVICES, PANELS, VAV TERMINALS, AND AUTOMATIC ACTUATORS COMPLETE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.
- ALL SMOKE DETECTORS ARE PROVIDED AND WIRED BY THE ELECTRICAL CONTRACTOR, AND INSTALLED BY THE MECHANICAL CONTRACTOR.
- INSTALL SMOKE DETECTORS AT AC UNITS PER THE INTERNATIONAL MECHANICAL CODE. ALL AC UNITS WITH SMOKE DETECTORS SHALL BE INTERLOCKED TO THE FIRE ALARM SYSTEM AND SHALL SHUT DOWN ACCORDING TO THE STATE REQUIREMENTS (10 SECONDS) AND SHALL AUTOMATICALLY RESTART WHEN ALARM STATUS CLEARS, OVERRIDE OF THE FIRE ALARM SHUTDOWN IS NOT ALLOWED UNDER ANY CIRCUMSTANCES.
- BAS OPERATOR INTERFACE COMPUTER SHALL BE INSTALLED AT THE LOCATION DETERMINED BY THE OWNER. COORDINATE LOCATION WITH OWNER PRIOR TO PREPARING SUBMITTALS. CLEARLY INDICATE OPERATOR INTERFACE COMPUTER LOCATION IN THE SUBMITTALS, AND PROVIDE THE LOCATION TO THE ELECTRICAL CONTRACTOR, AND THE OWNERS, IT DEPARTMENT HEAD. CLEARLY INDICATE IN THE SUBMITTALS EXACTLY WHAT THE OWNER MUST PROVIDE TO INTERFACE HIS INFRASTRUCTURE WITH THE OPERATOR INTERFACE COMPUTER.
- THE BAS CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY RELAYS, SWITCHES, SENSORS, LOW VOLTAGE CONTROL WIRING, ACTUATORS, ETC. AND SHALL COORDINATE WITH THE REQUIREMENTS FOR FACTORY MOUNTED CONTROL DEVICES, AND SENSORS, FOR A COMPLETE AND FUNCTIONAL CONTROLS SYSTEM.
- COORDINATE THE FINAL LOCATION OF ALL WALL MOUNTED SENSORS WITH THE ARCHITECTURAL PLANS, FURNITURE LAYOUTS, ELECTRICAL SWITCHES, AND OTHER WALL MOUNTED DEVICES.
- PRIOR TO THE DATE OF SUBSTANTIAL COMPLETION THE CONTROL CONTRACTOR SHALL COMPLETE THE FOLLOWING:
 - CHECK OUT AND COMMISSION ALL SEQUENCES OF OPERATION.
 - COMPLETE VERIFICATION OF ALL POINT TO POINT CHECKS.
 - OPERATOR INTERFACE TERMINAL SHALL BE INSTALLED, WITH ALL GRAPHICS COMPLETE, INCLUDING VERIFICATION OF POINT MAPPING.
 - POINTS SPECIFIED TO BE TRENDED SHALL BE ACTIVE WITH DATA AVAILABLE.

RTU-1, RTU-4 AND RTU-9 CONTROL DIAGRAM

NO SCALE

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22.07.163

2/9/2024

USSRC - INSPIRATION 4 TRAINING FACILITY

OWNER
UNITED STATES SPACE AND ROCKET CENTER

PROJECT ADDRESS
1 Tranquility Base
Huntsville, AL 35895



PROJECT STATUS:
ISSUED: BID SET FOR CONSTRUCTION

ISSUE DATE: FEBRUARY 05, 2024

REVISIONS

No. Description Date

DRAWING TITLE
BUILDING AUTOMATION SYSTEM CONTROLS DIAGRAMS AND SEQUENCES OF OPERATION

DRAWN BY: MTG
CHECKED BY: UB

PROJECT NUMBER
225029-00

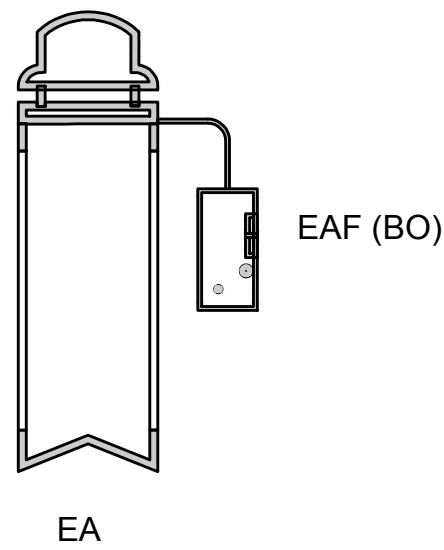
DRAWING NO.

M1.03



DRAWING NO.
M1.04

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SEQUENCE OF OPERATION

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller an Occupied or Unoccupied command. If a BAS is not present, or communication is lost with the BAS, the controller shall operate in the Occupied mode.

Occupied:

During occupied periods, the exhaust fan shall run continuously.

Unoccupied:

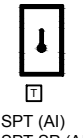
During unoccupied periods the exhaust fan shall be disabled.

POINTS LIST															
System Point Description		POINTS								ALARMS					
						</									

EXHAUST FANS CONTROL DIAGRAM

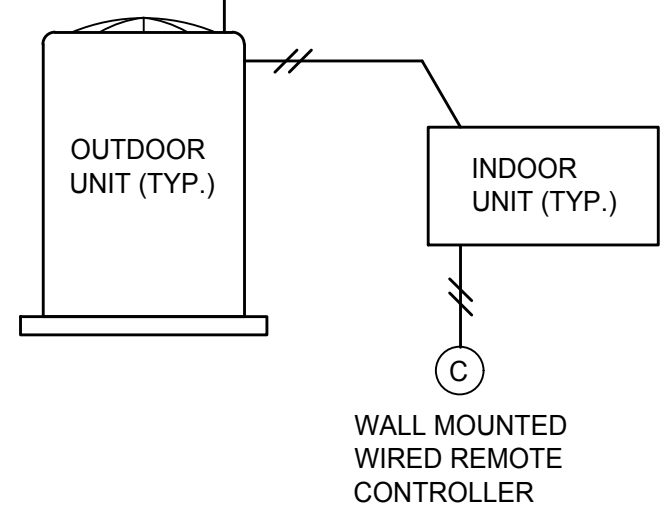
NO SCALE

WALL MOUNTED SPACE TEMPERATURE SENSOR FOR BAS MONITORING. ALARM HIGH TEMPERATURE WHEN SPACE TEMPERATURE IS ABOVE 80°F. ONE REQUIRED FOR EACH SPACE.



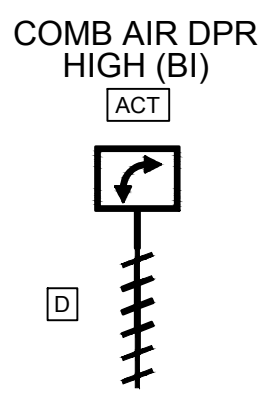
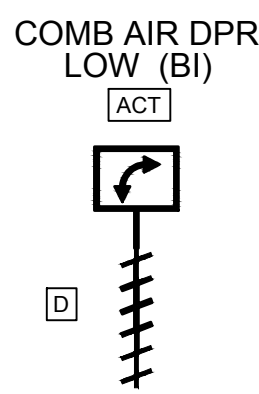
DISCONNECT SWITCH FURNISHED & INSTALLED BY ELECTRICAL

SEE PLANS FOR V/Ø/HZ



MINI-SPLIT AC UNIT CONTROL DIAGRAM

NO SCALE



SEQUENCE OF OPERATION

Building Automation System Interface:

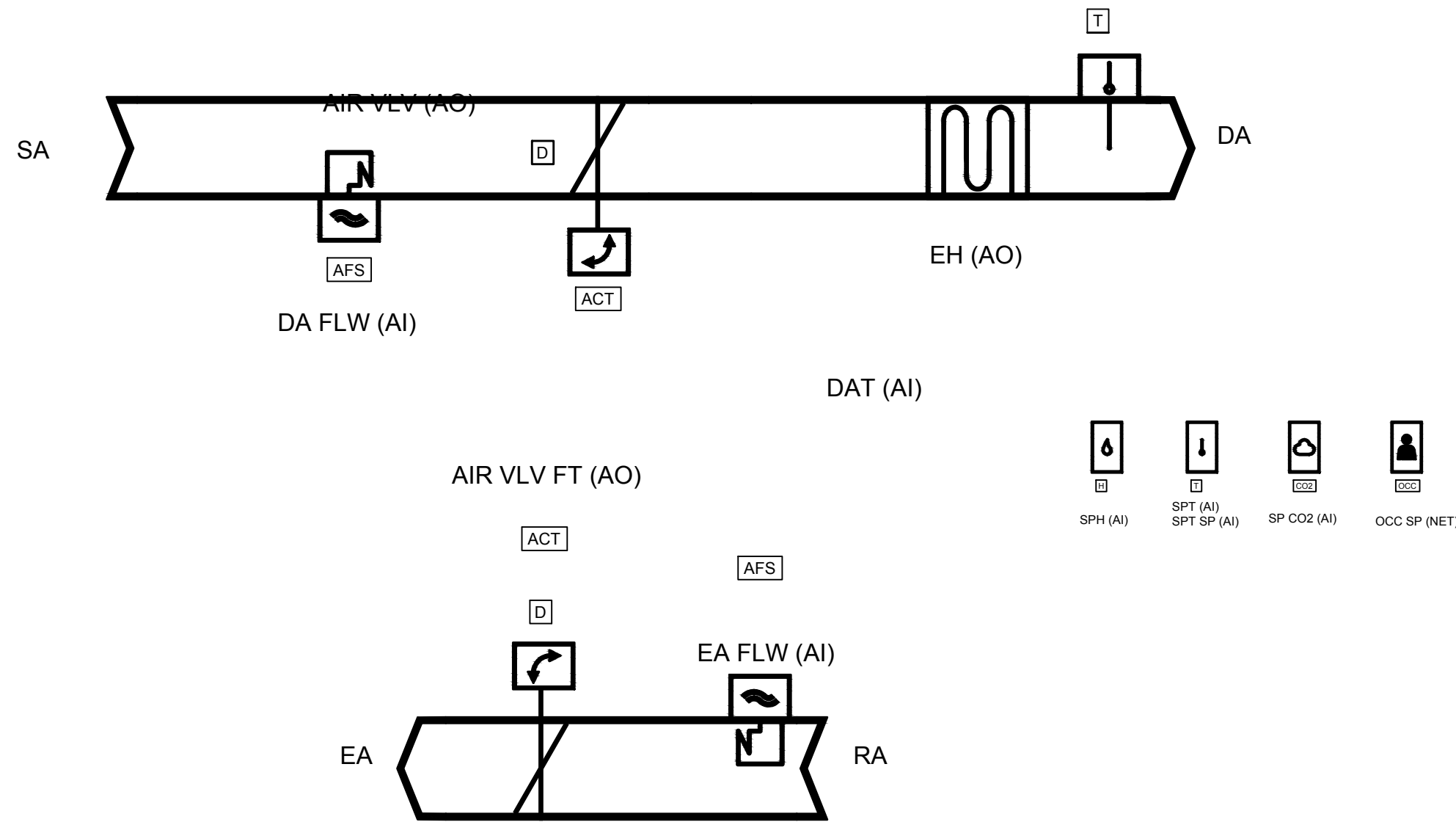
The Building Automation System (BAS) shall monitor the dry contacts at each clothes dryer.

When the contacts at either clothes dryer close indicating a dryer start the high and low combustion air dampers shall be commanded 100% open.

When the contacts at either clothes dryer open indicating a dryer stop the high and low combustion air dampers shall be commanded 0% open.

DRYER COMBUSTION AIR CONTROL DIAGRAM

NO SCALE



SEQUENCE OF OPERATION

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied, and Unoccupied commands. The BAS may also send a Heat/Cool mode, priority shutdown commands, space temperature and/or space temperature setpoint. If communication is lost with the BAS, the controller shall operate using its local setpoints.

Occupied:

Normal operating mode for occupied spaces or daytime operation. When the unit is in the occupied mode the VAV shall maintain the space temperature at the active occupied heating or cooling setpoint. Applicable ventilation and airflow setpoints shall be enforced. The occupied mode shall be the default mode of the VAV.

Unoccupied:

Normal operating mode for unoccupied spaces or nighttime operation. When the unit is in the unoccupied mode the VAV controller shall maintain the space temperature at the stored unoccupied heating or cooling setpoint regardless of the presence of a hardwired or communicated setpoint. When the space temperature exceeds the active unoccupied setpoint the VAV shall modulate fully closed.

Occupied Bypass:

Mode used to temporarily place the unit into the occupied operation. Tenants shall be able to override the unoccupied mode from the space sensor. The override shall last for a maximum of 4 hours (adj.). The tenants shall be able to cancel the override from the space sensor at any time. During the override the unit shall operate in occupied mode.

Heat/Cool Mode:

The Heat/Cool mode shall be set by a communicated value or automatically by the VAV. In standalone or auto mode the VAV shall compare the primary air temperature with the configured auto changeover setpoint to determine if the air is "hot" or "cold". Heating mode implies the primary air temperature is hot. Cooling mode implies the primary air temperature is cold."

Heat/Cool Setpoint:

The space temperature setpoint shall be determined either by a local (e.g., thumbwheel) setpoint, the VAV default setpoint or a communicated value. The VAV shall use the locally stored default setpoints when neither a local setpoint nor communicated setpoint is present. If both a local setpoint and communicated setpoint exist, the VAV shall use the communicated value.

Cooling Mode:

When the unit is in cooling mode, the VAV controller shall maintain the space temperature at the active cooling setpoint by modulating the airflow between the active cooling minimum airflow setpoint to the maximum cooling airflow setpoint. The VAV shall use the measured space temperature and the active cooling setpoint to determine the requested cooling capacity of the unit. The outputs will be controlled based on the unit configuration and the requested cooling capacity. When in the Occupied Mode, the controller shall use the measured space temperature and the active cooling setpoint to determine the requested cooling capacity of the unit. The outputs shall be controlled based on the unit configuration and the requested cooling capacity.

Heating Mode:

When the unit is in heating mode, the VAV controller shall maintain the space temperature at the active heating setpoint by modulating the airflow between the active heating minimum airflow setpoint to the maximum heating airflow setpoint. The VAV controller shall use the measured space temperature and the active heating setpoint to determine the requested heating capacity of the unit. The outputs will be

controlled based on the unit configuration and the requested heating capacity.

Local Reheat Control:

Reheat will only be allowed when the primary air temperature is 5.0 deg. F below the configured reheat enable setpoint of 70.0 deg. F (adj.). The reheat shall be enabled when the space temperature drops below the active heating setpoint and the minimum airflow requirements are met. During reheat the VAV shall operate at its minimum heating airflow setpoint and energize the heat as follows:

Electric Silicon Controlled Rectifier Reheat (SCR):

If the space temperature is at the heating setpoint, the electric heater shall modulate as required to maintain space temperature at the active heating setpoint while the VAV operates at its minimum heating airflow setpoint. If the discharge air temperature reaches the design heating discharge air temperature setpoint (adj.), the VAV shall modulate airflow between the minimum heating airflow setpoint and the maximum heating airflow setpoint as required to maintain space temperature at the active heating setpoint, while the electric heater modulates to maintain discharge air temperature at the design heating discharge air temperature setpoint. If the airflow reaches the maximum heating airflow setpoint, the VAV shall modulate the electric heater as required to maintain space temperature at the active heating setpoint, while the VAV operates at its maximum heating airflow setpoint.

Demand Control Ventilation:

When the unit is in unoccupied mode, the ventilation airflow setpoint will be zero. When the unit is in occupied mode, the ventilation airflow setpoint shall be equal the design outdoor airflow and reset based on CO2.

CO2 SENSOR: When the unit is in occupied mode, the ventilation airflow setpoint will be continuously calculated using the measured CO2 concentration in the space.

The current ventilation airflow setpoint shall be communicated to the BAS for control of the system outdoor-air intake.

Space Sensor Failure:

If there is a fault with the operation of the zone sensor an alarm shall be annunciated at the BAS. Space sensor failure shall cause the VAV to drive the damper to minimum air flow if the VAV is in the occupied mode, or drive it closed if the VAV is in the unoccupied mode.

Space Humidity Monitoring:

The VAV Box will monitor the space humidity.

Flow Tracking Control:

A space temperature control VAV box and a flow tracking VAV box are coordinated together to achieve space pressure control. The space temperature control box air flow will be communicated to the flow tracking box as its air flow setpoint.

Positive Space Pressure Control - When enabled, the flow tracking control box will modulate the air damper to maintain the space air flow setpoint plus the air flow offset (adj.).

Negative Space Pressure Control - When enabled, the flow tracking control box will modulate the air damper to maintain the space air flow setpoint minus the air flow offset (adj.).

POINTS LIST

System Point Description	POINTS										ALARMS				
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT (AO)	BINARY HARDWARE OUTPUT (BO)	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
AIR VALVE MODULATION COMMAND	X														
AIR VLV															
AIR VALVE MODULATION COMMAND	X		X												
FLOW TRACKING															
AIR VLV FT															
DISCHARGE AIR TEMPERATURE	X	X								X	X			X	
DAT															
EXHAUST AIRFLOW	X	X								X	X				
EA FLW															
LOCAL HEAT ELECTRIC SCR OUTPUT	X		X												
EH															
SPACE CO2 CONCENTRATION LOCAL	X	X								X					
SP CO2															
SPACE HUMIDITY LOCAL	X	X								X					
SPH															
SPACE OCCUPANCY INPUT	X		X												
SP OCC															
SPACE TEMPERATURE LOCAL	X	X													
SPT															
SPACE TEMPERATURE SETPOINT	X	X													
LOCAL															
SPT SP															
SUPPLY AIRFLOW	X	X								X	X				
DA FLW															
BAS COMMUNICATION STATE					X										X
BAS COM															
DESIGN HEAT DISCHARGE AIR TEMP					X										
SETPOINT															
DSNG HT DAT SP															
MAXIMUM COOLING AIRFLOW					X										
SETPOINT															
MAX CLG FLW SP															
MINIMUM COOLING AIRFLOW					X										
SETPOINT															
MIN CLG FLW SP															
MAXIMUM HEATING AIRFLOW					X										
SETPOINT															
MAX HTG FLW SP															
MINIMUM HEATING AIRFLOW					X										
SETPOINT															
MIN HTG FLW SP															
OCCUPIED BYPASS TIMER	X		X												
OCC TMR															
OCCUPIED COOLING SETPOINT	X		X												
OCC CLG SP															
OCCUPIED HEATING SETPOINT	X		X												
OCC HTG SP															
UNOCCUPIED COOLING SETPOINT	X		X												
UNOCC CLG SP															
SPACE OCCUPANCY (COMMUNICATED)	X								X						
OCC SP															
UNOCCUPIED HEATING SETPOINT	X		X												
UNOCC HTG SP															
SUPPLY FAN COMMAND	X		X												
SF CMD															

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OWNER
UNITED STATES SPACE AND ROCKET CENTER

PROJECT ADDRESS
1 Tranquility Base
Huntsville, AL 35805



PROJECT STATUS: BID SET FOR CONSTRUCTION

ISSUED:

ISSUE DATE: FEBRUARY 05, 2024

REVISIONS

No. Description Date

DRAWING TITLE
BUILDING AUTOMATION SYSTEM CONTROLS DIAGRAMS AND SEQUENCES OF OPERATION

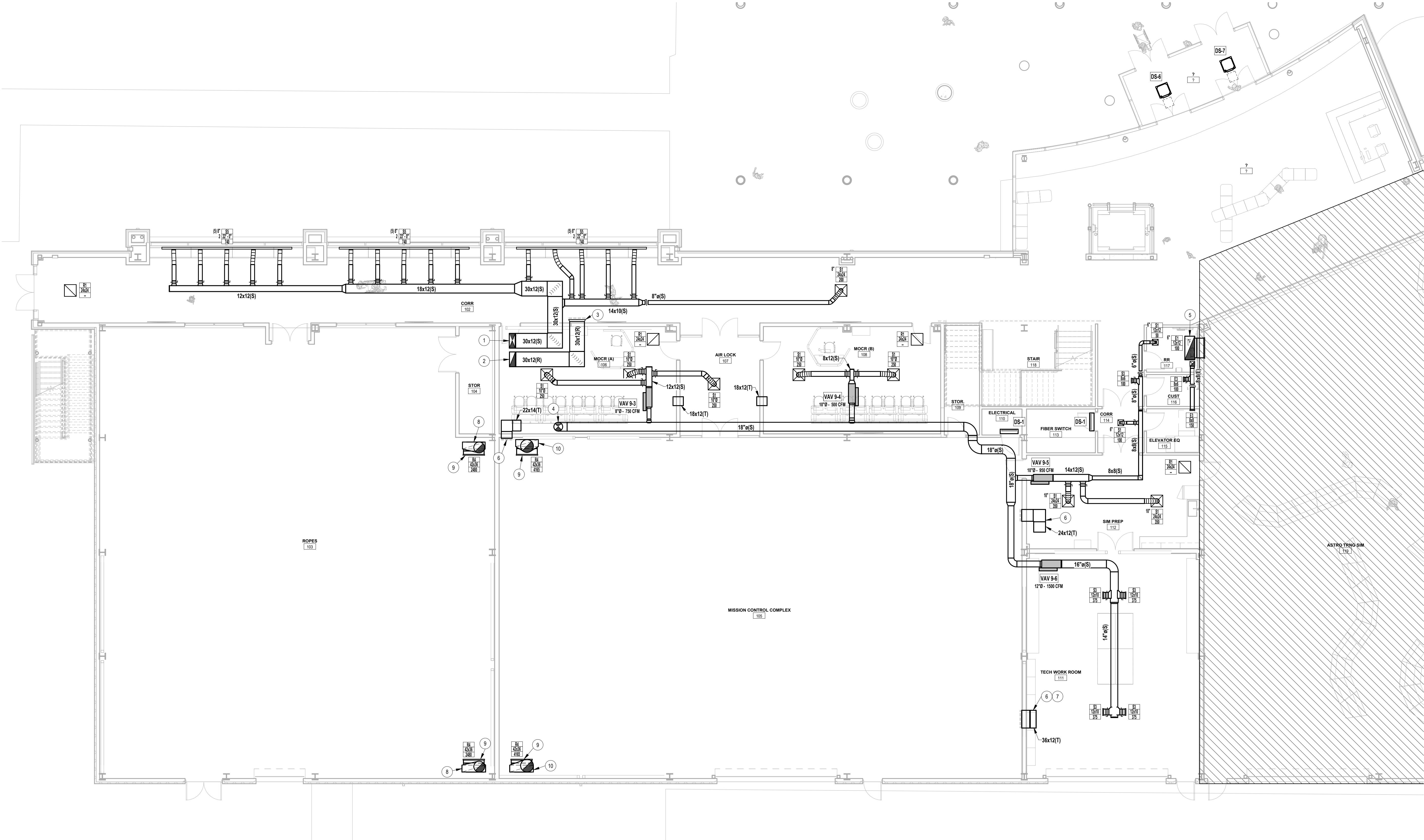
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CHECKED BY: UB

PROJECT NUMBER
225029-00

DRAWING NO.
M1.05

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BBG&S



1 1ST FLOOR - WEST WING - DUCTWORK
1/8" = 1'-0"

KEYED NOTES

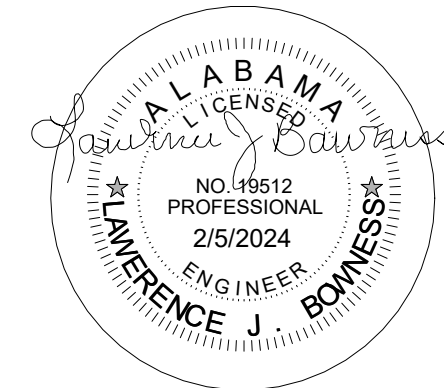
- 30x12 SUPPLY UP TO RTU-11 ON ROOF.
- 30x12 RETURN UP TO RTU-11 ON ROOF.
- OPEN RETURN ABOVE CEILING WITH EXPANDED METAL GRILLE OVER OPENING.
- 18"Ø SUPPLY UP.
- 48x20 RETURN UP. MD IN VERTICAL.
- LINED DUCT TRANSFER WITH EXPANDED METAL GRILLE OVER OPENING.
- BOTTOM OF DUCT TRANSFER TO BE 10" AFF.
- 48x14 UP TO 22"Ø RETURN UP.
- BOTTOM OF RETURN GRILLE TO BE 1'-0" AFF.
- 48x14 UP TO 26"Ø RETURN UP.

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Huntsville, AL 35805



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No. Description Date

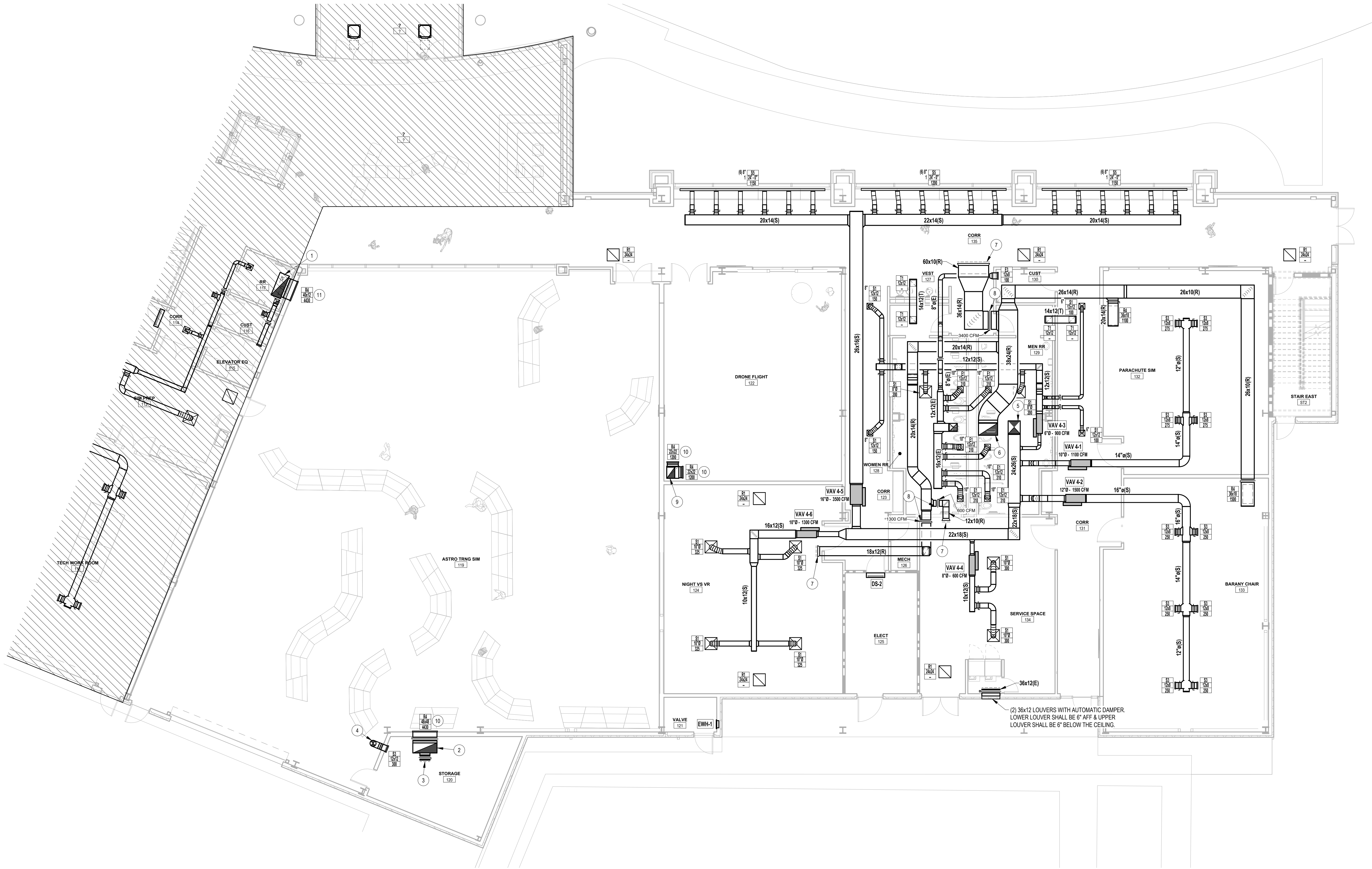
DRAWING TITLE
LEVEL 1 FLOOR
PLAN - WEST WING

DRAWN BY: MTG
CHECKED BY: LB

PROJECT NUMBER
225029-00

DRAWING NO.
M2.11

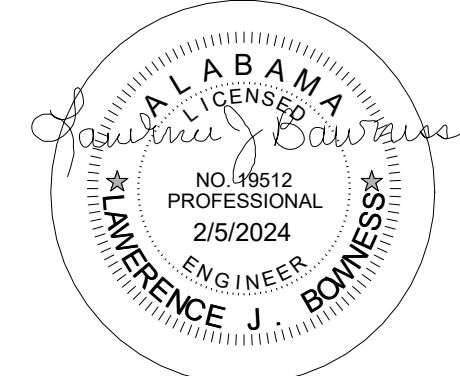
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1 1ST FLOOR - EAST WING - DUCTWORK
1/8" = 1'-0"

KEYED NOTES

- 48x20 RETURN UP. MD IN VERTICAL.
- 48x20 RETURN UP.
- 20x12 RETURN WITH EXPANDED METAL GRILLE OVER OPENING. BOTTOM OF DUCT 10" AFF.
- 12"Ø SUPPLY UP. MD IN VERTICAL.
- 24x26 SUPPLY UP TO RTU-4 ON ROOF.
- 38x24 RETURN UP TO RTU-4 ON ROOF.
- OPEN RETURN ABOVE CEILING WITH EXPANDED METAL GRILLE OVER OPENING.
- BALANCE MANUAL DAMPER TO CFM SHOWN.
- 24x24 UP TO 22x16 RETURN UP TO RTU-5 ON ROOF.
- BOTTOM OF RETURN GRILLE TO BE 10" AFF.
- RETURN GRILLE TO BE INSTALLED AS LOW AS POSSIBLE ABOVE CEILING IN RESTROOM (117).



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ISSUED: FOR CONSTRUCTION

ISSUE DATE: FEBRUARY 05, 2024

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No. Description Date

DRAWING TITLE
LEVEL 1 FLOOR
PLAN - EAST WING

DRAWN BY: MTG
CHECKED BY: LB

PROJECT NUMBER
225029-00

DRAWING NO.
M2.12

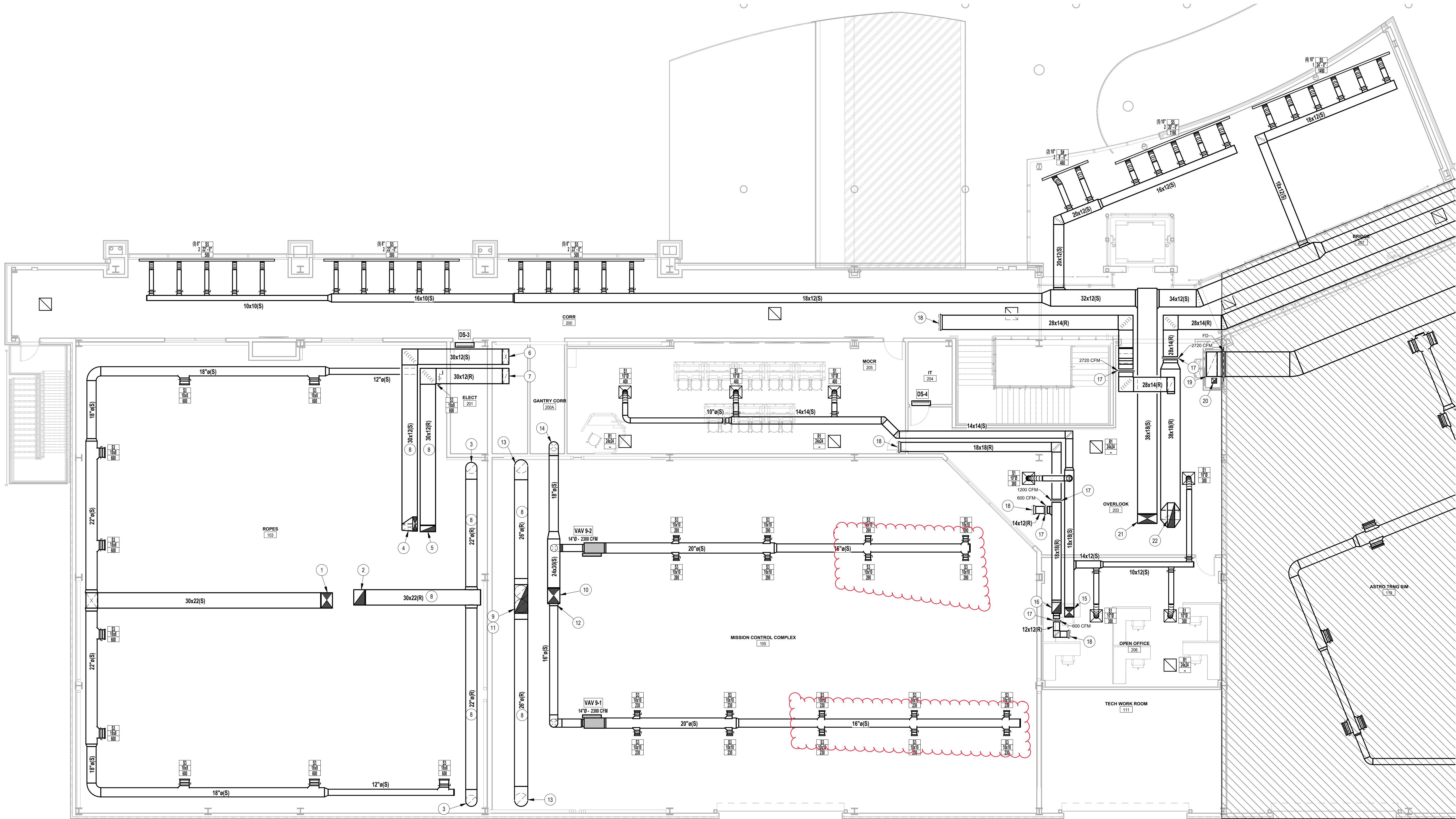
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Engineering Consultants, Inc.
2850 Oak Ridge Road, Suite 115
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1 2ND FLOOR - WEST WING - DUCTWORK
1/8" = 1'-0"

KEYED NOTES

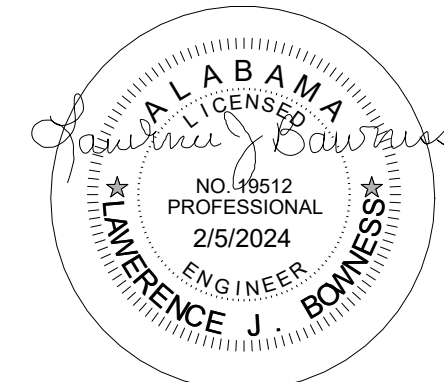
- 30x22 SUPPLY UP TO RTU-10 ON ROOF.
- 30x22 RETURN UP TO RTU-10 ON ROOF.
- 22"Ø RETURN DN.
- 30x12 SUPPLY UP TO RTU-11 ON ROOF.
- 30x12 RETURN UP TO RTU-11 ON ROOF.
- 30x12 SUPPLY DN.
- 30x12 RETURN DN.
- DUCTWORK TO BE INSTALLED TIGHT TO STRUCTURE.
- 56x26 UP TO RTU-9 ON ROOF.
- 30x24 UP TO RTU-9 ON ROOF.
- SPLIT IN VERTICAL FROM 56x26 TO (2) 26"Ø.
- TAP 16Ø IN VERTICAL DROP.
- 26"Ø RETURN DN.
- 18"Ø SUPPLY DN.
- 18x18 SUPPLY UP TO RTU-7 ON ROOF.
- 22x18 RETURN UP TO RTU-7 ON ROOF.
- BALANCE MANUAL DAMPER TO CFM SHOWN.
- OPEN RETURN ABOVE CEILING WITH EXPANDED METAL GRILLE OVER OPENING.
- 46x20 RETURN DN.
- 10x10 EXHAUST UP TO EF-1 ON ROOF.
- 38x18 SUPPLY UP TO RTU-8 ON ROOF.
- 38x18 RETURN UP TO RTU-8 ON ROOF.

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1 Tranquility Base
Huntsville, AL 35805



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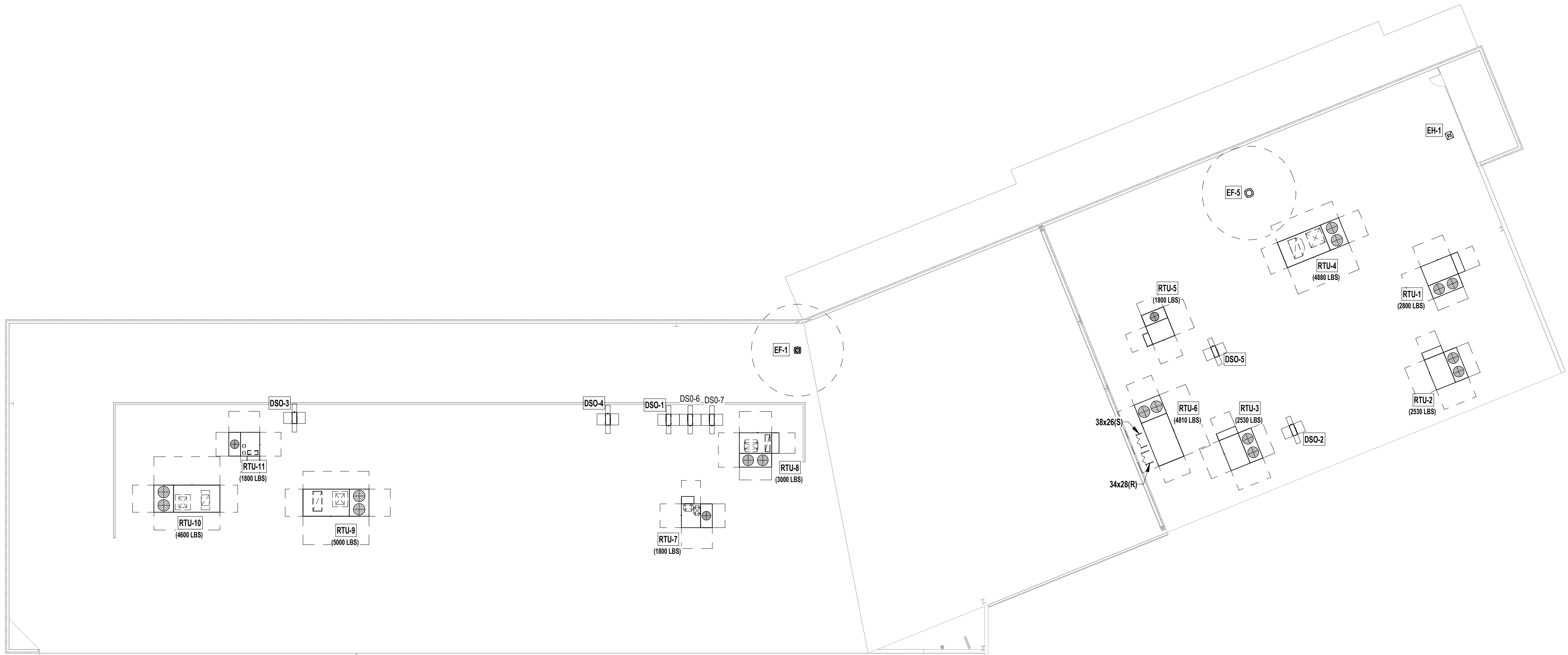
DRAWING TITLE
**LEVEL 2 FLOOR
PLAN - WEST WING**

DRAWN BY: MTG
CHECKED BY: LB

PROJECT NUMBER
225029-00

DRAWING NO.
M2.13

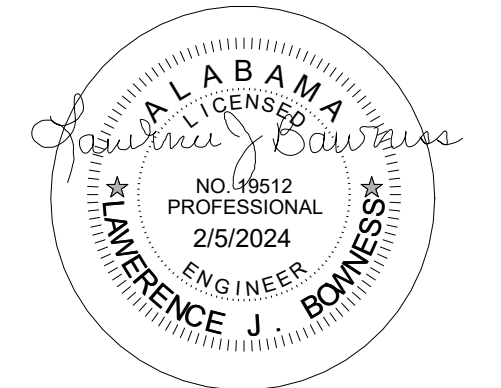
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1 ROOF PLAN - HVAC
1/16" = 1'-0"

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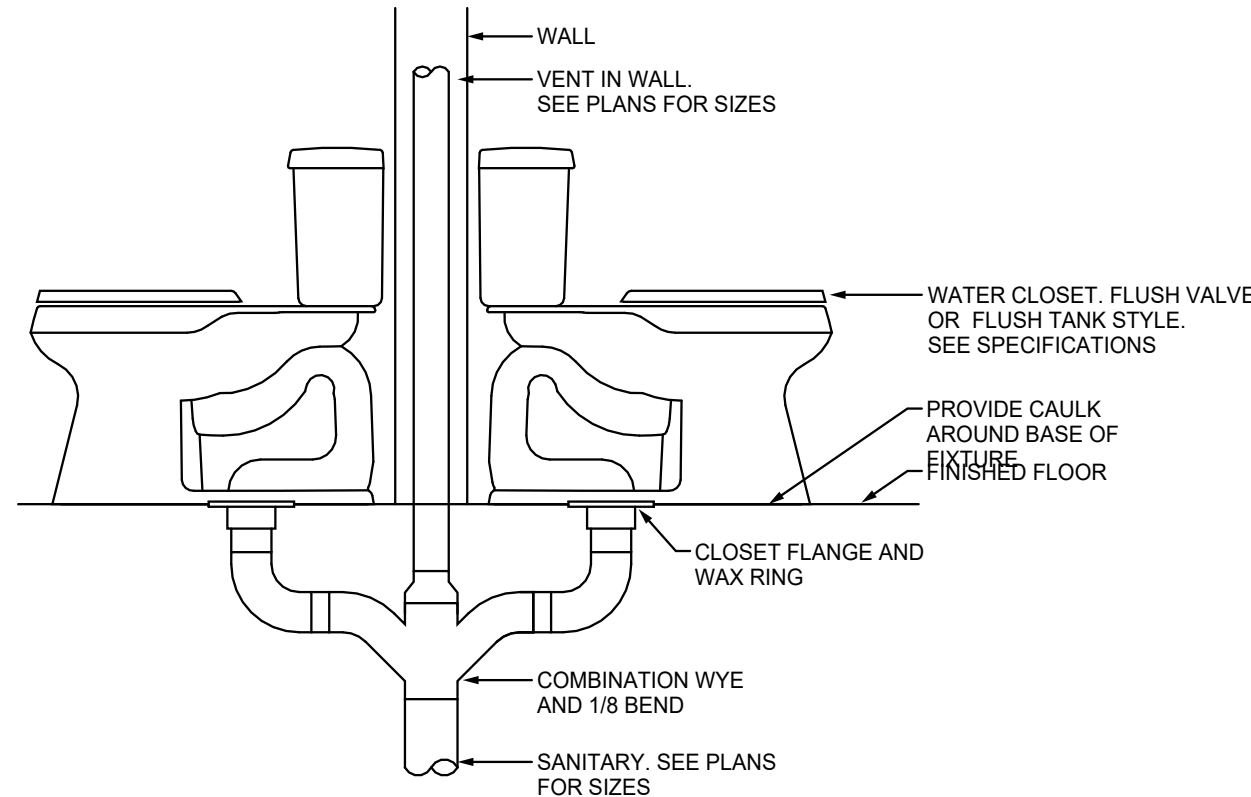
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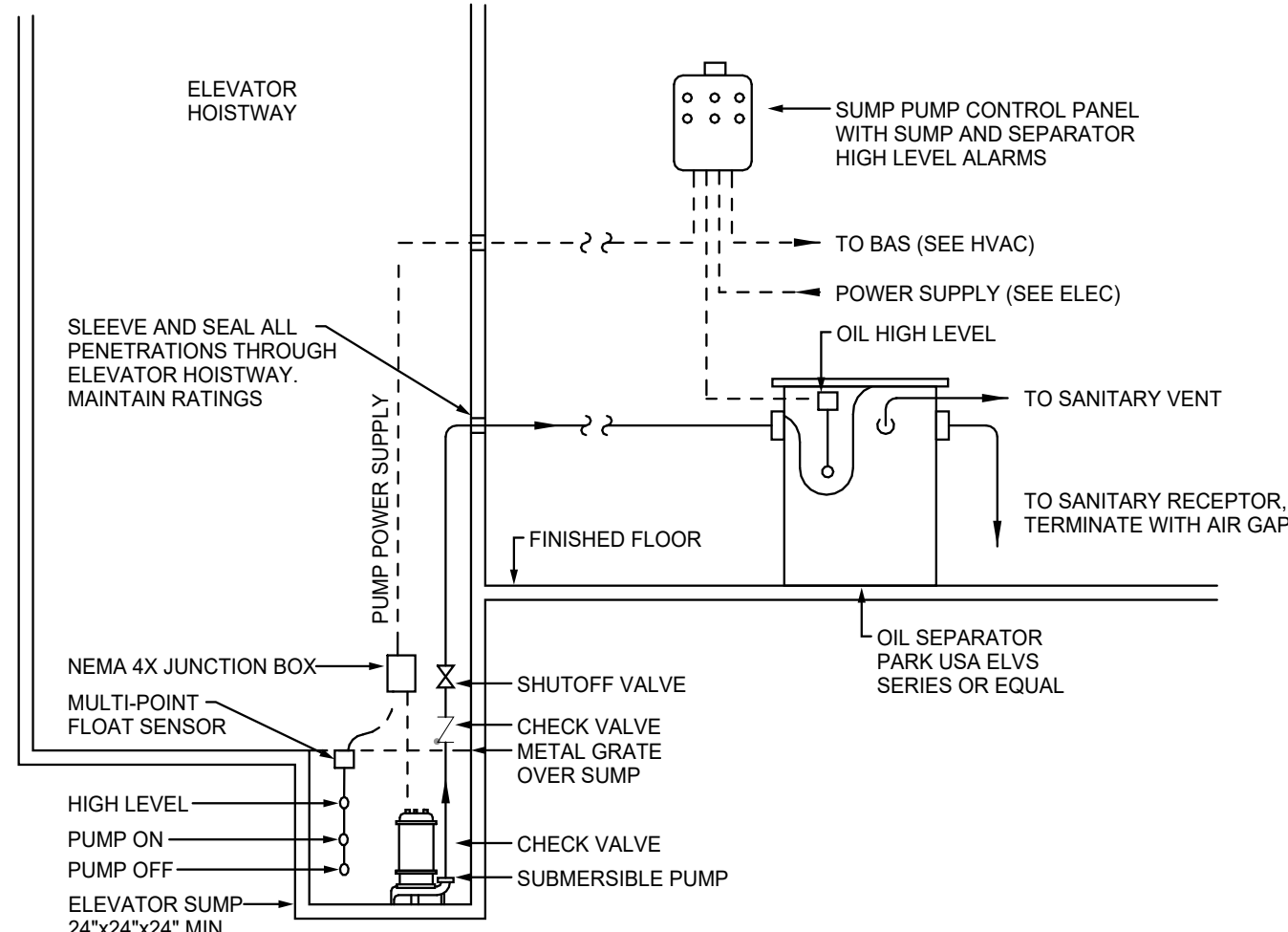
PROJECT STATUS: ISSUED:	BID SET FOR CONSTRUCTION	
ISSUE DATE:	FEBRUARY 05, 2024	
REVISIONS		
No.	Description	Date
DRAWING TITLE		
ROOF PLAN - HVAC		
DRAWN BY: MTG		
CHECKED BY: LB		
PROJECT NUMBER		
225029-00		
DRAWING NO.		
M2.15		

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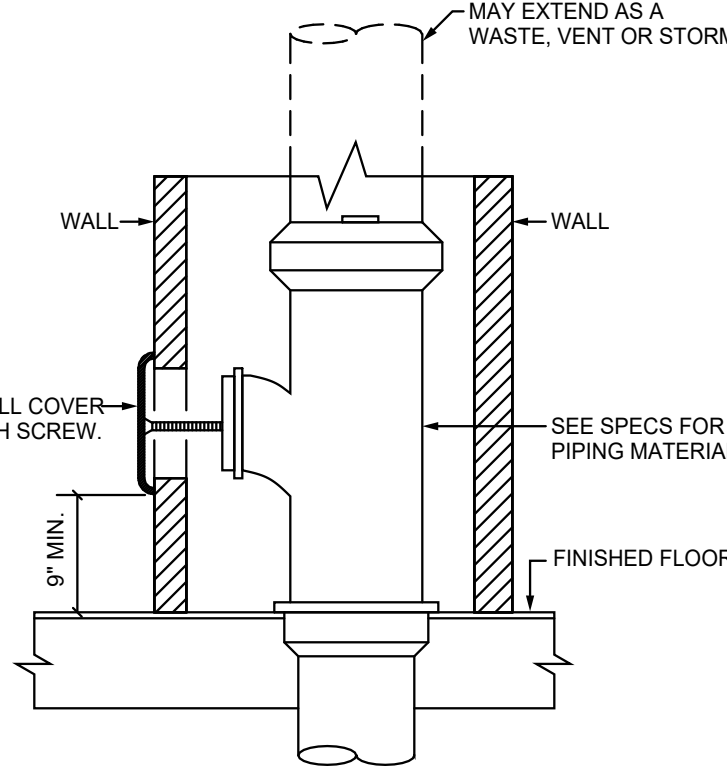
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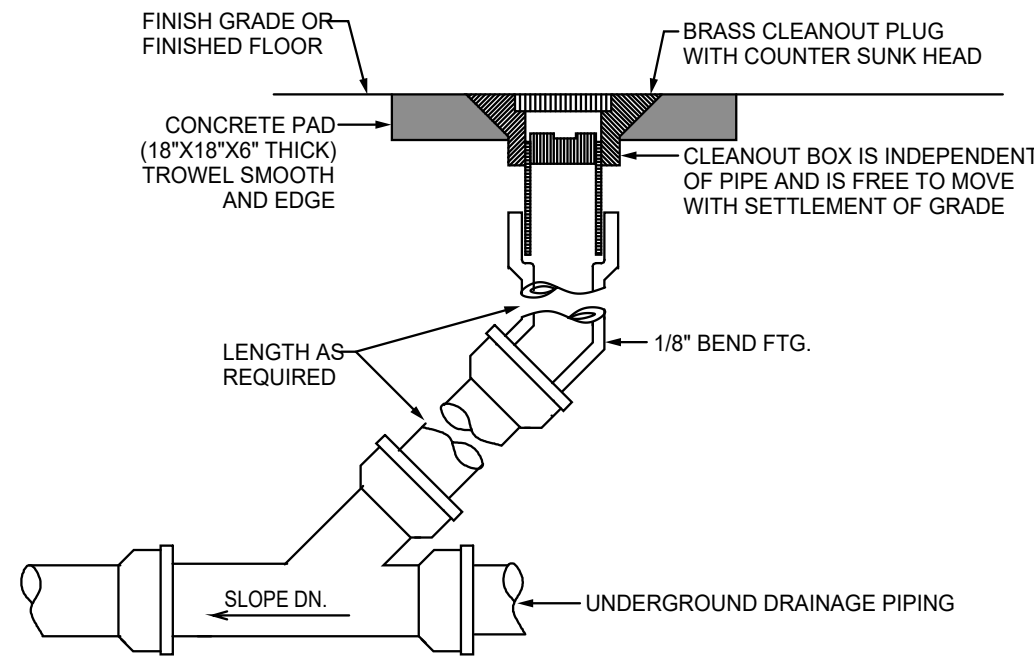
DETAIL OF BACK TO BACK WATER CLOSETS
NO SCALE



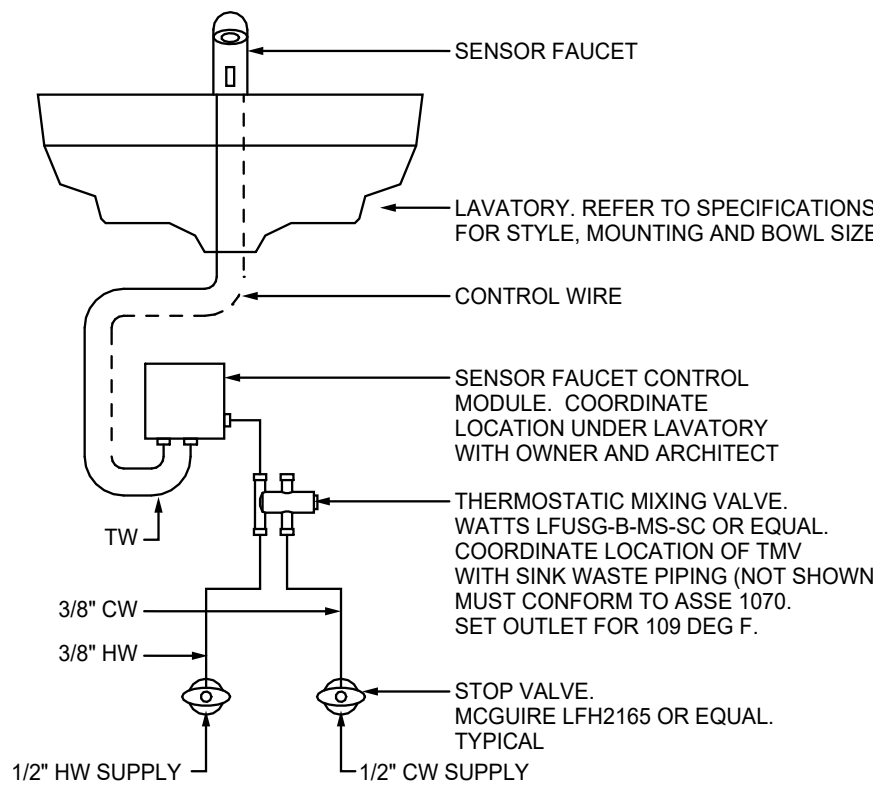
DETAIL OF ELEVATOR SUMP PUMP
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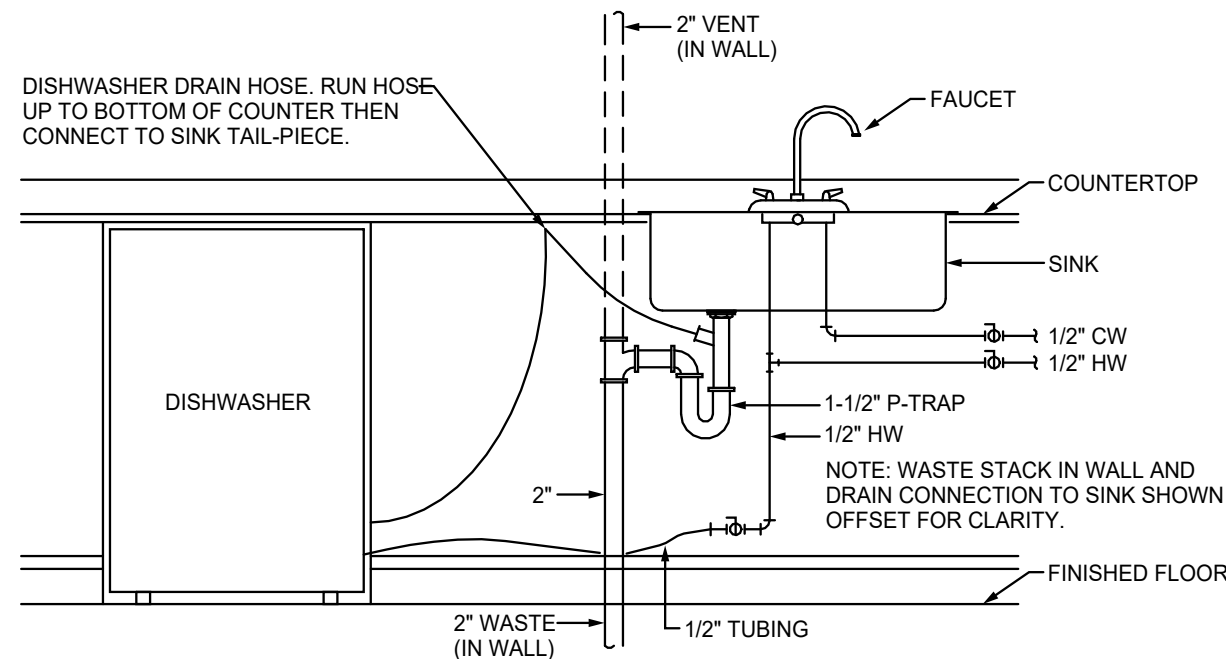
DETAIL OF WALL CLEANOUT
NO SCALE



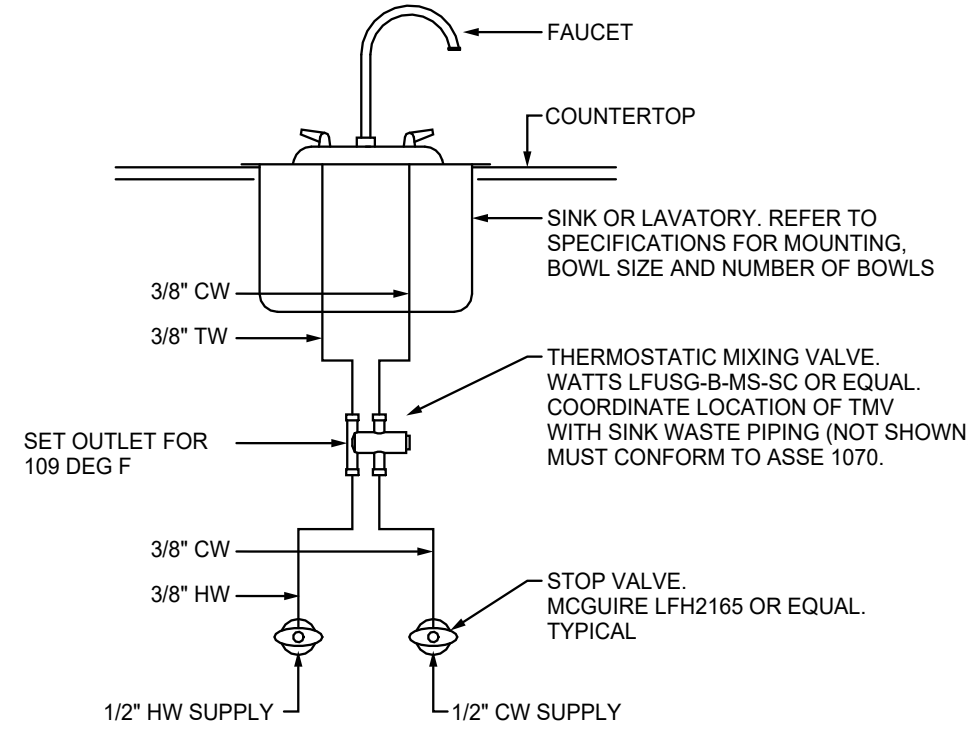
DETAIL OF SANITARY YARD / FLOOR CLEANOUT
NO SCALE



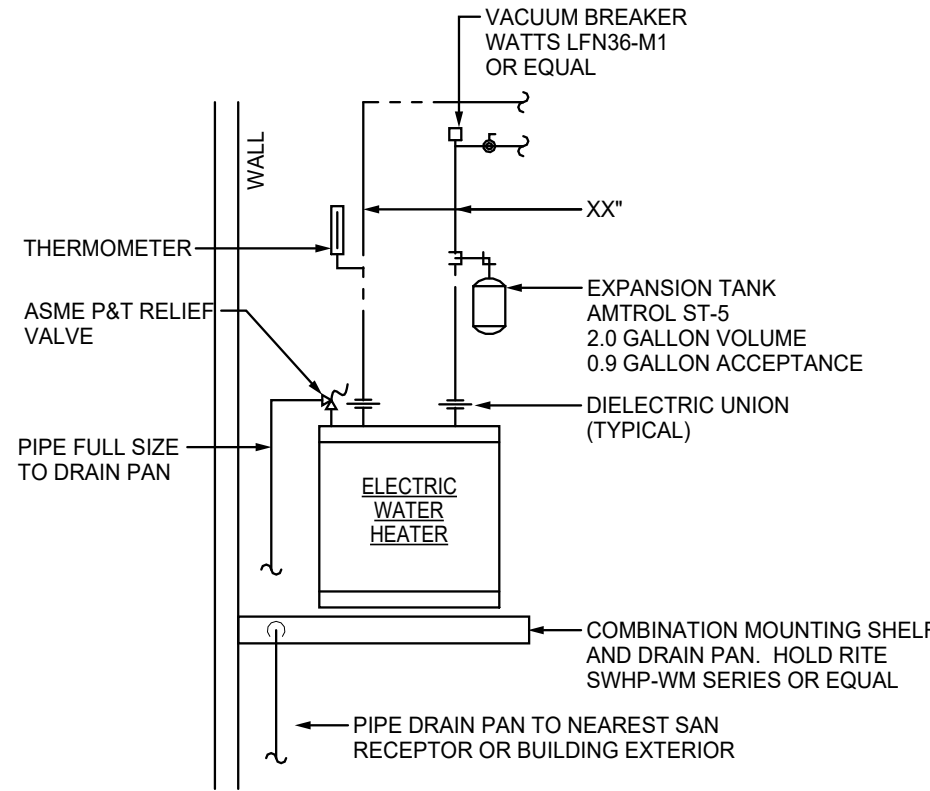
DETAIL OF THERMOSTATIC PROTECTION AT LAVATORY
NO SCALE



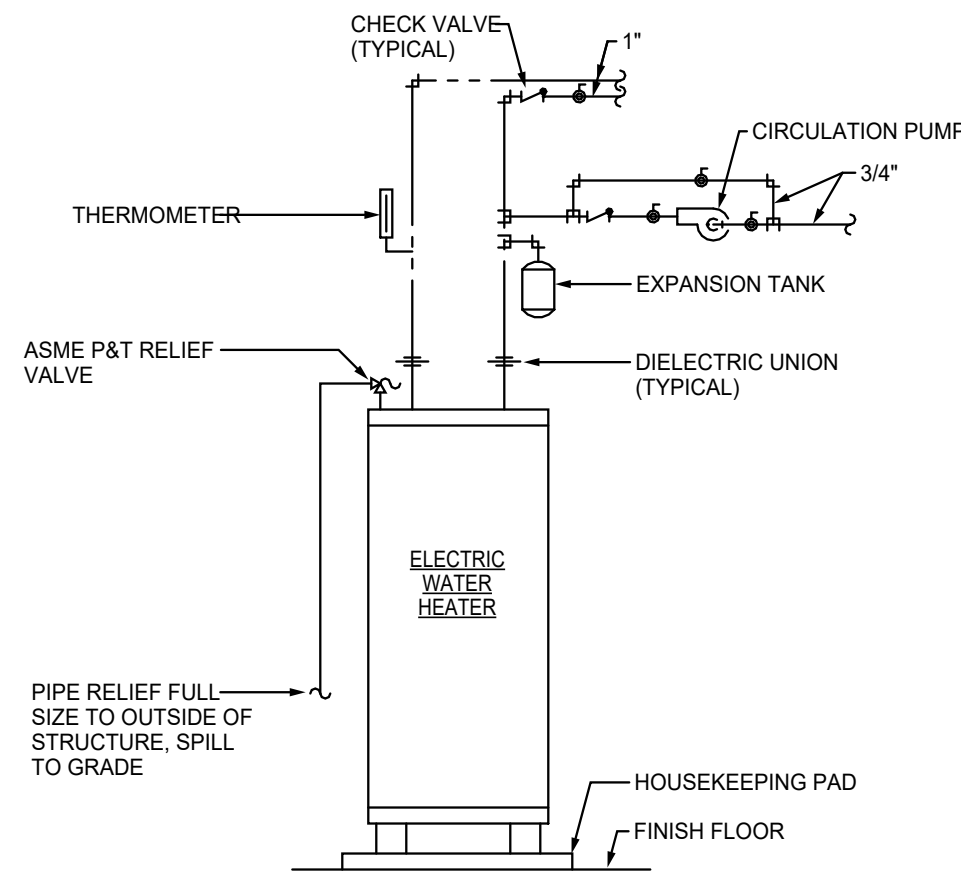
DETAIL OF PANTRY SINK AND DISHWASHER
NO SCALE



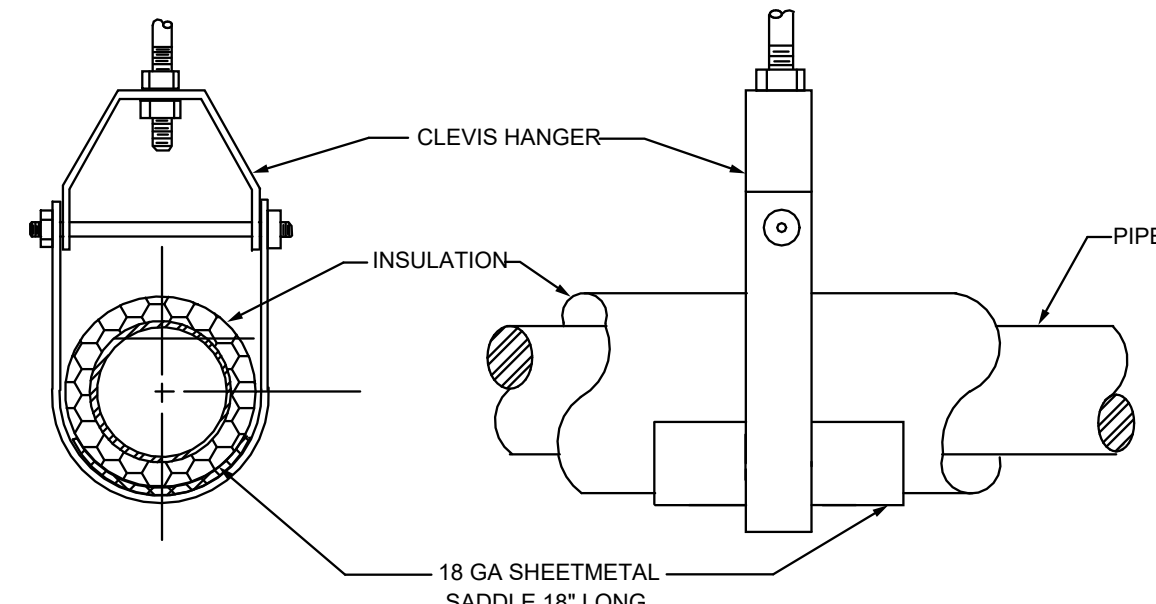
DETAIL OF THERMOSTATIC PROTECTION AT HAND SINK
NO SCALE



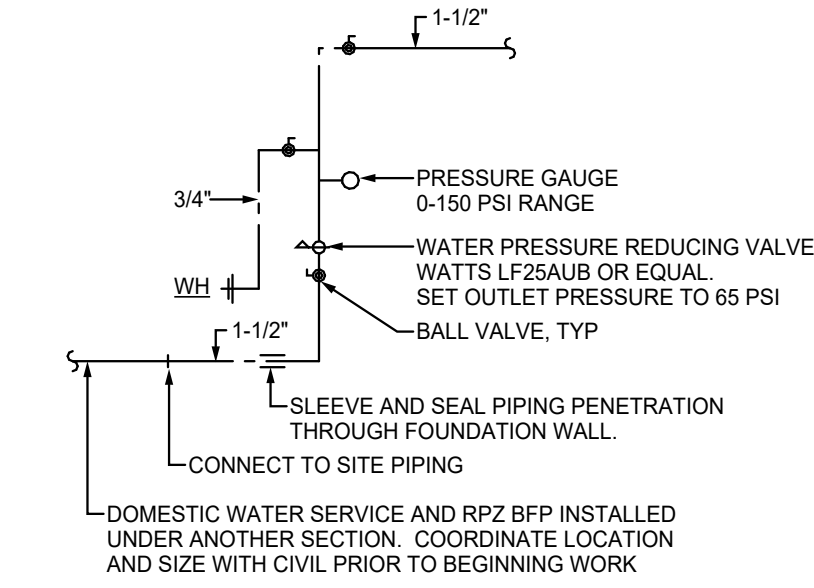
DETAIL OF ELECTRIC WATER HEATER
NO SCALE



DETAIL OF PIPING AT ELECTRIC WATER HEATER
NO SCALE



SUSPENDED PIPE SUPPORT
NO SCALE



DETAIL OF DOMESTIC WATER SERVICE
NO SCALE

DETAIL OF IN-LINE PUMP
NO SCALE

- DETAIL NOTES:
- PRESSURE GAUGES - SELECT GAUGE RANGE TO PLACE MAXIMUM SYSTEM OPERATING PRESSURE IN MIDDLE ONE THIRD OF RANGE.
 - PROVIDE UNION ON PUMP INLET AND OUTLET IF PUMP IS NOT FLANGED.
 - INSTALL PUMP PER MANUFACTURER'S INSTALLATION INSTRUCTIONS
 - INSTALL CHECK VALVE HORIZONTALLY OR VERTICALLY WITH FLOW UPWARD.

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Fax: 256-961-5076

ALABAMA
Professional Engineer
No. 16612
2/5/2024
Inference J. Bonnes
22.07.163

USSRC - INSPIRATION 4 TRAINING FACILITY

OWNER
UNITED STATES SPACE AND ROCKET CENTER

PROJECT ADDRESS
1 Tranquility Base
Huntsville, AL 35805

U.S. Space & Rocket Center.

PROJECT STATUS: BID SET
ISSUED: FOR CONSTRUCTION

ISSUE DATE: FEBRUARY 05, 2024

REVISIONS

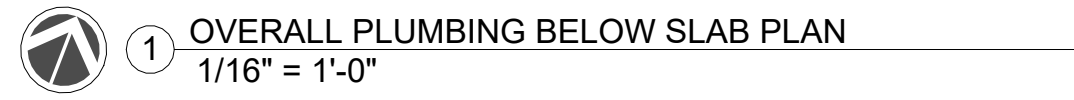
No. Description Date

DRAWING TITLE
PLUMBING DETAILS

DRAWN BY: KAJ
CHECKED BY: LIB

PROJECT NUMBER
225029-00

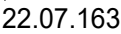
DRAWING NO.
P0.02



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HVAC • Plumbing • Fire Protection
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Phone: 205-956-4979
web: bbgps.com

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UNITED STATES SPACE AND ROCKET CENTER

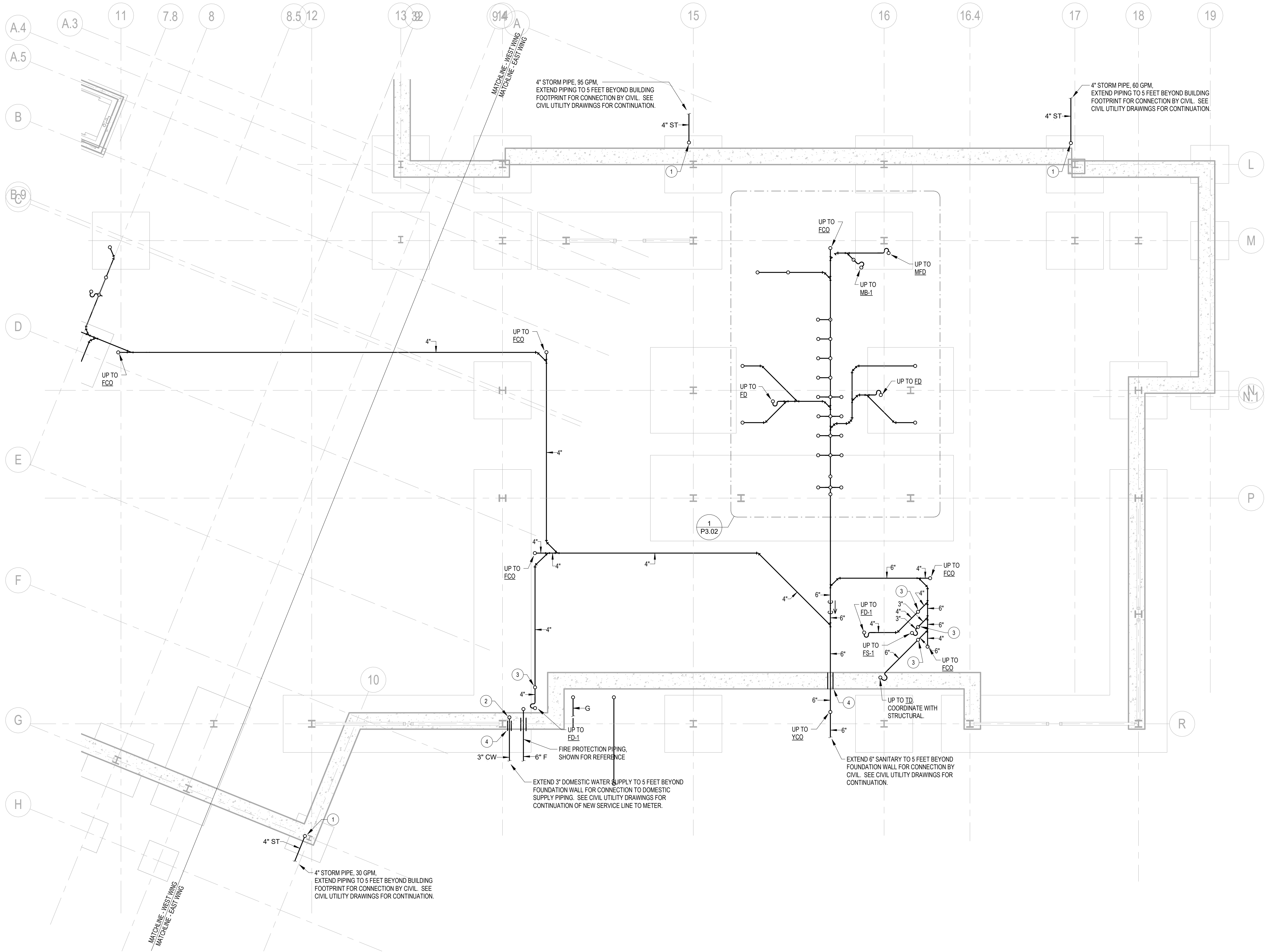
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DRAWING NO.
P1.10

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2/27/2024 3:16 AM



1 PLUMBING BELOW SLAB PLAN - EAST WING
1/8" = 1'-0"

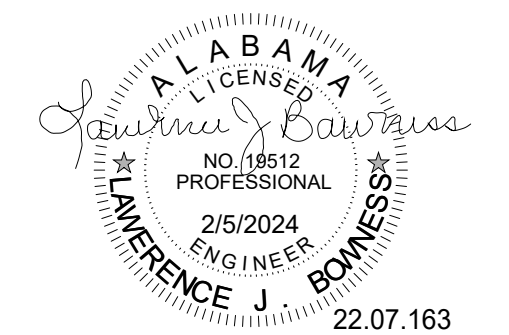
KEYNOTES - BELOW SLAB	
1	4" STORM UP
2	3" CW UP
3	2" VENT UP
4	COORDINATE UNDERSLAB PIPING WITH STRUCTURAL. SLEEVE FOUNDATION WHERE PIPING PENETRATES FOUNDATION WALL OR TURNDOWN.
5	2" WASTE UP
6	3" WASTE DOWN, 2" VENT UP
7	1-1/2" WASTE UP

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ISSUE DATE: FEBRUARY 05, 2024

REVISIONS
No. Description Date

DRAWING TITLE
PLUMBING BELOW
SLAB PLAN - EAST
WING

DRAWN BY: KAJ
CHECKED BY: LB

PROJECT NUMBER
225029-00

DRAWING NO.
P1.11

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1/17/2024 11:17 AM



1 PLUMBING BELOW SLAB PLAN - WEST WING

1/8" = 1'-0"

KEYNOTES - BELOW SLAB	
1	4" STORM UP
2	3" CW UP
3	2" VENT UP
4	COORDINATE UNDERSLAB PIPING WITH STRUCTURAL. SLEEVE FOUNDATION WHERE PIPING PENETRATES FOUNDATION WALL OR TURNDOWN.
5	2" WASTE UP
6	3" WASTE DOWN, 2" VENT UP
7	1-1/2" WASTE UP

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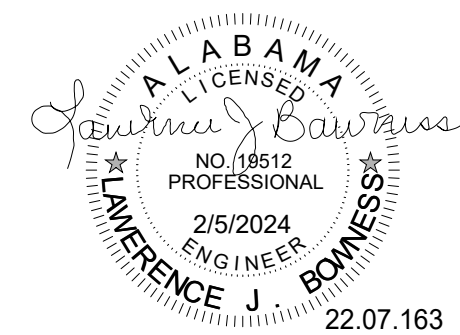
DRAWN BY: KAJ
CHECKED BY: LB
DATE: 02/05/2024

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No. Description Date

DRAWING TITLE
PLUMBING BELOW
SLAB PLAN - WEST
WING

DRAWN BY: KAJ
CHECKED BY: LB

PROJECT NUMBER
225029-00

DRAWING NO.
P1.12



1	EXTEND 4" STORM TO 5 FEET BEYOND FOUNDATION WALL FOR CONNECTION BY CIVIL. SEE CIVIL UTILITY DRAWINGS FOR CONTINUATION.
2	EXTEND 3" DOMESTIC WATER SUPPLY TO 5 FEET BEYOND FOUNDATION WALL FOR CONNECTION TO DOMESTIC SUPPLY PIPING. SEE CIVIL UTILITY DRAWINGS FOR CONTINUATION OF NEW SERVICE LINE TO METER.
3	EXTEND 9" SANITARY TO 5 FEET BEYOND FOUNDATION WALL FOR CONNECTION BY CIVIL. SEE CIVIL UTILITY DRAWINGS FOR CONTINUATION.
4	COORDINATE UNDERLAP PIPING WITH STRUCTURAL. SLEEVE FOUNDATION WHERE PIPING PENETRATES FOUNDATION WALL OR TURNDOWN.
5	TERMINATE 4" ERL WITH DSN AT 1" 24" ANG
6	EXTEND NATURAL GAS SUPPLY TO 5 FEET BEYOND FOUNDATION WALL FOR CONNECTION TO NATURAL GAS SUPPLY PIPING. SEE CIVIL UTILITY DRAWINGS FOR PRESSURE AND CONTINUATION.
7	1-1/2" WASTE UP

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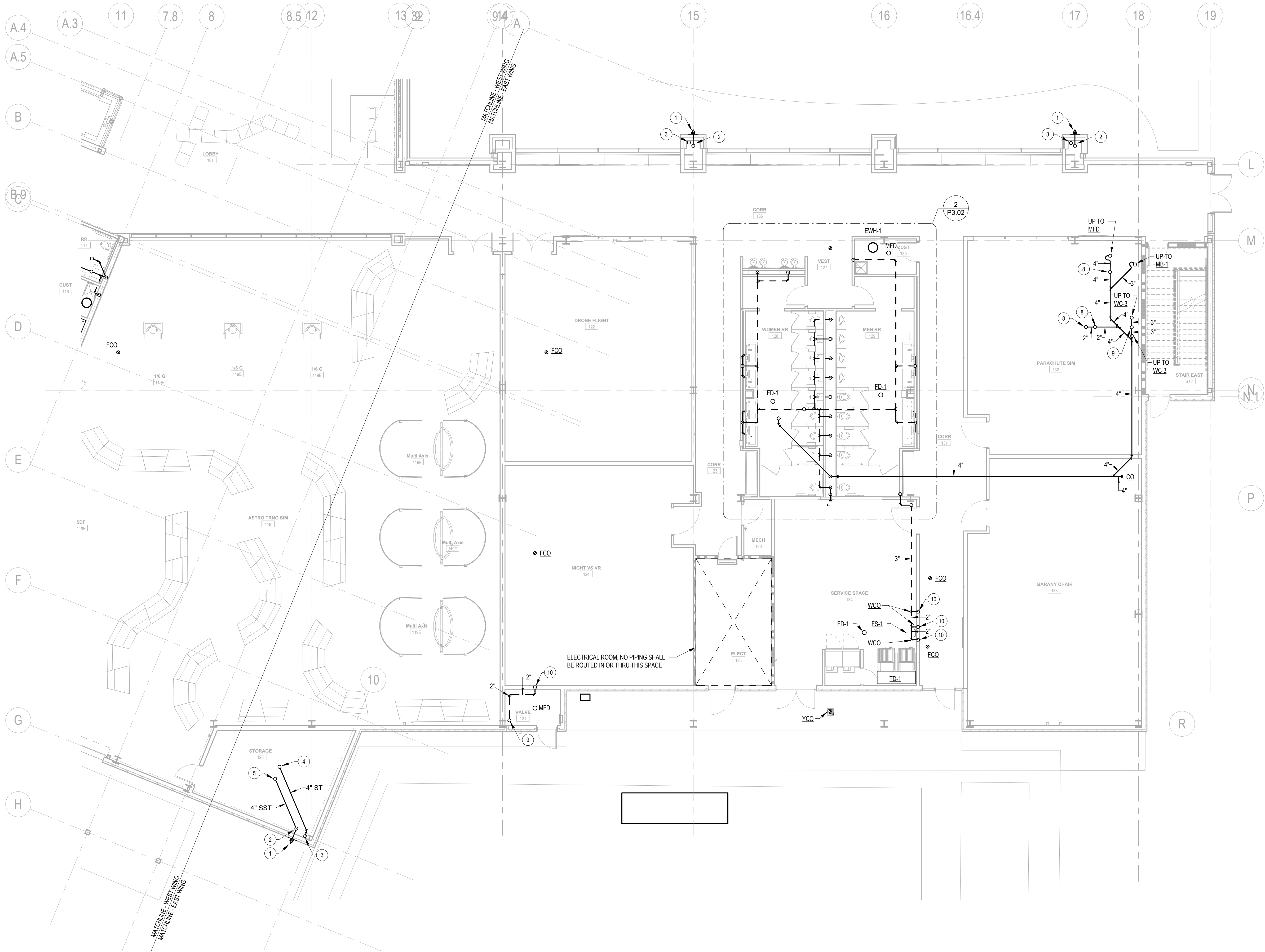
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Huntsville, AL 35805



U.S. Space & Rocket Center

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ISSUED: FOR CONSTRUCTION	
ISSUE DATE:	FEBRUARY 05, 2024
REVISIONS	
No.	Description
	Date
DRAWING TITLE	
PLUMBING OVERALL NON-PRESSURE FLOOR PLANS	
DRAWN BY:	KAJ
CHECKED BY:	LIB
PROJECT NUMBER	
225029-00	
DRAWING NO.	
P1.20	



1 PLUMBING FIRST FLOOR PLAN - NON-PRESSURE - EAST WING
1/8" = 1'-0"

KEYNOTES - NON-PRESSURE

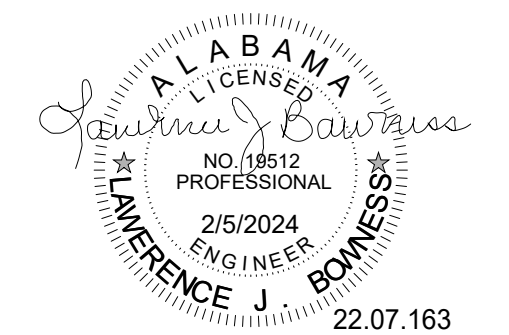
- 1 TERMINATE 4" ERL WITH DSN-1 AT 24" AFG
- 2 4" SECONDARY STORM UP
- 3 4" STORM UP & DOWN
- 4 4" STORM UP TO 4" RD
- 5 4" SECONDARY STORM UP TO 4" ERD
- 6 4" STORM DOWN
- 7 4" SECONDARY STORM DOWN
- 8 2" WASTE UP
- 9 2" VENT UP
- 10 2" VENT RISE
- 11 3" VENT DOWN
- 12 2" VENT DOWN
- 13 2" WASTE DOWN, 2" VENT UP TO 2" VTR
- 14 3" VENT UP TO 2" VTR
- 15 1-1/2" WASTE DOWN TO SUMP PUMP

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ISSUE DATE: FEBRUARY 05, 2024

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DRAWING TITLE
**PLUMBING
NON-PRESSURE 1ST
FLOOR PLAN - EAST
WING**

DRAWN BY: KAJ
CHECKED BY: LIB

PROJECT NUMBER
225029-00

DRAWING NO.
P1.21

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17/07/2022 11:36 AM

1 PLUMBING FIRST FLOOR PLAN - NON-PRESSURE - WEST WING
1/8" = 1'-0"

KEYNOTES - NON-PRESSURE	
1	TERMINATE 4" ERL WITH DSN-1 AT 24" AFG
2	4" SECONDARY STORM UP
3	4" STORM UP & DOWN
4	4" STORM UP TO 4" RD
5	4" SECONDARY STORM UP TO 4" ERD
6	4" STORM DOWN
7	4" SECONDARY STORM DOWN
8	2" WASTE UP
9	2" VENT UP
10	2" VENT RISE
11	3" VENT DOWN
12	2" VENT DOWN
13	2" WASTE DOWN, 2" VENT UP TO 2" VTR
14	3" VENT UP TO 2" VTR
16	1-1/2" WASTE DOWN TO SUMP PUMP

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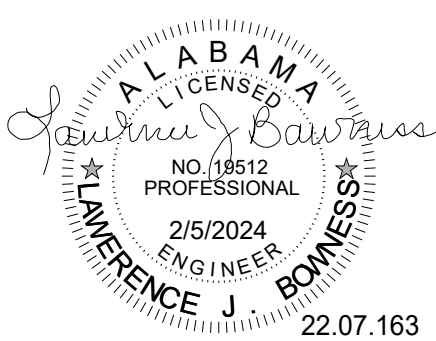
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ISSUE DATE: FEBRUARY 05, 2024

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No.	Description	Date
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DRAWING TITLE
PLUMBING
NON-PRESSURE 1ST
FLOOR PLAN -
WEST WING

DRAWN BY: KAJ
CHECKED BY: LIB

PROJECT NUMBER
225029-00

DRAWING NO.
P1.22



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1 PLUMBING SECOND FLOOR PLAN - NON-PRESSURE - WEST WING
1/8" = 1'-0"

KEYNOTES - NON-PRESSURE	
1	TERMINATE 4" ERL WITH DSN-1 AT 24" AFG
2	4" SECONDARY STORM UP
3	4" STORM UP & DOWN
4	4" STORM UP TO 4" RD
5	4" SECONDARY STORM UP TO 4" ERD
6	4" STORM DOWN
7	4" SECONDARY STORM DOWN
8	2" WASTE UP
9	2" VENT UP
10	2" VENT RISE
11	2" VENT DOWN
12	2" VENT DOWN
13	2" WASTE DOWN, 2" VENT UP TO 2" VTR
14	2" VENT UP TO 2" VTR
16	1-1/2" WASTE DOWN TO SUMP PUMP

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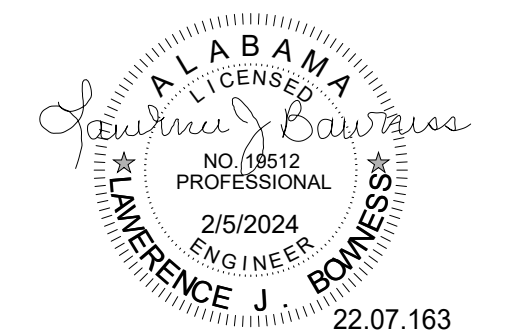
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REVISIONS
No. Description Date

DRAWING TITLE
PLUMBING
NON-PRESSURE
2ND FLOOR PLAN -
WEST WING

DRAWN BY: KAJ
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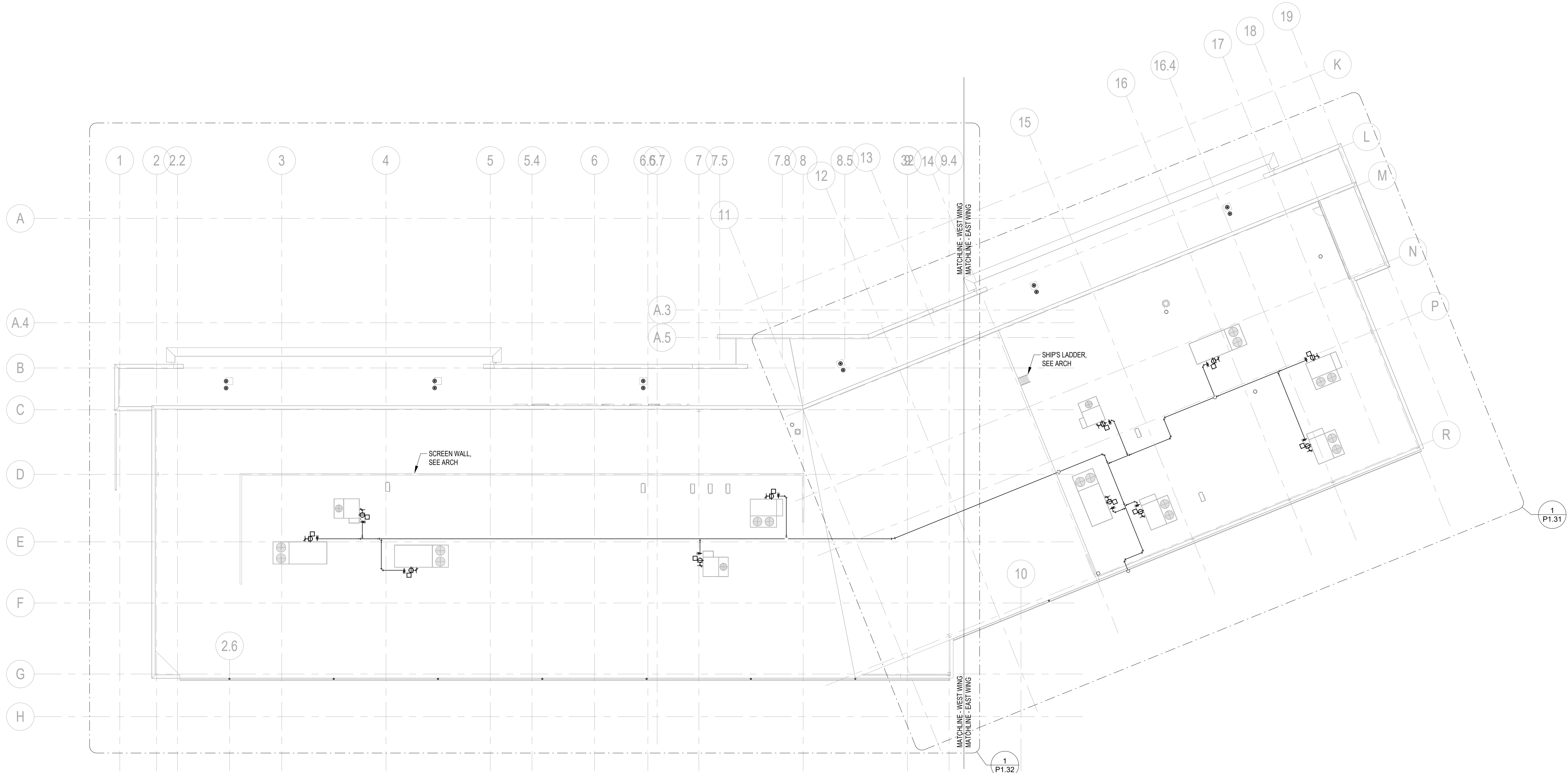
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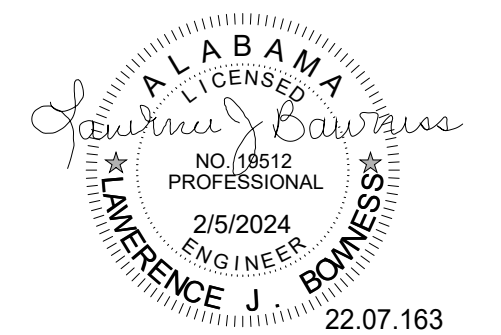
1 OVERALL PLUMBING ROOF PLAN
1/16" = 1'-0"

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DRAWING TITLE
PLUMBING ROOF PLAN

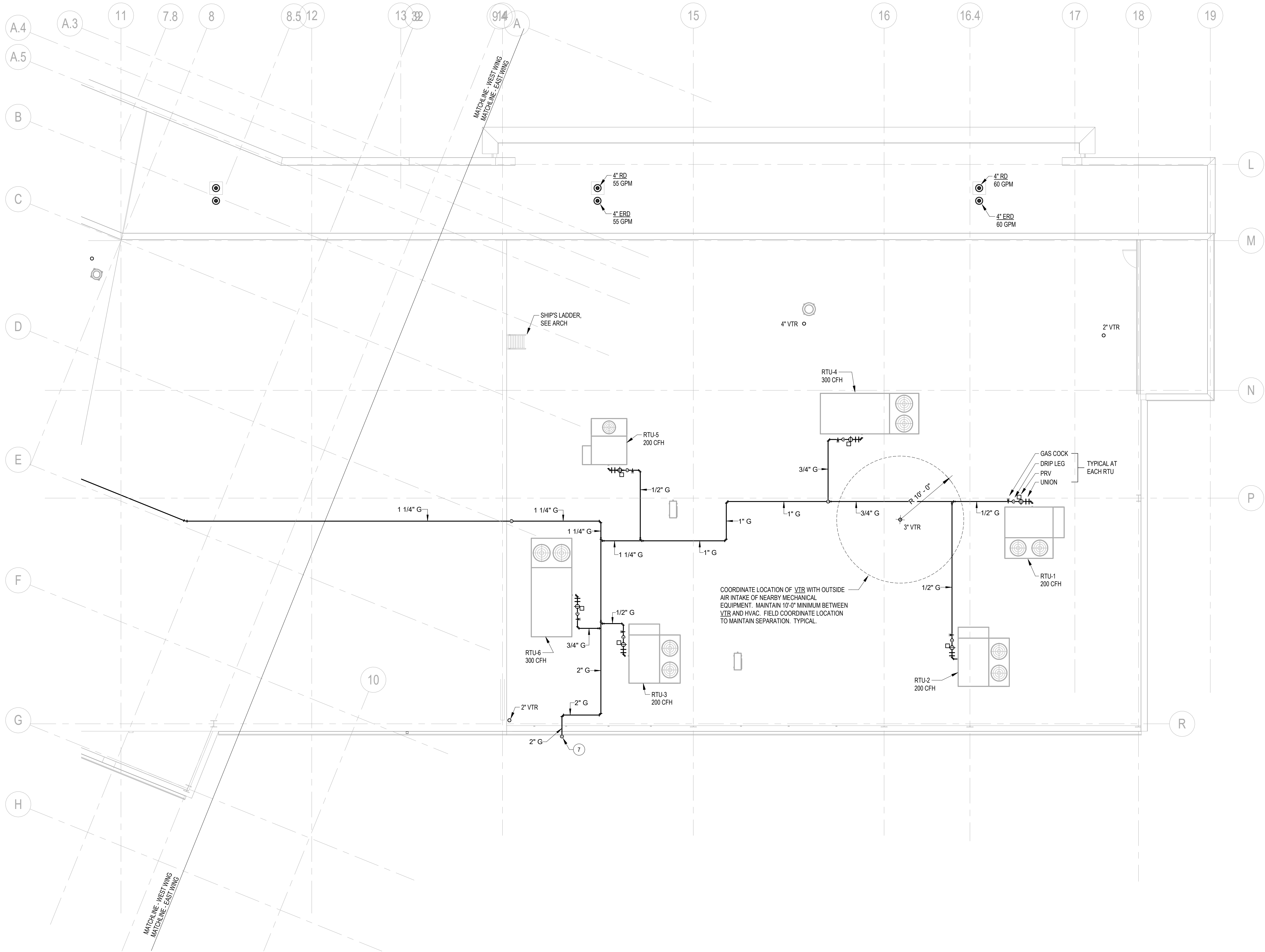
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P1.30

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1 PLUMBING ROOF PLAN - EAST WING
1/8" = 1'-0"

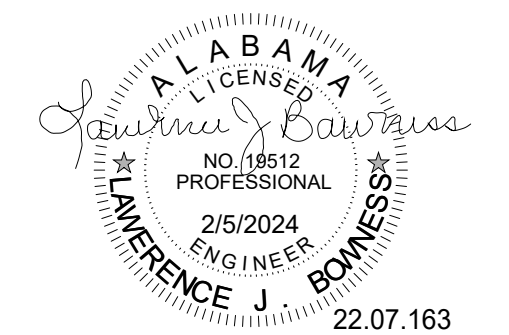
KEYNOTES - PRESSURE	
1	3" CW DOWN
2	DROP 1/2" CW & HW IN WALLCHASE
3	DROP 1/2" CW IN WALLCHASE
4	1-1/2" CW DOWN
5	1/2" CW DOWN
6	2" NATURAL GAS UP
7	2" NATURAL GAS DOWN

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REVISIONS	No.	Description	Date
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DRAWING TITLE
PLUMBING ROOF
PLAN - EAST WING

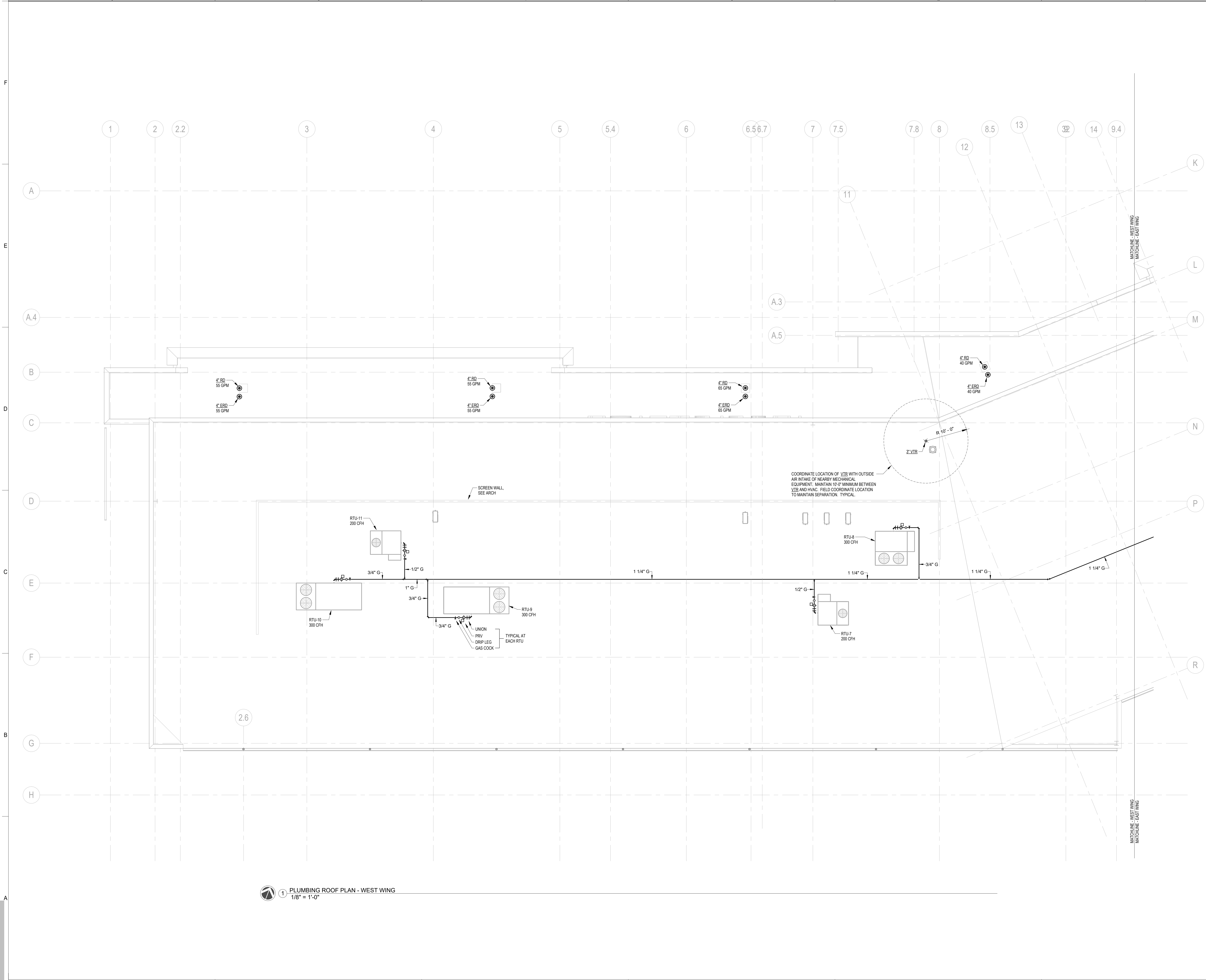
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225029-00

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P1.31

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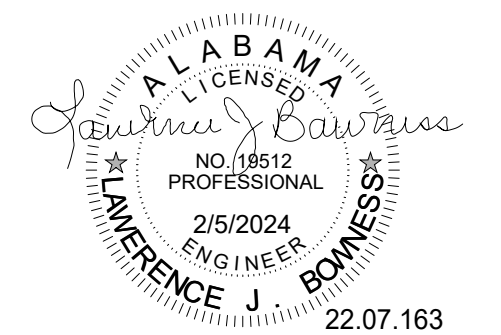
1 PLUMBING ROOF PLAN - WEST WING
1/8" = 1'-0"

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ISSUE DATE: FEBRUARY 05, 2024

REVISIONS		
No.	Description	Date

DRAWING TITLE
**PLUMBING ROOF
PLAN - WEST WING**

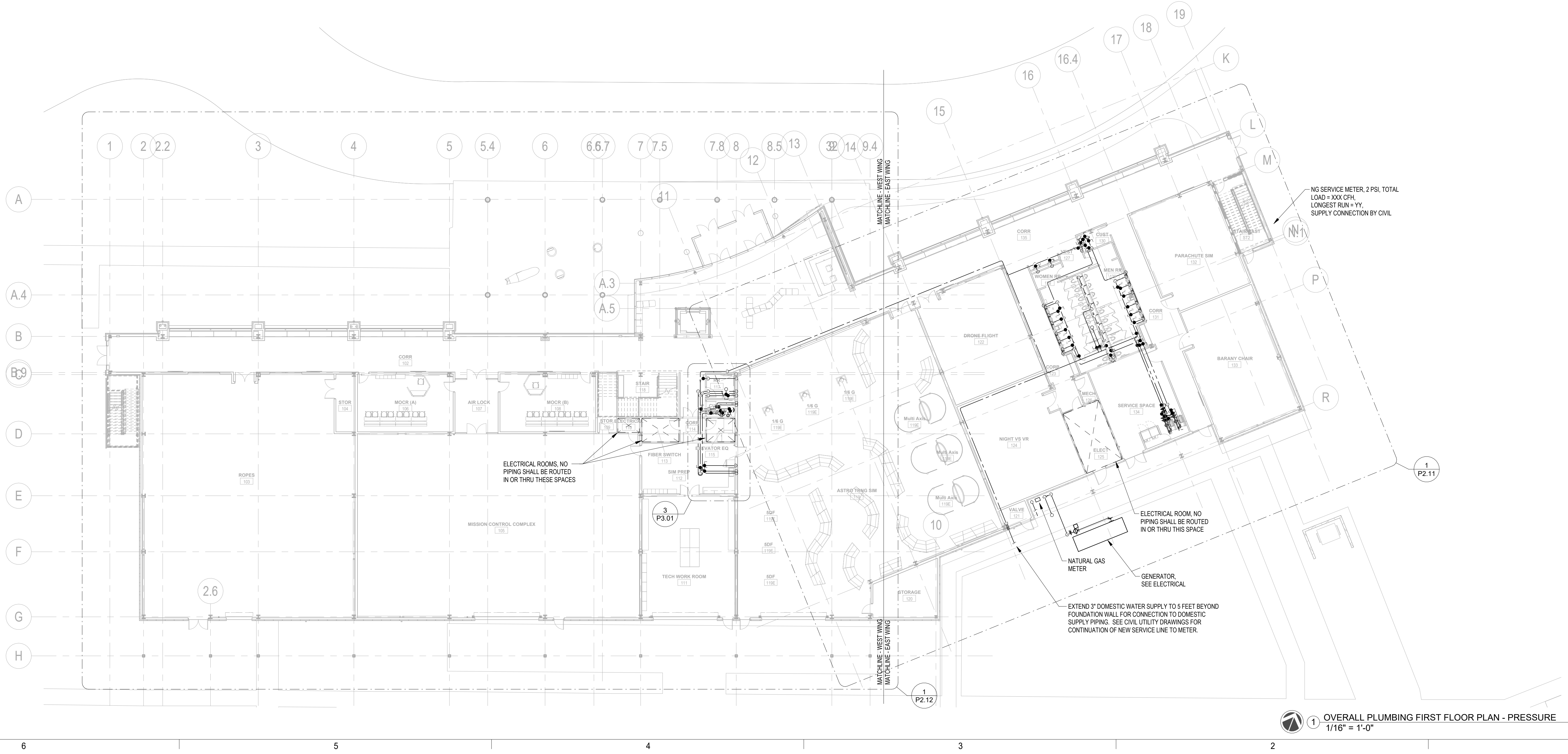
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CHECKED BY: LIB

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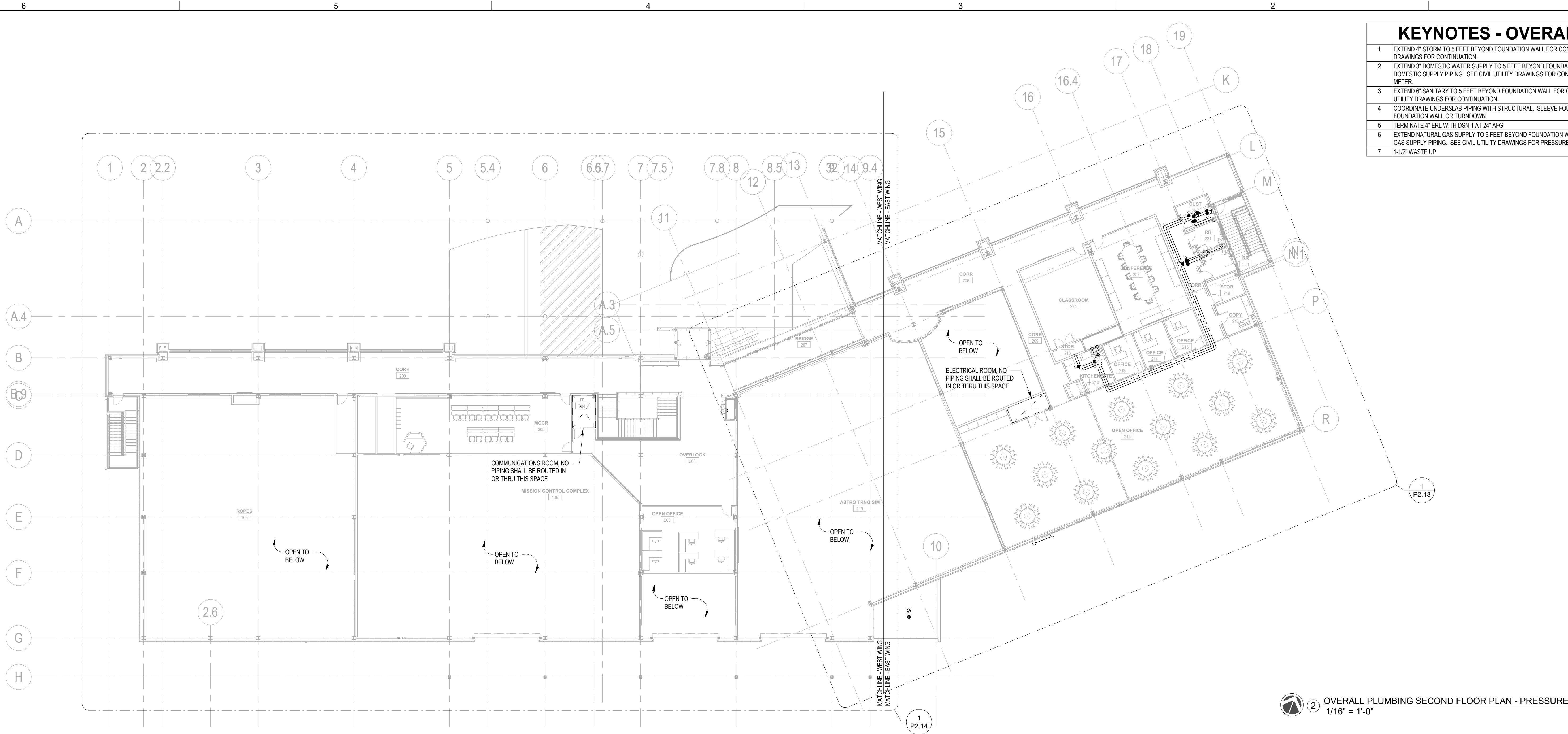
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1 OVERALL PLUMBING FIRST FLOOR PLAN - PRESSURE
1/16" = 1'-0"



2 OVERALL PLUMBING SECOND FLOOR PLAN - PRESSURE
1/16" = 1'-0"

KEYNOTES - OVERALL PLANS	
1	EXTEND 4" STORM TO 5 FEET BEYOND FOUNDATION WALL FOR CONNECTION BY CIVIL. SEE CIVIL UTILITY DRAWINGS FOR CONTINUATION.
2	EXTEND 3" DOMESTIC WATER SUPPLY TO 5 FEET BEYOND FOUNDATION WALL FOR CONNECTION TO DOMESTIC SUPPLY PIPING. SEE CIVIL UTILITY DRAWINGS FOR CONTINUATION OF NEW SERVICE LINE TO METER.
3	EXTEND 1" SANITARY TO 5 FEET BEYOND FOUNDATION WALL FOR CONNECTION BY CIVIL. SEE CIVIL UTILITY DRAWINGS FOR CONTINUATION.
4	COORDINATE UNDERSLAB PIPING WITH STRUCTURAL. SLEEVE FOUNDATION WHERE PIPING PENETRATES FOUNDATION WALL OR TURNDOWN.
5	TERMINATE 1/2" ERL WITH USN-1 AT 24" AFG.
6	EXTEND NATURAL GAS SUPPLY TO 5 FEET BEYOND FOUNDATION WALL FOR CONNECTION TO NATURAL GAS SUPPLY PIPING. SEE CIVIL UTILITY DRAWINGS FOR PRESSURE AND CONTINUATION.
7	1-1/2" WASTE UP.



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DRAWING TITLE
PLUMBING
OVERALL PRESSURE
FLOOR PLANS

DRAWN BY: KAJ
CHECKED BY: LIB

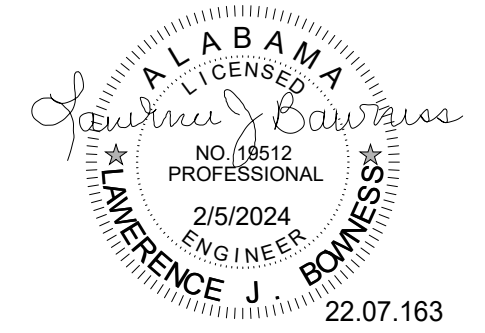
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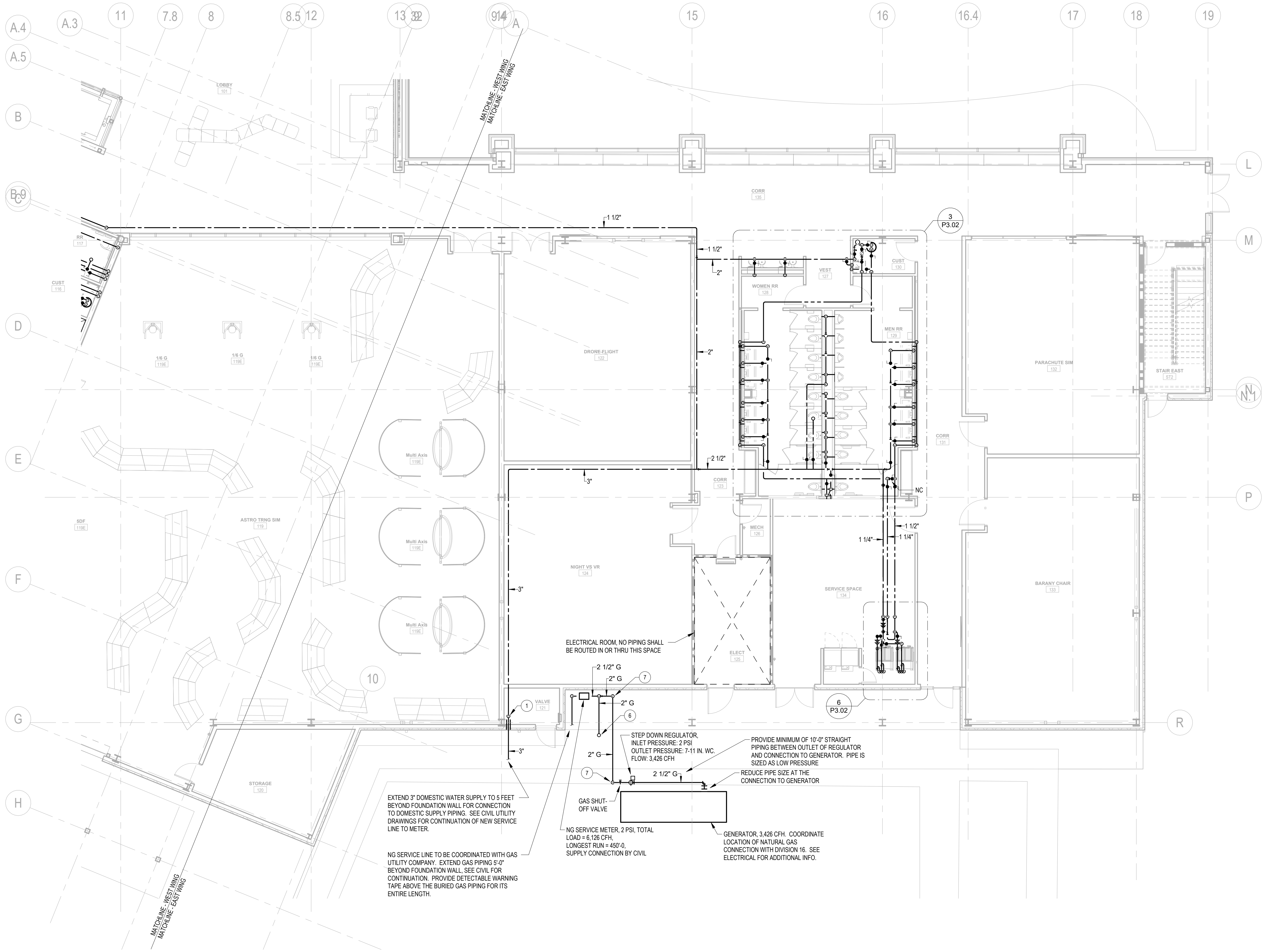


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*DESIGNED BY: LIB
*CHECKED BY: LIB
*DRAWN BY: KAJ



1 PLUMBING FIRST FLOOR PLAN - PRESSURE - EAST WING
1/8" = 1'-0"

KEYNOTES - PRESSURE	
1	3" CW DOWN
2	DROP 1/2" CW & HW IN WALLCHASE
3	DROP 1/2" CW IN WALLCHASE
4	1-1/2" CW DOWN
5	1/2" CW DOWN
6	2" NATURAL GAS UP
7	2" NATURAL GAS DOWN

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ALABAMA
Professional Engineer
No. 14612
2/5/2024
CONFERENCE J. BOWERS
22.07.163

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DRAWING TITLE
**PLUMBING
PRESSURE 1ST
FLOOR PLAN - EAST
WING**

DRAWN BY: KAJ
CHECKED BY: LIB

PROJECT NUMBER
225029-00

DRAWING NO.
P2.11

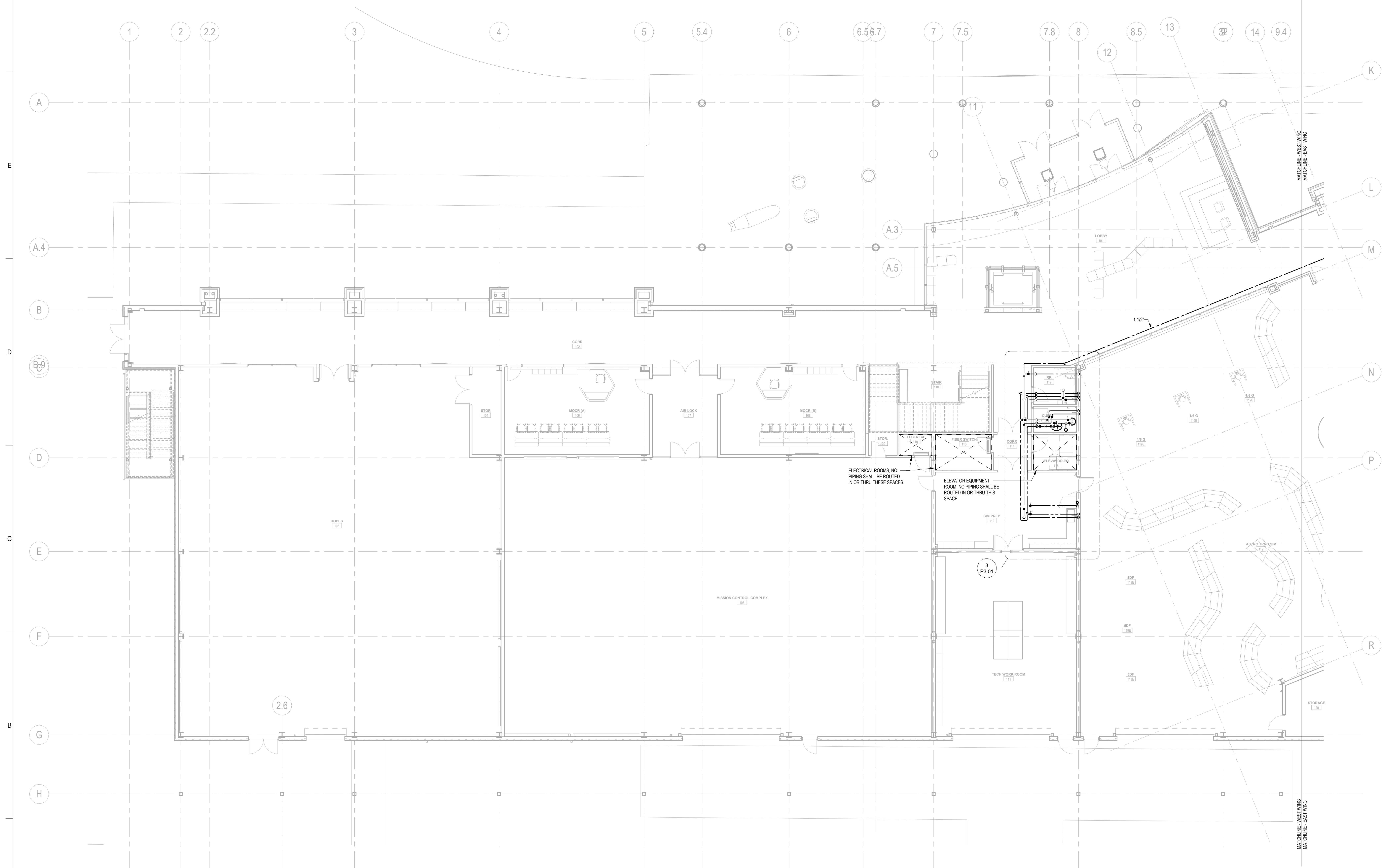
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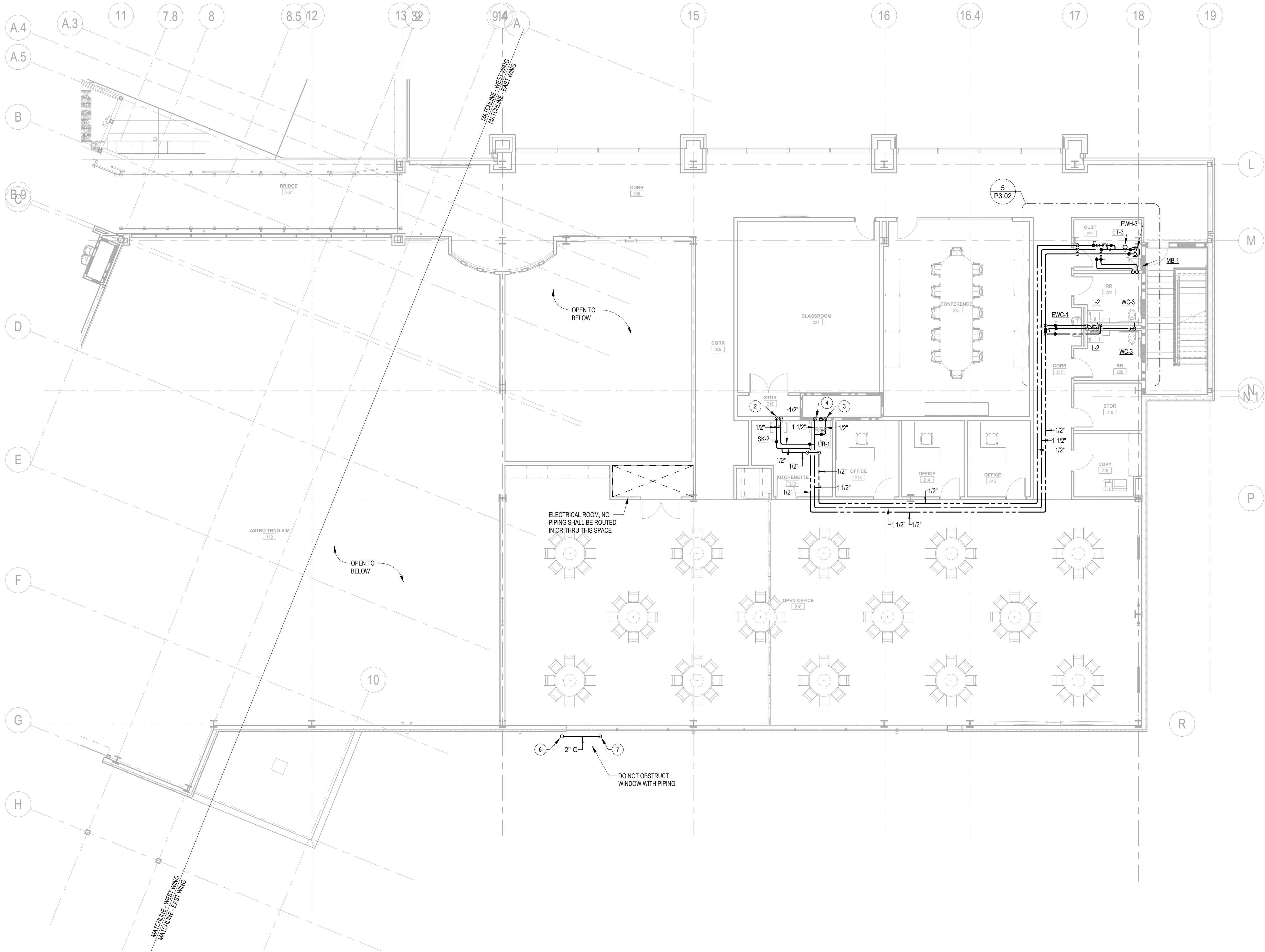
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ISSUE DATE:	FEBRUARY 05, 2024	
REVISIONS		
No.	Description	Date
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DRAWN BY: CHECKED BY:		KAJ LJB
<div>PROJECT NUMBER</div> <div>225029-00</div>		
		<div>DRAWING NO.</div> <div>P2.12</div>



 1 PLUMBING FIRST FLOOR PLAN - PRESSURE - WEST WING
1/8" = 1'-0"

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1 PLUMBING SECOND FLOOR PLAN - PRESSURE - EAST WING
1/8" = 1'-0"

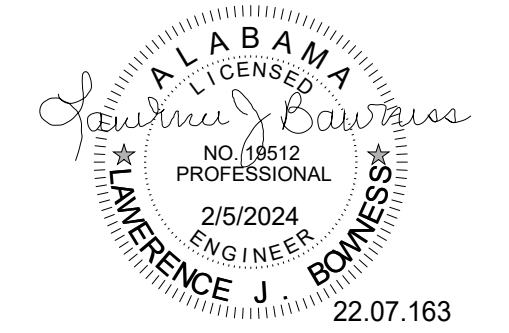
KEYNOTES - PRESSURE	
1	3" CW DOWN
2	DROP 1/2" CW & HW IN WALLCHASE
3	DROP 1/2" CW IN WALLCHASE
4	1-1/2" CW DOWN
5	1/2" CW DOWN
6	2" NATURAL GAS UP
7	2" NATURAL GAS DOWN

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DRAWING TITLE
PLUMBING
PRESSURE 2ND
FLOOR PLAN - EAST
WING

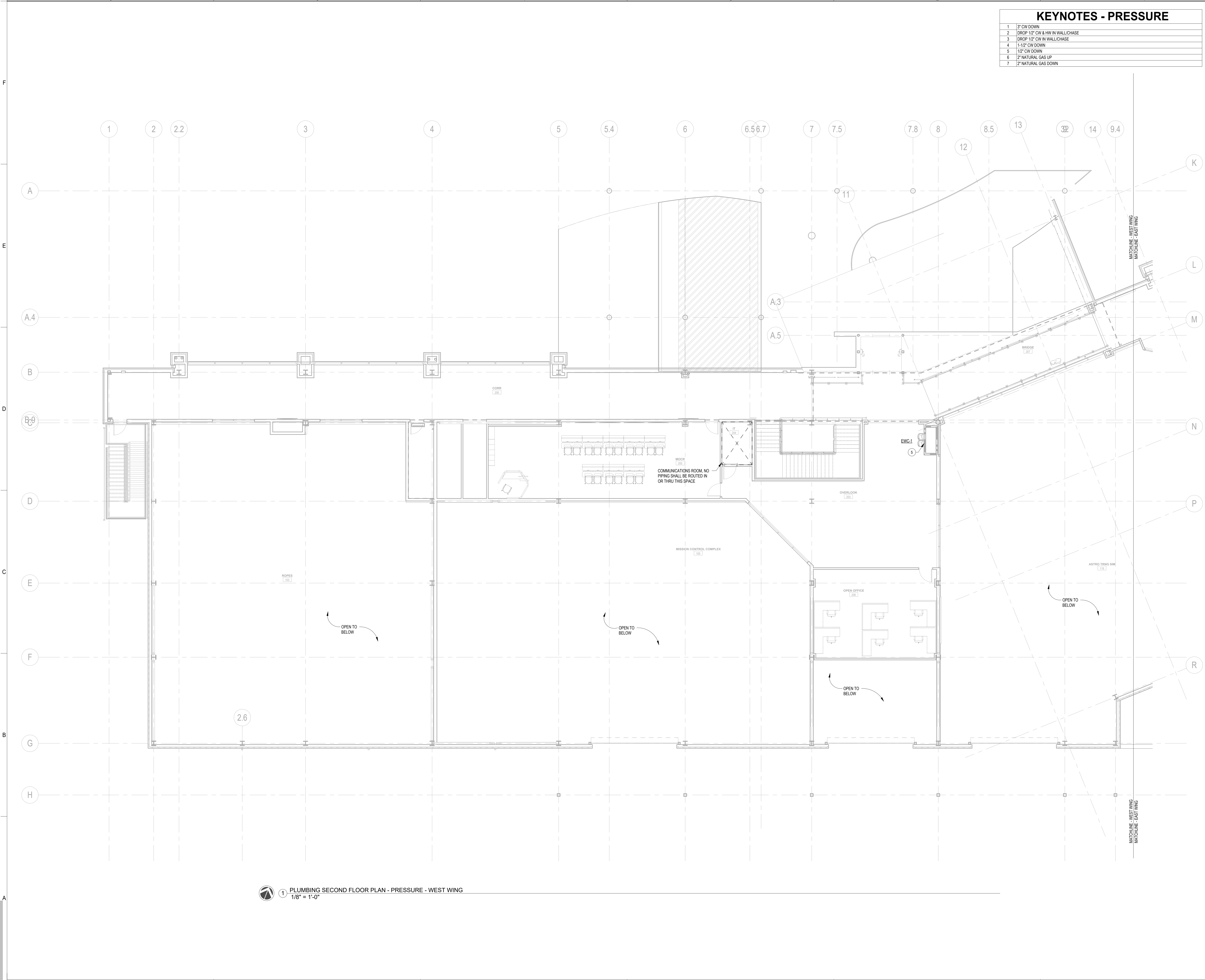
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1 PLUMBING SECOND FLOOR PLAN - PRESSURE - WEST WING
1/8" = 1'-0"

KEYNOTES - PRESSURE	
1	3" CW DOWN
2	DROP 1/2" CW & HW IN WALLCHASE
3	DROP 1/2" CW IN WALLCHASE
4	1-1/2" CW DOWN
5	1/2" CW DOWN
6	2" NATURAL GAS UP
7	2" NATURAL GAS DOWN

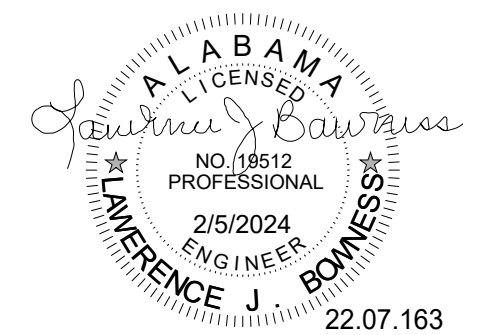
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DRAWING TITLE
PLUMBING
PRESSURE 2ND
FLOOR PLAN -
WEST WING

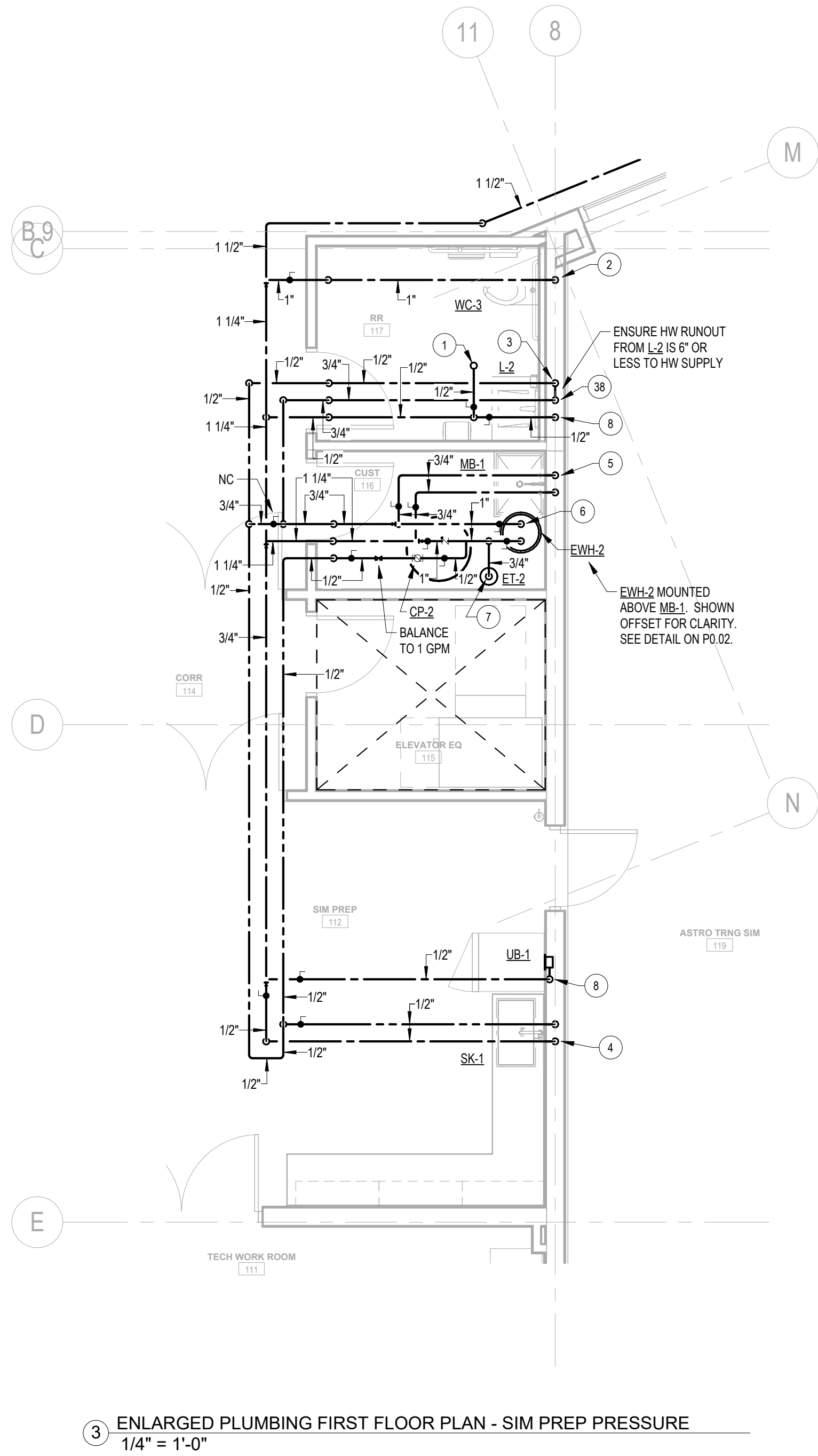
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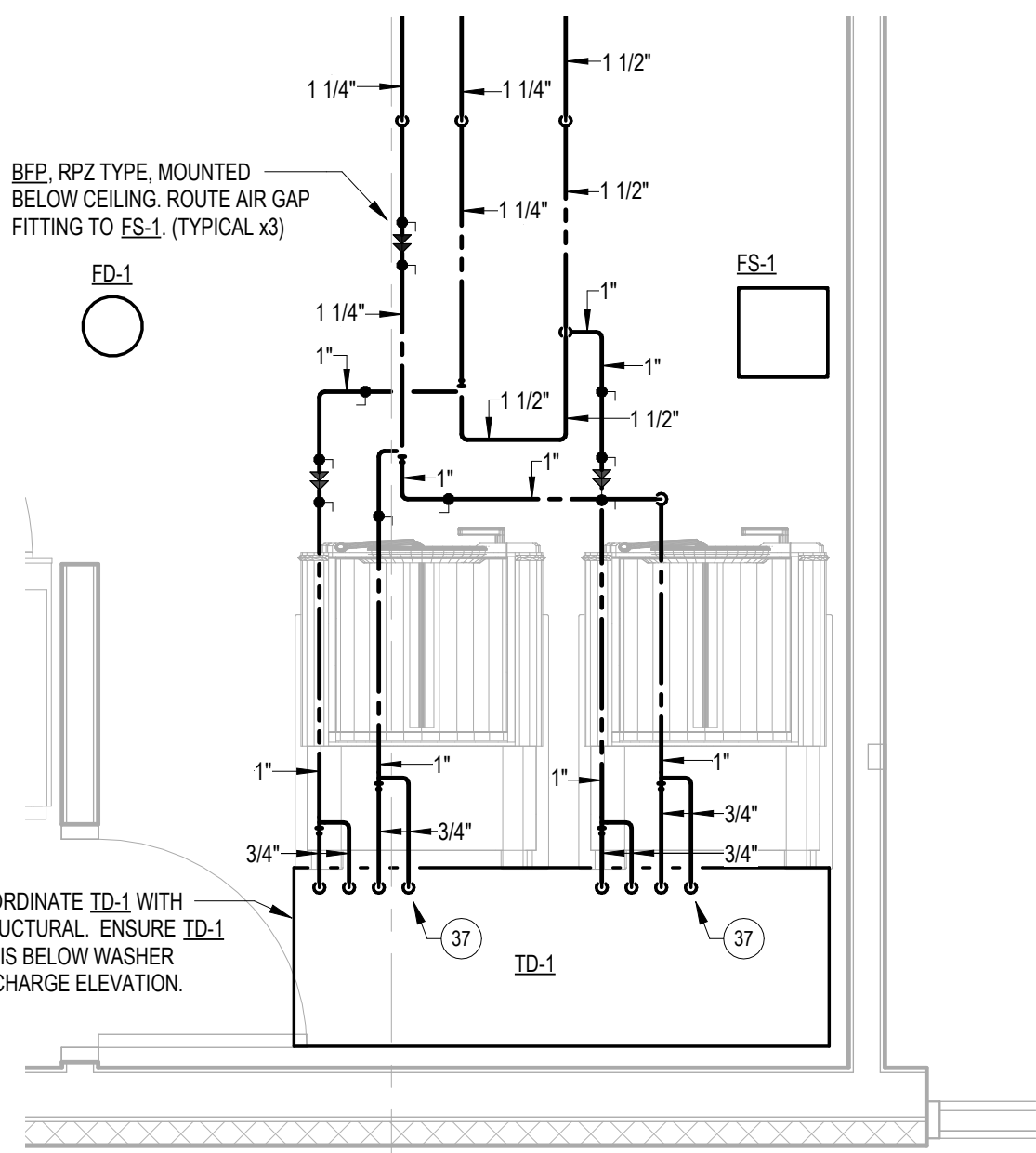
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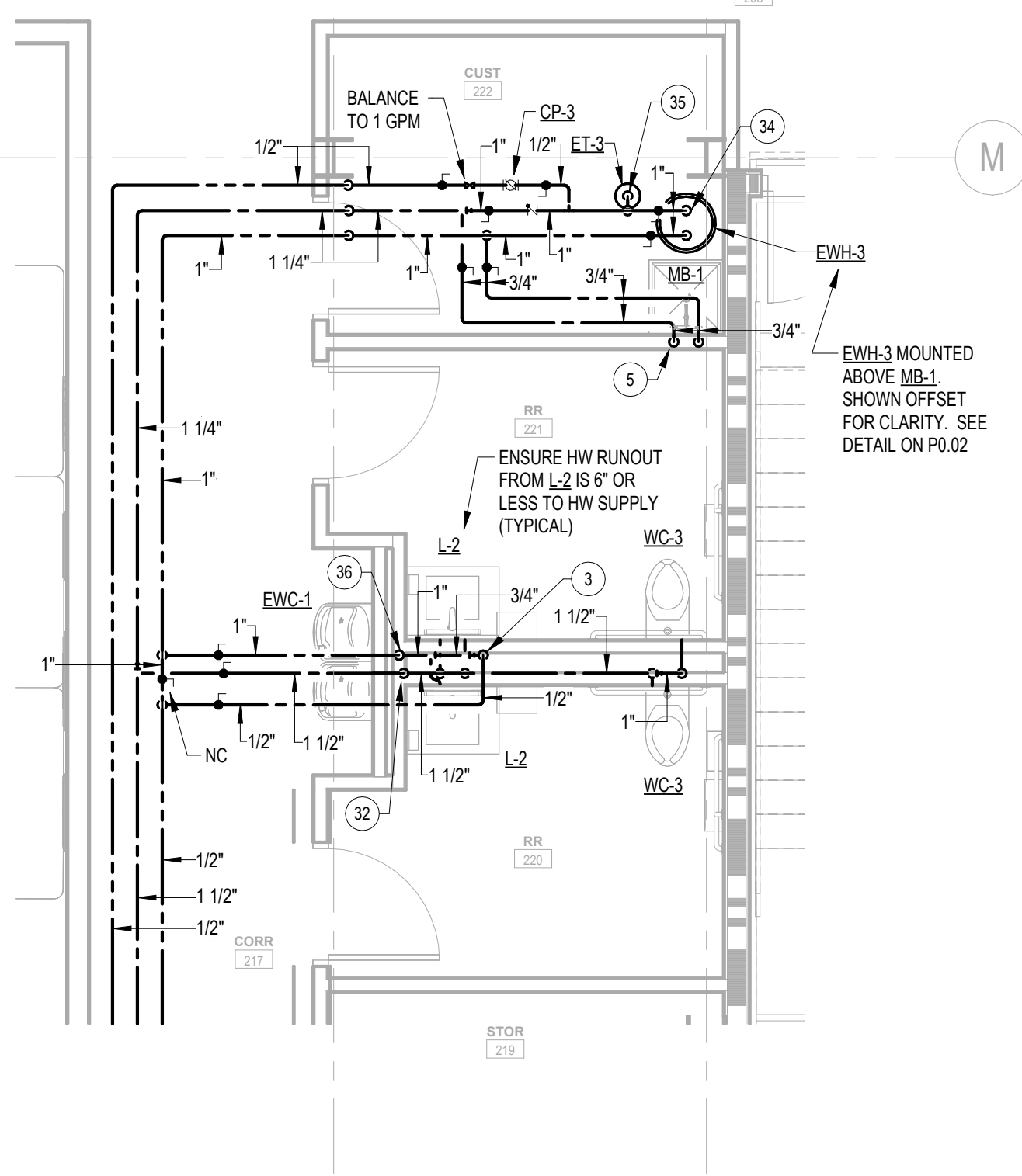
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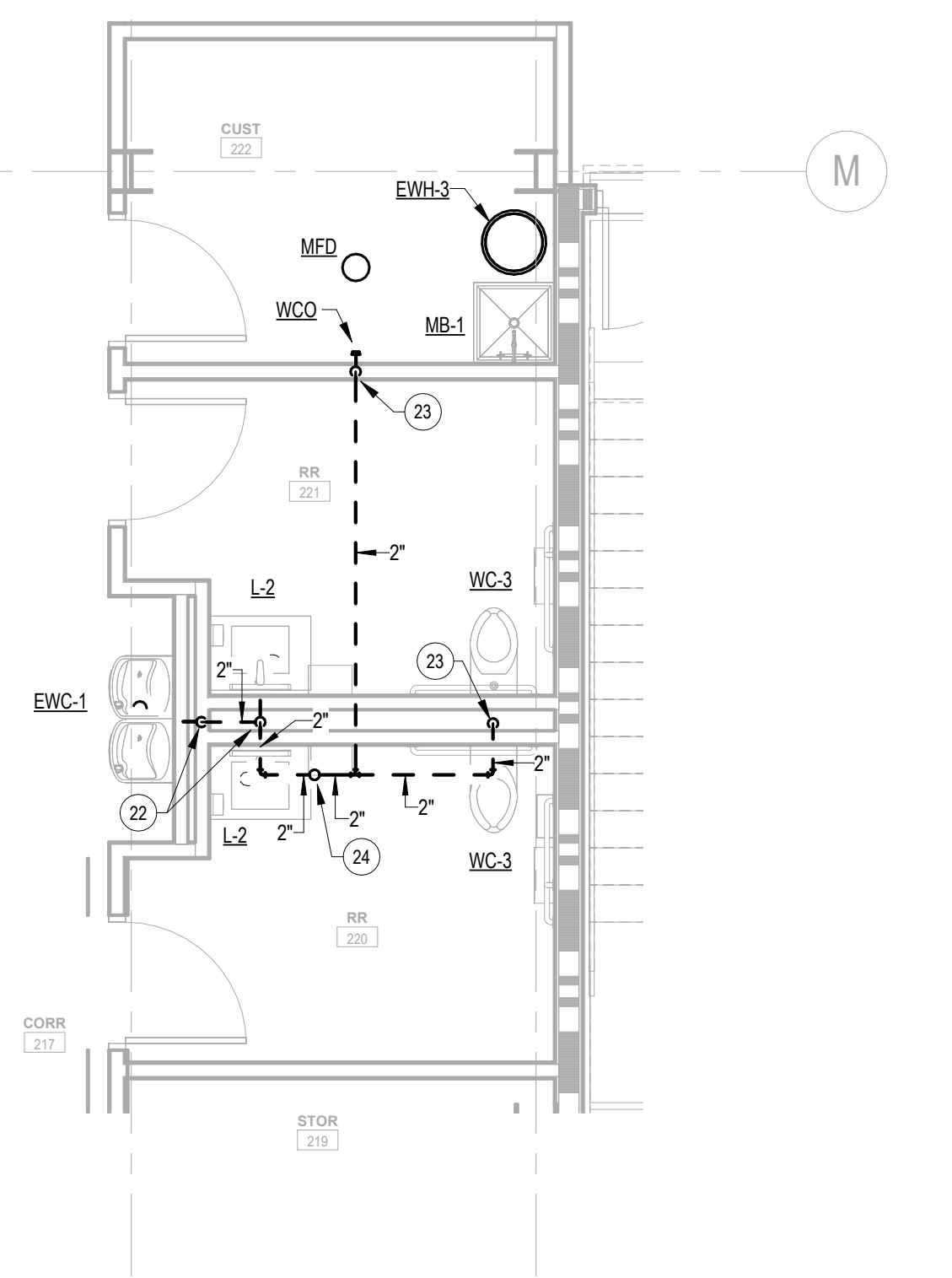
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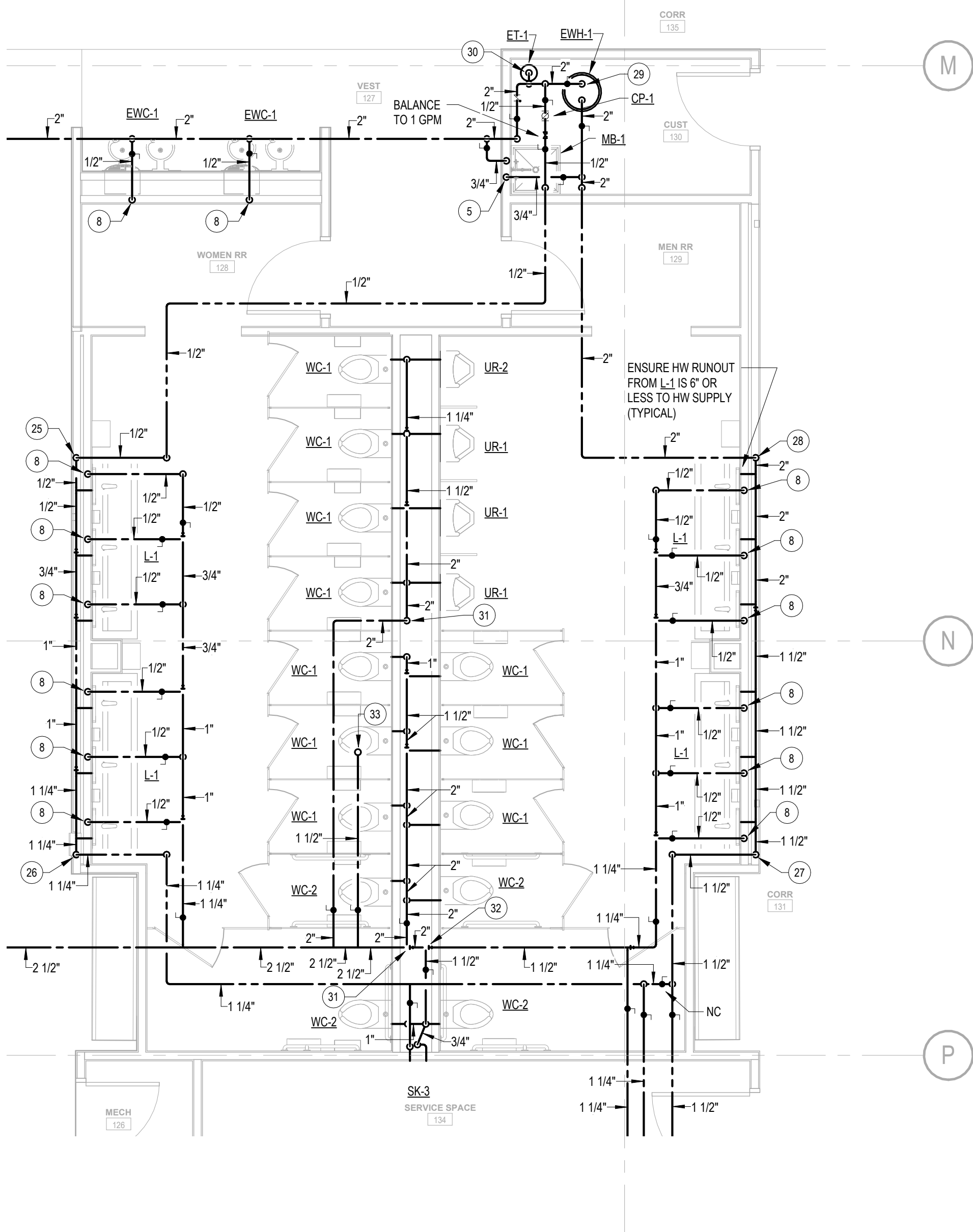
6 ENLARGED PLUMBING SERVICE SPACE PLAN - PRESSURE
1/2\" = 1'-0"



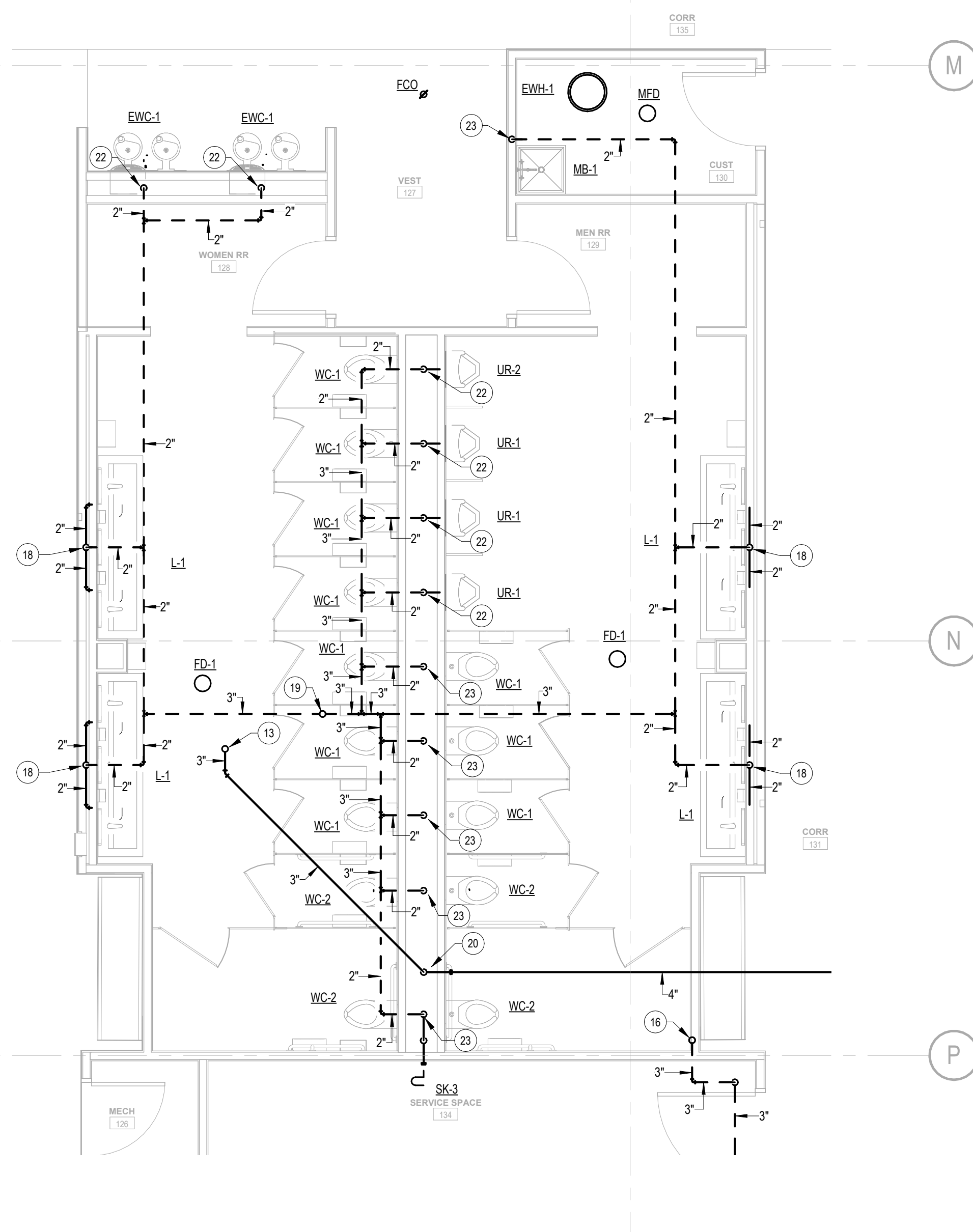
5 ENLARGED PLUMBING SECOND FLOOR PLAN - RESTROOMS - PRESSURE
1/4\" = 1'-0"



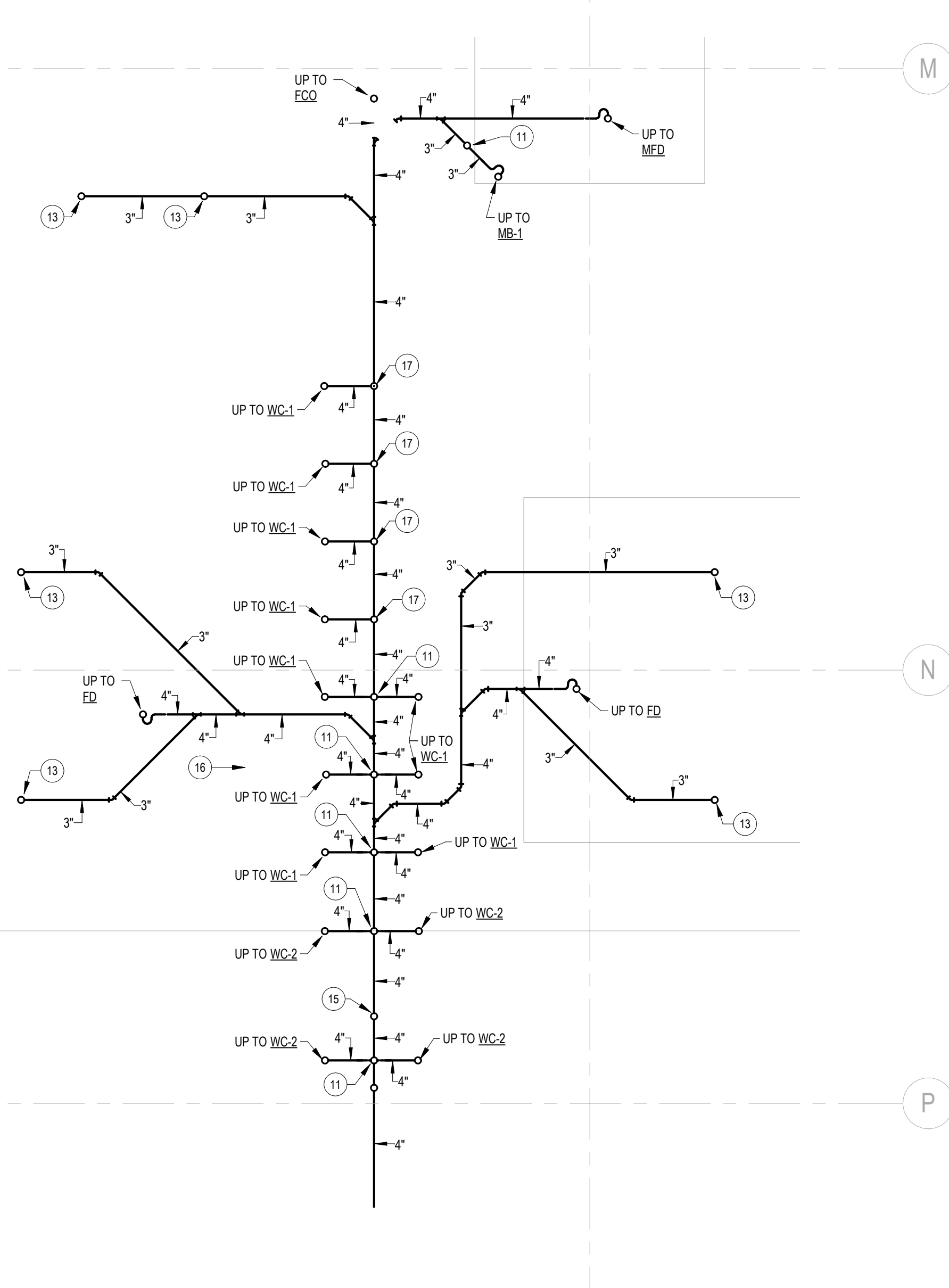
4 ENLARGED PLUMBING SECOND FLOOR PLAN - RESTROOMS - NON-PRESSURE
1/4\" = 1'-0"



3 ENLARGED PLUMBING FIRST FLOOR PLAN - PUBLIC RESTROOMS
PRESSURE
1/4\" = 1'-0"



2 ENLARGED PLUMBING FIRST FLOOR PLAN - PUBLIC RESTROOMS
NON-PRESSURE
1/4\" = 1'-0"



1 ENLARGED PLUMBING BELOW SLAB PLAN - PUBLIC RESTROOMS
1/4\" = 1'-0"

KEYNOTES - ENLARGED PLANS

- 1 1/2\" CW UP
- DROP 1\" CW IN WALLCHASE
- DROP 1/2\" HW IN WALLCHASE
- DROP 1/2\" CW & HW IN WALLCHASE
- DROP 3/4\" CW & HW IN WALLCHASE
- DROP 1\" CW & HW TO EQUIPMENT
- DROP 3/4\" CW TO EQUIPMENT
- DROP 1/2\" CW IN WALLCHASE
- 2\" WASTE STACK DOWN, 2\" VENT UP
- 3\" WASTE DOWN, 2\" VENT UP
- 2\" VENT UP
- 2\" WASTE DOWN, 2\" VENT UP
- 2\" WASTE UP
- 4\" SANITARY UP
- 3\" VENT UP
- 2\" SANITARY UP
- 2\" WASTE DOWN, 2\" VENT RISE
- 4\" VENT UP
- 4\" SANITARY DOWN, 2\" WASTE RISE
- 2\" SANITARY DOWN, 2\" VENT RISE
- 2\" VENT DOWN, 2\" VENT RISE
- 2\" VENT UP TO 2\" VTR
- DROP 1/2\" HW IN WALLCHASE
- DROP 1-1/4\" HW IN WALLCHASE
- DROP 1-1/2\" HW IN WALLCHASE
- DROP 2\" HW IN WALLCHASE
- DROP 2\" CW & HW TO EQUIPMENT
- DROP 3/4\" CW TO EQUIPMENT
- DROP 2\" CW IN WALLCHASE
- DROP 1-1/2\" CW IN WALLCHASE
- 1-1/2\" CW UP
- DROP 1\" CW & HW TO EQUIPMENT
- DROP 3/4\" CW TO EQUIPMENT
- DROP 1\" HW IN WALLCHASE
- DROP (2) 3/4\" CW & (2) 3/4\" HW TO EQUIPMENT
- DROP 3/4\" HW IN WALLCHASE
- 1-1/2\" WASTE DOWN TO OIL SEPARATOR. PROVIDE AIR GAP.
- 2\" WASTE DOWN TO MFD. PROVIDE AIR GAP.

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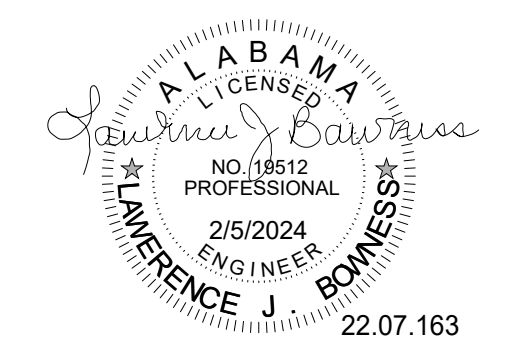
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DRAWING TITLE
PLUMBING
ENLARGED PLANS

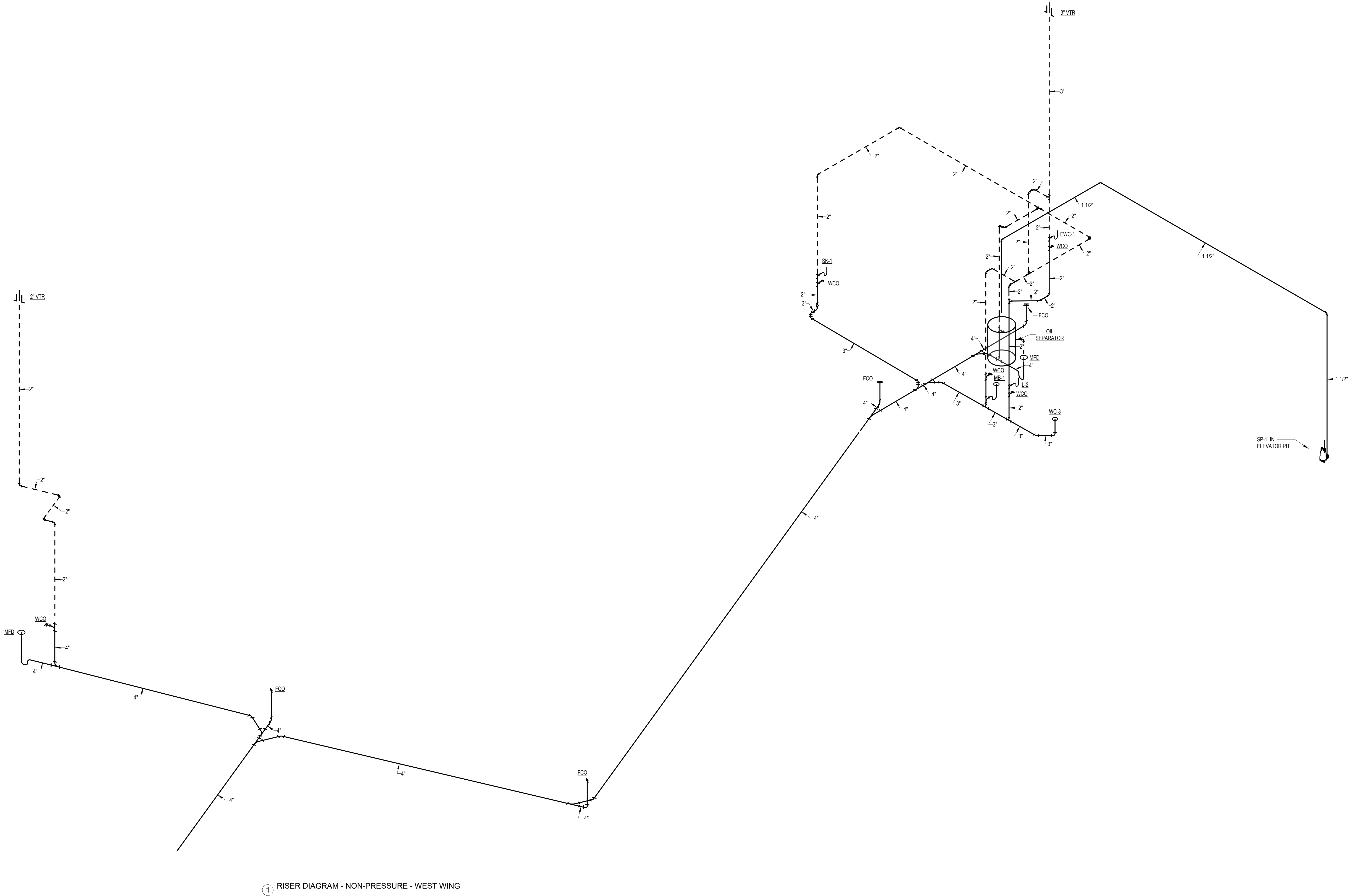
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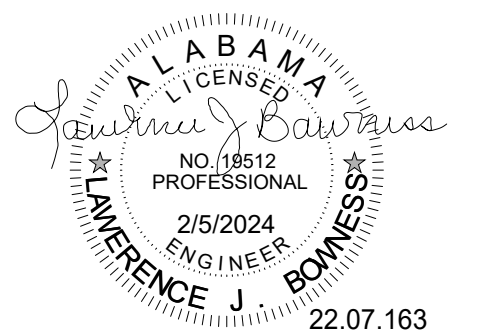


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*CHECKED BY: LIB

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DRAWING TITLE
**PLUMBING RISER
DIAGRAMS**

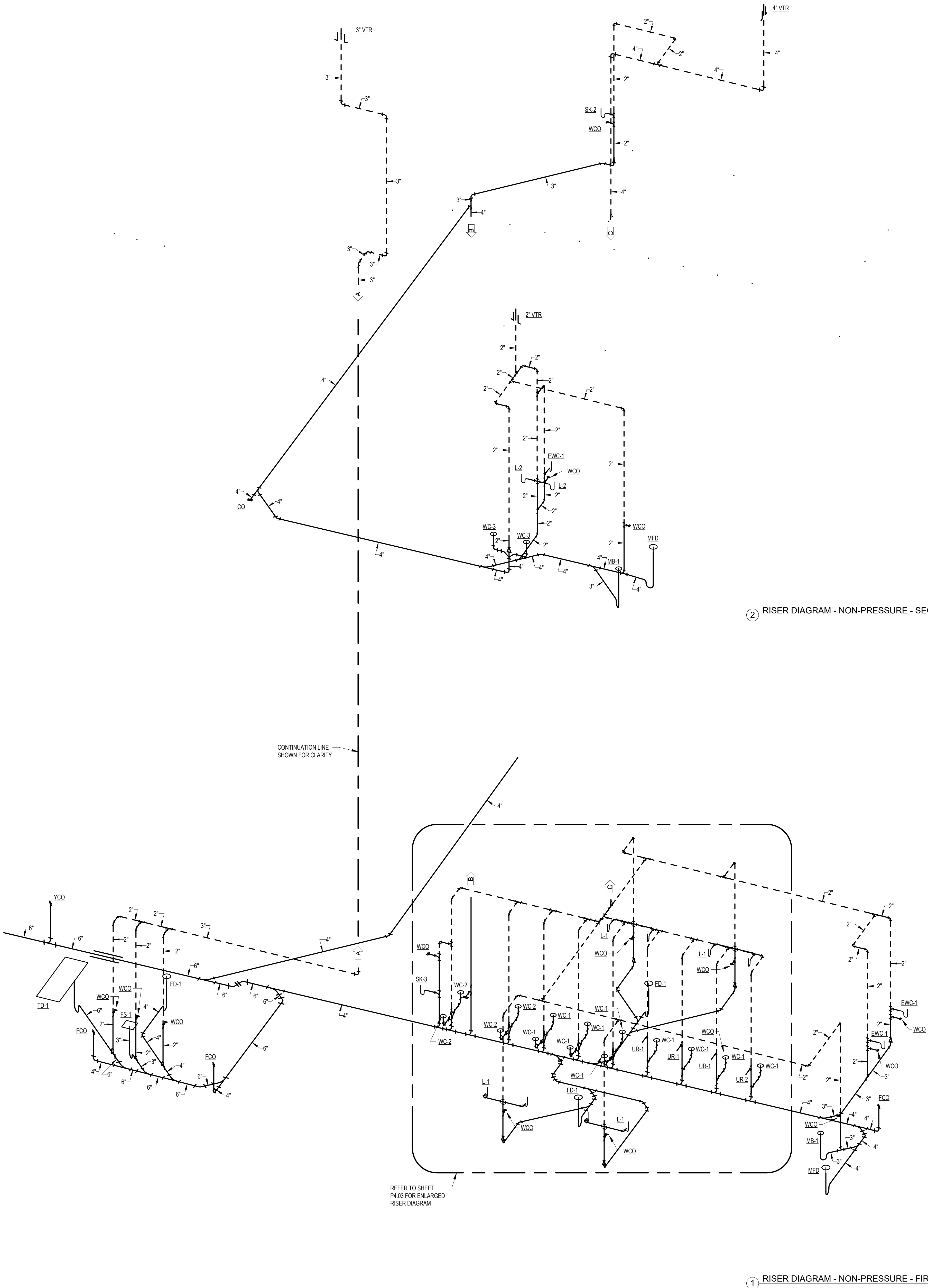
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DRAWING NO.
P4.01

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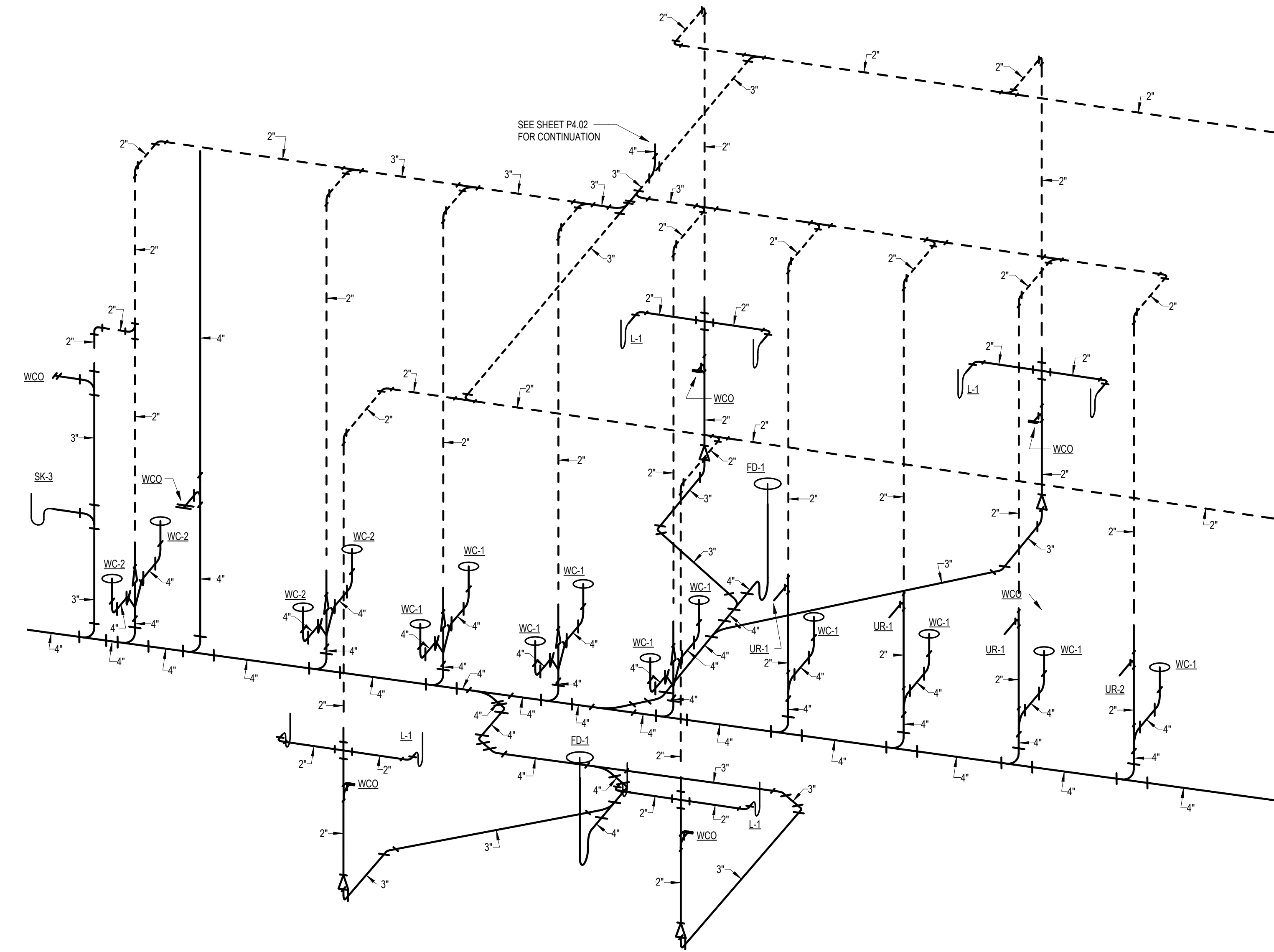
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DRAWING TITLE		
PLUMBING RISER DIAGRAMS		
DRAWN BY:		KAJ
CHECKED BY:		LIB
PROJECT NUMBER		225029-00
DRAWING NO.		P4.02



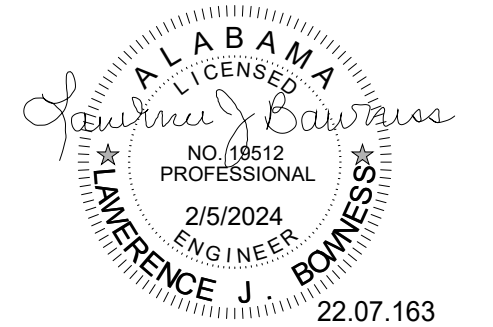
1 RISER DIAGRAM - NON-PRESSURE - ENLARGED BATHROOM

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ISSUE DATE: FEBRUARY 05, 2024

REVISIONS
No. Description Date

DRAWING TITLE
**PLUMBING RISER
DIAGRAMS**

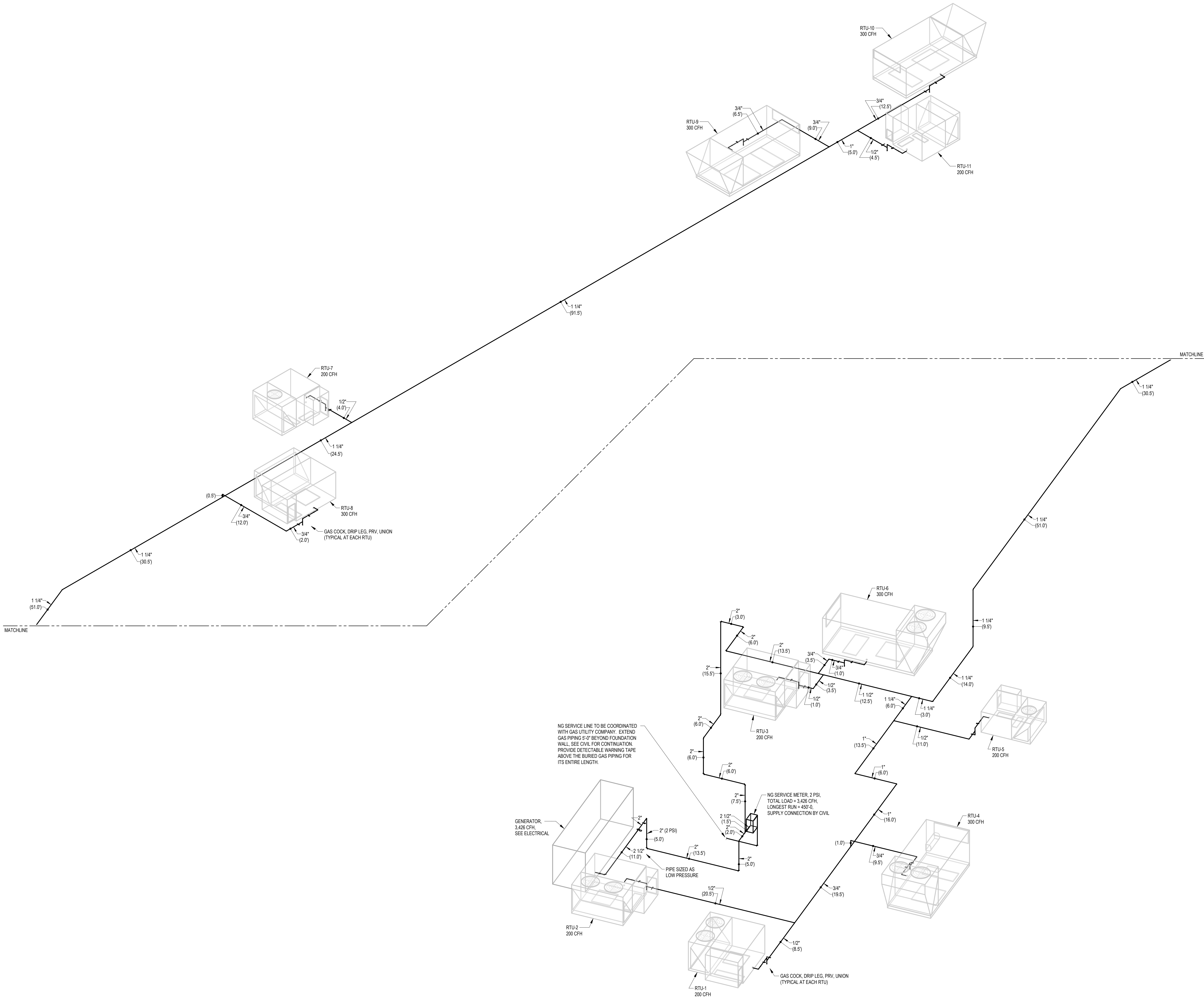
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1 RISER DIAGRAM - NATURAL GAS

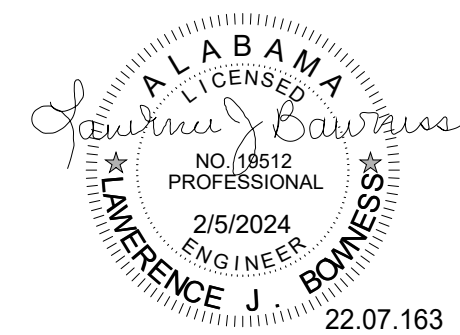
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DRAWING TITLE
**PLUMBING RISER
DIAGRAM**

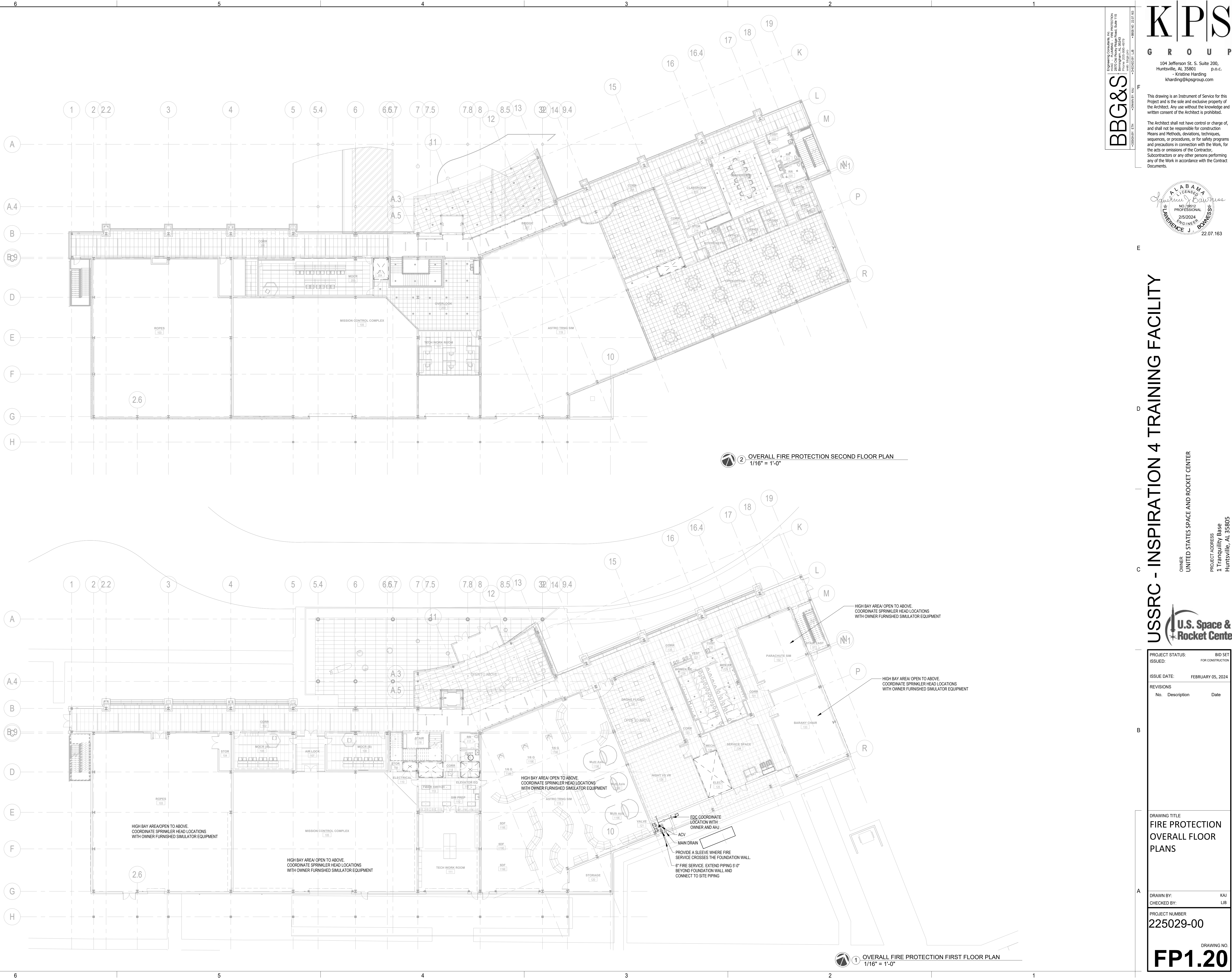
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




















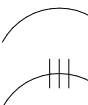



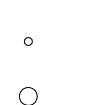
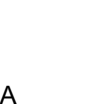


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ALABAMA
Professional Engineer
No. 16512
2/5/2024
CONFERENCE J. BOWEN
22.07.163

RECEPTACLES			
	WALL OUTLET: DUPLEX RECEPTACLE, NEMA 5-20R.		
	WALL OUTLET: SINGLE RECEPTACLE, NEMA 5-20R.		
	WALL OUTLET: DUPLEX RECEPTACLE, NEMA 5-20R, MOUNT 44" AFF UNLESS OTHERWISE NOTED OR EQUAL.		
	WALL OUTLET: SINGLE RECEPTACLE, NEMA 6-30R, MOUNT AT 18" AFF.		
	WALL OUTLET: ELECTRIC WATER COOLER DOUBLE DUPLEX RECEPTACLE, GFI TYPE, 20A, 125V, 2P, 3W, NEMA 5-20R. VERIFY EXACT HEIGHT AND LOCATION PRIOR TO INSTALLATION.		
	WALL OUTLET: GROUND FAULT INTERRUPTER RECEPTACLE, TERMINAL NEMA 5-15R, MOUNT AT 18" A.F.F. OR AS NOTED.		
	WALL OUTLET: DUPLEX RECEPTACLE, WEATHERPROOF, NEMA 5-20R.		
	WALL OUTLET: DOUBLE-DUPLEX, NEMA 5-20R, MOUNT 44" AFF.		
	WALL OUTLET: DOUBLE-DUPLEX, NEMA 5-20R, MOUNT 18" AFF.		
	CEILING MOUNTED QUAD BOX OUTLET POWER CORD REEL WITH 45' CORD. EQUAL TO REELCRAFT #L454S-123-7Q		
FIRE ALARM			
	FIRE ALARM SYSTEM: MANUAL STATION, MOUNT 4'-0".		
	FIRE ALARM SYSTEM: LOCAL ALARM AND SUPERVISORY PANEL.		
	FIRE ALARM SYSTEM: ANNUNCIATOR		
	FIRE ALARM SYSTEM: SMOKE DETECTOR, SURFACE MOUNTED.		
	FIRE ALARM SYSTEM: AUTOMATIC FIRE DETECTOR, HIGH TEMPERATURE, 190 DEG. F.(THERMAL AND RATE OF RISE).		
	FIRE ALARM SYSTEM: SMOKE DETECTOR IN A/C DUCT WITH SAMPLING TUBES.		
	FIRE ALARM SYSTEM: COMBINATION HORN AND LIGHT, MOUNT 80" A.F.F.		
	FIRE ALARM SYSTEM: COMBINATION SPEAKER AND STROBE, WALL MOUNTED		
	FIRE ALARM SYSTEM: ALARM SIGNAL LIGHT, MOUNT 80" A.F.F.		
	FIRE ALARM SYSTEM: (AUTOMATIC DOOR RELEASE)		
	FIRE ALARM SYSTEM: CONTROL PANEL, (SURFACE) (FLUSH) MOUNTED.		
	FIRE ALARM SYSTEM: FLOW SWITCH CONNECTION		
	FIRE ALARM SYSTEM: SUPERVISORY VALVE CONNECTION		
	FIRE ALARM SYSTEM: NAC PANEL		
	FIRE ALARM SYSTEM: SPEAKER ONLY, CEILING MOUNTED		
BRANCH CIRCUITS			
	BRANCH CIRCUIT: CONCEALED IN CEILING OR WALL.		
	BRANCH CIRCUIT: CONCEALED IN CEILING OR WALL, 3#12, 1#12G-3/4"		
	BRANCH CIRCUIT: HOMERUN TO PANELBOARD AND 20A, 1P, BREAKER, UNLESS OTHERWISE NOTED. SHOWN, 2#12, 1#12G-3/4" THE NUMBER IN THE CIRCUIT INDICATES A.W.G. WIRE SIZE WHEN DIFFERENT THAN #12 AWG. SEE NOTE 22.		
	BRANCH CIRCUIT: HOMERUN TO PANELBOARD AND 20A, 1P, BREAKER, UNLESS OTHERWISE NOTED. SHOWN, 2#12, 2#12(N), 1#12(G)-3/4" THE NUMBER IN THE CIRCUIT INDICATES A.W.G. WIRE SIZE WHEN DIFFERENT THAN #12 AWG. SEE NOTE 22.		
	BRANCH CIRCUIT: HOMERUN TO PANELBOARD AND 20A, 1P, BREAKER, UNLESS OTHERWISE NOTED. SHOWN, 3#12, 3#12(N), 1#12(G)-3/4" THE NUMBER IN THE CIRCUIT INDICATES A.W.G. WIRE SIZE WHEN DIFFERENT THAN #12 AWG. SEE NOTE 22.		
	BRANCH CIRCUIT: CONCEALED IN OR BELOW FLOOR OR UNDERGROUND		
	RISER: DOWN		
	RISER: UP		
ABBREVIATIONS			
A	ABOVE COUNTER	IG	ISOLATED GROUND
AFG	ABOVE FINISH GRADE	NL	NIGHT LIGHT
AFF	ABOVE FINISH FLOOR	MCB	MAIN CIRCUIT BREAKER
AIC	AVAILABLE INTERRUPT CURRENT	MLO	MAIN LUGS ONLY
AL	ALUMINUM	RR	REMOVE AND REPLACE WITH NEW
AWG	AMERICAN WIRE GAUGE	TBB	TELEPHONE BACK BOARD
C	CONDUIT RACEWAY	TP	TAMPER PROOF
CB	CIRCUIT BREAKER	TV	TELEVISION
CU	COPPER	TYP	TYPICAL
DISC	DISCONNECT	UC	UNDER COUNTER
EM	EMERGENCY	UG	UNDER GROUND
EMT	ELECTRICAL METALLIC TUBING	WAP	WIRELESS ACCESS POINT
EP	EXPLOSION PROOF	WP	WEATHERPROOF, NEMA 3R.
EX	EXISTING	XR	EXISTING - REMOVE
F	FUSE	XRR	EXISTING - REMOVE AND RELOCATE
G, GRD	GROUND	XRL	EXISTING - RELOCATED
GFI	GROUND FAULT INTERRUPTING		

LIGHTING (SEE LIGHT FIXTURE SCHEDULE)	
	CEILING OUTLET: RECESSED LED LIGHT FIXTURE, AS NOTED, TYPE "A" CIRCUIT #1.
	CEILING OUTLET: RECESSED EMERGENCY LED LIGHT FIXTURE, AS NOTED, TYPE "A" CIRCUIT #1.
	CEILING OUTLET: EXIT LIGHT, SEE LIGHT FIXTURE SCHEDULE.
	CEILING OUTLET: RECESSED LED LIGHT FIXTURE, LUMINAIRE TYPE "A", CIRCUIT #1
	CEILING OUTLET: RECESSED EMERGENCY LED LIGHT FIXTURE, LUMINAIRE TYPE "A", CIRCUIT #1
	CEILING OUTLET: SURFACE MOUNTED LED LIGHT FIXTURE.
	CEILING OUTLET: SURFACE MOUNTED EMERGENCY LED LIGHT FIXTURE.
	WALL OUTLET: WALL MOUNTED EMERGENCY LED LIGHT FIXTURE.
	WALL OUTLET: WALL MOUNTED LED LIGHT FIXTURE.
	POLE MOUNTED FIXTURE: LED LIGHT FIXTURE, TYPE "A", CIRCUIT #1.
LIGHTING CONTROLS	
	WALL SWITCH: LINE VOLTAGE OR 0-10V, DIMMING
	WALL SWITCH: A.C. TYPE, 1-POLE, 15A, 125/277V.
	WALL SWITCH: A.C. TYPE, 3-WAY, 15A, 125/277V.
	PHOTOCELL: TORK #2101 OR EQUAL MOUNTED ON ROOF.
	WALL SWITCH: OCCUPANCY SENSOR & MANUAL ON/OFF, WATTSTOPPER DW-100 OR EQUAL.
	SWITCH: LOCAL ON/OFF OVERRIDE FOR OCCUPANCY SENSOR PLUS DIMMING CONTROL
	SWITCH: OCCUPANCY SENSOR AND DIMMING, ON/OFF.
	WALL OCCUPANCY SENSOR: SEE DETAILS.
	CEILING OCCUPANCY SENSOR: SEE DETAILS
	CEILING OCCUPANCY SENSOR HIGH BAY: SEE DETAILS
	LIGHTING POWER PACK: FOR USE WITH OCCUPANCY SENSORS & LIGHTING CONTROL. SEE DETAILS.
	CEILING DAYLIGHT SENSOR: SEE DETAILS
POWER	
	CEILING EXHAUST FAN.
	NON-FUSED DISCONNECT SWITCH.
	FUSED DISCONNECT SWITCH.
	CIRCUIT BREAKER.
	AUTOMATIC TRANSFER SWITCH.
	LIGHTING PANEL: SEE SCHEDULE AND SPECIFICATIONS.
	RECEPTACLE PANEL: SEE SCHEDULE AND SPECIFICATIONS.
	ELECTRICAL PANEL: SEE SCHEDULE AND SPECIFICATIONS.
	POWER PANEL
	TRANSFORMER
	FUSED DISCONNECT SWITCH WITH CONNECTION TO EQUIPMENT.
	MANUAL MOTOR STARTER THERMAL SWITCH, WALL MOUNT 5'-6\"/>
	RECESSED FLUSH WITH WALL 4 GANG LEGRAND BOX, #FBS4-EFSC MOUNT AT 4'-8\"/>
POWER & AUXILIARY - FLOOR OUTLETS	
	FLOOR OUTLET: FLOOR BOX WITH 2 EACH DUPLEX 20 AMP RECEPTACLES, 2 EACH DATA DROPS, 1 EACH HDMI, EQUAL TO: WIREMOLD EVOLUTION 6 GANG SERIES: EF6BS-OG-WITH INTERIOR PLATES AND DEVICES AS DESCRIBED.
	FLOOR OUTLET: FLOOR BOX WITH 4 EACH DUPLEX 20 AMP RECEPTACLES, 1 EACH HDMI, AND 4 EACH DATA DROPS, WITH ROOM FOR ADDITIONAL AUX OUTLETS, EQUAL TO: WIREMOLD EVOLUTION 6 GANG SERIES: EF6BS-OG-WITH INTERIOR PLATES AND DEVICES AS DESCRIBED.
	FLOOR OUTLET: (POKE-THRU) FLOOR BOX WITH 2 EACH DUPLEX 20 AMP RECEPTACLES, 1 EACH HDMI, AND 2 EACH DATA DROPS, EQUAL TO WIREMOLD EVOLUTION POKE-THRU: 6STC-68REC-25(X2)-6CTC2GY PLUS INTERIOR PLATES AND DEVICES AS DESCRIBED.

NOTES

- ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL ORDINANCES. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS.
- CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH ALL DETAILS OF THE WORK AND ALL EXISTING FIELD CONDITIONS.
- CONTRACTOR SHALL PROVIDE A COMPLETE ELECTRICAL INSTALLATION INCLUDING ALL WORK CUSTOMARILY INCLUDED EVEN IF NOT SPECIFICALLY CALLED OUT.
- THE ELECTRICAL CONTRACTOR SHALL CAREFULLY COORDINATE HIS WORK WITH OTHER CONTRACTORS THROUGH THE GENERAL CONTRACTOR FOR SPACE REQUIREMENTS, ETC.
- CONTRACTOR SHALL VERIFY ALL MECHANICAL EQUIPMENT NAMEPLATE DATA BEFORE ANY WORK IS DONE AND MAKE ANY ADJUSTMENTS IN BREAKER AND WIRE SIZE AS MAY BE REQUIRED.
- SHOULD THE CONTRACTOR FIND DISCREPANCIES OR OMISSIONS IN THE CONTRACT DOCUMENTS OR BE IN DOUBT AS TO INTENT, HE SHALL IMMEDIATELY OBTAIN CLARIFICATION FROM THE ARCHITECT OR ENGINEER.
- THE ELECTRICAL DRAWINGS ARE SCHEMATIC AND ARE NOT INTENDED TO SHOW THE EXACT LOCATION OF CONDUITS, OUTLETS, ETC. THE CONTRACTOR SHALL REFER TO ARCHITECTURAL, MECHANICAL, AND PLUMBING DRAWINGS AND SHALL FIT HIS WORK TO CONFORM WITH THE BUILDING CONSTRUCTION AND WITH THE OTHER TRADES.
- ELECTRICAL CONTRACTOR SHALL VERIFY EXACT HEIGHT OF ALL COUNTER TOPS AND BACK-SPLASHES ON CASEWORK SHOP DRAWINGS, AND CHANGE SPECIFIED MOUNTING HEIGHT OF WALL OUTLETS INDICATED AS REQUIRED SO THAT BOTTOM OF OUTLET BOX IS 2" ABOVE TOP OF BACK-SPLASH OR IF NO BACK-SPLASH IS USED, 4" ABOVE COUNTERTOP.
- DO NOT MOUNT OUTLETS BACK-TO-BACK. PROVIDE MINIMUM 24" SEPARATION IN FIRE RATED WALLS.
- ALL OUTLETS IN EXPOSED CONCRETE BLOCKS SHALL BE ADJUSTED AS REQUIRED TO ALLOW CUTTING OF ONLY ONE BLOCK. MAINTAIN UNIFORM HEIGHTS THROUGHOUT THE BUILDING.
- VERIFY ALL DOOR SWINGS WITH ARCHITECT PRIOR TO ROUGHING LIGHT SWITCHES.
- CONTRACTOR SHALL CHECK ALL LIGHT FIXTURES FOR EXACT TYPE MOUNTING AND SPACE REQUIRED BEFORE ROUGHING IN.
- BRANCH CIRCUITS #12 A.W.G. AND 3/4" CONDUIT (GALVANIZED) MINIMUM. CONDUCTORS SHALL BE 98% CONDUCTIVITY COPPER. SEE SPECIFICATIONS FOR TYPE INSULATION.
- VOLTAGE DROP: FOR 20 AMP CIRCUITS OVER 100 FEET AND LESS THAN 175 FEET, USE #10 CONDUCTORS. FOR 20 AMP CIRCUITS OVER 175 FEET AND LESS THAN 275 FEET, USE #8 CONDUCTORS.
- ALL CONDUITS CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION TYPE FITTINGS.
- THE ATTACHED DRAWINGS WERE DEVELOPED FROM RECORD DRAWINGS AND INFORMATION PROVIDED BY OTHERS WHICH MAY NOT REFLECT ACTUAL FIELD CONDITIONS. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS IN THE FIELD BEFORE PROCEEDING WITH SUBSEQUENT WORK. THE DESIGN TEAM SHALL BE NOTIFIED OF ANY DISCREPANCIES OR CONFLICTS WITH DRAWINGS FOR CLARIFICATION PRIOR TO PROCEEDING WITH WORK.
- FOR ALL SINGLE-PHASE CIRCUITS SHARING A NEUTRAL WITH OTHER SINGLE-PHASE CIRCUITS, CONTRACTOR SHALL INSTALL CIRCUIT BREAKER HANDLE TIES WHICH WILL PROVIDE FOR SIMULTANEOUS DISCONNECTION OF ALL CIRCUIT BREAKERS FOR CIRCUITS WHICH SHARE THE SAME NEUTRAL. HANDLE TIE SHALL NOT PREVENT THE REQUIRED TRIPPING OF A BREAKER.
- LABEL PANELS PER NEC11024.
- FIRE ALARM CONTRACTOR SHALL BE LICENSED WITH THE STATE FIRE MARSHALLS OFFICE AND SHALL BE NICET III CERTIFIED AT MINIMUM.

DO NOT SCALE DIMENSIONS FROM DRAWINGS. CONSULT OWNER/ARCHITECT FOR EXACT DIMENSIONAL DATA.

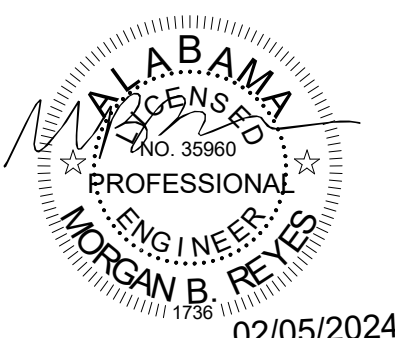
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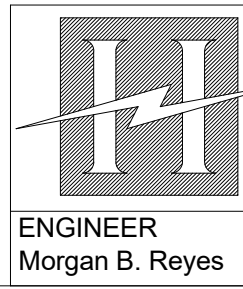
USSRC - INSPIRATION 4 TRAINING FACILITY

OWNER
UNITED STATES SPACE AND ROCKET CENTER

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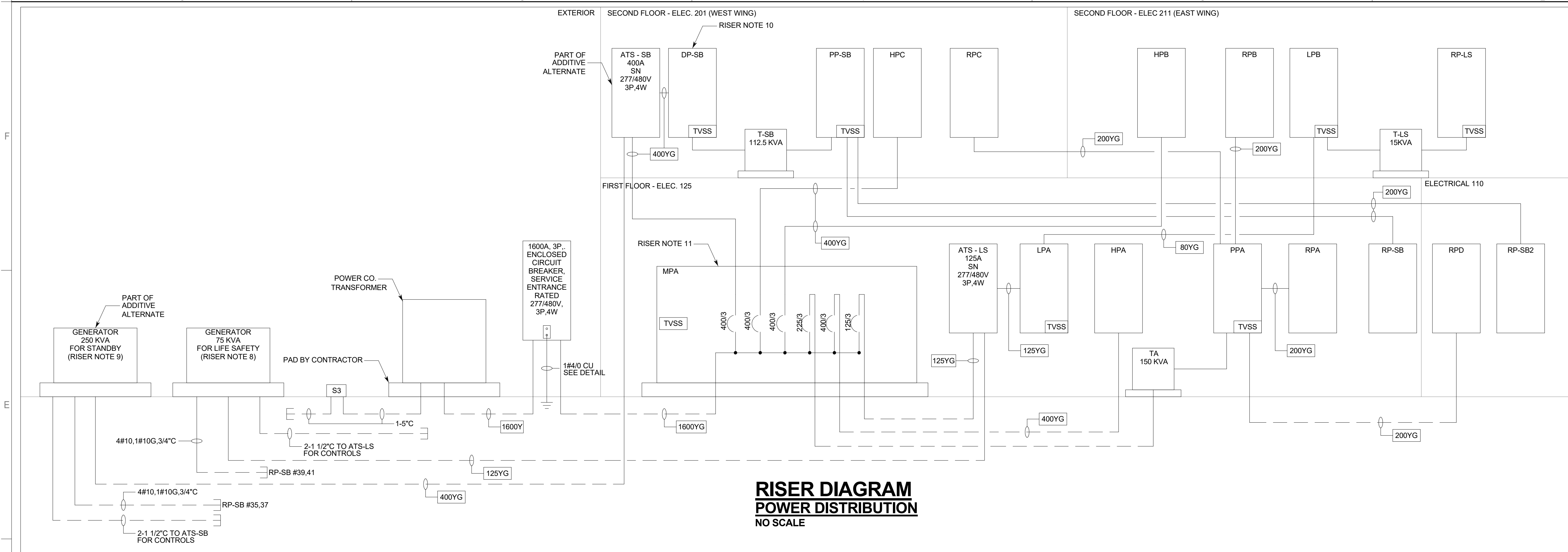


PROJECT STATUS: ISSUED		BID SET FOR CONSTRUCTION
ISSUE DATE:		FEBRUARY 5, 2024
REVISIONS		
No.	Description	Date
DRAWING TITLE LEGEND AND NOTES		
DRAWN BY:		BR
CHECKED BY:		MBR
PROJECT NUMBER 225029-00		DRAWING NO. E0.1



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PROJECT #
23168.1



- SHORT CIRCUIT, COORDINATION, AND ARC FLASH:
1. ACTUAL AVAILABLE FAULT CURRENT DATA WAS NOT OBTAINED FROM THE POWER COMPANY. E.C. IS TO OBTAIN FAULT CURRENT DATA FROM POWER COMPANY.
 2. E.C. TO PROVIDE SHORT CIRCUIT, COORDINATION, AND ARC FLASH STUDIES FOR ALL NEW EQUIPMENT.
 3. STUDIES ARE TO START AT UTILITY SOURCE AND/OR GENERATOR AND INCLUDE ALL EXISTING UPSTREAM EQUIPMENT.
 4. E.C. IS RESPONSIBLE FOR COLLECTING ALL DATA NECESSARY TO COMPLETE STUDY.
 5. STUDIES ARE TO BE PERFORMED USING SKM POWERWARE, EASYPPOWER, OR ETAP SOFTWARE UNDER THE SUPERVISION OF A REGISTERED ENGINEER. ARC FLASH STUDIES SHALL BE CONSISTENT WITH IEEE 1584.
 6. PROVIDE PRELIMINARY STUDY REPORT AT TIME OF POWER EQUIPMENT SUBMITTALS. POWER EQUIPMENT SUBMITTALS WILL BE REJECTED WITHOUT PRELIMINARY STUDY. PRELIMINARY PANEL RATINGS HAVE BEEN ESTABLISHED FOR BID. THESE SHALL BE UPDATED WITH ARC FLASH STUDY.
 7. USE RESULTS OF STUDY TO SELECT AIC RATINGS, BREAKER TYPES, ETC. FOR POWER EQUIPMENT PRIOR TO ORDERING EQUIPMENT.
 8. MARK EQUIPMENT PER BOTH NFPA 70 AND 70E TO INCLUDE, BUT NOT LIMITED TO, ARC FLASH LABELS.
 9. PROVIDE FINAL STUDY REPORT AS PART OF CLOSE-OUT DOCUMENTATION (BOTH HARD COPY AND ELECTRONIC PDF FORM).

TRANSFORMER TABLE - 480V PRIMARY - 208/120V, SECONDARY									
	KVA	FL AMPS	BKR SIZE	FDR	TRANSFORMER GROUNDING ELECTRODE (3)		FL AMPS	BKR SIZE	FDR
NAME	3PH	480V	(1)	(2)	WIRE AWG	CONDUIT IN	208V	(1)	(2)
T-LS	15	18	30	30DG	8	3/4	41.7	50	60YG
T-SB	112.5	135.3	200	200DG	1/0	1	312.3	400	420YG
TA	150	180.4	225	225DG	1/0	1	416.4	500	500YG

NOTES:
1 - USE DEVICE TYPES INDICATED ON SINGLE LINE DIAGRAM.
2 - REFERENCE FEEDER TABLE FOR FEEDER SIZE
3 - PROVIDE COPPER GROUNDING ELECTRODE

DRY-TYPE TRANSFORMER WITH COPPER WINDINGS. PROVIDE NEMA 3R ENCLOSURE FOR ALL EXTERIOR TRANSFORMERS.

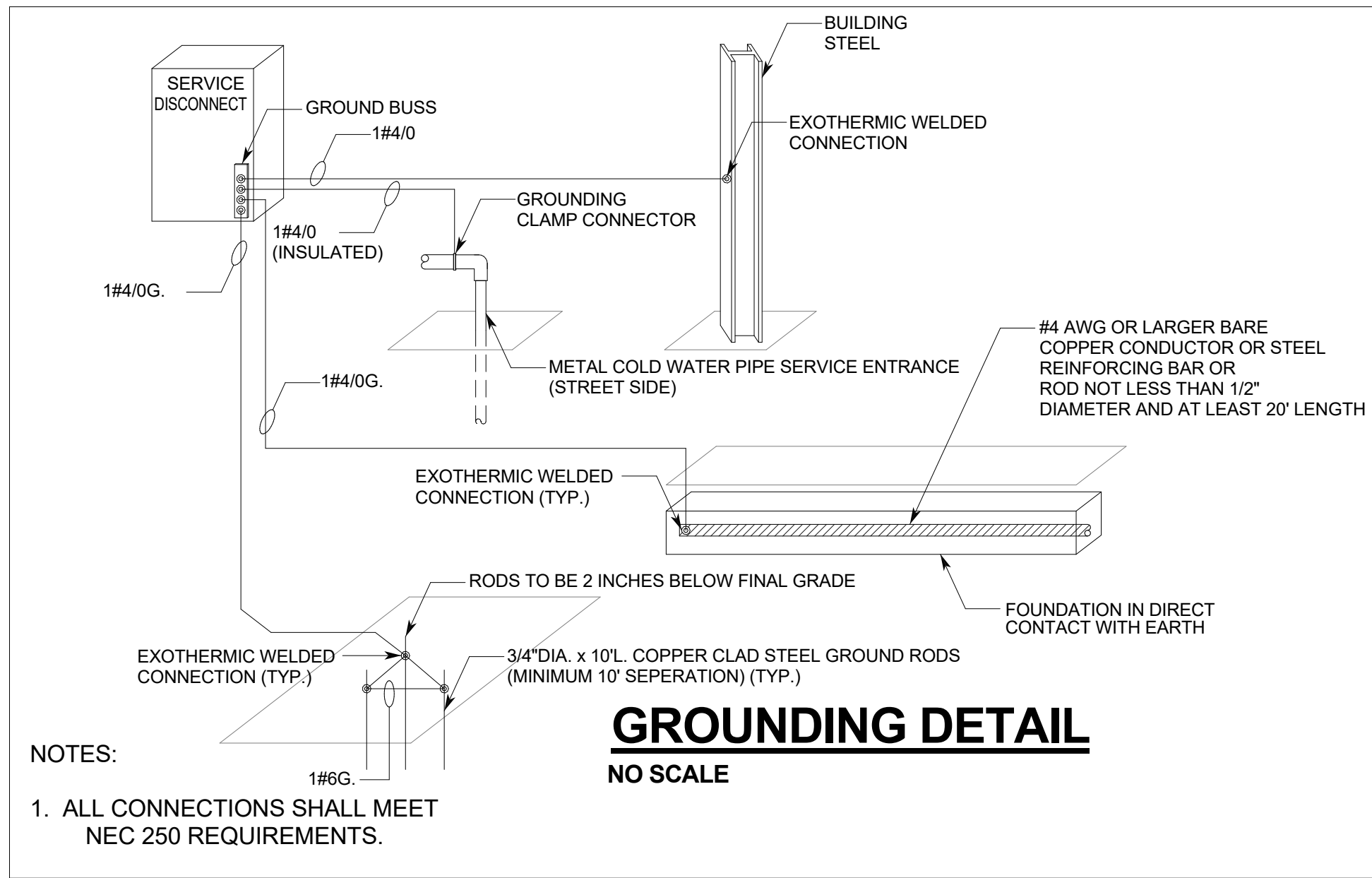
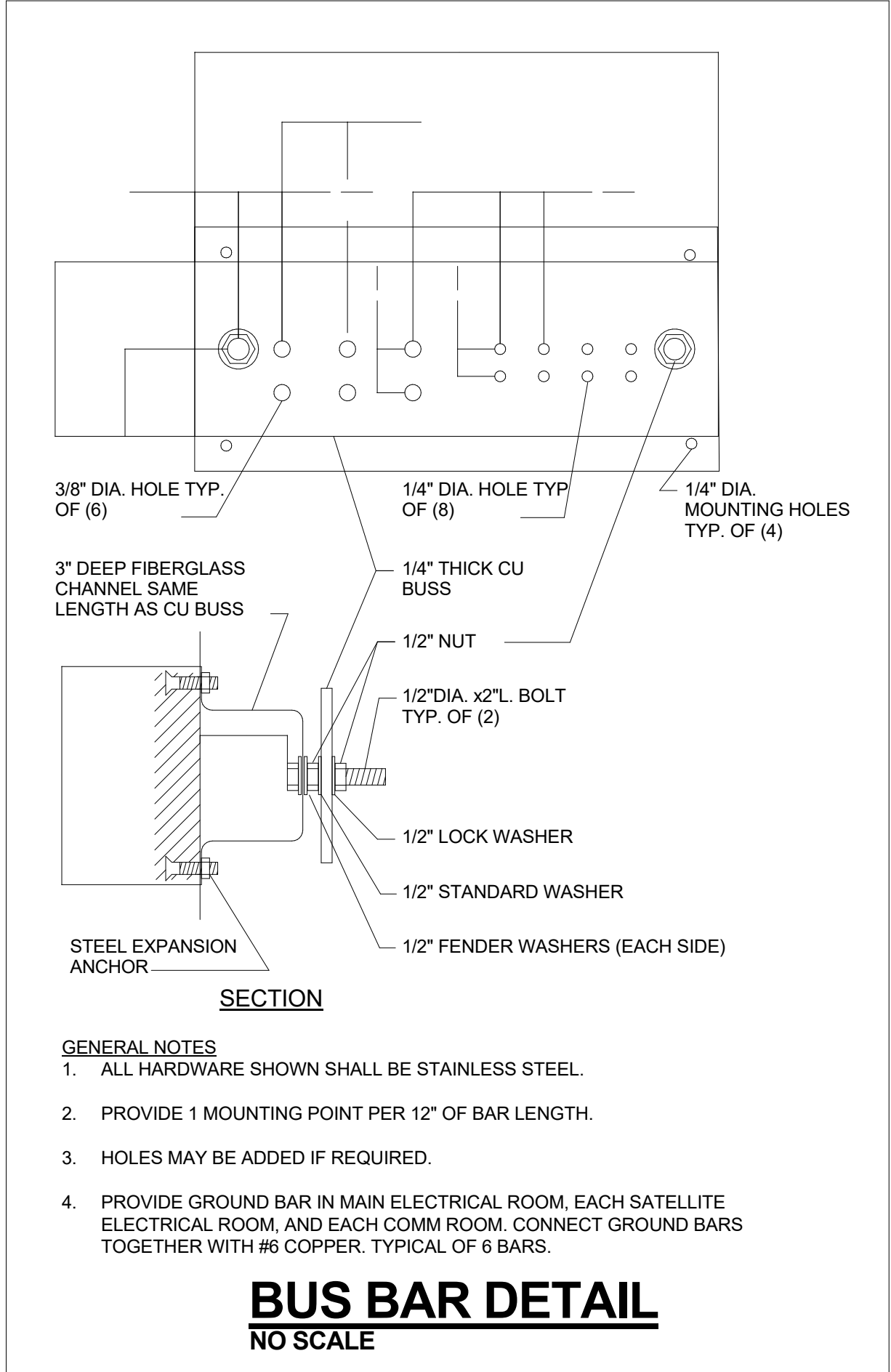
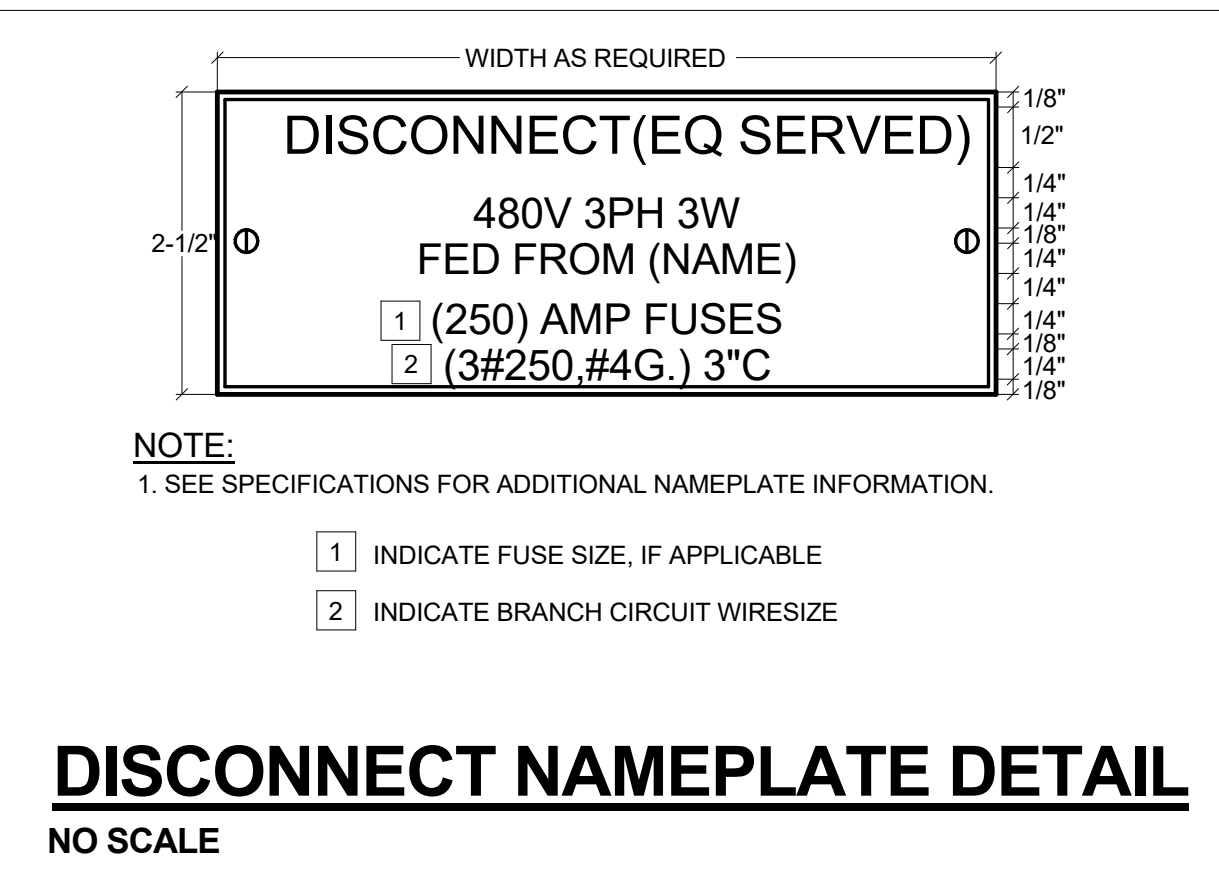
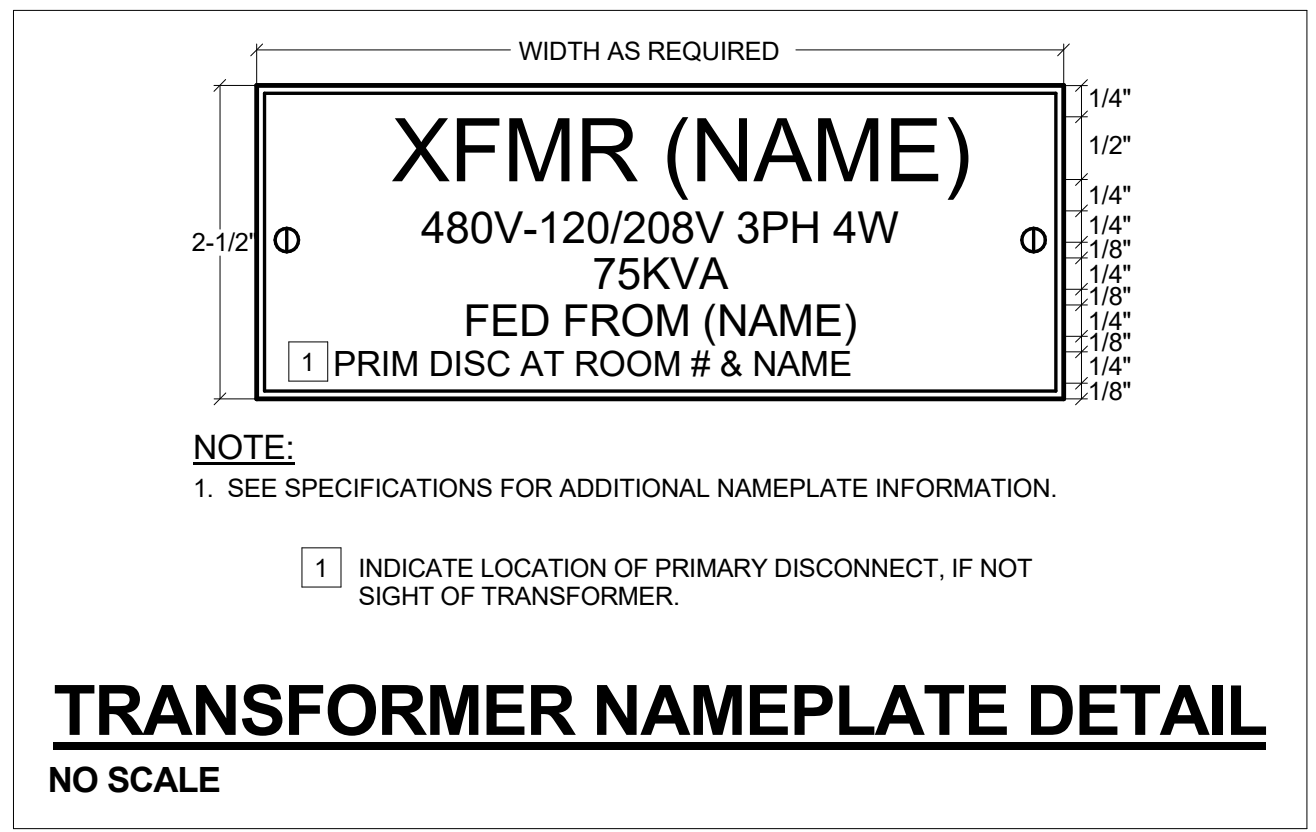
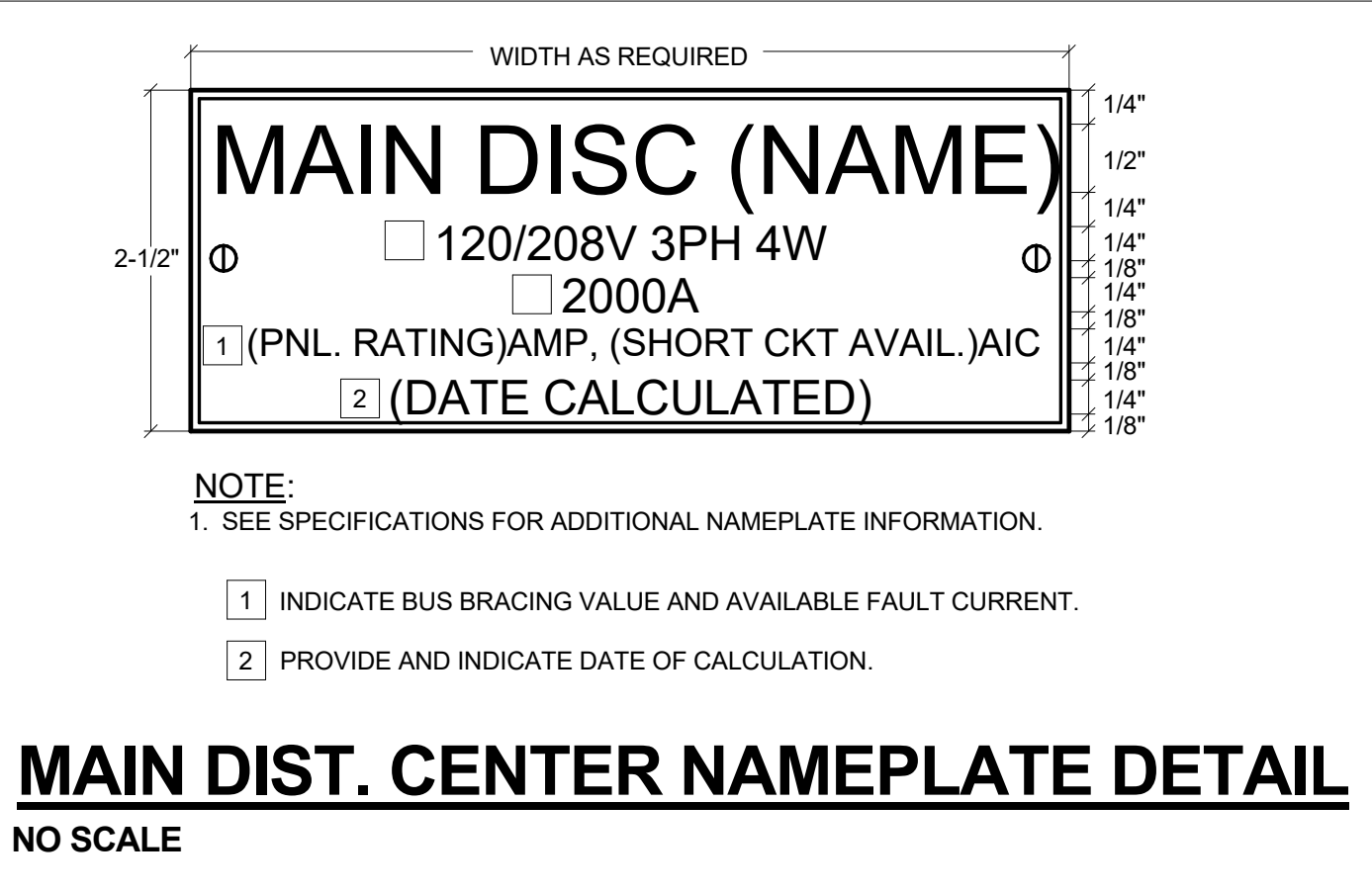
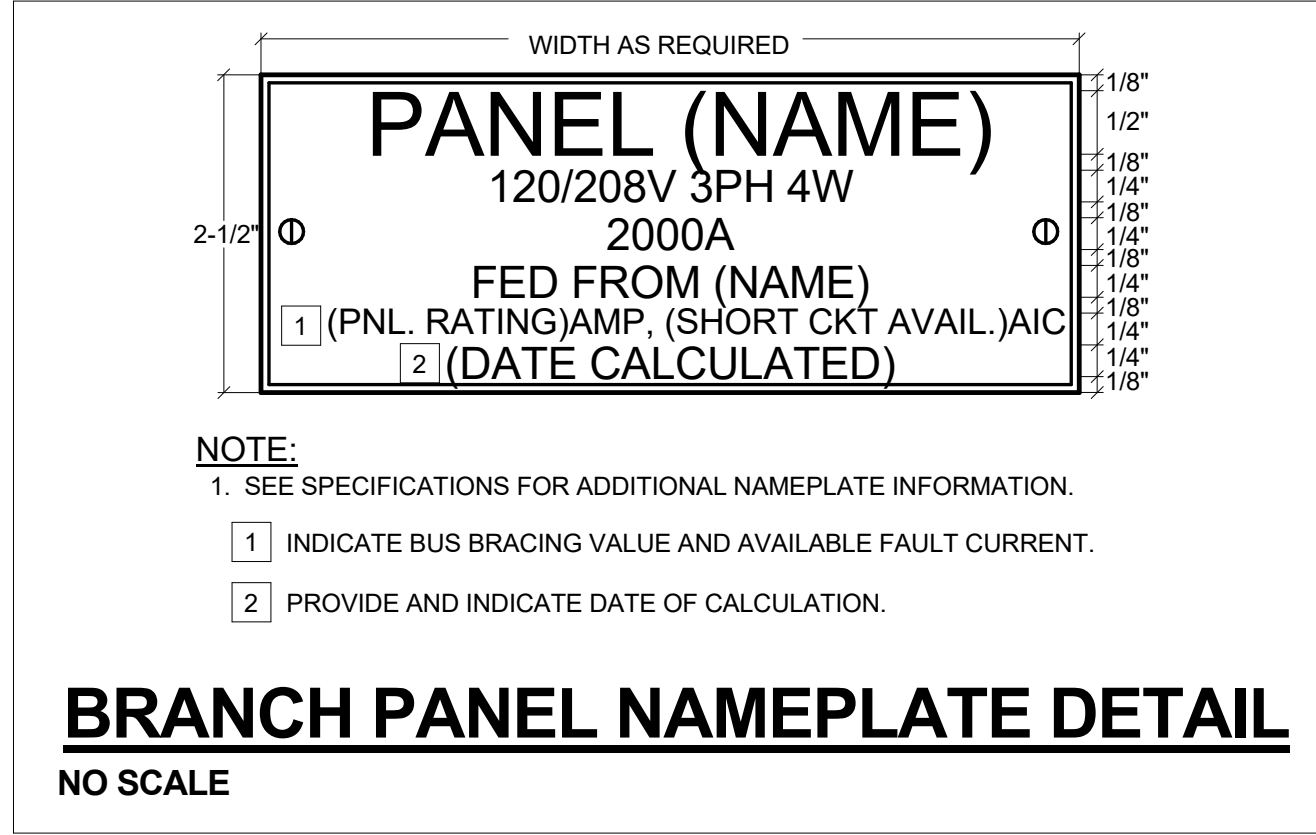
FEEDER SCHEDULE					
20DG	3#12 & 1#12G -1/2"	20SG	2#12 & 1#12G -1/2"	30DG	3#10 & 1#10G -3/4"
30SG	2#10 & 1#10G -3/4"	40DG	3#8 & 1#10G -1"	40SG	2#8 & 1#10G -1"
45DG	3#8 & 1#10G -1"	60DG	3#6 & 1#10G -1 1/4"	60YG	4#6 & 1#10 -1 1/2"
90DG	3#2 & 1#8G -1 1/2"	100DG	3#2 & 1#8G -1 1/2"	125YG	4#1 & 1#6G -2"
200YG	4#3/0 & 1#6G -3"	200DG	3#3/0 & 1#6G -2 1/2"	400YG	4#500MCM & 1#2G -4"
400DG	3#500MCM & 1#2G -3"	420YG	2 SETS OF 4#3/0 & 1#6G -3"	840YG	2 SETS 4#600, 1#3/0G -4"
1600Y	5 SETS 4#400G MCM -4"	1600YG	5 SETS 4#400, 1#4/0 -4"		

SERVICE NOTES:

1. THE SECONDARY SERVICE: 270/480V, 3Ø, 4W., GROUND NEUTRAL, WYE CONNECTED AS SHOWN ON SINGLE LINE DIAGRAM.
2. ARRANGE WITH LOCAL ELECTRICAL SERVICE COMPANY FOR SERVICE TO BE BROUGHT TO BUILDING, AND FOR THE INSTALLATION OF METER. PAY ALL CHARGES (IF ANY) IN CONNECTION THEREWITH, INCLUDING PERMANENT METER DEPOSIT, WHICH DEPOSITS WILL BE REFUNDED TO CONTRACTOR AT TIME OF OWNER'S OCCUPANCY IN THE BUILDING.
3. VERIFY WITH UTILITY COMPANIES INVOLVED THAT LOCATIONS, ARRANGEMENT, POWER COMPANY VOLTAGE, PHASE, METERING REQUIRED, AND CONNECTIONS TO UTILITY SERVICE ARE IN ACCORDANCE WITH THEIR REGULATIONS AND REQUIREMENTS. IF THEIR REQUIREMENTS ARE AT VARIANCE WITH THESE DRAWINGS AND/OR SPECIFICATIONS, CONTRACT SHALL INCLUDE AN ADDITIONAL COST NECESSARY TO MEET THOSE REQUIREMENTS WITHOUT EXTRA COST TO OWNER AFTER BIDS ARE ACCEPTED.
4. OBTAIN FROM UTILITY COMPANY ANY ADDITIONAL CHARGES FOR SERVICE OF TYPE, SIZE, AND LOCATION CALLED FOR. INCLUDE CHARGES IN BID TO BE PAID BY CONTRACTOR TO APPROPRIATE PARTY. PROVIDE PAYMENT OF THESE CHARGES SO AS TO ALLOW LOGICAL PROGRESSION OF CONSTRUCTION AND AVOID DELAY OF COMPLETION.
5. COORDINATE SERVICE WORK WITH POWER COMPANY. FURNISH AND INSTALL ALL SERVICE RELATED ITEMS NOT PROVIDED BY THE POWER COMPANY. PERFORM WORK IN ACCORDANCE WITH THEIR REQUIREMENTS AND RECOMMENDATIONS.

RISER NOTES:

1. INDUSTRY AVERAGE EQUIPMENT SIZES WERE USED TO DETERMINE FIT AND WORKING CLEARANCES. E.C. IS TO VERIFY FIT AND WORKING CLEARANCES BASED ON ACTUAL EQUIPMENT CONSIDERED.
2. FOR 277/480 VOLT SYSTEMS 1000A. & OVER, PROVIDE GFI PROTECTION FOR EACH PROTECTIVE DEVICE RATED 1000A. OR MORE. FIELD TEST PER NEC 230.95(C).
3. PROTECTIVE DEVICES RATED 800A & GREATER AND ALL DEVICES IN THE EMERGENCY AND STANDBY SYSTEM(S) SHALL BE STATIC TRIP TYPE WITH LSI SETTINGS.
4. PROTECTIVE DEVICES RATED 1200A & GREATER SHALL HAVE ENERGY REDUCING MAINTENANCE SWITCHING WITH LOCAL STATUS INDICATOR OR ARC-FLASH ENERGY REDUCTION SCHEME/METHOD APPROVED BY ENGINEER.
5. SEE FLOOR PLANS FOR PLACEMENT OF EQUIPMENT.
6. PROVIDE DOUBLE LUGS IN TWO SECTION PANELS.
7. ALL EXTERIOR EQUIPMENT TO BE IN NEMA 3R ENCLOSURES.
8. DIESEL GENERATOR FOR LIFE SAFETY WITH A TANK LARGE ENOUGH FOR 3 HOURS OF CONTINUOUS RUN AT FULL POWER. GENERATOR TO BE 75 KVA, 480V, 3P WITH ONE 125/3 OUTPUT BREAKER. WEATHER SHROUD AND LEVEL 1 SOUND ENCLOSURE.
9. NATURAL GAS GENERATOR FOR STANDBY POWER. GENERATOR TO BE 250KVA 480V, 3P WITH ONE 400/3 OUTPUT BREAKER, WEATHER SHROUD AND LEVEL 1 SOUND ENCLOSURE. THIS GENERATOR AND TRANSFER SWITCH ARE A PART OF AN ADDITIVE ALTERNATE.
10. FOR BASE BID PANEL DP-SB SHALL BE FED DIRECTLY FROM PANEL MPA WITH 400YG FEEDER.
11. SEE PANEL SCHEDULE FOR SPARES AND SPACES.



PANEL: MPA																						
VOLTAGE: 277/480			PHASE/WIRE: 3P., 4W.			MAIN BUS RATING: 2000A										MAIN CB TRIP: MLO						
MOUNTING: SURFACE			MINIMUM BREAKER INTERRUPTING CAPACITY (RMS SYM AMPS): 65000																			
DEVICE:			BRANCH CIRCUIT						PHASE LOAD (VA)						BRANCH CIRCUIT						DEVICE:	
AMPS TRIP	POLES	DESIGNATION	LTS	RCPT	HVAC	MISC	NO.	Φ A	Φ B	Φ C	NO.	MISC	HVAC	RCPT	LTS	DESIGNATION	POLES	AMPS TRIP				
100	3	SPARE					1	0	0	2						SPARE	3	200				
							3				4											
							5			0	6											
					21401	29940	7	51341			8											
400	3	HPA			21401	29940	9		51341		10					SPARE	3	200				
					21401	29940	11			51341	12											
					65416		13	65416			14											
400	3	HPB			65416		15		65416		16					SPARE	3	200				
					65416		17			65416	18											
					27714	49500	19	77214			20											
400	3	HPC			27714	49500	21		77214		22					SPARE	3	200				
					27714	49500	23			77214	24											
					19600	10929	8700	25	39229		26											
225	3	TA/PPA			18600	8864	8640	27		36104	28					PREPARED SPACE UP TO 200A	3					
					19000	10423	6700	29			36123	30										
					14159		7300	31	21459		32											
125	3	ATS-LS/LPA			11891		7300	33		19191	34					PREPARED SPACE UP TO 200A	3					
					7300		5600	35			12900	36										
					5900	39866	31500	37	77266		38											
400	3	DP-SB			5900	39866	31500	39		77266	40					PREPARED SPACE UP TO 200A	3					
					7400	39866	31500	41			78766	42										
DIVERSIFICATION (VA)								TOTAL PHASE LOAD				DEMAND CALCULATIONS (NEC 220):				Φ A	Φ B	Φ C	REQUIRED AMPACITY			
								33192326532321760				LARGEST MOTOR				0	0	0				
LIGHTS SUBTOTALS								33350				14159 11891 7300				14416.5 13916.5 14866.5				1285.62 AMPS		
RECEPT. SUBTOTALS								76400				25500 24500 26400				17698.75 14863.75 9125						
HVAC SUBTOTALS								493407				165326163261164820				158675 158600 154050						
MISC SUBTOTALS								377060				126940126880123240				356116.25 350641.25 342861.5						

PANEL: HPB																				
VOLTAGE: 277/480				PHASE/WIRE: 3P., 4W.				MAIN BUS RATING: 400A								MAIN CB TRIP: MLO				
MOUNTING: SURFACE								MINIMUM BREAKER INTERRUPTING CAPACITY (RMS SYM AMPS): 42000												
DEVICE:				BRANCH CIRCUIT				PHASE LOAD (VA)				BRANCH CIRCUIT				DEVICE:				
AMPS TRIP	POLES	DESIGNATION	VOLT-AMPS				NO.	Φ A	Φ B	Φ C	NO.	VOLT-AMPS				POLES		AMPS TRIP		
			LTS	RCPT	HVAC	MISC						MISC	HVAC	RCPT	LTS					
30	3	RTU-1			6319		1	7786			2					VAV 1-2	3	20		
					6319		3		7786		4									
					6319		5			7786	6									
					4351		7	6185			8									
20	3	RTU-2			4351		9		6185		10					VAV 1-3	3	20		
					4351		11			6185	12									
					4351		13	5885			14									
20	3	RTU-3			4351		15		5885		16					VAV 1-4	3	20		
					4351		17			5885	18									
					18623		19	19523			20									
90	3	RTU-4			18623		21		19523		22					VAV 1-5	3	20		
					18623		23			19523	24									
					3880		25	6514			26									
20	3	RTU-5			3880		27		6514		28					VAV 1-6	3	20		
					3880		29			6514	30									
					18623		31	18623			32									
					18623		33		18623		34					SPARE	3	20		
					18623		35			18623	36									
					900		37	900			38									
					900		39			900	40					SPARE	3	20		
20	3	VAV 1-1			900		41			900	42									
DIVERSIFICATION (VA)							SUBTOTALS			TOTAL PHASE LOAD			DEMAND CALCULATIONS (NEC 220):				Φ A	Φ B	Φ C	REQUIRED AMPACITY
LIGHTS SUBTOTALS							0			65416 65416 65416			LARGEST MOTOR				0	0	0	236.16 AMPS
RECEPT. SUBTOTALS							0			0			RECEPT				0	0	0	
HVAC SUBTOTALS							196248			65416 65416 65416			LIGHTS				0	0	0	
MISC SUBTOTALS							0			0			MISC				0	0	0	
TOTAL DEMAND:							0			0			TOTAL DEMAND:				65416	65416	65416	

PANEL LPA																								
VOLTAGE:			277/480		PHASE/WIRE: 3P., 4W.			MAIN BUS RATING: 125A				MAIN CB TRIP: MLO												
MOUNTING: SURFACE										MINIMUM BREAKER INTERRUPTING CAPACITY (RMS SYM AMPS): 42000														
DEVICE:					BRANCH CIRCUIT					PHASE LOAD (VA)					BRANCH CIRCUIT					DEVICE:				
AMPS TRIP	POLES	DESIGNATION	VOLT-AMPS				NO.	Φ A	Φ B	Φ C	NO.	VOLT-AMPS				DESIGNATION	POLES	AMPS TRIP						
			LTS	RCPT	HVAC	MISC						MISC	HVAC	RCPT	LTS									
20	1	CANOPY LIGHTING			2000		1	2109			2				109	STAIRWELL LIGHTING	1	20						
20	1	PLANE LIGHTING			488		3		1134		4				646	CORRIDOR LIGHTING	1	20						
20	1	BOLLARD LIGHTING			374		5			433	6				59	ELEVATOR EQ. 115	1	20						
20	1	SITE LIGHTING			2792		7	4728			8				1936	INTERIOR LIGHTING	1	20						
20	1	SITE LIGHTING			1640		9		4559		10				2919	INTERIOR LIGHTING	1	20						
20	1	EXTERIOR LIGHTING			385		11			494	12				109	STAIRWELL LIGHTING	1	20						
20	1	LTG CONTROL PANEL					13	300			14				300	EXTERIOR LIGHTING	1	20						
20	1	EXTERIOR LIGHTING			342		15		3091		16				2749	INTERIOR LIGHTING	1	20						
20	1	EXTERIOR LIGHTING			800		17			2034	18				1234	INTERIOR LIGHTING	1	20						
20	1	SPARE					19	1499			20				1499	INTERIOR LIGHTING	1	20						
20	1	SPARE					21	0			22													
20	1	SPARE					23		0		24													
20	1	SPARE					25	0			26													
20	1	SPARE					27	0			28													
20	1	SPARE					29				30													
20	1	SPARE					31	0			32													
20	1	SPARE					33		0		34													
20	1	SPARE					35		0		36													
20	1	SPARE					37	13541			38			7300	6241									
20	1	SPARE					39		10746		40			7300	3446									
20	1	SPARE					41			11124	42			5600	5524									
							DIVERSIFICATION (VA)		SUBTOTALS		TOTAL PHASE LOAD		DEMAND CALCULATIONS (NEC 220):		Φ A			Φ B		Φ C		REQUIRED AMPACITY		
											22717 19530 14085		LARGEST MOTOR		0			0		0		86.33 AMPS		
							LIGHTS SUBTOTALS		35592		14871 12230 8485		RECEPT		5316.5			5316.5		4466.5				
							RECEPT. SUBTOTALS		20200		7300 7300 5600		LIGHTS		15696.25			15287.5		10606.25				
							HVAC SUBTOTALS		0		0 0 0 0		MISC		0			0		0				
							MISC SUBTOTALS		0		0 0 0 0		TOTAL DEMAND:		23912.75			20604		15072.75				

PANEL: PPA																																																																							
VOLTAGE:				120/208				PHASE/WIRE: 3P., 4W.				MAIN BUS RATING: 600A				MAIN CB TRIP: 600A MB																																																							
MOUNTING: SURFACE																																																																							
DEVICE:				BRANCH CIRCUIT				MINIMUM BREAKER INTERRUPTING CAPACITY (RMS SYM AMPS): 35000				PHASE LOAD (VA)				BRANCH CIRCUIT				DEVICE:																																																			
AMPS TRIP		POLES		DESIGNATION				VOLT-AMPS						VOLT-AMPS						DESIGNATION		POLES		AMPS TRIP																																															
						LTS		RCPT		HVAC		MISC		NO.		Φ A		Φ B		Φ C		NO.		MISC		HVAC		RCPT		LTS																																									
										1000		3		1		7200						2		1000		5200																																													
20		3		ELECTRIC WALL HEATER						1000		5		4		7200						4		1000		6200						RPA		3 200																																					
										1000		3		6		1000		7200		6		1000		4160		5200																																													
										1000		7		12560		2		7200		8		3000		4160		2400																																													
30		3		EWH-1						1000		9		9501		2		1000		10		2200		2101		4200						RPB		3 200																																					
										1000		11		10701		2		12		2000		2101		2		5600																																													
20		1		RCP-1						200		13		12641						14		1500		5741		5200																																													
				SPACE								15		12741						16		3000		5741		4000						RPC		3 200																																					
				SPACE								17				12222		18		1500		7322		3400																																															
				SPACE								19		6828				20		2000		28		4800																																															
				SPACE								21				6661		22		2440		21		4200						RPD		3 200																																							
				SPACE								23						24		6000		24		1200		4800																																													
				SPACE								25		0				26																																																					
				SPACE								27		0				28												SPARE		3 200																																							
				SPACE								29		0				30																																																					
				SPACE								31		0				32																																																					
				SPACE								33		0				34												SPARE		3 100																																							
				SPACE								35		0				36																																																					
				SPACE								37		0				38																																																					
				SPACE								39		0				40												SPARE		3 100																																							
				SPACE								41		0				42																																																					
DIVERSIFICATION (VA)										SUBTOTALS										TOTAL PHASE LOAD 39229.26103.26123.2										DEMAND CALCULATIONS (NEC 220):										Φ A			Φ B			Φ C			REQUIRED AMPS																						
LIGHTS SUBTOTALS										0										0										0										LARGEST MOTOR										11466.5			10966.5			11166.5			277.26 AMPS												
RECEPT SUBTOTALS										57200										19600										18600										19000										LIGHTS										0			0			0					
HVAC SUBTOTALS										30215.6										10929										28863										210423.2										MISC										10875			10800			8375					
MISC SUBTOTALS										24040										8700										8640										6700										TOTAL DEMAND:										33270.7			30629.7			29964.7					

EQUIPMENT SCHEDULE										
MARK	DESCRIPTION	ELECTRICAL CHARACTERISTICS				PANEL	DISCONNECT SW.		FEEDER	REMARKS
		VOLT/PHASE	KW	HP	FLA		SIZE	FUSE		
RTU 1	ROOF TOP UNIT	480/3		8	22.8	HPB	30	30	30DG	1,2,3,4.
RTU 2	ROOF TOP UNIT	480/3		3	15.7	HPB	30	20	20DG	1,2,3,4.
RTU 3	ROOF TOP UNIT	480/3		3	15.7	HPB	30	20	20DG	1,2,3,4.
RTU 4	ROOF TOP UNIT	480/3		15	67.2	HPB	100	90	90DG	1,2,3,4.
RTU 5	ROOF TOP UNIT	480/3		1.5	14	HPB	30	20	20DG	1,2,3,4.
RTU 6	ROOF TOP UNIT	480/3		10	67.2	HPB	100	90	90DG	1,2,3,4.
RTU 7	ROOF TOP UNIT	480/3		3	14	HPC	30	20	20DG	1,2,3,4.
RTU 8	ROOF TOP UNIT	480/3		3	33.3	HPC	60	45	45DG	1,2,3,4.
RTU 9	ROOF TOP UNIT	480/3		15	72.4	DP-SB	100	100	100DG	1,2,3,4.
RTU 10	ROOF TOP UNIT	480/3		3	38.7	HPC	60	60	60DG	1,2,3,4.
RTU 11	ROOF TOP UNIT	480/3		1.5	14	HPC	30	20	20DG	1,2,3,4.
DS 1A	DUCTLESS SPLIT UNIT INDOOR	208/1			1.6	DSO-1	30	30	30SG	1,2,3,4,5.
DS 1B	DUCTLESS SPLIT UNIT INDOOR	208/1			1.6	DSO-1	30	30	30SG	1,2,3,4,5.
DS 2	DUCTLESS SPLIT UNIT INDOOR	208/1			1.6	DSO-2	30	30	30SG	1,2,3,4,5.
DS 3	DUCTLESS SPLIT UNIT INDOOR	208/1			1.6	DSO-3	30	30	30SG	1,2,3,4,5.
DS 4	DUCTLESS SPLIT UNIT INDOOR	208/1			1.6	DSO-4	30	30	30SG	1,2,3,4,5.
DS 5	DUCTLESS SPLIT UNIT INDOOR	208/1			1.6	DSO-5	30	30	30SG	1,2,3,4,5.
DS 6	DUCTLESS SPLIT UNIT INDOOR	208/1			0.8	DSO-6	30	30	30SG	1,2,3,4,5.
DS 7	DUCTLESS SPLIT UNIT INDOOR	208/1			0.8	DSO-7	30	30	30SG	1,2,3,4,5.
DSO 1	DUCTLESS SPLIT UNIT OUTDOOR	208/1			20	RPC	60	40	40SG	1,2,3,4.
DSO 2	DUCTLESS SPLIT UNIT OUTDOOR	208/1			20	RPB	60	40	40SG	1,2,3,4.
DSO 3	DUCTLESS SPLIT UNIT OUTDOOR	208/1			20	RPC	60	40	40SG	1,2,3,4.
DSO 4	DUCTLESS SPLIT UNIT OUTDOOR	208/1			20	RPC	60	40	40SG	1,2,3,4.
DSO 5	DUCTLESS SPLIT UNIT OUTDOOR	208/1			20	RPB	60	40	40SG	1,2,3,4.
DSO 6	DUCTLESS SPLIT UNIT OUTDOOR	208/1			15.2	RPC	30	30	30DG	1,2,3,4.
DSO 7	DUCTLESS SPLIT UNIT OUTDOOR	208/1			15.2	RPC	30	30	30DG	1,2,3,4.
EF 1	EXHAUST FAN	120/1	0.028			RPD			20SG	1,2,3,4.
EF 2	EXHAUST FAN	120/1	0.021			RPD			20SG	1,2,3,4.
EF 3	EXHAUST FAN	120/1	0.021			RPB			20SG	1,2,3,4.
EF 4	EXHAUST FAN	120/1	0.021			RPB			20SG	1,2,3,4.
EF 5	EXHAUST FAN	208/3	0.005			RPB	30	20	20DG	1,2,3,4.
EF 6	EXHAUST FAN	120/1							20SG	1,2,3,4.
EAH 1	ELECTRIC HEATER	208/3	3		8.3	PPA	30	20	20DG	1,2,3,4.
VAV 1-1	VAV AIR TERMINAL BOX	480/3	2.7			HPB	30	20	20DG	1,2,3,4.
VAV 1-2	VAV AIR TERMINAL BOX	480/3	4.4			HPB	30	20	20DG	1,2,3,4.
VAV 1-3	VAV AIR TERMINAL BOX	480/3	5.5			HPB	30	20	20DG	1,2,3,4.
VAV 1-4	VAV AIR TERMINAL BOX	480/3	4.6			HPB	30	20	20DG	1,2,3,4.
VAV 1-5	VAV AIR TERMINAL BOX	480/3	2.7			HPB	30	20	20DG	1,2,3,4.
VAV 1-6	VAV AIR TERMINAL BOX	480/3	7.9			HPB	30	20	20DG	1,2,3,4.
VAV 4-1	VAV AIR TERMINAL BOX	480/3	7.8			HPA	30	20	20DG	1,2,3,4.
VAV 4-2	VAV AIR TERMINAL BOX	480/3	11.3			HPA	30	30	30DG	1,2,3,4.
VAV 4-3	VAV AIR TERMINAL BOX	480/3	6.8			HPA	30	20	20DG	1,2,3,4.
VAV 4-4	VAV AIR TERMINAL BOX	480/3	4.5			HPA	30	20	20DG	1,2,3,4.
VAV 4-5	VAV AIR TERMINAL BOX	480/3	22.2			HPA	60	40	40DG	1,2,3,4.
VAV 4-6	VAV AIR TERMINAL BOX	480/3	11.6			HPA	30	20	20DG	1,2,3,4.
GD 1	GEAR DRYER	480/3			45	HPA	60	60	60DG	1,2,4.
GD 2	GEAR DRYER	480/3			45	HPA	60	60	60DG	1,2,4.
GW 1	GEAR WASHER	480/3	7.5			HPA	30	20	20DG	1,2,4.
GW 2	GEAR WASHER	480/3	7.5			HPA	30	20	20DG	1,2,4.

EQUIPMENT SCHEDULE										
MARK	DESCRIPTION	ELECTRICAL CHARACTERISTICS				PANEL	DISCONNECT SW.		FEEDER	REMARKS
		VOLT/PHASE	KW	HP	FLA		SIZE	FUSE		
VAV 9-1	VAV AIR TERMINAL BOX	480/3	18.1			DP-SB	30	30	30DG	1,2,3,4.
VAV 9-2	VAV AIR TERMINAL BOX	480/3	18.1			DP-SB	30	30	30DG	1,2,3,4.
VAV 9-3	VAV AIR TERMINAL BOX	480/3	4.8			DP-SB	30	20	20DG	1,2,3,4.
VAV 9-4	VAV AIR TERMINAL BOX	480/3	4.8			DP-SB	30	20	20DG	1,2,3,4.
VAV 9-5	VAV AIR TERMINAL BOX	480/3	5.5			DP-SB	30	30	30DG	1,2,3,4.
VAV 9-6	VAV AIR TERMINAL BOX	480/3	8.1			DP-SB	30	20	20DG	1,2,3,4.
EAH 1	ELECTRIC WATER HEATER	208/3	3		8.3	PPA	30	30	30DG	1,2,4.
EAH 2	ELECTRIC WATER HEATER	208/3	3		8.3	RPD	30	30	30DG	1,2,4.
EAH 3	ELECTRIC WATER HEATER	208/3	6		16.7	RPB	60	60	60DG	1,2,4.
ESP 1	ELEVATOR SUMP SYSTEM	120/1		1	12	RPD	30	20	20SG	1,2,4.
RCP 1	CIRCULATING PUMP	120/1	0.075		0.38	PPA			20SG	1,2,4.
RCP 2	CIRCULATING PUMP	120/1	0.075		0.38	RPD			20SG	1,2,4.
RCP 3	CIRCULATING PUMP	120/1	0.075		0.49	RPB			20SG	1,2,4.

NOTES:

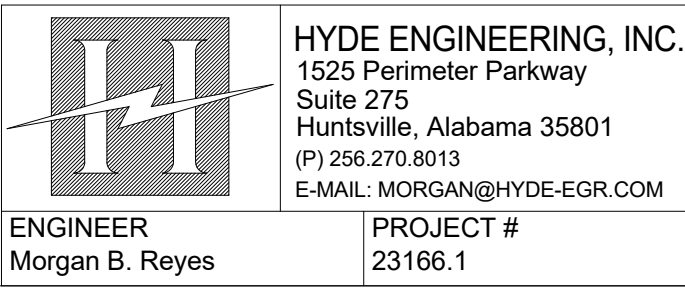
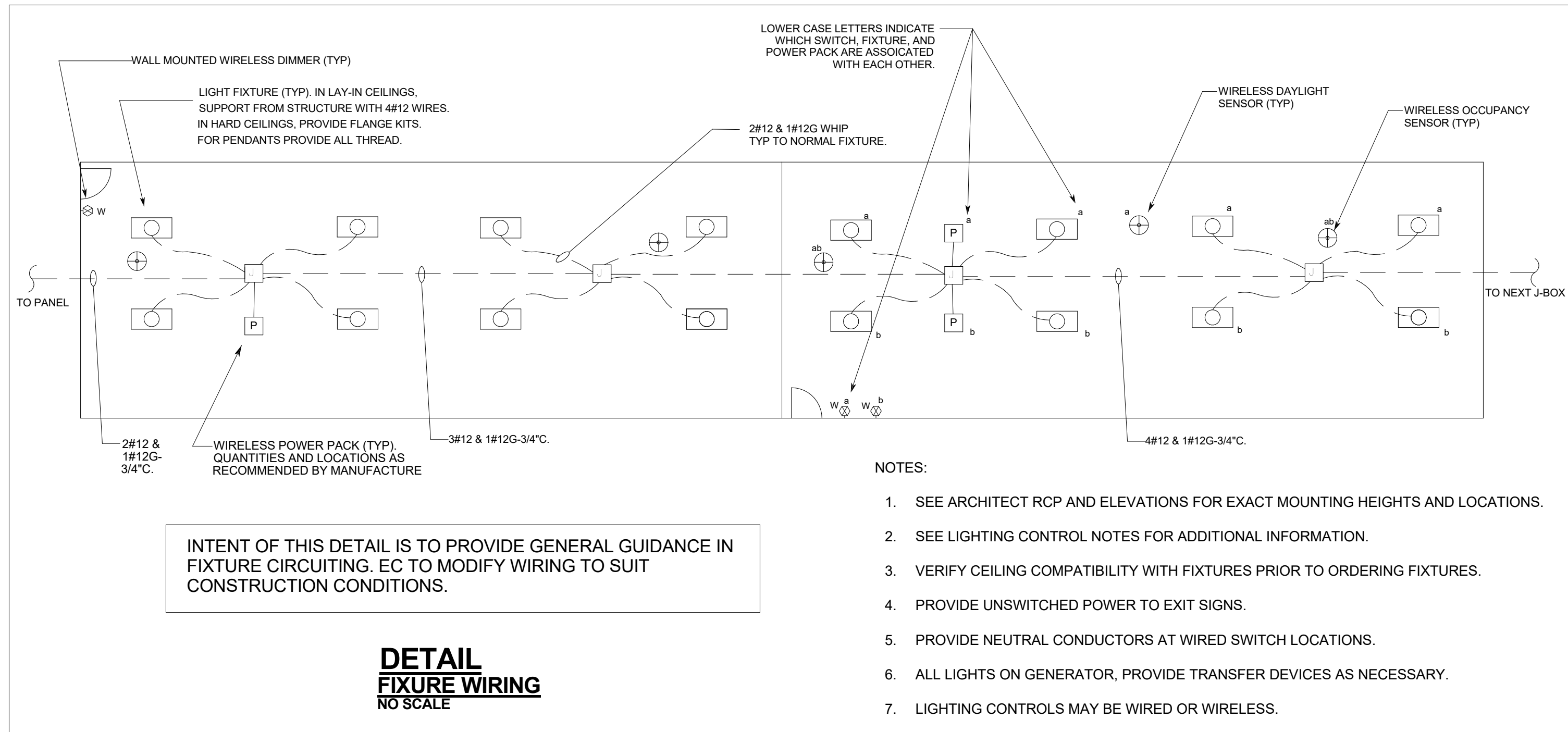
- VERIFY NAMEPLATE DATA PRIOR TO ROUGH-IN.
- PROVIDE REQUIRED WORKING CLEARANCE FOR ALL DISCONNECTS.
- ALL OUTDOOR EQUIPMENT TO BE NEMA 3R.
- FUSE TO BE DUAL ELEMENT TYPE.
- INDOOR UNITS ARE POWERED BY OUTDOOR UNITS. COORDINATE WITH MECHANICAL CONTRACTOR.

EQUIPMENT SCHEDULE										
PANEL: RPA										
VOLTAGE: 120/208 PHASE/WIRE: 3P., 4W. MAIN BUS RATING: 200A MAIN CB TRIP: MLO										
MOUNTING: SURFACE MINIMUM BREAKER INTERRUPTING CAPACITY (RMS SYM AMPS): 35000										
DEVICES: BRANCH CIRCUIT PHASE LOAD (VA) BRANCH CIRCUIT PHASE LOAD (VA) BRANCH CIRCUIT PHASE LOAD (VA)										
AMPS TRIP	POLES	DESIGNATION	VOLT-AMPS		NO.	Φ A	Φ B	Φ C	NO.	AMPS TRIP
			LTS	RCPT	MISC					
20	1	STORAGE 120	800		1	1200			2	20
20	1	CORRIDOR 135	1200		3	1600			4	20
20	1	CORRIDOR 135	1200		5		1400		6	20
20	1	EWVC	200		7	600			8	20
20	1	ASTRO TRNG 119	200		9		400		10	20
20	1	EWVC	200		11		1200		12	1000
20	1	EWVC	200		13	1200			14	1000
20	1	DRONE FLIGHT 122	600		15		600		16	
20	1	DRONE FLIGHT 122	800		17		800		18	
20	1	NIGHT VS VR	600		19	1200			20	600
20	1	NIGHT VS VR	800		21		1600		22	800
20	1	MECH 126	400		23		1200		24	800
20	1	CORRIDORS	800		25	800			26	
20	1	GFI RECEPT.	1000		27		1000		28	
20	1	SERVICE SPACE 134	600		29		600		30	
20	1	SERVICE SPACE 134	400		31	400			32	
20	1	BARANY CHAIR 133	600		33		600		34	
20	1	BARANY CHAIR 133	600		35		600		36	
20	1	BARANY CHAIR 133	800		37	800			38	
20	1	LOBBY 101	400		39		400		40	
20	1	LOBBY 101	400		41		400		42	
20	1	VALVE 121	200		43	200			44	
		SPACE			45	0			46	
		SPACE			47	0			48	
		SPACE			49	0			50	
		SPACE			51	0			52	
		SPACE			53	0			54	
		SPACE			55	0			56	
		SPACE			57	0			58	
		SPACE			59	0			60	
DIVERSIFICATION SUBTOTALS (VA)			TOTAL PHASE LOAD			DEMAND CALCULATIONS (NEC 220):			REQUIRED AMPACITY	
LIGHTS SUBTOTALS			0			RECEPT			46.81 AMPS	
RECEPTABLE SUBTOTALS			2400			LIGHTS				
HVAC SUBTOTALS			0			MISC				
MISC SUBTOTALS			0			TOTAL DEMAND:				
			0			5616.5			4766.5 5516.5	

PANEL: RPD																		
VOLTAGE: 120/208			PHASE/WIRE: 3P., 4W.			MAIN BUS RATING: 200A			MAIN CB TRIP: MLO									
MOUNTING: SURFACE						MINIMUM BREAKER INTERRUPTING CAPACITY (RMS SYM AMPS): 35000												
DEVICES:			BRANCH CIRCUIT			PHASE LOAD (VA)			BRANCH CIRCUIT			DEVICES:						
AMPS TRIP	POLES	DESIGNATION	LTS	RCPT	HVAC	MISC	NO.	Φ A	Φ B	Φ C	NO.	MISC	HVAC	RCPT	LTS	DESIGNATION	POLES	AMPS TRIP
20	1	EF-1			28		1	828			2			800		CORRIDOR 102	1	20
20	1	EF-2			21		3	621			4			600		EXTERIOR RECEPT.	1	20
20	1	CORRIDOR 102			1200		5			1800	6			600		EXTERIOR RECEPT.	1	20
20	1	CORRIDOR 102			1000		7	1000			8					SPARE	1	20
20	1	ROPES 103			600		9		600		10					SPARE	1	20
20	1	ROPES 103			600		11			600	12					SPARE	1	20
20	1	ROPES 103			600		13	600			14					SPARE	1	20
20	1	ROPES 103			400		15		400		16					SPARE	1	20
20	1	ROPES 103			600		17			600	18					SPARE	1	20
20	1	ROPES 103			600		19	1000			20		400			FIBER SWITCH 113	1	20
20	1	ROPES 103			400		21		800		22		400			FIBER SWITCH 113	1	20
20	1	ROPES 103			400		23			800	24		400			GFI RECEPT	1	20
20	1	SIM PREP 112			600		25	800			26		200			ELEVATOR EQ. 115	1	20
20	1	TECH WORK 111			400		27		1200		28		800			TECH WORK 111	1	20
20	1	TECH WORK 111			400		29			1000	30		600			TECH WORK 111	1	20
20	1	MIRROR LIGHTING				1000	31	1600			32		600			TECH WORK 111	1	20
20	1	ESP-1			1440	33			2040		34		600			TECH WORK 111	1	20
20	1	RCP-2			200	35				200	36					SPARE	1	20
30	3	EAH-2			1000	37	1000				38					SPARE	1	20
					1000	39			1000		40					SPARE	1	20
					1000	41				1000	42					SPARE	1	20
20	1	SIM PREP 112		600		43	600				44					SPARE	1	20
20	1	ELEVATOR RECEPT				45		0			46					SPARE	1	20
20	1	ELEVATOR J-BOX				47			0		48					SPARE	1	20
		SPACE				49	0				50					SPARE	1	20
		SPACE				51		0			52					SPARE	1	20
		SPACE				53			0		54					SPARE	1	20
		SPACE				55	0				56					SPARE	1	20
		SPACE				57		0			58					SPARE	1	20
		SPACE				59			0		60					SPARE	1	20
			DIVERSIFICATION SUBTOTALS (VA)				TOTAL PHASE LOAD 7428 6861 6000				DEMAND CALCULATIONS (NEC 220):				Φ A Φ B Φ C REQUIRED AMPACITY			
ONE SINGLE SECTION			LIGHTS SUBTOTALS 0				0 0 0 RECEPT 4366.5				3766.5 4066.5				57.46 AMPS			
			HVAC SUBTOTALS 0				28 21 0 MISC 2500				3050 1500							
			MISC SUBTOTALS 3200				2000 2440 1200				TOTAL DEMAND: 6894.5 6837.5 5566.5							



LIGHT FIXTURE SCHEDULE			
MARK	DESCRIPTION	LAMPS	MANUFACTURER
BLA	LED EXTERIOR BOLLARD FIXTURE, 277V, 4000K		LANDSCAPE FORMS #AE-SM-200
		13W	OR PRE-APPROVED EQUAL
CLA (CLAE)	LED SURFACE MOUNTED CYLINDER FIXTURE, WET LOCATION RATED 277V, 4000K, 60° BEAM	3895LM	METEOR LIGHTING #AS6-40-408-UNV-STV-60-FINISH-SUM-NO(EMP)
	(WITH EMERGENCY BATTERY)	40W	OR PRE-APPROVED EQUAL
CLB (CLBE)	LED SURFACE MOUNTED CYLINDER FIXTURE, WET LOCATION RATED 277V, 4000K, 60° BEAM	7845LM	METEOR LIGHTING #AS6-80-408-UNV-STV-60-FINISH-SUM-NO(EMP)
	(WITH EMERGENCY BATTERY)	80W	OR PRE-APPROVED EQUAL
CLC (CLCE)	6° LED SURFACE MOUNTED CYLINDER FIXTURE, WET LOCATION RATED, 277V, 4000K, WIDE BEAM	7845LM	METEOR LIGHTING #AS6-80-408-UNV-STV-WD-FINISH-STD-SUM-NO(EMP)
	(WITH EMERGENCY BATTERY)	80W	OR PRE-APPROVED EQUAL
CLD	6° LED SURFACE MOUNTED CYLINDER FIXTURE, WET LOCATION RATED, 277V, 4000K + RGB, WIDE BEAM	7845LM	METEOR LIGHTING #AS6-100W-408C-UNV-DMX-WD-FINISH-STD-SUM-NO
		80W	OR PRE-APPROVED EQUAL
DPA	LED DECORATIVE PENDANT WITH 30 HANGING GLOBES, VERIFY VOLTAGE		KIMI LIGHTING #GREGG LONG STAIRCASE PENDANT LIGHT - 30 LIGHTS
		150W	OR PRE-APPROVED EQUAL
FPL	LED FLAGE POLE LIGHT, 277V, 4000K, ON FLUSH WITH GRADE CONCRETE BASE SEE DETAILS	2400LM	LUMARK #IFNFDL-C75-D-UNV-33-S-FINISH
		236W	OR PRE-APPROVED EQUAL
LF4 (LF4E)	4° LED LENSED STRIP LIGHT, 277V, 3500K	4000LM	COOPER #4SLSTP4035DD-UNV-(EBPLED7W)
	(WITH EMERGENCY BATTERY)	36W	OR PRE-APPROVED EQUAL
LLA (LLAE)	8° LED RECESSED LINEAR, 277V, 3500K	2800LM	LUMENWERX #VIA4RD-WDO-FH-SW-80CRI-350LMF-35K-#8#0°-UNV-D1-GTD-MOUNTING-FINISH-(#EMB1)
	(WITH EMERGENCY BATTERY)	27.2W	OR PRE-APPROVED EQUAL
LLB (LLBE)	4° LED RECESSED LINEAR, 277V, 3500K	1400LM	LUMENWERX #VIA4RD-WDO-FH-SW-80CRI-350LMF-35K-#4°-0°-UNV-D1-GTD-MOUNTING-FINISH-(#EMB1)
	(WITH EMERGENCY BATTERY)	14W	OR PRE-APPROVED EQUAL
LLC	LED DECORATIVE PENDANT, 277V, 3500K	2625LM	KUZCO #LP95354
		27W	OR PRE-APPROVED EQUAL
LLD (LLDE)	4° LED STRIPLIGHT, LENSED, 277V, 35K	5700LM	COOPER LIGHTING #4SLSTP553DD-UNV-(EBPLED7W)
	(WITH EMERGENCY BATTERY)	47W	OR PRE-APPROVED EQUAL
LLE (LLEE)	24° LED RECESSED LINEAR, 277V, 3500K	18,000LM	LUMENWERX #VIA4RD-WDO-FH-SW-80CRI-750LMF-35K-#24#0°-UNV-D1-GTD-MOUNTING-FINISH-(#EMB1)
	(WITH EMERGENCY BATTERY)	160.8W	OR PRE-APPROVED EQUAL
LLF	26° LED RECESSED LINEAR, 277V, 3500K	9100LM	LUMENWERX #VIA4RD-WDO-FH-SW-80CRI-350LMF-35K-#26#0°-UNV-D1-GTD-MOUNTING-FINISH
		78W	OR PRE-APPROVED EQUAL
LLG (LLGE)	48° LED RECESSED LINEAR, 277V, 3500K	3600LM	LUMENWERX #VIA4RD-WDO-FH-SW-80CRI-750LMF-35K-#48#0°-UNV-D1-GTD-MOUNTING-FINISH-(#EMB2)
	(WITH EMERGENCY BATTERY)	321.6W	OR PRE-APPROVED EQUAL
LLH	2° WIDE LINEAR PATTERN RGBW FIXTURE, 277V, SEE FLOOR PLANS FOR PATTERN REQUIRED.		
		9W/FT	OR PRE-APPROVED EQUAL
LLI (LLIE)	4° LED RECESSED LINEAR, RGBW, 277V, 4000K		
	(WITH EMERGENCY BATTERY)	20W	OR PRE-APPROVED EQUAL
LPA (LPAE)	HIGH BAY LED, 277V, 3500K	19,000LM	COOPER LIGHTING #HUB-18-UNV-L840-CD-U-(WITH LVS #CEPS-250)
	(WITH EMERGENCY BATTERY)	147W	OR PRE-APPROVED EQUAL
LPB (LPBE)	HIGH BAY LED, 277V, 3500K	26,000LM	COOPER LIGHTING #HUB-24-UNV-L840-CD-U-(WITH LVS #CEPS-250)
	(WITH EMERGENCY BATTERY)	197W	OR PRE-APPROVED EQUAL
LPC (LPCe)	8° LED CYLINDER X 12" TALL SURFACE MOUNTED, 277V, 3500K, WIDE OPTIC	3000LM	SPECTRUM LIGHTING #C0812XT-30L-35K-WD-DO10X-TCY-GL-SM-FINISH(EMCRC)
	(WITH EMERGENCY BATTERY)	32.6W	OR PRE-APPROVED EQUAL
LPD (LPDe)	4° LED CYLINDER X 6" TALL SURFACE MOUNTED, 277V, 3500K, WIDE OPTIC	1450LM	SPECTRUM LIGHTING #CFO406PC-20L-35K-WD-DO10X-CL-SM-FINISH(EMCRC)
	(WITH EMERGENCY BATTERY)	12.9W	OR PRE-APPROVED EQUAL
LPE (LPEE)	4° LED LINEAR SURFACE MOUNTED, 277V, 3500K	1400LM	LUMENWERX #VIA4S-WDO-FH-SW-80CRI-350LMF-35K-#4#0-UNV-D1-GTD-MOUNTING-FINISH-(#EMB1)
	(WITH EMERGENCY BATTERY)	14W	OR PRE-APPROVED EQUAL
LRA (LRAE)	6° LED CAN LIGHT, 277V, 3500K	3188LM	SPECTRUM LIGHTING #SG6LEDXF40L-35K-OX-BH27-ARB23FX-FINISH-MF-SO-(EM)
	(WITH EMERGENCY BATTERY)	30W	OR PRE-APPROVED EQUAL
LRB (LRBE)	6° RECESSED CAN LIGHT, WET LOCATION, 277V, 4000K	3000LM	SPECTRUM LIGHTING #RDF6XT-30L-MD-D010-277-H12-RD6XT-FINISH-SOW-(EM)
	(WITH EMERGENCY BATTERY)	34.6W	OR PRE-APPROVED EQUAL
LRE	6° LED CAN LIGHT, STATIC RED, 277V	2000LM	METEOR #R6N-30-F RED ONLY-VOLT-NOD-R-XXX-XXX-50-EM
	(WITH EMERGENCY BATTERY)	30W	OR PRE-APPROVED EQUAL
LTA	2 X 4 LED TROFFER, RGBW, 277V		
		40W	OR PRE-APPROVED EQUAL
LTB (LTBE)	2 X 2 LED FLAT PANEL, 277V, SELECTABLE CCT AND LUMENS	3500LM	METALUX #22FSL2SCT3-(EL10W)
	(WITH EMERGENCY BATTERY)	31W	OR PRE-APPROVED EQUAL
LTC (LTCE)	2 X 2 LED FLAT PANEL, 277V, 3500K, HIGH LUMENS	6581LM	LITHONIA #CPX-2X2-6000LM-80CRI-35K-SWL-MIN10-ZT-MVOLT-(E7W)
	(WITH EMERGENCY BATTERY)	54.1W	OR PRE-APPROVED EQUAL
LTD (LTDE)	2 X 4 FLAT PANEL TROFFER, 277V, SELECTABLE LUMENS AND CCT	6300LM	METALUX #24FSL2SCT3-(EL10W)
	(WITH EMERGENCY BATTERY)	56.3W	OR PRE-APPROVED EQUAL
LWA	LED RECESSED LINEAR FIXTURE THAT TURNS DOWN WALL, 114° VERTICAL AND 8° HORIZONTAL	10000LM	LUMENWERX #VIA4RPAT-D-HLO-FH-SW-80CRI-500LMF-35K-15FT4IN(#11FT4IN-8FT0IN)-#INN2C(90)-(90)-UNV-D1-1C-XXX-XXX-FINISH
		82W	OR PRE-APPROVED EQUAL
LWB (LWBE)	LED RECESSED LINEAR FIXTURE THAT TURNS DOWN WALL, 114° VERTICAL AND 4° HORIZONTAL	8000LM	LUMENWERX #VIA4RPAT-D-HLO-FH-SW-80CRI-500LMF-35K-15FT4IN(#11FT4IN-4FT0IN)-#INN2C(90)-(90)-UNV-D1-1C-XXX-XXX-FINISH-(#EMB1)
	(WITH EMERGENCY BATTERY)	66W	OR PRE-APPROVED EQUAL



DATA STATION CABLE SPECIFICATIONS (CAT6)

MODULAR JACKS FOR 2-PORT DATA OUTLETS

INDICATES: WALL OUTLET FOR DATA STATION. X = # DATA JACKS. 8 PIN STAINLESS STEEL (CAT6/568B) EQUAL TO: SIEMON COMPANY KIT #MX-FP-S-SS-L-XX WITH YELLOW LABELS FOR CAT 6A DATA TO BE INSTALLED BY CONTRACTOR. WALL MOUNT 18" A.F.F.

INDICATES: SINGLE STATION DATA JACK ABOVE CEILING OR SURFACE MOUNT TO EXPOSED STRUCTURE.

WALL CAMERA OUTLET. ROUTE 1 - CAT6 TO NEAREST BACKBOARD.

WALL OUTLET. ROUTE 1 - CAT6 TO NEAREST BACKBOARD.

NOTE: DATA JACKS SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR.

SPEAKER - ROUTE 1 - CAT6 CABLE TO NEAREST BACKBOARD

CABLE FOR 2-PORT DATA OUTLETS (EXAMPLE)

1. THE FOLLOWING CABLES SHALL BE USED FOR ALL 2-PORT DATA STATIONS:

NON-PLENUM AREAS:
DATA(1): GENERAL 4 PAIR CAT6 PT. #7133902
DATA(2): GENERAL 4 PAIR CAT6 PT. #7133902
DATA CABLE COLOR YELLOW
PLENUM AREAS:
DATA(1): GENERAL 4 PAIR CAT6 PT. #7131902
DATA(2): GENERAL 4 PAIR CAT6 PT. #7131902
DATA CABLE COLOR YELLOW

2. THE CONTRACTOR SHALL IDENTIFY AND STENCIL ALL STATION CABLES AS FOLLOWS:

ALL STATION CABLES SHALL BE DESIGNATED WITH THE TYPE AND UNIQUE JACK NUMBER (SEE BELOW) NEATLY WITH A PERMANENT MARKER OR WITH A 3M SCOTCHCODE IDENTIFICATION SYSTEM INDICATING LETTERS AND NUMBERS.
XX-YYY = UNIQUE JACK #
XX = FLOOR NUMBER & YYY = UNIQUE JACK NUMBER

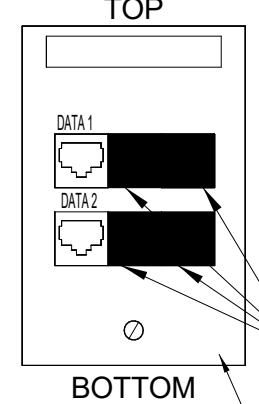
A. 2-PORT WIRELESS STATIONS
(1) 4 PAIR DATA(1): D1-001
(1) 4 PAIR DATA(2): D2-001
B. 2-PORT DATA STATIONS
(1) 4 PAIR DATA(1): D1-002
(1) 4 PAIR DATA(2): D2-002

3. PROVIDE TWO (2) 4 PAIR DATA FROM EACH OUTLET TO THE DESIGNATED COMMUNICATION BACKBOARD. CABLE SHALL BE 24 A.W.G. AND BE COLOR CODED AS FOLLOWS:

4 PAIR - WHITE/BLUE, WHITE/ORANGE, WHITE/GREEN, WHITE/BROWN

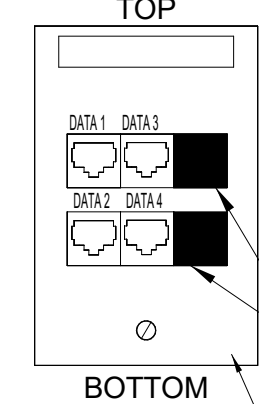
TYPICAL 2-PORT DATA JACK

TYPICAL JACK FRONT VIEW TOP



TYPICAL 4-PORT DATA JACK

TYPICAL JACK FRONT VIEW TOP



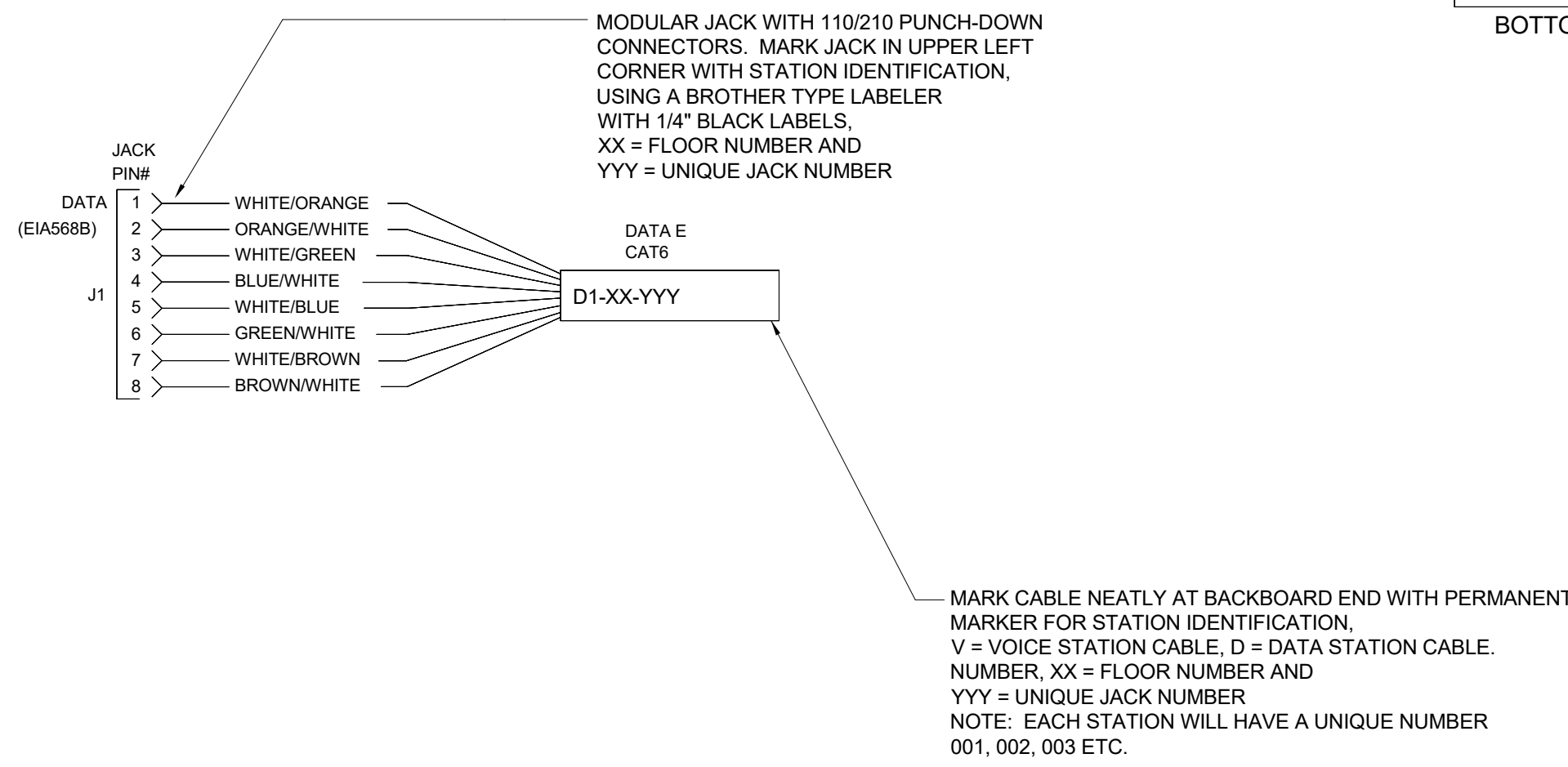
BLACK BLANK

SINGLE GANG DEVICE PLATE MOUNTED ON DOUBLE GANG OUTLET BOX WITH 5/8" SINGLE GANG ADAPTER SHEET ROCK PLATE (MOUNTED VERTICALLY)

BLACK BLANK

SINGLE GANG DEVICE PLATE MOUNTED ON DOUBLE GANG OUTLET BOX WITH 5/8" SINGLE GANG ADAPTER SHEET ROCK PLATE (MOUNTED VERTICALLY)

TYPICAL DATA STATION CABLING



- NOTES:
- CONDUIT SIZING SHALL BE AS FOLLOWS: 1 OUTLET - 3/4"C., 2 OUTLETS - 1"C., 3 OUTLETS - 1-1/4"C., 4 OUTLETS - 1-1/2"C., 4 OUTLETS IS THE MAXIMUM FOR ANY HOMERUN.
 - CONTRACTOR SHALL TEST ALL CABLES TO ENSURE END-TO-END CONTINUITY OF ALL CONDUCTORS IN EACH CABLE. THE VOICE/DATA JACKS SHALL BE FURNISHED, INSTALLED AND TERMINATED BY CONTRACTOR. AFTER TERMINATION, CONTRACTOR SHALL TEST FOR CONDUCTOR OPENS, TIP AND RING REVERSAL AND SHORTS, GROUNDS AND CABLE TRANSPOSITION. THE CONTRACTOR, AT NO ADDITIONAL COST, SHALL REPLACE ANY CABLES THAT FAIL TO MEET PUBLISHED PERFORMANCE CRITERIA.
 - CONTRACTOR SHALL CONTACT OWNER 45 DAYS PRIOR TO TOTAL COMPLETION OF THE PROJECT TO INDICATE THEIR COMPLETION DATE FOR ALL STATION DROPS.
 - PROVIDE WRITTEN CABLE REPORT/MAP. COORDINATE FORMAT WITH OWNER.
 - CONTRACTOR SHALL LAND CABLES ON PATCH PANELS IN COMM ROOMS.
 - CABLING FOR DIFFERENT APPLICATIONS SHALL HAVE A DIFFERENT JACKET COLOR: DATA: BLUE, CAMERAS: GREEN, CARD READERS: WHITE. OR COLORS APPROVED BY OWNER.
 - CONTRACTOR TO FURNISH AND INSTALL PATCH PANELS FOR ALL DATA CABLING. ALL CABLING SHALL BE TERMINATED AND LAUDED AT EACH END.
 - CONTRACTOR SHALL PROVIDE PATCH CORDS AS FOLLOWS: 1-6FT FOR EVERY WALL OUTLET, 100-6", 100-12", AND 100-18".

PA SYSTEM AND NOTES

INTERCOM SPEAKER: LAY-IN TYPE POE WITH TALKBACK, VALCOM #VE4022A OR EQUAL. ROUTE 1-CAT6 TO NEAREST COMM ROOM.

INTERCOM SPEAKER PENDANT MOUNT ONE WAY, VALMONT ROUTE 1-CAT6 CABLE TO NEAREST TBB. (SOME NOTED ARE LAY-IN TYPE).

INTERCOM SPEAKER - WALL MOUNTED WITH VOLUME CONTROL.

- NOTES:
- PROVIDE PUBLIC ADDRESS SYSTEM THROUGHOUT BUILDING.
 - COORDINATE LOCATION OF SPEAKERS WITH SPECIALTY WALL TYPES AND CEILINGS. CARE SHALL BE TAKEN TO AVOID SPECIALTY WALLS.
 - ALLOW FOR CALL TO ALL SPEAKERS FROM THE RECEPTION DESK (PROVIDE A HEADSET FOR THIS USE) AND TO INDIVIDUAL OFFICES/CLASSROOMS.
 - ALLOW CLASSROOMS TO RESPOND TO CALL WITH TALKBACK SPEAKERS.
 - ALLOW VOLUME CONTROL IN LARGE SPACES.
 - ALLOW CALL TO RECEPTION FROM VOIP PHONES IN OFFICES.

Camera #	Location
1-001	INTERIOR CORR 102
1-002	INTERIOR CORR 102
1-003	INTERIOR WEST STAIRWELL
1-004	INTERIOR ROPES 103
1-005	INTERIOR ROPES 103
1-006	INTERIOR ROPES 103
1-007	INTERIOR MISSION CC 105
1-008	INTERIOR MISSION CC 105
1-009	INTERIOR MISSION CC 105
1-010	INTERIOR MOCR (A) 106
1-011	INTERIOR AIR LOCK 107
1-012	INTERIOR MOCR (B) 108
1-013	INTERIOR STAIR 118
1-014	INTERIOR LOBBY 101
1-015	INTERIOR LOBBY 101
1-016	INTERIOR CORR 135
1-017	INTERIOR CORR 135
1-018	INTERIOR CORR 123
1-019	INTERIOR CORR 131
1-020	INTERIOR ASTRO TRNG SIM 119
1-021	INTERIOR ASTRO TRNG SIM 119
1-022	INTERIOR ASTRO TRNG SIM 119
1-023	INTERIOR NIGHT VS VR 124
1-024	INTERIOR DRONE FLIGHT 122
1-025	INTERIOR BARANY CHAIR 133
1-026	INTERIOR BARANY CHAIR 133
1-027	INTERIOR PARACHUTE SIM 132

CAMERA SYSTEM NOTES:

- BASE BID: BASE BID SHALL INCLUDE ALL ROUGH IN (BOXES, CONDUITS BACK TO TBB, AND CABLING) FOR ALL CAMERAS SHOWN. NO CAMERA INSTALLATION IS INCLUDED IN BASE BID.
- ADDITIVE ALTERNATE: FOR ALTERNATE CONTRACTOR SHALL INSTALL OWNER FURNISHED CAMERAS AND CONNECT TO CABLING PROVIDED IN BASE BID.
- ALL CAMERAS, LICENSES, AND SOFTWARE ARE PROVIDED BY OWNER.

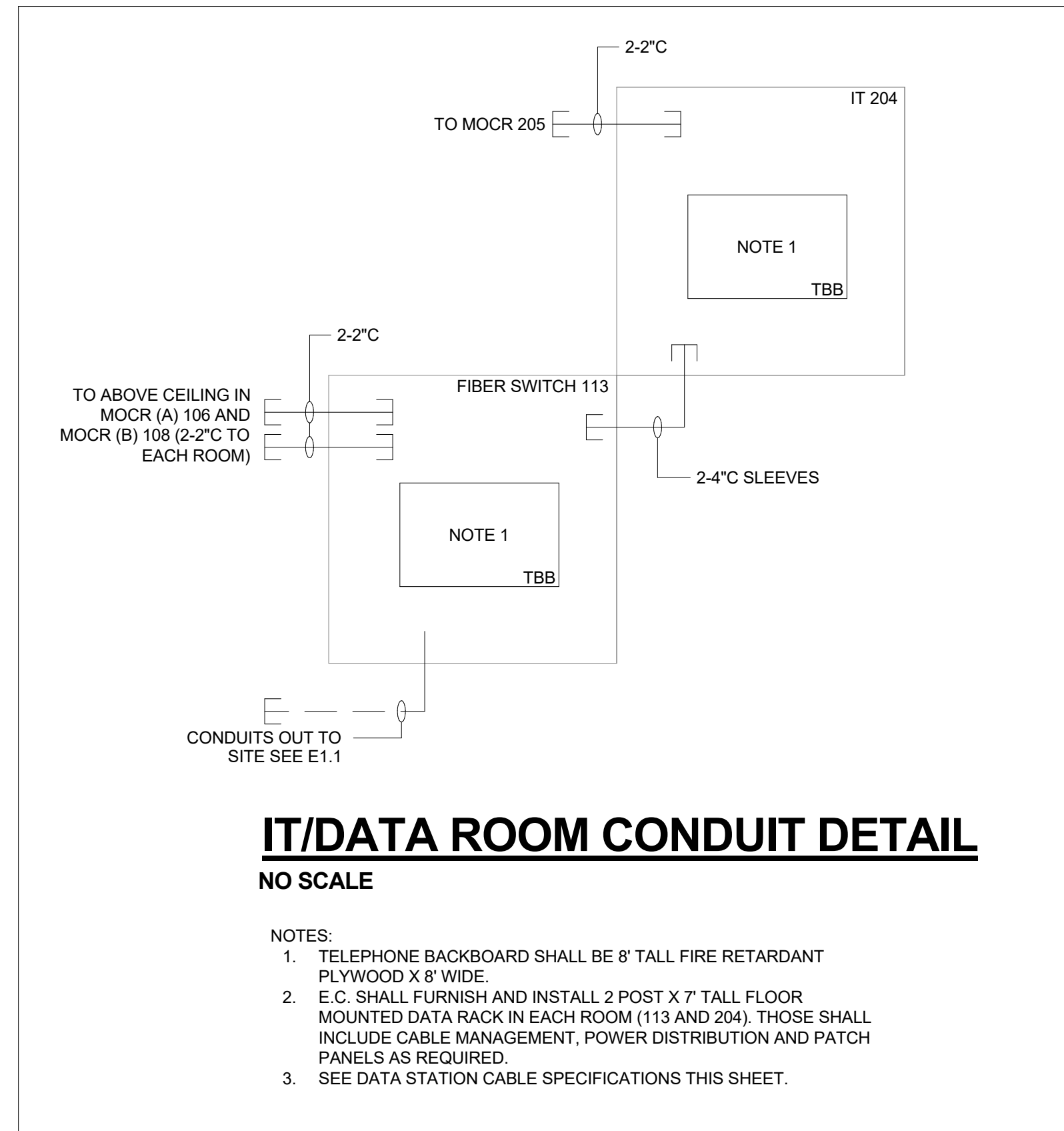
Camera #	Location
1-028	INTERIOR EAST STAIRWELL
2-001	INTERIOR WEST STAIRWELL
2-002	INTERIOR CORR 200
2-003	INTERIOR CORR 200
2-004	INTERIOR MOCR 205
2-005	INTERIOR OVERLOOK 203
2-006	INTERIOR CORR 208
2-007	INTERIOR CORR 208
2-008	INTERIOR CORR 208
2-009	INTERIOR CLASSROOM 224
2-010	INTERIOR OPEN OFFICE 210
2-011	INTERIOR OPEN OFFICE 210
2-012	INTERIOR CORR 217
2-013	INTERIOR EAST STAIRWELL
3-001	EXTERIOR NW CORNER
3-002	EXTERIOR NORTH SIDE BUILDING
3-003	EXTERIOR NORTH SIDE BUILDING
3-004	EXTERIOR AT VESTIBULE
3-005	EXTERIOR AT WEST STAIR
3-006	EXTERIOR AT SW CORNER
3-007	EXTERIOR NORTH SIDE BUILDING
3-008	EXTERIOR AT NE CORNER
3-009	EXTERIOR AT SE CORNER
3-010	EXTERIOR AT SE CORNER
3-011	EXTERIOR SOUTH SIDE BUILDING
3-012	EXTERIOR SOUTH SIDE BUILDING

Card Reader #	Location
CR-1	EXTERIOR VESTIBULE
CR-2	INTERIOR VESTIBULE
CR-3	EXTERIOR WEST BUILDING EXIT
CR-4	EXTERIOR ROPES 104
CR-5	EXTERIOR MCC 105
CR-6	EXTERIOR TECH WORK ROOM 111
CR-7	EXTERIOR ASTRO TRNG SIM 119
CR-8	EXTERIOR ELECTRICAL RM 125
CR-9	EXTERIOR SERVICE SPACE 134
CR-10	EXTERIOR CORR 131
CR-11	EXTERIOR EAST BUILDING EXIT
CR-12	INTERIOR ROPES 103
CR-13	INTERIOR MOCR(A) 106
CR-14	INTERIOR AIR LOCK 107

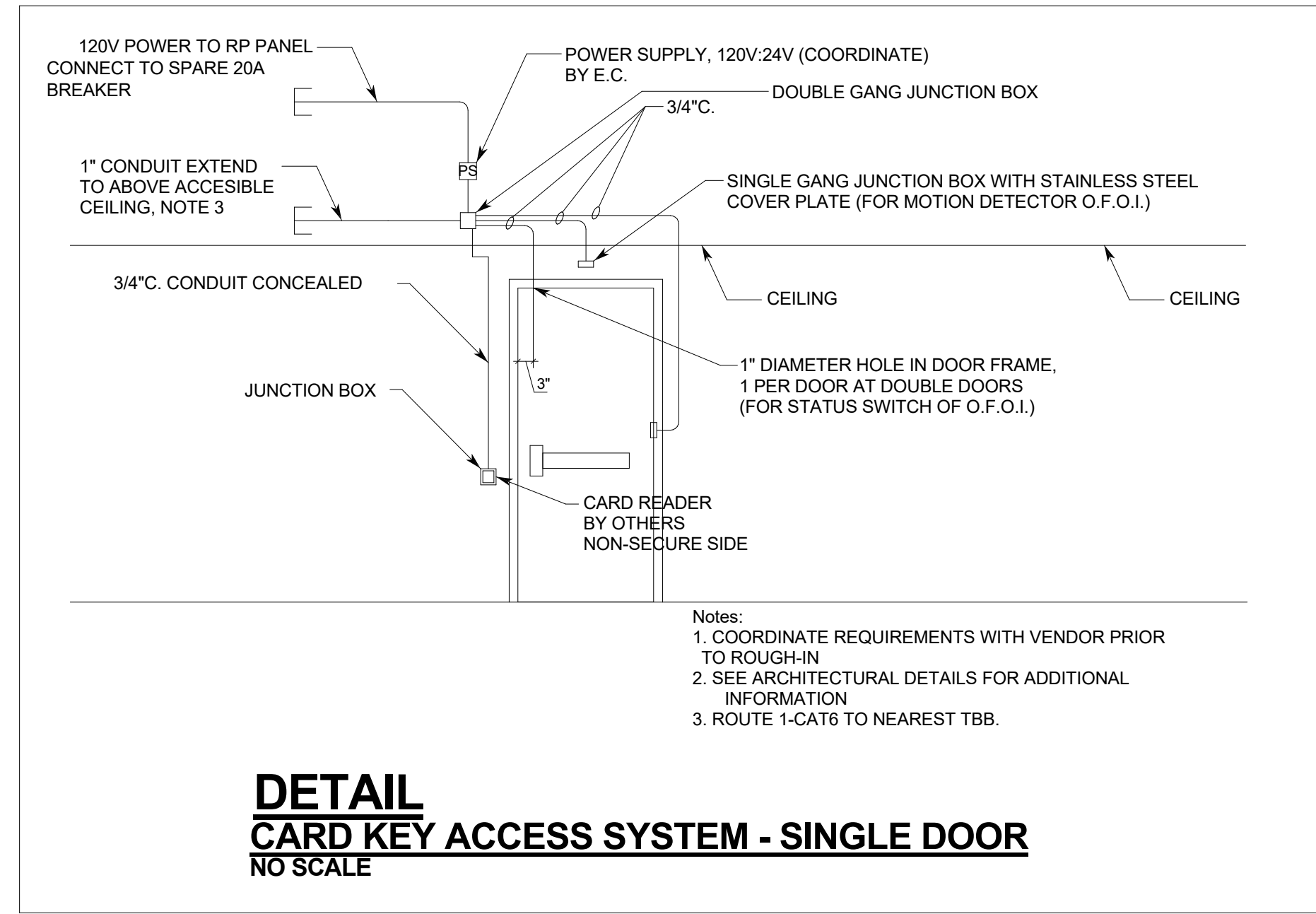
CARD READER NOTES:

BASE BID: CONTRACTOR SHALL PROVIDE ALL ROUGH IN AND POWER REQUIRED FOR ACCESS CONTROL DOORS. SEE DETAILS. CONTRACTOR SHALL ROUTE 1-CAT6 FROM EACH CARD READER LOCATION TO THE NEAREST TBB.

Card Reader #	Location
CR-15	INTERIOR MOCR(B) 108
CR-16	INTERIOR ASTRO TRNG SIM 119
CR-17	INTERIOR DRONE FLIGHT 122
CR-18	INTERIOR NIGHT VS VR 124
CR-19	INTERIOR ELECTRICAL 125
CR-20	INTERIOR SERVICE SPACE 134
CR-21	INTERIOR BARANY CHAIR 133
CR-22	INTERIOR PARACHUTE SIM 132
CR-23	INTERIOR FIBER SWITCH 115
CR-24	INTERIOR ELECTRICAL 211
CR-25	INTERIOR IT 204
CR-26	INTERIOR MOCR 205
CR-27	INTERIOR ELECTRICAL 201
CR-28	INTERIOR ELECTRICAL 110



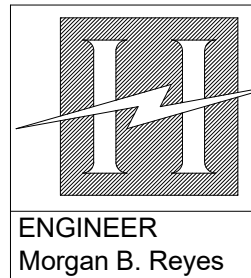
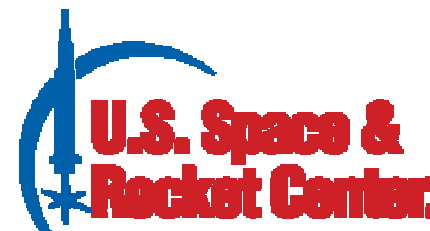
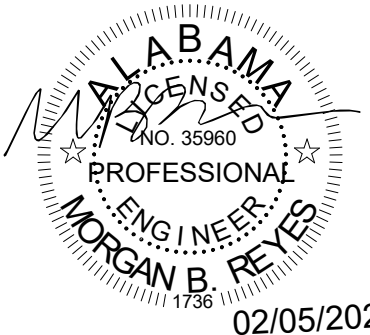
- NOTES:
- TELEPHONE BACKBOARD SHALL BE 8" TALL FIRE RETARDANT PLYWOOD X 8" WIDE.
 - E.C. SHALL FURNISH AND INSTALL 2 POST X 7" TALL FLOOR MOUNTED DATA RACK IN EACH ROOM (113 AND 204). THOSE SHALL INCLUDE CABLE MANAGEMENT, POWER DISTRIBUTION AND PATCH PANELS AS REQUIRED.
 - SEE DATA STATION CABLE SPECIFICATIONS THIS SHEET.



- Notes:
- COORDINATE REQUIREMENTS WITH VENDOR PRIOR TO ROUGH-IN
 - SEE ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION
 - ROUTE 1-CAT6 TO NEAREST TBB.

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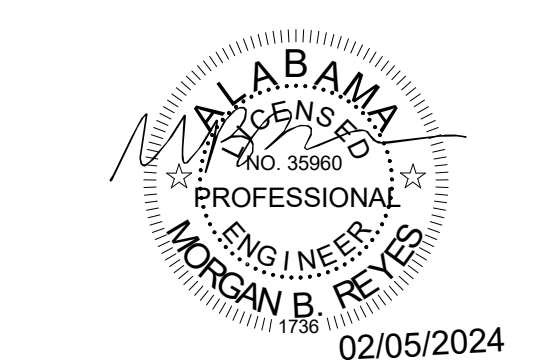


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Suite 275
Huntsville, Alabama 35801
(256) 270-8013
E-MAIL: MORGAN@HYDE-EGR.COM

PROJECT #
23168.1

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JSSRC - INSPIRATION 4 TRAINING FACILITY

OWNER
UNITED STATES SPACE AND ROCKET CENTER

PROJECT ADDRESS
11 Tranquility Base
Huntsville, AL 35805



PROJECT STATUS:	BID SET
ISSUED:	FOR CONSTRUCTION

ISSUE DATE: FEBRUARY 5, 2024

REVISIONS		
No.	Description	Date

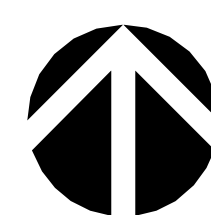
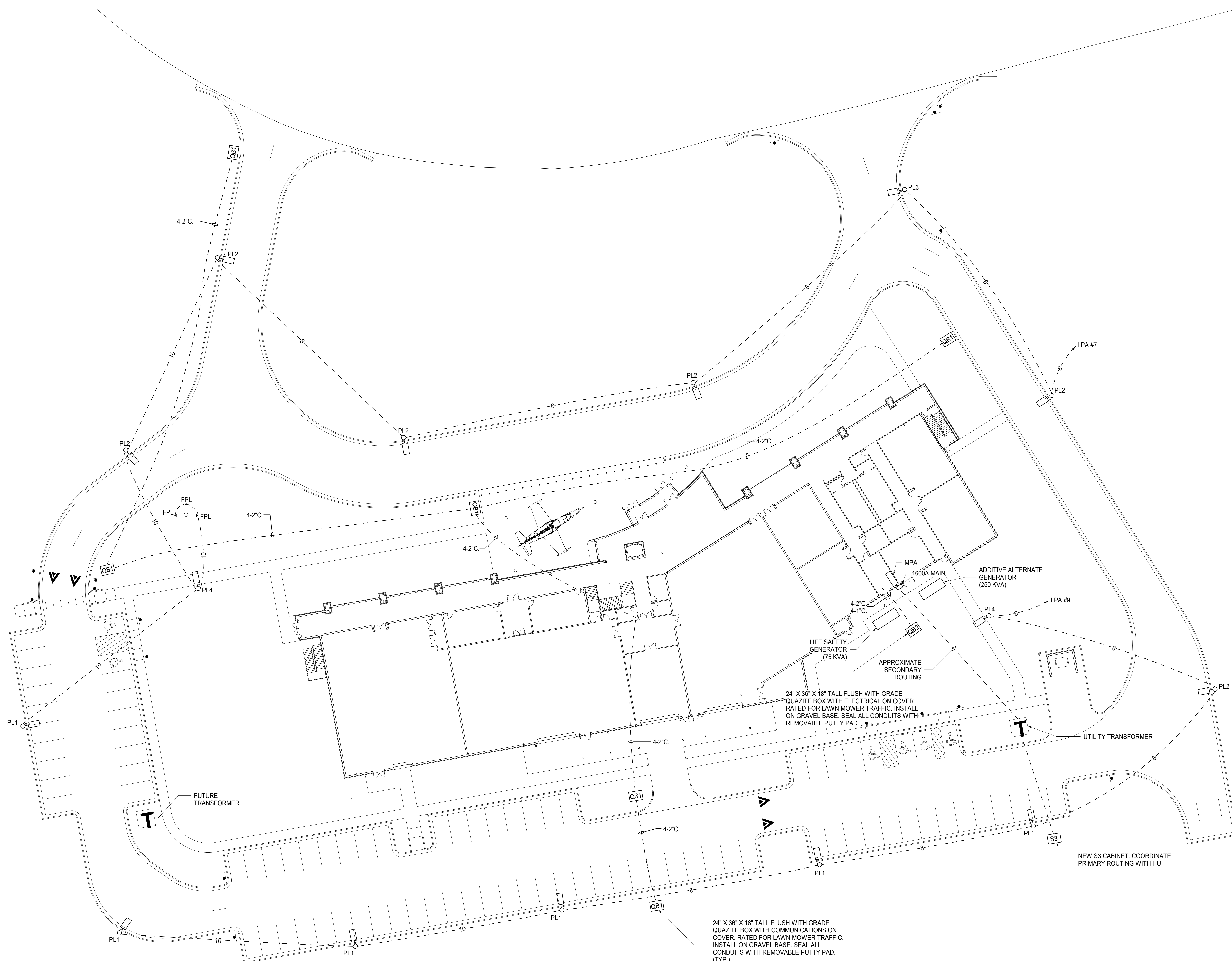
DRAWING TITLE

**SITE PLAN -
ELECTRICAL**

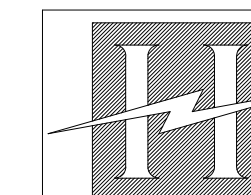
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1 SITE PLAN - ELECTRICAL
1" = 20'-0"



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Morgan B. Reyes

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PROJECT #	23166.1
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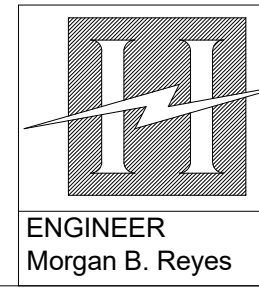
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FIRST FLOOR PLAN - WEST WING -
LIGHTING
1/8" = 1'-0"

NOTES:

- 120V MIRRORS TO BE CONTROLLED WITH ROOM LIGHTING CONTROLS. PROVIDE RELAY AS REQUIRED. COORDINATE POWER ROUGH-IN LOCATION WITH SUBMITTALS PRIOR TO WORK.
- SEE E0.7 FOR LIGHT FIXTURE SCHEDULE AND LIGHTING CONTROL NOTES.
- GENERAL NOTES:
 - PROVIDE A NEUTRAL TO ALL WIRED SWITCHES.
 - REFER TO ARCHITECTURAL RCP FOR EXACT LIGHT FIXTURE PLACEMENT AND MOUNTING REQUIREMENTS.
 - BYPASS LIGHTING CONTROLS ON EMERGENCY.



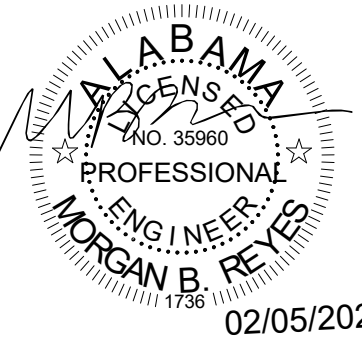
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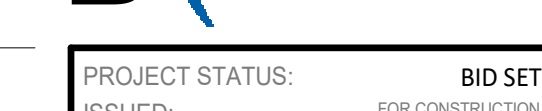
PROJECT STATUS: BID SET
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No.	Description	Date
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B

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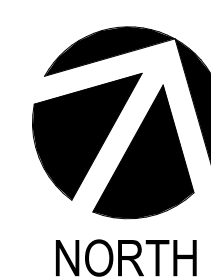
LIGHTING

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DRAWN BY:	BR
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225029-00

E2.2



FIRST FLOOR PLAN - EAST WING
LIGHTING
1/8" = 1'-0"

1. 120V MIRRORS TO BE CONTROLLED WITH ROOM LIGHTING CONTROLS. PROVIDE RELAY AS REQUIRED. COORDINATE POWER ROUGH-IN LOCATION WITH SUBMITTALS PRIOR TO WORK.

2. SEE E0.7 FOR LIGHT FIXTURE SCHEDULE AND LIGHTING CONTROL NOTES.
3. GENERAL NOTES:
 - A. PROVIDE A NEUTRAL TO ALL WIRED SWITCHES.
 - B. REFER TO ARCHITECTURAL RCP FOR EXACT LIGHT FIXTURE PLACEMENT AND MOUNTING REQUIREMENTS.
 - C. BYPASS LIGHTING CONTROLS ON EMERGENCY.

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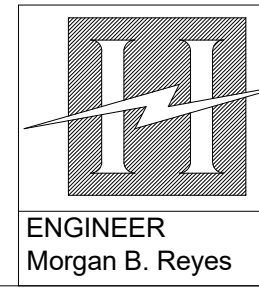
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SECOND FLOOR PLAN - WEST WING -
LIGHTING
1/8" = 1'-0"

NOTES:

- SEE NOTES ABOUT CEILING PANELS ON E2.4.
- SEE E0.7 FOR LIGHT FIXTURE SCHEDULE AND LIGHTING CONTROL NOTES.
- GENERAL NOTES:
 - PROVIDE A NEUTRAL TO ALL WIRED SWITCHES.
 - REFER TO ARCHITECTURAL RCP FOR EXACT LIGHT FIXTURE PLACEMENT AND MOUNTING REQUIREMENTS.
 - BYPASS LIGHTING CONTROLS ON EMERGENCY.



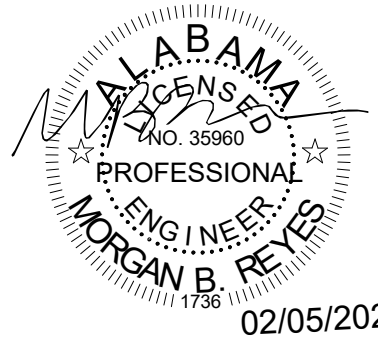
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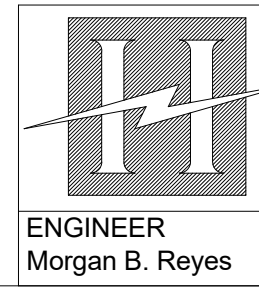
SECOND FLOOR PLAN - EAST WING -
LIGHTING
1/8" = 1'-0"

NOTES:

- LIGHTED WALL PANELS BY ARCHITECT. FIXTURES (LOW VOLTAGE) ARE PROVIDED WITH WALL SYSTEM. EACH 2X4 PANEL IS 18 WATTS. THERE ARE 77 PANELS. TWELVE FIXTURES (PANELS) MAY BE CONNECTED TO EACH DRIVER. E.C. SHALL ASSUME THAT THIS WALL WILL REQUIRE CONNECTION TO 7 DRIVERS (DRIVERS WILL BE FURNISHED WITH WALL SYSTEM). DIMMING CONNECTION TO EACH DRIVER WILL BE REQUIRED AS WELL. E.C. SHALL ASSUME THAT INTERCONNECTION OF THE LIGHTING OF WALL SYSTEM IS BY THE E.C. CONNECT THE 7 DRIVERS TO THE ONE 20AMP CIRCUIT SHOWN.
- LIGHTED CEILING PANELS BY ARCHITECT. FIXTURES (LOW VOLTAGE) ARE PROVIDED WITH WALL SYSTEM. EACH 2X4 PANEL IS 18 WATTS. THERE ARE 177 PANELS. TWELVE FIXTURES (PANELS) MAY BE CONNECTED TO EACH DRIVER. E.C. SHALL ASSUME THAT THIS WALL WILL REQUIRE CONNECTION TO 15 DRIVERS (DRIVERS WILL BE FURNISHED WITH WALL SYSTEM). DIMMING CONNECTION TO EACH DRIVER WILL BE REQUIRED AS WELL. E.C. SHALL ASSUME THAT INTERCONNECTION OF THE LIGHTING OF WALL SYSTEM IS BY THE E.C. CONNECT THE 15 DRIVERS TO THE TWO 20AMP CIRCUITS SHOWN.
- 120V MIRRORS TO BE CONTROLLED WITH ROOM LIGHTING CONTROLS. PROVIDE RELAY AS REQUIRED. COORDINATE POWER ROUGH-IN LOCATION WITH SUBMITTALS PRIOR TO WORK.

NOTES:

- LIGHTING SHOWN IS FOR ADDITIVE ALTERNATE. FOR BASE BID INCLUDE 4 EACH XA FIXTURES AND 4 EACH LF4 TYPE FIXTURES AND 2 EACH LF4E TYPE FIXTURES. EVENLY SPACE IN SHELL AREA AND CONNECT TO LPB#11
- SEE E0.7 FOR LIGHT FIXTURE SCHEDULE AND LIGHTING CONTROL NOTES.
- GENERAL NOTES:
 - PROVIDE A NEUTRAL TO ALL WIRED SWITCHES.
 - REFER TO ARCHITECTURAL RCP FOR EXACT LIGHT FIXTURE PLACEMENT AND MOUNTING REQUIREMENTS.
 - BYPASS LIGHTING CONTROLS ON EMERGENCY.



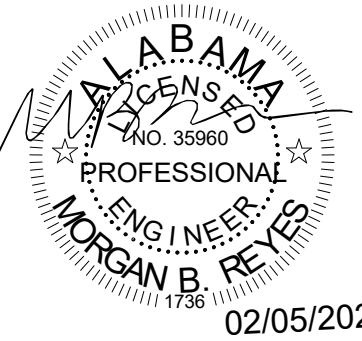
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DRAWING TITLE
SECOND FLOOR
PLAN - EAST WING
- LIGHTING

DRAWN BY: BR
CHECKED BY: MBR

PROJECT NUMBER
225029-00

DRAWING NO.
E2.4

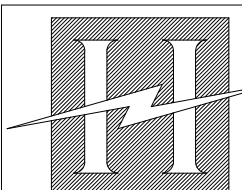
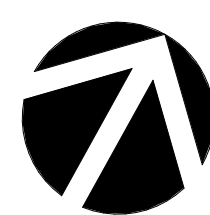
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DRAWING TITLE
FIRST FLOOR PLAN
- WEST WING -
POWERDRAWN BY: BR
CHECKED BY: MBRPROJECT NUMBER
225029-00DRAWING NO.
E3.1HYDE ENGINEERING, INC.
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Morgan B. ReyesPROJECT #
23166.1FIRST FLOOR PLAN - WEST WING -
POWER
1/8" = 1'-0"

NOTES:

- CONTRACTOR TO COORDINATE CONDUIT ROUTING WITH STRUCTURAL ASPECTS OF WALLS AND THROUGHOUT BUILDING.

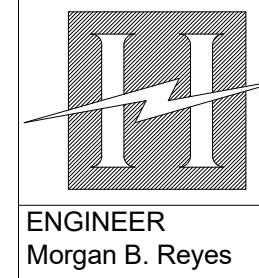
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FIRST FLOOR PLAN - EAST WING -
POWER
1/8" = 1'-0"

NOTES:

- NOTED OUTLETS ARE TO BE MOUNTED TO STRUCTURAL RIGGING INCLUDE STRAIN RELIEF ON CABLE. (TYP. ASTRO TRAINING SIM 119)
- NEMA L6-30R, 220V TWIST LOCK RECEPTACLES.
- POWER FOR FLUSH VALVES. CONTRACTOR TO COORDINATE EXACT ROUGH-IN LOCATIONS FOR ALL REQUIRED JUNCTION BOXES.
- CONTRACTOR TO CORDINATE CONDUIT ROUTING WITH STRUCTURAL ASPECTS OF WALLS AND THROUGHOUT BUILDING.
- EMERGENCY POWER OFF (EPO) BUTTON FOR GENERATOR(S). BUTTON SHALL BE RED MUSHROOM TYPE, PUSH TO ACTIVATE, TWIST TO RESET, WITH HINGED COVER. FURNISH AND INSTALL LARGE RED SIGN THAT READS " EMERGENCY GENERATOR SHUT OFF " IN 4" TALL WHITE LETTERS ON RED BACKGROUND. CONNECT TO GENERATOR(S) CONTROLS AS REQUIRED. UNDER ADDITIVE ALTERNATE EPO SHALL SHUT DOWN BOTH GENERATORS.



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DRAWING TITLE
FIRST FLOOR PLAN
- EAST WING -
POWER

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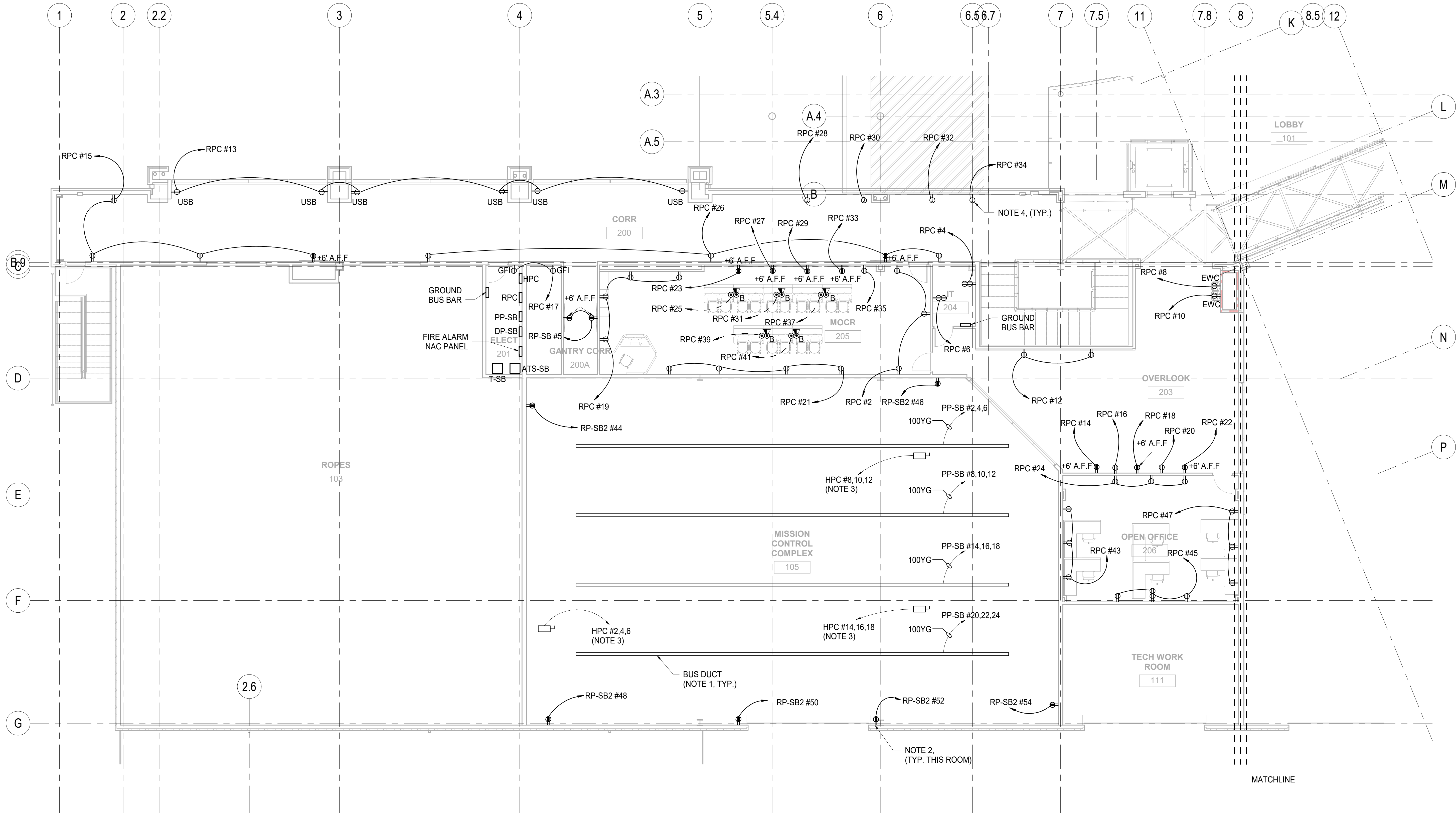
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DRAWING NO.
E3.2

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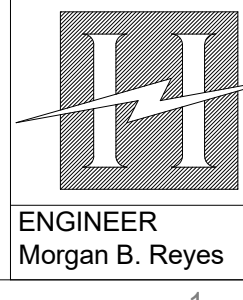


SECOND FLOOR PLAN - WEST WING -
POWER
1/8" = 1'-0"



NOTES:

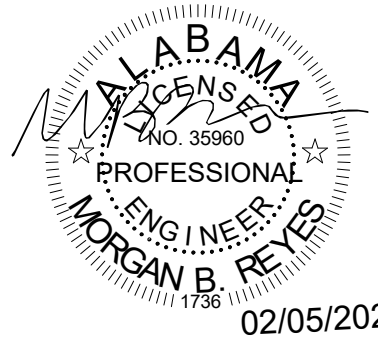
- 100 AMP RATED 120/208V 3 PHASE BUS DUCT WITH 20 EACH 20/1 BUS DUCT PLUGS AND PROVISIONS FOR ADDITIONAL AS REQUESTED BY OWNER.
- RECEPTACLE FOR POWER TO STAR CURTAINS. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH THE ARCHITECTURAL AND FINAL PRODUCT SUBMITTALS PRIOR TO ROUGH-IN. OUTLETS TO BE LOCATED 6" BELOW CEILING.
- POWER FOR SIMULATOR. COORDINATE EXACT ROUGH-IN LOCATION. FURNISH AND INSTALL 100A/3P/FUSED @100 SAFETY SWITCH AT CEILING.
- POWER FOR BUILDING MOUNTED SIGNAGE. COORDINATE EXACT LOCATION PRIOR TO ROUGH-IN.
- CONTRACTOR TO COORDINATE CONDUIT ROUTING WITH STRUCTURAL ASPECTS OF WALLS AND THROUGHOUT BUILDING.



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DRAWING TITLE
SECOND FLOOR
PLAN - WEST WING
- POWER

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DRAWING NO.
E3.3

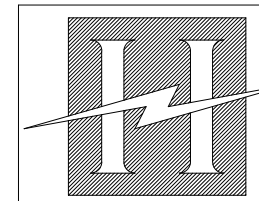
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SECOND FLOOR PLAN - EAST WING -
POWER
1/8" = 1'-0"

NOTES:

- CONTRACTOR TO COORDINATE CONDUIT ROUTING WITH STRUCTURAL ASPECTS OF WALLS AND THROUGHOUT BUILDING.



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DRAWING TITLE
SECOND FLOOR
PLAN - EAST WING
- POWER

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FIRST FLOOR PLAN

- WEST WING -

AUXILIARY

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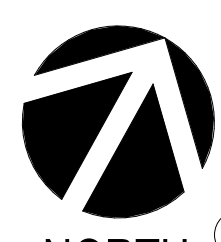
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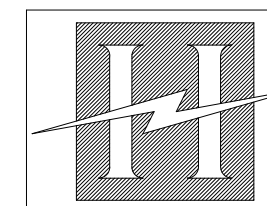
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E4.1

FIRST FLOOR PLAN - WEST WING -
AUXILIARY
1/8" = 1'-0"

NOTES:

- CONTRACTOR TO COORDINATE CONDUIT ROUTING WITH STRUCTURAL ASPECTS OF WALLS AND THROUGHOUT BUILDING.
- CONDUITS FROM MCC FLOOR AND WALL BOXES SHALL STUB OUT ABOVE ACCESSIBLE CEILING IN THE ROOM NOTED. ALL CONDUITS TO HAVE 3 WAY INNERDUCT WITH PULL STRINGS AND DATA BUSHINGS ON THE END.
- FIRE ALARM SPEAKER STROBES SHALL BE CEILING MOUNTED UNLESS SHOWN ON WALL.
- PROVIDE ROUGH-IN FOR ADA DOOR OPERATOR CONTROLS. COORDINATE ALL REQUIREMENTS WITH FINAL SUBMITTALS.

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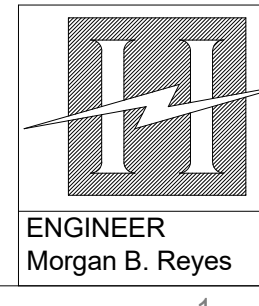
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1 FIRST FLOOR PLAN - EAST WING -
AUXILIARY
1/8" = 1'-0"

NOTES:

1. CONTRACTOR TO COORDINATE CONDUIT ROUTING WITH STRUCTURAL ASPECTS OF WALLS AND THROUGHOUT BUILDING.
2. LOCATE FIRE ALARM ANNUNCIATOR HAND HELD MICROPHONE AND GENERATOR ANNUNCIATOR HERE.
3. FIRE ALARM SPEAKER STROBES TO BE CEILING MOUNTED UNLESS SHOWN ON WALL.
4. ROUTE 1-CAT6 DATA TO TIMECLOCK STATION.
5. FLUSH WITH CEILING TYPE SPEAKER, ONE WAY.



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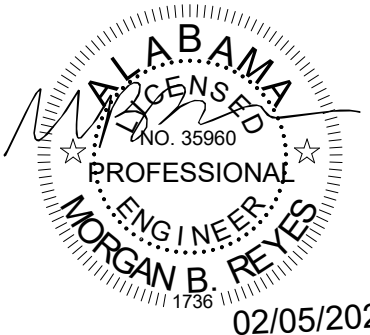
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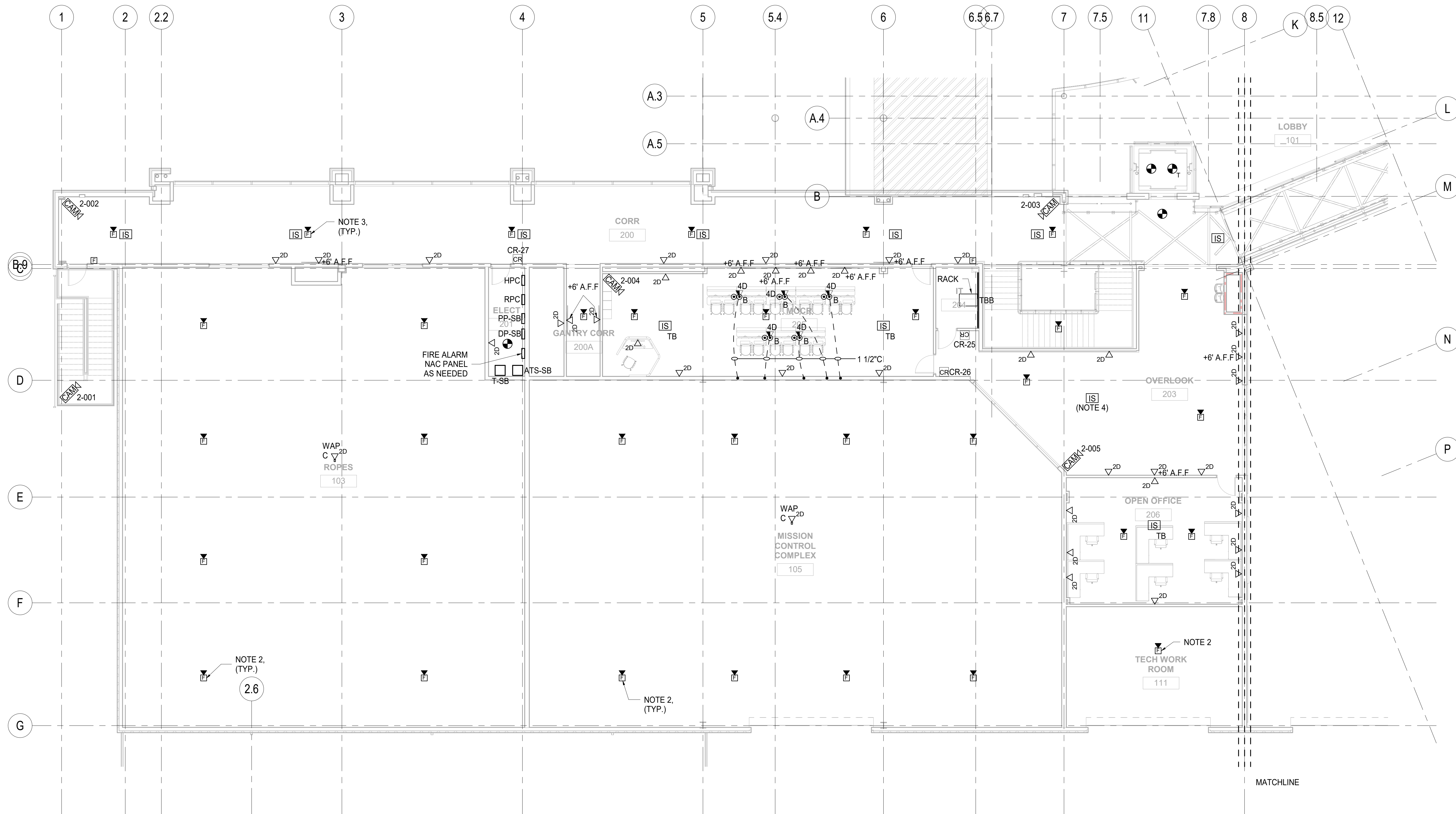
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FIRST FLOOR PLAN
- EAST WING -
AUXILIARY

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DRAWING NO.
E4.2



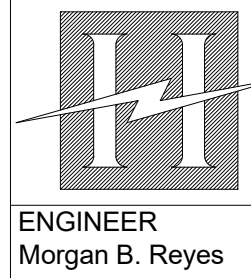
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SECOND FLOOR PLAN - EAST WING -
AUXILIARY
1/8" = 1'-0"

NOTES:

- CONTRACTOR TO COORDINATE CONDUIT ROUTING WITH STRUCTURAL ASPECTS OF WALLS AND THROUGHOUT BUILDING.
- SOME SPACES HAVE HIGH CEILINGS. SPEAKER VOLUME AND STROBE INTENSITIES SHALL BE ADJUSTED AS NECESSARY.
- FIRE ALARM SPEAKER STROBES SHALL BE CEILING MOUNTED UNLESS SHOWN ON WALL.
- FLUSH WITH CEILING TYPE SPEAKER, ONE WAY.
- ROUTE 1 CAT6 CABLE TO TIME CLOCK STATION.



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UNITED STATES SPACE AND ROCKET CENTER

PROJECT ADDRESS
1 Tranquility Base
Huntsville, AL 35805



PROJECT STATUS: BID SET
ISSUED: FOR CONSTRUCTION

ISSUE DATE: FEBRUARY 5, 2024

REVISIONS
No. Description Date

DRAWING TITLE
SECOND FLOOR
PLAN - EAST WING
- AUXILIARY

DRAWN BY: BR
CHECKED BY: MBR

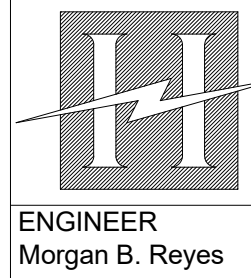
PROJECT NUMBER
225029-00

DRAWING NO.
E4.4

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



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E-MAIL: MORGAN@HYDE-EGR.COM
PROJECT #
23168.1

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No. Description Date

DRAWING TITLE
FIRST FLOOR PLAN
- WEST WING -
HVAC

DRAWN BY: BR
CHECKED BY: MBR

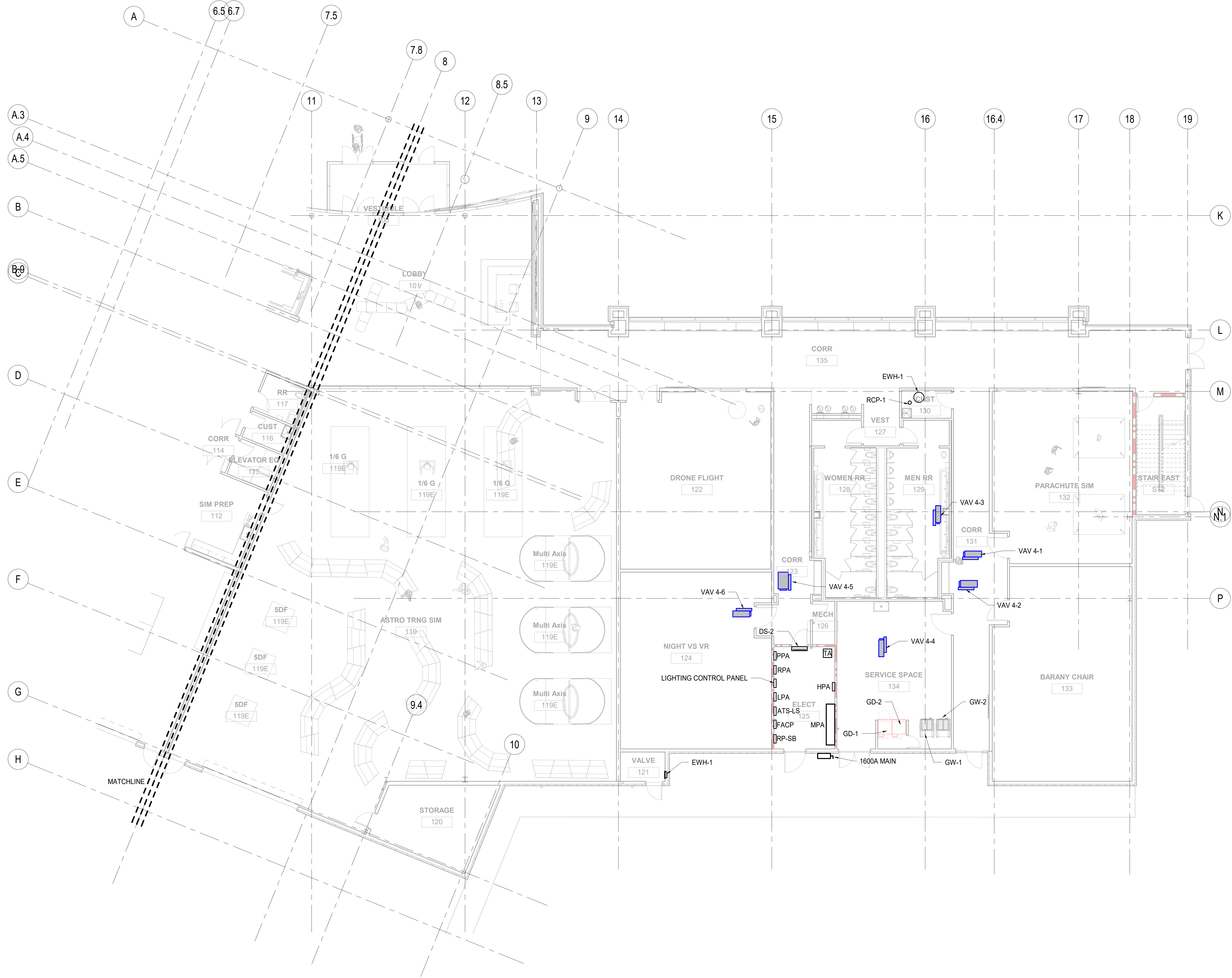
PROJECT NUMBER
225029-00

DRAWING NO.
E5.1

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



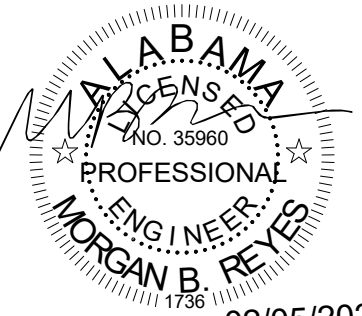
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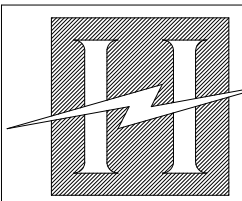
No.	Description	Date
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DRAWING TITLE
FIRST FLOOR PLAN
- EAST WING -
HVAC

DRAWN BY: BR
CHECKED BY: MBR

PROJECT NUMBER
225029-00

DRAWING NO.
E5.2



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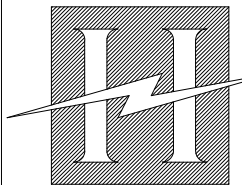
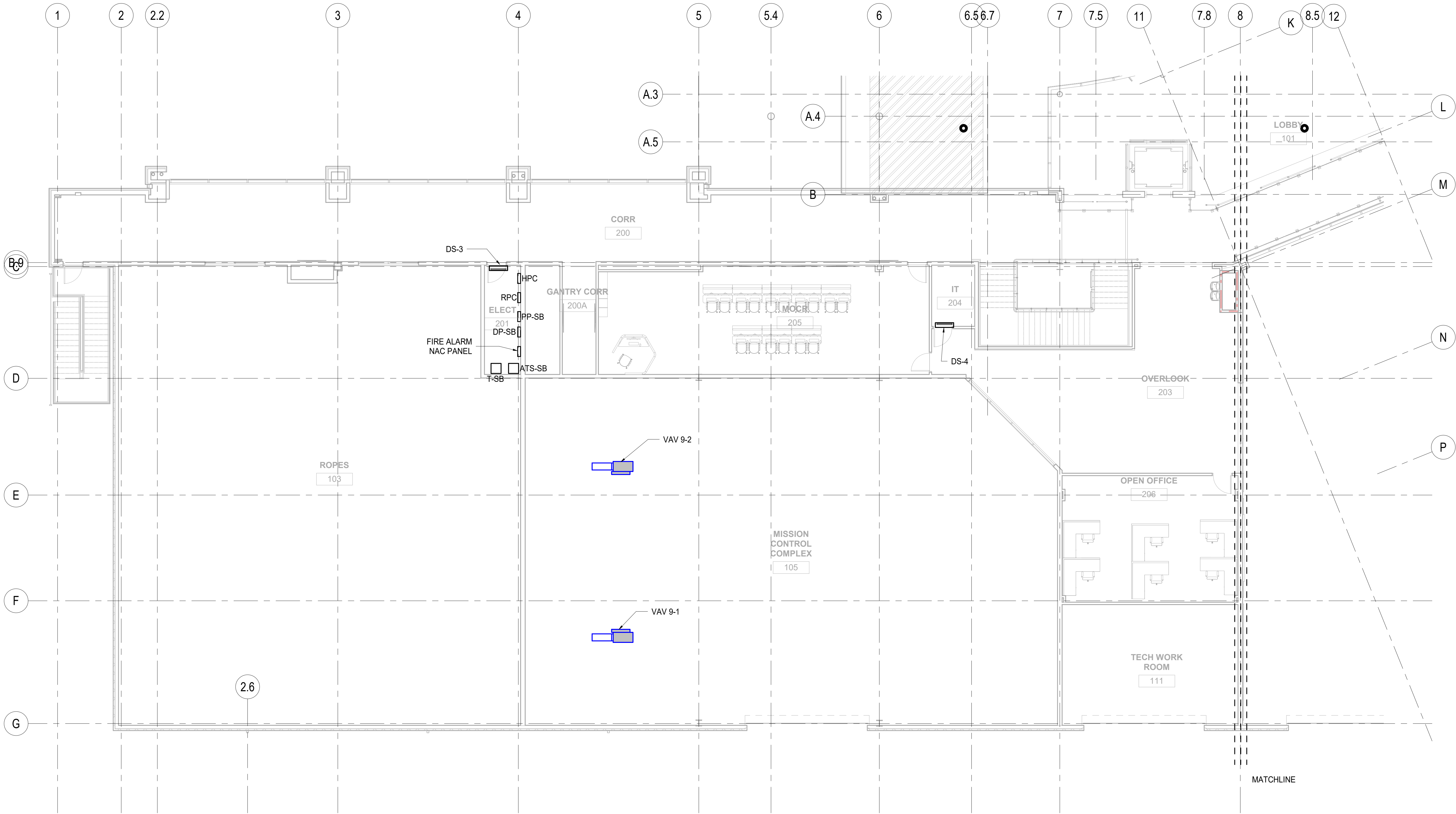
ENGINEER
Morgan B. Reyes

PROJECT #
23168.1

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



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ENGINEER
Morgan B. Reyes

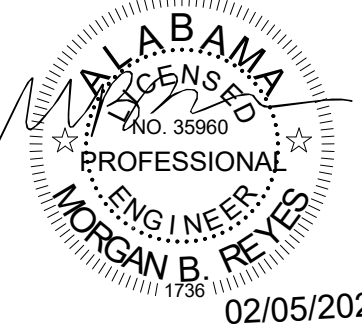
PROJECT #
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DRAWING TITLE
SECOND FLOOR
PLAN - WEST WING
- HVAC

DRAWN BY: BR
CHECKED BY: MBR

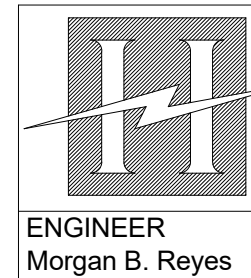
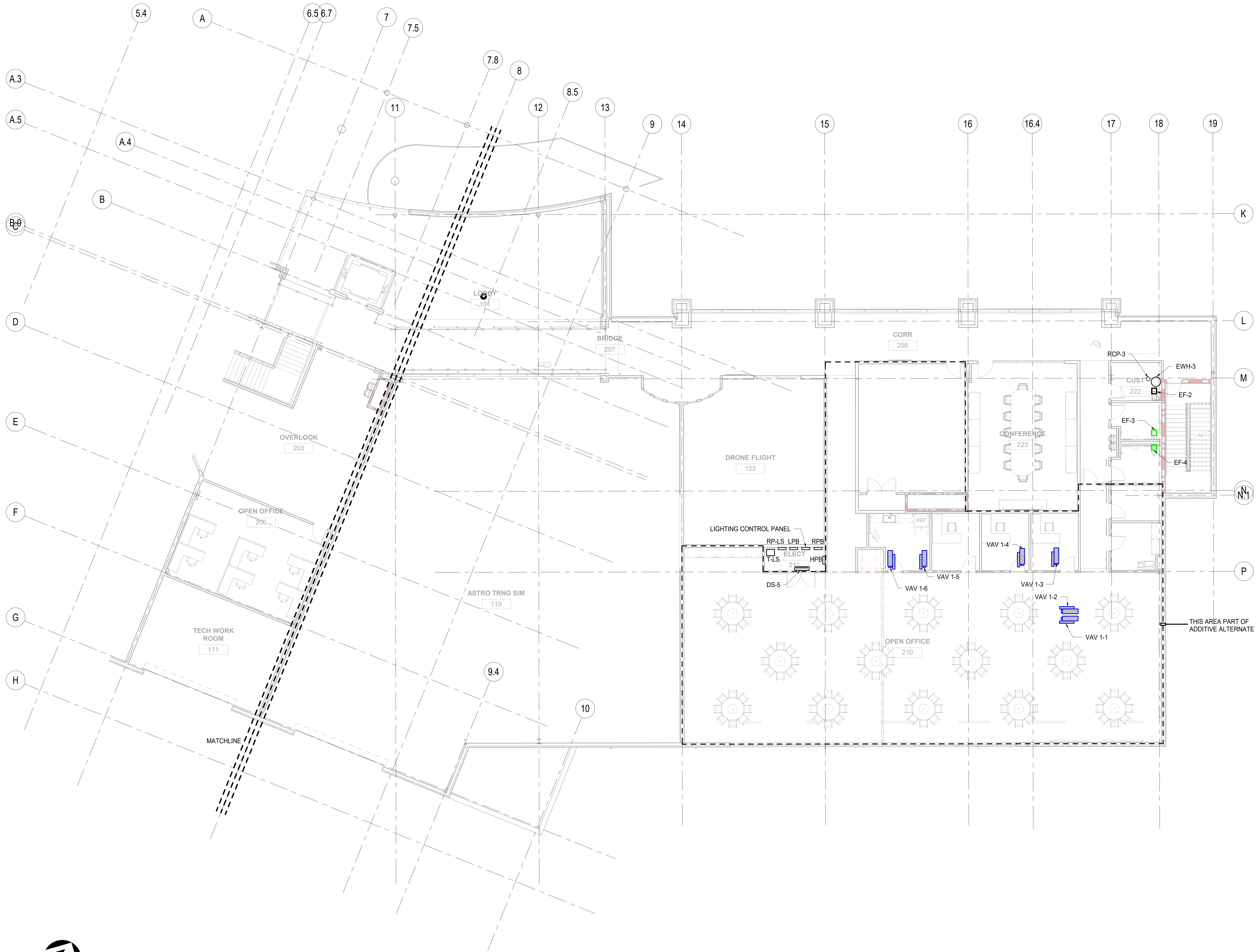
PROJECT NUMBER
225029-00

DRAWING NO.
E5.3

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



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REVISIONS
No. Description Date

DRAWING TITLE
SECOND FLOOR
PLAN - EAST WING
- HVAC

DRAWN BY: BR
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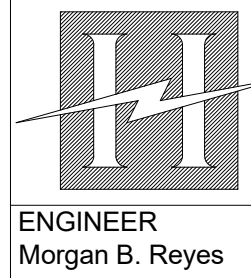
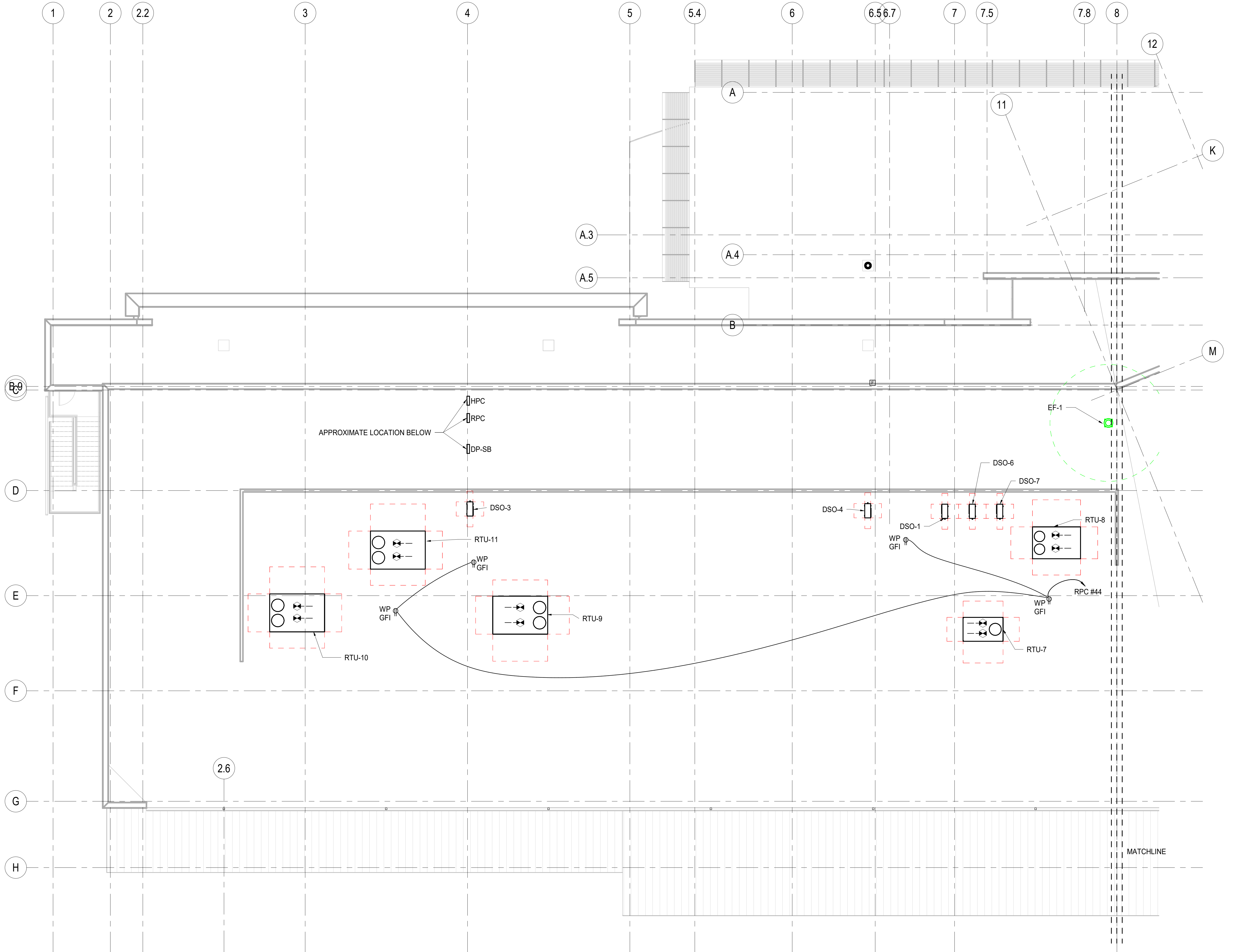
PROJECT NUMBER
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DRAWING NO.
E5.4

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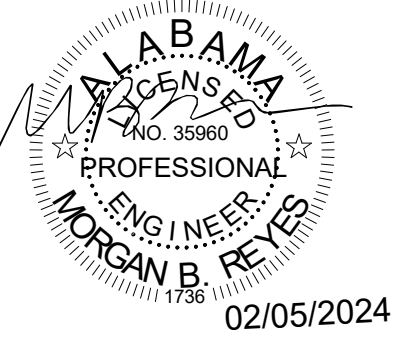
1 ROOF PLAN - WEST WING
1/8" = 1'-0"



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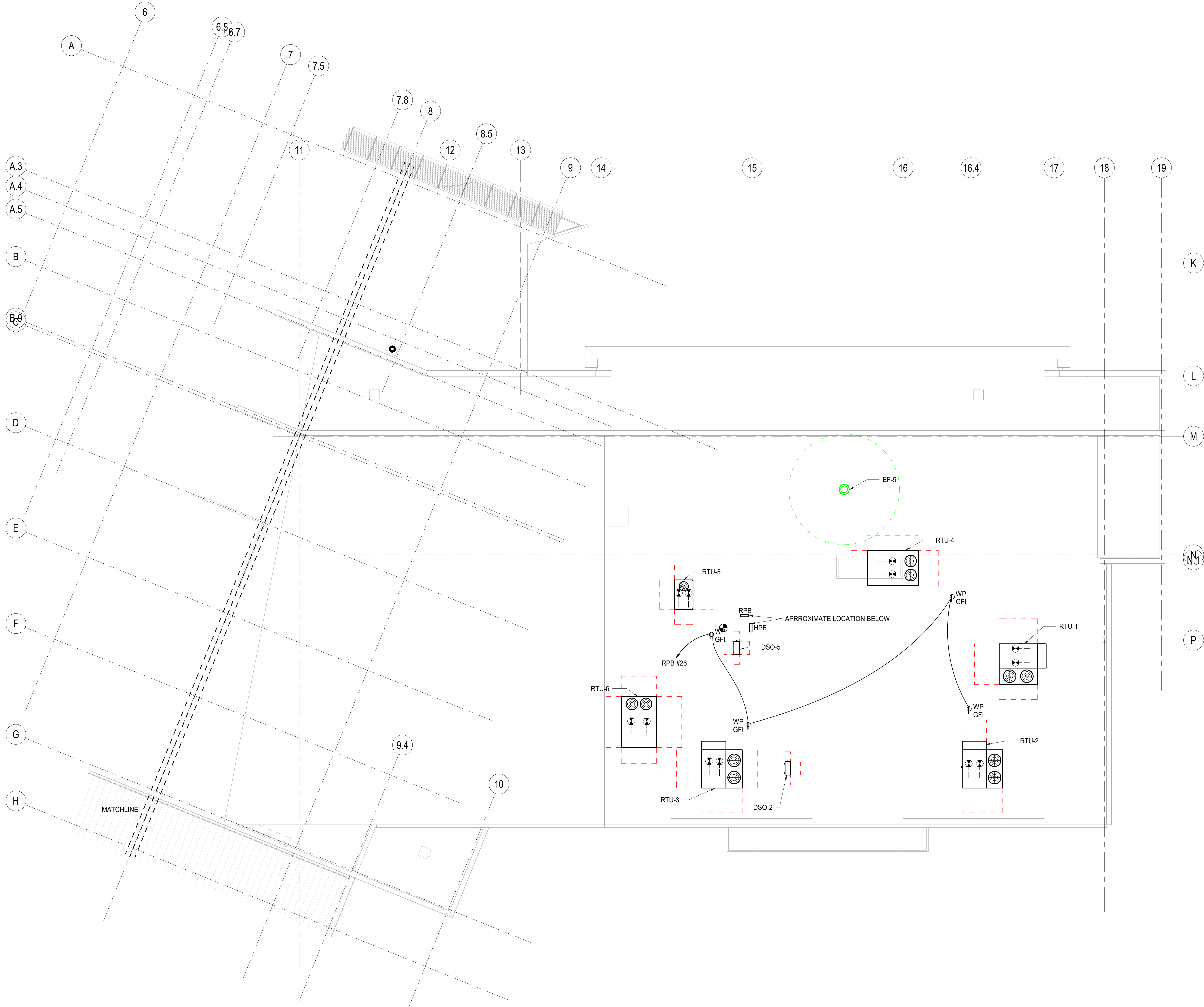
DRAWING TITLE
ROOF PLAN - WEST WING - ELECTRICAL

DRAWN BY: BR
CHECKED BY: MBR

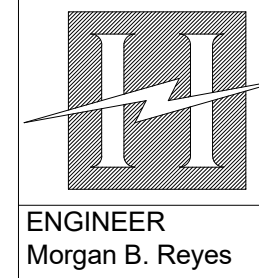
PROJECT NUMBER
225029-00

DRAWING NO.
E6.1

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1 ROOF PLAN - EAST WING
1/8" = 1'-0"



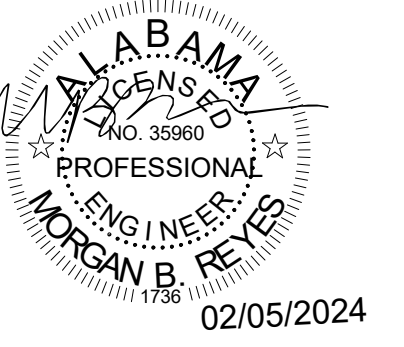
HYDE ENGINEERING, INC.
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PROJECT #
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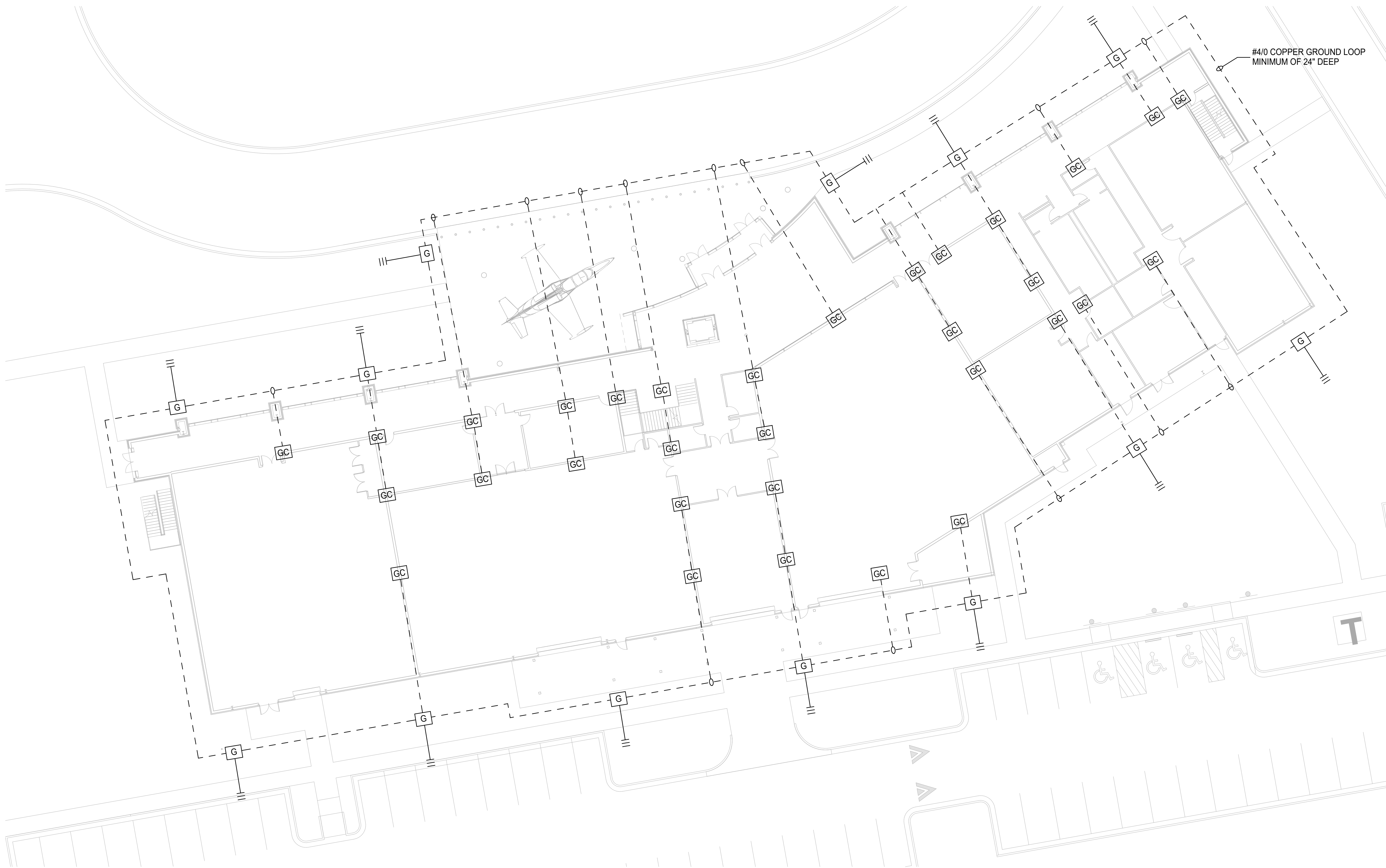
DRAWING TITLE
ROOF PLAN - EAST WING
WING - ELECTRICAL

DRAWN BY: BR
CHECKED BY: MBR

PROJECT NUMBER
225029-00

DRAWING NO.
E6.2

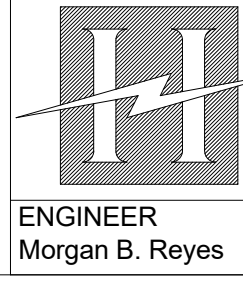
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1 SITE PLAN - LIGHTNING PROTECTION
1/16" = 1'-0"

NOTES:

1. LIGHTNING PROTECTION SYSTEM SHALL BE MASTER LABEL CERTIFIED BY LIGHTNING PROTECTION COMPANY.
2. LIGHTNING PROTECTION COMPANY SHALL PROVIDE FINAL DETAILS AND DESIGN DRAWINGS DURING SUBMITTALS. SYSTEM SHOWN IS BASIS OF DESIGN.
3. SEE DETAILS ON E7.3.



ENGINEER
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ISSUE DATE: FEBRUARY 5, 2024

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DRAWING TITLE
**SITE PLAN -
LIGHTNING
PROTECTION**

DRAWN BY: BR
CHECKED BY: MBR

PROJECT NUMBER
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DRAWING NO.
E7.1

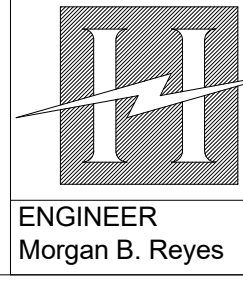
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1 ROOF PLAN - LIGHTNING PROTECTION
1/16" = 1'-0"

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PROJECT #
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DRAWING TITLE
**ROOF PLAN -
LIGHTNING
PROTECTION**

DRAWN BY: BR
CHECKED BY: MBR

PROJECT NUMBER
225029-00

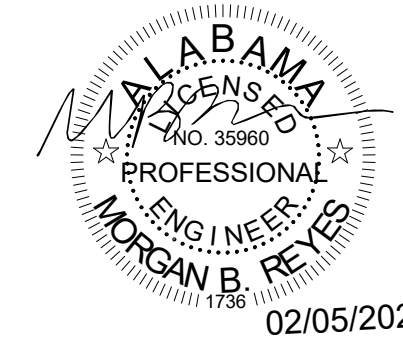
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