	MECHANI ABBREV.	ICAL ABBREVIATIONS  DESCRIPTION	SYMBOL	HVAC PIPING LEGEND
	AC	AIR CONDITIONING UNIT	SYMBOLNPW	DESCRIPTION  NOT POTABLE WATER
	ACC ACD	ACCESS DOOR	RL	REFRIGERANT LIQUID LINE REFRIGERANT SUCTION LINE
	AD	AUTOMATIC DAMPER		REFRIGERANT HOT GAS LINE
	AFF AHU	ABOVE FINISH FLOOR  AIR HANDLING UNIT		VENT LINE  A.C UNIT DRAIN LINE
F	ARCH AUX	ARCHITECTURAL AUXILIARY	—— AD———	· AUXILIARY DRAIN PIPING LINE
	BS	BIRD SCREEN	- G	NATURAL GAS BRANCH OFF TOP OF MAIN
	BOD	BOTTOM OF DUCT  BOTTOM OF STEEL	1	BRANCH OFF BOTTOM OF MAIN
	CFM	CUBIC FEET/MINUTE	G	PIPE DOWN
	CMD	CONCEALED DAMPER REGULATOR  CONCRETE	<u> </u>	PIPE UP  RISE OR DROP IN PIPE
	CONN	CONNECT	<u> </u>	BRANCH OFF SIDE OF MAIN
_	CP CU	CONTROL PANEL  CONDENSING UNIT		ECCENTRIC REDUCER  SLOPE DOWN IN DIRECTION OF ARROW, 1" IN 20FT
	DISC	DISCONNECT		SOLENOID VALVE
	DL DWG	DOOR LOUVER DRAWING	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	CHECK VALVE
	DR DN	DOOR DOWN	<u> </u>	BASKET STRAINER PRESSURE REDUCING STATION
	DPR	DAMPER		
	DOM DU	DOMESTIC DUCT UP	] — —     	FLANGED UNION SCREWED UNION
	EAT	ENTERING AIR TEMPERATURE		ASME PRESSURE RELIEF VALVE
	EMG EX, EXIST	EXPANDED METAL GRILLE  EXISTING	<b>. . .</b>	PRESSURE TEMPERATURE PORT -PETES PLUG
	FD	FIRE DAMPER	р	THERMOMETER WITH WELL
	FTB FZS	FLOOR TO BOTTOM  FREEZESTAT	Q <sub>I</sub>	PRESSURE GAUGE WITH GAUGE COCK
	HDR	HEADER	= =	PIPE GUIDES  EXPANSION JOINT
	HP HS	HORSE POWER HUMIDITY SENSOR	•	EXPANSION JOINT  CONNECT TO EXISTING - VERIFY SIZE & LOCATION
	HTR	HEATER	<u> </u>	FLEXIBLE PIPING CONNECTOR
_	LAT MBH	LEAVING AIR TEMPERATURE  1000 BTUH/HR	MFD	MECH. ROOM FLOOR DRAIN ( SEE PLBG)
	MD	MANUAL DAMPER		<u>END NOTES:</u> BOLS PRECEDED BY "E" INDICATE EXISTING LINES (ECH = EXISTING CHILLED
_	MTR MFD	MOTOR  MECHANICAL FLOOR DRAIN	WATER SUPPLY).	
	NC NO	NORMALLY CLOSED  NORMALLY OPEN		
	OD	OUTSIDE DIAMETER		
	OSA PSIG	OUTSIDE AIR POUNDS PER SQUARE INCH GAGE	1	
	RL	REFRIGERANT LIQUID LINE		
	RS RH	REFRIGERANT SUCTION LINE  RELATIVE HUMIDITY	-	
	SD	SMOKE DETECTOR		
	SFD T	COMBINATION SMOKE/FIRE DAMPER THERMOSTAT	_	
	TS UC	TEMPERATURE SENSOR  DOOR UNDERCUT	]	
	UG	UNDERGROUND		
	\$ DUC	TWORK LEGEND	-	
	SYMBOL	DESCRIPTION	_	
	40)/40	DUCTWORK, DOUBLE LINE. INSIDE "FREE AREA" DIMENSIONS ARE SHOWN.	_	
	WIDTH DEPTH		_	
		DUCTWORK, DOUBLE LINE. INSIDE "FREE AREA" DIMENSIONS SHOWN Ø= ROUND.		
		FLEXIBLE ROUND DUCT. MAX LENGTH= 5'-0".		
		EXISTING DUCTWORK, AIR DEVICES, EQUIPMENT, ETC. TO REMAIN	-	
	     > EX.18X12  >	EXISTING DUCTWORK, AIR DEVICES, EQUIPMENT, ETC.	-	
_	    	TO BE REMOVED  SUPPLY DUCTWORK SECTION INSIDE DIMENSIONS ARE	-	
		SHOWN.		
_ 	<i>-</i> 1 <i>-</i> 1	RETURN OR EXHAUST DUCTWORK SECTION INSIDE DIMENSIONS ARE SHOWN.		
<u></u>	1 111 111 1	DUCTWORK RISE OR DROP. ARROW SHOWS DIRECTION	-	
	<del>                                     </del>	OF AIR FLOW.	_	
_		ELBOW TURNED UP WITH TURNING VANES.		
	<b>&gt;</b> X	ELBOW TURNED DOWN WITH TURNING VANES.		
		RADIUS TYPE ELBOW CENTERLINE RADIUS= 1.5 X WIDTH.	1	
	<u> </u>	SQUARE TYPE ELBOW WITH DOUBLE THICKNESS VANES	-	
	\[ \frac{1}{2} \land \frac{1}{2} \rangle \frac	REQUIRED IN ALL DUCTWORK ELBOWS UNLESS NOTED OTHERWISE.		
	TU-XXX	TERMINAL UNIT TAG. XXX = TERMINAL UNIT DESIGNATION. A"Ø = TERMINAL UNIT ROUND INLET SIZE.	1	
	XX-YYY	EQUIPMENT TAG. XX = EQUIPMENT TYPE (AC, AHU, EF,	1	
_		ETC). YYY = EQUIPMENT DESIGNATION (1, 2, A, B, ETC.)  ACCESS DOOR (AD) 12X12 UNLESS NOTED OTHERWISE.	-	
_	AD	EIDE DAMPED (ED) EIDE DAMPED SUSCIE TIET		
	<u> </u>	FIRE DAMPER (FD), FIRE DAMPER 3-HOUR RATED (FD(3HR)), FIRE DAMPER W/SIDEWALL GRILLE (FD(THINLINE) (RUSKIN IBD20G), COMBINATION SMOKE		
		AND FIRE DAMPER (SFD), OR SMOKE DAMPER (SD). ALL FD, SFD AND SD SHALL HAVE A 12X12 ACCESS DOOR		
_		UNLESS NOTED OTHERWISE.  CONCIAL SPIN-IN.	-	
_	للالر	MANUAL VOLUME DAMPER (MD).	-	
_	7 11 7			
	<u> </u>	MANUAL VOLUME DAMPER WITH CONCEALED DAMPER REGULATOR (CMD) (YOUNG'S REGULATOR-BEVEL GEAR TYPE).		
_	<u> </u>	AUTOMATIC MOTOR OPERATED DAMPER (AD) ALL AD	1	
	AD	SHALL HAVE A 12X12 ACCESS DOOR UNLESS NOTED OTHERWISE.	_	
L		FLEXIBLE DUCTWORK CONNECTION.		
		LOW PRESSURE RUNOUT WITH SQUARE- TO-ROUND TRANSITION AND CONICAL SPIN-IN.		
-		¾" DOOR UNDERCUT- SEE ARCH.	-	
1 -	₩ UC			

EQUAL AREA SPLITTER.

CONNECT TO EXISTING VERIFY SIZE& LOCATION.

MARK

CEILING DIFFUSERS

DESCRIPTION

A= ROUND NECK SIZE

A= ROUND NECK SIZE

CFM= AIRFLOW

**Z**= 4-WAY THROW

CFM= AIRFLOW

AXB= NECK SIZE

**AXB**= NECK SIZE

A= SLOT LENGTH

**W**=ROUND RUNOUT (IN.)

A'-0"= BAR GRILLE LENGTH

**Z** = BAR GRILLE WIDTH

CFM=AIRFLOW

CFM-AIRFLOW

AXB=NECK SIZE

**W**=ROUND RUNOUT

DAMPER & BLANKET

AXB=NECK SIZE

AXB CFM=AIRFLOW W=ROUND RUNOUT

WALL RETURN / EXHAUST GRILLES

CFM=AIRFLOW

AXB=NECK SIZE

AXB=NECK SIZE

CFM=AIRFLOW

FD= EQUIP WITH CEILING RADIATION

CFM=AIRFLOW

RETURN/EXHAUST GRILLES

Z A W=ROUND RUNOUT (IN.)
CFM Z=NUMBER OF SLOTS

CFM-AIRFLOW

CFM-AIRFLOW

AIR DEVICE SCHEDULE

BASIS OF DESIGN

ARCHITECTURAL SQUARE PLAQUE

SURFACE MOUNT - BORDER TYPE 1

ARCHITECTURAL ROUND PLAQUE

DIFFUSER

TITUS MODEL OMNI

CEILING DIFFUSER

TITUS MODEL 300F

DRUM LOUVERS

PLASTER FRAME

(FLOOR)

R=RETURN E=EXHAUST T=TRANSFER | CUBE CORE CEILING GRILLE

R=RETURN E=EXHAUST T=TRANSFER | LOUVERED CEILING RETURN GRILLE

R=RETURN E=EXHAUST T=TRANSFER | WALL RETURN GRILLE HORIZONTAL

R=RETURN E=EXHAUST T=TRANSFER BAR RETURN GRILLE

TITUS DL-SV

TITUS MODEL R-OMNI

SURFACE MOUNT FRAME

SIDEWALL SUPPLY REGISTER

SIDEWALL BUILT MOUNTED

LINEAR BAR SUPPLY GRILLE

BORDER TYPE 3 (SIDEWALL)

BORDER TYPE 6 W/ HEAVY CORE

TITUS-50F BORDER TYPE NO. 1- ALUM. GRILLES

TITUS-50R BORDER TYPE NO. 1-STEEL

SURFACE MOUNT - BORDER TYPE 1

TITUS MODEL CT-PP-0

"EGGCRATE" (1/2"X 1/2")

TITUS MODEL 355R

TITUS-355ZRL BORDER TYPE 1

TITUS MODEL 30R

BORDER TYPE 1

LAY-IN BORDER TYPE 3

LINEAR SLOT DIFFUSER

TITUS-ML39 (1" SLOT)

LAY-IN - BORDER TYPE 3

REMARKS

1. OPPOSED BLADE DAMPER

2.VERTICAL FRONT BLADES

1. OPPOSED BLADE DAMPER

1.INSULATED SUPPLY PLENUM

. 7/32" BARS W/ 0 DEGREE DEFLECTION

3.OPTIONAL BLACK FINISH

1. OPPOSED BLADE DAMPER

. OPPOSED BLADE DAMPER

GRILLES

BLADE SPACING

1. 1/2" SPACING

2. OBD NOT REQUIRED FOR TRANSFER

2. OBD NOT REQUIRED FOR TRANSFER

1. 3/8" SPACING, 0 DEGREE DEFLECTION

3. 35 DEGREE DEFLECTION AND 1/2"

2.SPLIT VANE

# **GENERAL NOTES**

- 1. 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.
- 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 O 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.
- 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

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FOR CONSTRUCTION ISSUE DATE: FEBRUARY 05, 2024 REVISIONS No. Description

DRAWING TITLE

ABBREVIATIONS, GENERAL NOTES AND LEGENDS

CHECKED BY:

225029-00

M0.01

						ROC	OFTOP A	AC UNI	T SCHE	DULE-	GAS	HEAT						
			CAPACITY		SUPPLY FAN				COOLING	COIL		HEATI	NG (NATURA	AL GAS)			MIN	BASIS OF
MARK	SERVES	NOTES	TONS	CFM	ESP IN WG	HP	OSA CFM	MBHT	MBHS	EAT °F DB	EAT °F WB	INPUT MBH	OUTPUT MBH	EAT °F	ACCESSORIES	V/Ø/HZ	(SEER)/EER	DESIGN DAIKIN
RTU-1	SECOND FLOOR ADMIN SPACES	ABCDF	10.0	3500	3.0	8.0	500	118.2	69.5	72.6	69.5	200	160	64	[1][2][3][4][5][6][7][8][9][10][11]	460/3/60	12.4	DPS012A
RTU-2	SECOND FLOOR OPEN OFFICE	ABCDE	7.5	3000	1.0	3.0	450	94.3	72.8	78.5	65.9	200	160	64	[1][2][3][4][5][6][7][8][9][10][11]	460/3/60	12.1	DPS007A
RTU-3	SECOND FLOOR OPEN OFFICE	ABCDE	7.5	3000	1.0	3.0	450	84.9	62.7	77.5	64.8	200	160	64	[1][2][3][4][5][6][7][8][9][10][11]	460/3/60	12.1	DPS007A
RTU-4	FIRST FLOOR RMS 121, 125, 127,128, 130, 133	ABCDF	25.0	9000	3.0	15.0	1100	312.3	127.5	72.3	69.4	300	240	64	[1][2][3][4][5][6][7][8][9][10][11]	460/3/60	10.6	DPS025A
RTU-5	DRONE FLIGHT RM 122	ABCDE	6.0	2400	1.0	1.5	300	83.2	63.6	74.2	63.2	200	160	64	[1][2][3][4][5][6][7][8][9][10][11]	460/3/60	12.1	DPS006A
RTU-6	ASTRO TRAINING SIM RM 118	ABCDE	25.0	10000	2.0	10	1140	282.3	206.2	75.1	63.9	300	240	64	[1][2][3][4][5][6][7][8][9][10][11]	460/3/60	10.6	DPS025
RTU-7	MOCR RM 204, OFFICE RM 202 OVERLOOK ROM 203	ABCDE	6.0	2400	1.0	3.0	430	78.8	56.6	77.7	65.5	200	160	64	[1][2][3][4][5][6][7][8][9][10][11]	460/3/60	12.1	DPS006
RTU-8	CORRIDOR 208, BRIDGE 201, LOBBY 101	ABCDE	15.0	6000	1.2	3.0	560	153.9	126.6	75.1	62.9	300	240	64	[1][2][3][4][5][6][7][8][9][10][11]	460/3/60	11.0	DPS015
RTU-9	MISSION CONTROL RM 105, MOCR 106, MOCR 108 TECH RM 111 SIM PREP 112	ABCDF	25.0	10000	3.0	15.0	1670	276.5	205.6	76.1	63.1	300	240	64	[1][2][3][4][5][6][7][8][9][10][11]	460/3/60	10.6	DPS025
RTU-10	ROPES RM 103	ABCDE	15.0	6000	1.2	3.0	1040	198.5	153.2	76.1	64.7	300	240	64	[1][2][3][4][5][6][7][8][9][10][11]	460/3/60	11.4	DPS016A
RTU-11	CORRIDOR 102	ABCDE	6.0	2400	1.0	1.5	150	78.8	56.6	73.8	60.8	200	160	64	[1][2][3][4][5][6][7][8][9][10][11]	460/3/60	12.4	DPS006A

- 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 3Ø 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.

- [1] HOT GAS REHEAT, HUMIDITY SENSOR WITH DEHUMIDIFICATION CONTROL
- [3] CONVENIENCE OUTLET, POWERED FROM THE LINE SIDE OF THE DISCONNECT
- 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

						D	UCT	LESS	SPLIT	SYSTE	M AC U	NIT SC	HEDUL	E - CO	OLING	3 ONLY					
INDOOR					WEIGHT	С	OOLING	CAPAC	ITY	HEATING	CAPACITY	REFRIC	GERANT		ELECTRIC	CAL			INDOOR UNIT	OUTDOOR	
UNIT MARK	OUTDOOR UNIT MARK	SERVES	TYPE	SUPPLY FAN CFM	INDOOR/ OUTDOOR UNITS	MBH	MBH MIN	ENT °F DB	ENT °F WB	MBH @47°F	MBH @17°F	TYPE	RS - RL	V/Ø/HZ	INDOOR UNIT MCA	OUTDOOR UNIT MCA/MOCP	NOMINAL TONS	SEER	BASIS OF DESIGN (MITSUBISHI)	UNIT BASIS OF DESIGN (MITSUBISHI)	ACCESSORIES
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	3.0	18.8	PKA-A36KA4	PUZ-A36NKA7	[1] [2] [3] [4] [5] [6] [7]
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	3.0	18.8	PKA-A36KA4	PUZ-A36NKA7	[1] [2] [3] [4] [5] [6] [7]
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	3.0	18.8	PKA-A36KA4	PUZ-A36NKA7	[1] [2] [3] [4] [5] [6] [7]
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	3.0	18.8	PKA-A36KA4	PUZ-A36NKA7	[1] [2] [3] [4] [5] [6] [7]
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	3.0	18.8	PKA-A36KA4	PUZ-A36NKA7	[1] [2] [3] [4] [5] [6] [7]
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	2.5	22.8	PLA-A30EA7	PUZ-A30NHA7	[1] [2] [3] [4] [5] [6] [7]
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	2.5	22.8	PLA-A30EA7	PUZ-A30NHA7	[1] [2] [3] [4] [5] [6] [7]
																					1

- [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.
- 1. CAPACITIES ARE MINIMUM GROSS CAPACITIES
- 2. OUTDOOR UNIT: CAPACITY TO BALANCE INDOOR COOLING AT 95F AMBIENT
- 3. INDOOR UNIT POWERED FROM OUTDOOR UNIT

- <u>ACCESSORIES</u> [1] MICROPROCESSOR BASED CONTROLS W/ 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

[7] FACTORY INSULATED REFRIGERANT LINE SET

[5] INTERCONNECT WIRING BETWEEN INDOOR AND OUTDOOR UNIT [6] LOW AMBIENT CONTROL - WIND BAFFLE

					FAN	SCHE	DULE				
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	А	320	0.4	5.6	1/10	120/1/60	[1]	2	G-90VG
EF-2	CUST 222	CEILING MOUNTED	В	100	0.3	2.0	(28)	120/1/60	[1]	1	SP-A200
EF-3	RR 221	CEILING MOUNTED	В	70	0.4	2.0	(21)	120/1/60	[1]	1	SP-A200
EF-4	RR 220	CEILING MOUNTED	В	70	0.4	2.0	(21)	120/1/60	[1]	1	SP-A200
EF-5	RR 128; RR 129;	ABOVE CEILING	Α	1360	0.5	7.2	1/2	208/3/60	[2]	2	G-140VG

6.0

FAN TYPES [A] CENTRIFUGAL ROOF EXHAUSTER DOWNBLAST, DIRECT DRIVE

EF-6 MACHINE RM 113 ABOVE CEILING

[B] CEILING MOUNTED EXHAUST FAN, DIRECT DRIVE

CUST 130

- [C] INLINE CENTRIFUGAL, BELT DRIVE
- INTERLOCKS 1 OCCUPANCY SENSOR WALL MOUNTED
- 2 BAS, TIME OF DAY SCHEDULE.

FAN ACCESSORIES

1/15 120/1/60

[1] BACKDRAFT DAMPER; FLEXIBLE CONNECTORS; SOLID STATE SPEED CONTROLLER; ALUMINUM GRILLE; GRILLE MOUNTED MOTION DETECTOR; DISCONNECT SWITCH; ENERGY STAR RATED; ECM MOTOR

SP-70VG

- [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	REMARKS	BASIS OF DESIGN (MARKEL)
EWH-1	VALVE 120	EWH	41	3.0	245	208/3/60	8.3	UNIT MOUNTED	[1]	[A]	3420

EWH - ELECTRIC WALL HEATER: RECESSED WALL MOUNTED [1] WALL BOX FOR RECESSED INSTALLATION; 16 GA HEAVY DUTY GRILLE; [A] MOUNT 18" AFF.

CONTROL TRANSFORMER

170

0.4

			Al	R TERN	ЛINAL	UNIT	SCHEE	OULE-ELE	CTRIC H	EAT	
MADIC	T)/DE	ROUND	COO	LING	HEATING	ELECTI	RIC HEAT	ELECTRICAL	NOTEO	40050000150	DAGIO OF DEGICAL
MARK	TYPE	INLET	MAX CFM	MIN CFM	CFM	KW	STEPS	V/Ø/HZ	NOTES	ACCESSORIES	BASIS OF DESIGN
RTU-1			•				•	•			
TU-1-1	VVR	7	400	80	175	2.7	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-1-2	VVR	7	600	80	350	4.4	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-1-3	VVR	8	700	80	450	5.5	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-1-4	VVR	7	600	80	375	4.6	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-1-5	VVR	6	300	80	200	2.7	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-1-6	VVR	9	900	140	600	7.9	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
RTU-4			•				•				
TU-4-1	VVR	10	1100	110	650	7.8	SCR	480/3/60	A B	[1][2][3][4][5].	TITUS DESV
TU-4-2	VVR	12	1500	150	900	11.3	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-4-3	VVR	9	900	100	500	6.8	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-4-4	VVR	8	600	100	360	4.5	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-4-5	VVR	16	3600	750	1750	22.2	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-4-6	VVR	12	1400	140	840	11.6	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
RTU-9											
TU-9-1	VVR	14	3000	200	1500	18.1	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-9-2	VVR	14	2500	200	1500	18.1	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-9-3	VVR	8	800	100	400	4.8	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-9-4	VVR	8	800	100	400	4.8	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-9-5	VVR	14	750	360	400	5.5	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TU-9-6	VVR	12	1500	100	800	8.1	SCR	480/3/60	АВ	[1][2][3][4][5].	TITUS DESV
TYPE:				NOTES:						ACCESSORIES/FEATURE	<u>S:</u>

SINGLE DUCT TERMINAL UNITS: V V R= VARIABLE VOLUME REHEAT

- 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
- [1] REMOVABLE AIR FLOW MONITOR
  - [2] DISCHARGE TEMPERATURE SENSOR [3] DOOR INTERLOCK DISCONNECT SWITCH
- PRESSURE DUCT AND TERMINAL UNIT EXCEEDS 10 FEET EQUIVALENT LENGTH. [4] MAIN SUPPLY FUSE [5] CLASS II 24 VOLT TRANSFORMER

			G	RAVIT	Y VEN	T	
MARK	SERVICE	TYPE	AIR FLOW CFM	NECK SIZE	MAX. ΔP IN W.G	ACCESSORIES	BASIS OF DESIGN (GREENHECK)
EH-1	R	Α	240	12X12	0.1	[1][2]	GRSR-12
VENT TYF	PES				VENT ACCE	SSORIES	

<u>SERVICE</u>

VENT ACCESSORIES [1] 12" HIGH ROOF CURB [2] FLAT FLASHING FLANGE

I = INTAKE R = RELIEF

[A] ROUND SPUN ALUMINUM

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PROJECT STATUS: FOR CONSTRUCTION ISSUE DATE: FEBRUARY 05, 2024 REVISIONS No. Description

DRAWING TITLE HVAC DETAILS

CHECKED BY: PROJECT NUMBER 225029-00

MO.02

1588.4 **8862.4** 

1. Summary

Ventilation Sizing Method

Sum of Space OA Airflows

1. Summary Sum of Space OA Airflows Ventilation Sizing Method Design Ventilation Airflow Rate 2. Space Ventilation Analysis Zone Name / Space Name 103 ROPES 1. Summary Ventilation Sizing Method Sum of Space OA Airflows Design Ventilation Airflow Rate 2. Space Ventilation Analysis Zone Name / Space Name 102 CORRIDOR Totals (incl. Space Multipliers)

Floor Area Maximum Supply Air Outdoor Air Mult. (ft²) Occupants (CFM) (CFM/person) (CFM/ft²) (CFM) (% of supply) (CFM) Floor Area Maximum Supply Air Outdoor Air Mult. (ft²) Occupants (CFM) (CFM/person) (CFM/ft²) (CFM) (% of supply) (CFM)

104 Jefferson St. S. Suite 200, Huntsville, AL 35801 p.o.c. Kristine Harding kharding@kpsgroup.com  $\infty$ 

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4 INING

<u>R</u>

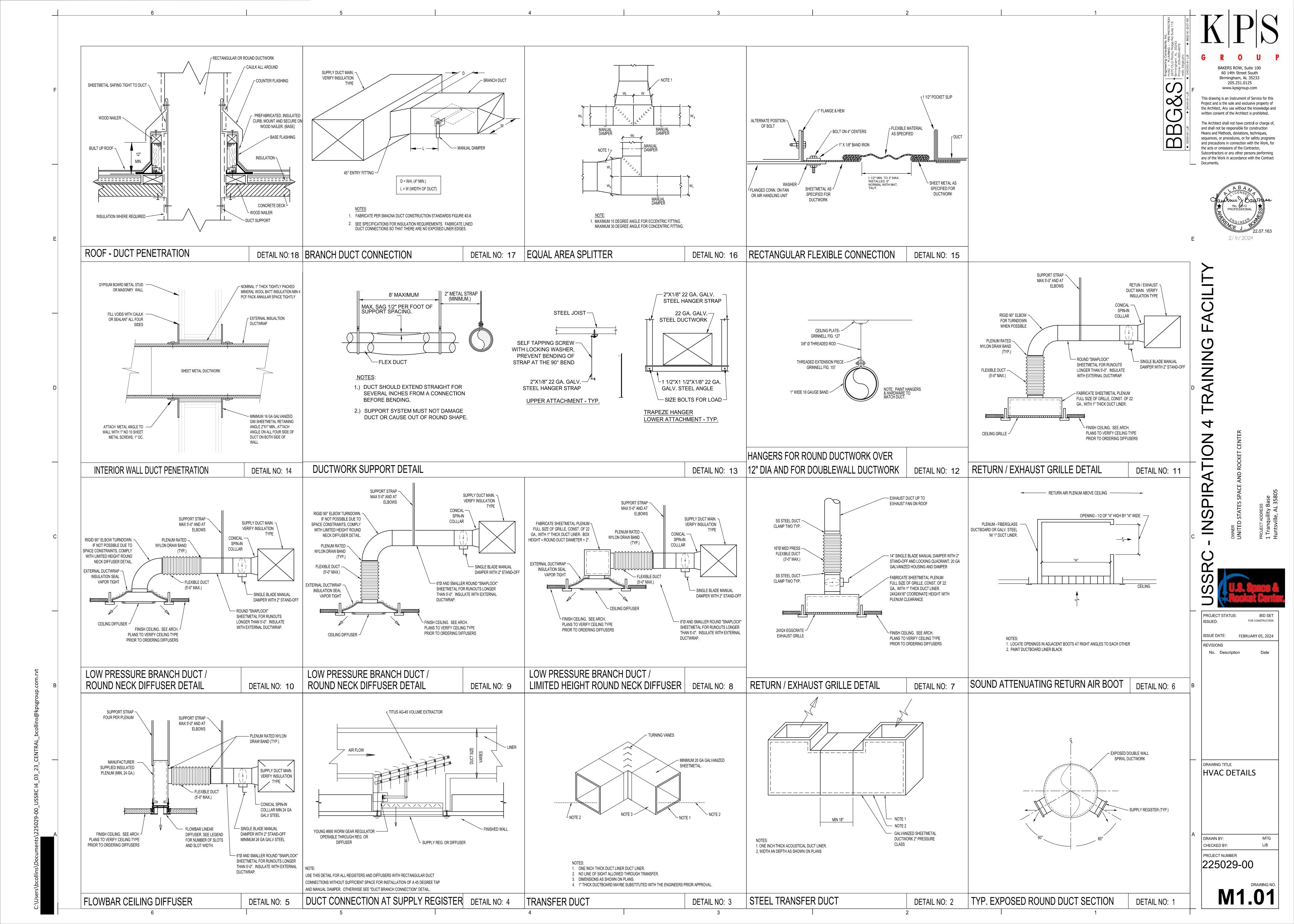
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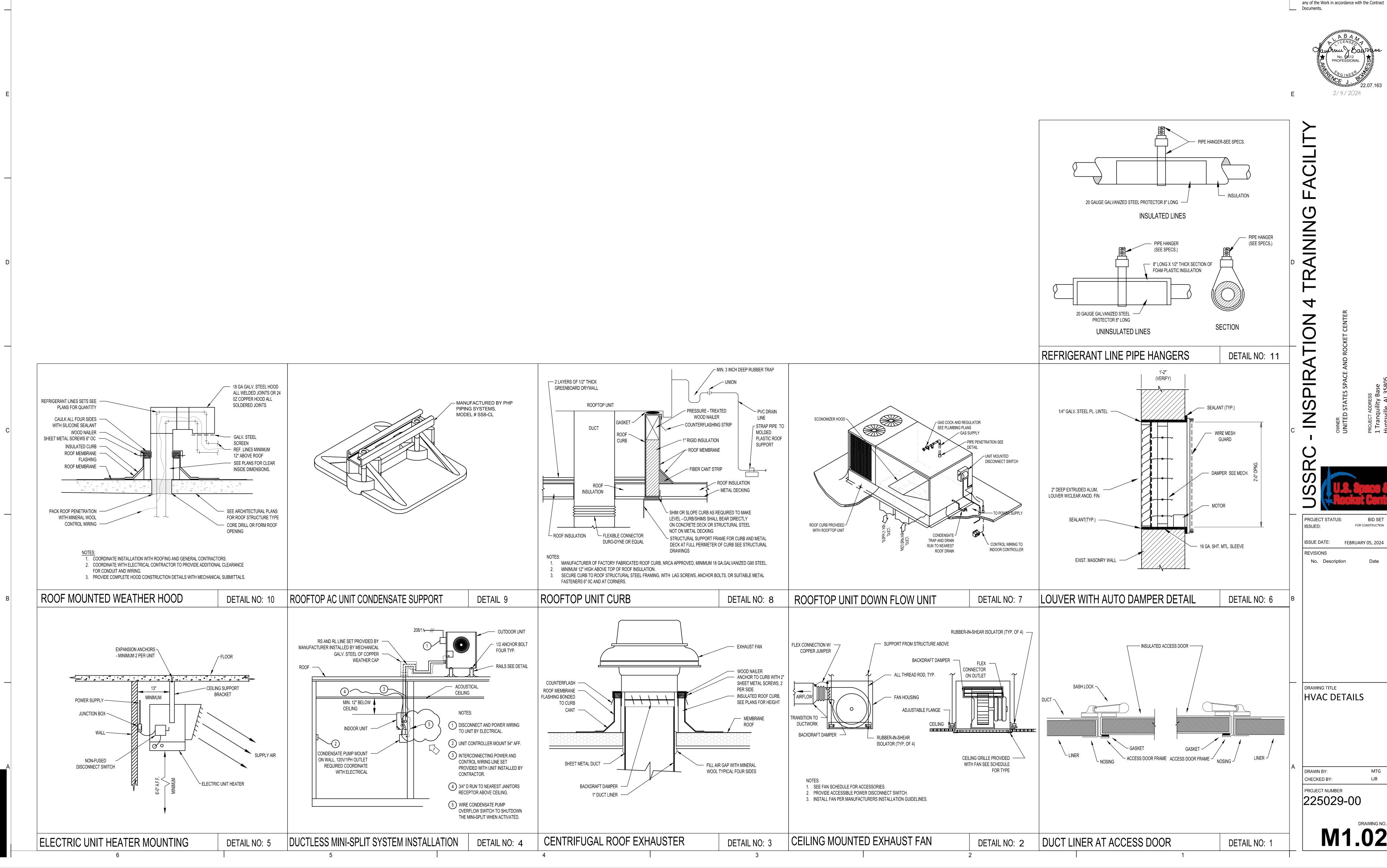
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		BID SET FOR CONSTRUCTION
ISSUE D	ATE:	FEBRUARY 05, 2024
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DRAWING TITLE OUTSIDE AIRFLOW

CHECKED BY: PROJECT NUMBER 225029-00





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and precautions in connection with the Work, for

the acts or omissions of the Contractor, Subcontractors or any other persons performing

RLF (AO)

### **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

## 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 satisfies, 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

### **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.

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.

BUILDING STATIC PRESSURE LOCAL **COMPRESSOR 1 MODULATION** COMMAND COMPRESSOR 2 COMMAND CONDENSATE OVERFLOW DETECTION LOCAL COOLING OUTPUT COMMAND DISCHARGE AIR STATIC PRESSURE DISCHARGE AIR TEMPERATURE DX COIL FROST STAT HOT GAS REHEAT VALVE COMMAND X MIXED AIR DAMPER OUTSIDE AIR DAMPER COMMAND OUTSIDE AIR FLOW LOCAL OUTSIDE AIR TEMPERATURE LOCAL PRIMARY FILTER STATUS LOCAL RELIEF AIR DAMPER OPEN/CLOSE RLF DPR RELIEF AIR FAN SPEED RELIEF AIR FAN START/STOP RELIEF AIR FAN STATUS LOCAL RETURN AIR DAMPER COMMAND RETURN AIR SMOKE DETECTION SPACE CO2 LOCAL (WIRED) SPACE HUMIDITY LOCAL (WIRED) SUPPLY AIR SMOKE DETECTION SUPPLY FAN SPEED SUPPLY FAN START/STOP SUPPLY FAN STATUS LOCAL APPLICATION MODE APP MODE **BAS COMMUNICATION STATE** BAS COM **COMPRESSOR ENABLE** COMPRESSOR LOCKOUT STATUS COOL OUTPUT DISCHARGE AIR STATIC PRESSURE SETPOINT DA SP SPT **ECONOMIZER ENABLE** ECONOMIZER MINIMUM POSITION ECON MIN POS SP FAN MODE COMMAND FAN MODE FILTER TIMER HOURS HEAT / COOL MODE REQUEST HEAT OUTPUT OCCUPANCY OCCUPIED COOLING SETPOINT SPACE CO2 HIGH LIMIT TIMED OVERRIDE STATUS UNOCCUPIED COOLING SETPOINT UNOCCUPIED HEATING SETPOINT

UNOCC HTG SP

NO SCALE

**System Point Description** 

**POINTS** 

**ALARMS** 

### BUILDING AUTOMATION SYSTEM (BAS) **GENERAL NOTES**

1. 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

OCCUPANCY:

2.1. 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

2.2. 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.

2.3. UNOCCUPIED: THE BUILDING SHALL BE COMMANDED TO UNOCCUPIED MODE AT 5:00 PM TO 7:00 AM TU. - SAT., AND

HEATING AND COOING 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.

2.5. HOLIDAYS: THE BAS CONTRACTOR SHALL OBTAIN AND IMPLEMENT OWNER'S CURRENT HOLIDAY SCHEDULE.

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.

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.

8. 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

9. THE BAS CONTRACTOR SHALL PROVIDE AND INSTALL ALL

10. COORDINATE THE FINAL LOCATION OF ALL WALL MOUNTED SENSORS WITH THE ARCHITECTURAL PLANS, FURNITURE LAYOUTS, ELECTRICAL SWITCHES, AND AND OTHER WALL MOUNTED DEVICES.

11. PRIOR TO THE DATE OF SUBSTANTIAL COMPLETION THE CONTROL CONTRACTOR SHALL COMPLETE THE FOLLOWING:

11.4. POINTS SPECIFIED TO BE TRENDED SHALL BE ACTIVE WITH

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

11.3. OPERATOR INTERFACE TERMINAL SHALL BE INSTALLED, WITH ALL GRAPHICS COMPETE, INCLUDING VERIFICATION

CONTROL DRAWINGS AND SYSTEMS.

SCHEDULED FOR SUBSTANTIAL COMPLETION.

12:00 PM TO 7:00 AM SAT. - MON. 2.4. UNOCCUPIED OVERRIDE: IN UNOCCUPIED MODE THE

### 3. SETPOINTS: 3.1. OCCUPIED: 72°F (ADJ)

3.2. UNOCCUPIED: 85°F SUMMER; 60°F WINTER.

4. BAS SHALL BE INTEGRATED WITH THE WITH FIRE ALARM SYSTEM

6. ALL SMOKE DETECTORS ARE PROVIDED AND WIRED BY THE ELECTRICAL CONTRACTOR, AND INSTALLED BY THE MECHANICAL

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

11.1. CHECK OUT AND COMMISSION ALL SEQUENCES OF 11.2. COMPLETE VERIFICATION OF ALL POINT TO POINT CHECKS.

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written consent of the Architect is prohibited.

and shall not be responsible for construction

Means and Methods, deviations, techniques,

the acts or omissions of the Contractor,

FOR CONSTRUCTION ISSUE DATE: FEBRUARY 05, 2024 REVISIONS No. Description

DRAWING TITLE BUILDING AUTOMATION SYSTEM CONTROLS DIAGRAMS AND SEQUENCES OF OPERATION

DRAWN BY: CHECKED BY: PROJECT NUMBER

225029-00

M1.03

# 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. 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. Upon a call for DX cooling, the unit controller shall enable and an alarm shall annunciate at the BAS. 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. The discharge air temperature setpoint shall be dynamically reset based on the deviation of actual space temperature from the active space temperature setpoint. If the discharge air temperature sensor fails, the DX cooling and the gas heat shall control to maintain the active space temperature setpoint and an alarm shall annunciate at the BAS. If the discharge air temperature sensor and the space temperature sensor fail, the DX cooling shall be disabled, the gas 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 gas 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 gas 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

Supply Fan: 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

### Morning Warm-Up Mode:

During optimal start, if the 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 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 sensor. 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:

When the space temperature rises above the occupied cooling setpoint the mode shall transition to cooling. When the space temperature falls below the occupied heating setpoint the mode shall transition to heating. When the space temperature is above the occupied cooling setpoint or below the occupied heating setpoint the mode shall remain in its last state. If the space temperature sensor fails the mode shall remain in its last state and an alarm shall annunciate at the BAS. If the local and communicated setpoints fail the controller shall disable the supply fan

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 modulate between its minimum position and 100% to maintain the space temperature setpoint. Minimum position shall be calculated based on supply fan speed. If the supply air temperature starts to fall below supply air temperature setpoint, the outdoor damper shall be at minimum position. Compressors shall be delayed from operating until the economizer has opened to 100% for 5

## 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.

The unit controller shall vary the supply fan speed to optimize minimum fan speed in all cooling and heating modes.

# **Supply Duct Static Pressure Control:**

The unit controller shall modulate the supply fan output as required to maintain the supply duct static pressure setpoint. If the supply duct static pressure falls below the supply air static setpoint + deadband, the unit controller shall increase the output to the supply fan to maintain setpoint. If the supply duct static pressure rises above the supply air static setpoint + deadband, the unit controller shall decrease the output to the supply fan to maintain setpoint.

### 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.

NO SCALE

System Point Description					אוכ 	TS					A	LA	RIV	15	
	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)		LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	
BUILDING STATIC PRESSURE LOCAL SP P	X	X								Х	Х			Х	
COMPRESSOR 1 MODULATION	X			X											
COMMAND CMP1															
COMPRESSOR 2 COMMAND CMP2	X				X										
CONDENSATE OVERFLOW DETECTION LOCAL	X		X									X			
CND OVRFL COOLING OUTPUT COMMAND	X			X											
CLG DISCHARGE AIR TEMPERATURE	X	X												X	
DX COIL FROST STAT	X		X									X			
FROSTAT HOT GAS REHEAT VALVE COMMAND	X				X										
HGRH MIXED AIR DAMPER	X			X											
MAD OUTSIDE AIR DAMPER COMMAND	X			X											_
OAD OUTSIDE AIR FLOW LOCAL	X	X													
OA FLW OUTSIDE AIR TEMPERATURE LOCAL	X	X												X	
OAT PRIMARY FILTER STATUS LOCAL	X		X									X			
FIL RELIEF AIR DAMPER OPEN/CLOSE	X				X										
RLF DPR RELIEF AIR FAN SPEED	X			X											
RLF RELIEF AIR FAN START/STOP	X				X										
RLF RELIEF AIR FAN STATUS LOCAL	X		X												
RLF RETURN AIR CO2 LOCAL		X								X				X	
RA CO2 RETURN AIR DAMPER COMMAND	X			X											
RAD RETURN AIR SMOKE DETECTION	\						X								
LOCAL RA SD															
SPACE HUMIDITY LOCAL (WIRED) SPH	X	Х								Х				Х	
SPACE TEMPERATURE LOCAL (WIRED) SPT	X	Х								X	Х				
SPACE TEMPERATURE SETPOINT LOCAL (WIRED) SPT SP	X	X													
SUPPLY AIR SMOKE DETECTION LOCAL SA SD							Х								
SUPPLY FAN SPEED SAF				Х											
SUPPLY FAN START/STOP SAF	X				Х										
SUPPLY FAN STATUS LOCAL SAF	X		X												
APPLICATION MODE APP MODE						Х									
BAS COMMUNICATION STATE BAS COM						X									>
COMPRESSOR ENABLE CMP ENA	X					X									
COMPRESSOR LOCKOUT STATUS CMP LCK						Х									
COOL OUTPUT CLG						Х									
DISCHARGE AIR STATIC PRESSURE SETPOINT	X					X									
DA SP SPT ECONOMIZER ENABLE						X									
ECON ENA ECONOMIZER MINIMUM POSITION	X					X			<u> </u>						
SETPOINT ECON MIN POS SP FAN MODE COMMAND						X									
FAN MODE FILTER TIMER HOURS						X									
FIL HRS HEAT / COOL MODE REQUEST	X					X									
H/C REQ HEAT OUTPUT	-					X									
HTG OCCUPANCY	X					X									
OCC OCCUPIED COOLING SETPOINT	X					X									
OCC CLG SP SPACE CO2 HIGH LIMIT						X									
SP CO2 HL TIMED OVERRIDE STATUS						X									
TOV UNOCCUPIED COOLING SETPOINT	X					X									
UNOCC CLG SP UNOCCUPIED HEATING SETPOINT	X					X			_						
UNOCC HTG SP															

RTU-2, 3, 5, 6, 7, 8, 10, AND 11 CONTROL DIAGRAM

BAKERS ROW, Suite 100

60 14th Street South Birmingham, AL 35233 205.251.0125 www.kpsgroup.com

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PROJECT STATUS: FOR CONSTRUCTION ISSUE DATE: FEBRUARY 05, 2024 REVISIONS

No. Description

DRAWING TITLE AUTOMATION SYSTEM CONTROLS DIAGRAMS AND

SEQUENCES OF

DRAWN BY: CHECKED BY:

OPERATION

PROJECT NUMBER 225029-00

M1.04

# SEQUENCE OF OPERATION

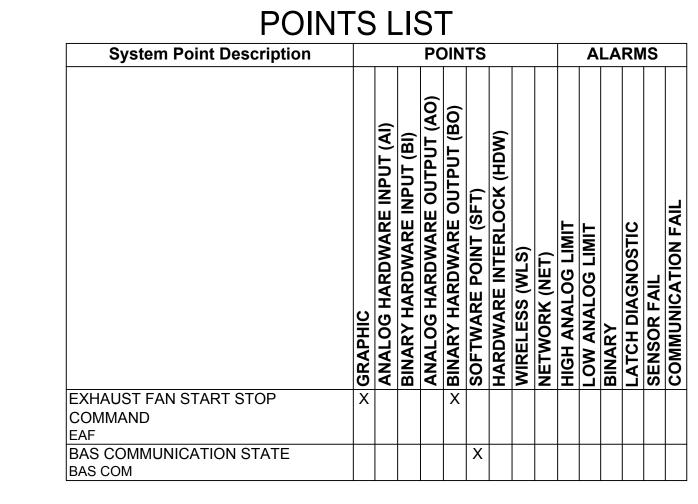
**Building Automation System Interface:** 

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.

During unoccupied periods the exhaust fan shall be disabled.



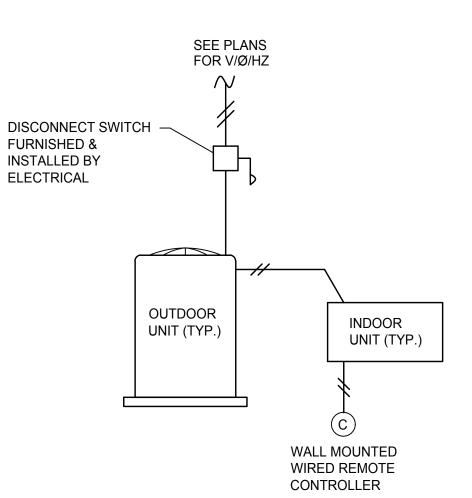
# EXHAUST FANS CONTROL DIAGRAM

NO SCALE WALL MOUNTED SPACE -SPT (AI) SPT SP (AI) TEMPERATURE SENSOR FOR BAS MONITORING. ALARM HIGH TEMPERATRE WHEN SPACE TEMPERATRUE IS ABOVE 80°F. ONE REQUIRED FOR EACH SPACE.

# SEQUENCE OF OPERATION

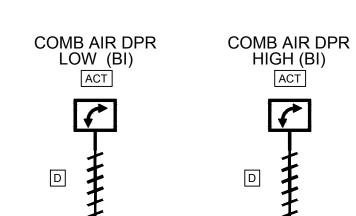
DUCTLESS SPLIT SYSTEMS SHALL BE CONTROLLED BY THE UNIT MOUNTED FACTORY CONTROLS TO OPERATE 24 HOURS PER DAY SEVEN DAYS PER WEEK, WITH A SPACE TEMPERATURE SETPOINT OF 72°F. THE BAS SHALL MONITOR SPACE TEMPERATURE AND PROVIDE ALARMS PER THE FOLLOWING:

- 1. MONITORING: THE BAS SHALL MONITOR SPACE TEMPERATURE, AND DISPLAY CURRENT TEMPERATURE AT THE OPERATOR INTERFACE. THE BAS SHALL TREND SPACE TEMPERATURE, AND TRENDS SHALL BE READILY AVAILABLE TO THE OPERATOR. SPACE TEMPERATURE TRENDING SHALL BE SET UP AND ENABLED WHEN THE BAS HAS BEEN INSTALLED AND COMMISSIONED.
- 2. ALARMS: THE BAS SHALL REGISTER A SPACE HIGH TEMPERATURE ALARM SUCH AS "COMPUTER ROOM XXX HIGH TEMPERATURE", IF CURRENT SPACE TEMPERATURE IS GREATER THAN THE OPERATOR ADJUSTABLE HIGH TEMPERATURE SETPOINT OF 80°F.



# 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.

low combustion air dampers shall be commanded 0% open.

EH (AO)

AIR VLV FT (AO) SPT (AI)
SPT SP (AI)
SP CO2 (AI)
OCC SP (NET) EA FLW (AI) ~

DAT (AI)

# 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.

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 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.

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:

NO SCALE

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.).

POINT			_!`			<b>T</b> ^				1	_			_	_
System Point Description				PC	NIC	TS 					A	LA	RN	IS 	Г
AIR VALVE MODULATION COMMAND	X GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	X 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	
AIR VALVE MODULATION COMMAND AIR VALVE MODULATION COMMAND	X			X											L
FLOW TRACKING AIR VLV FT	^														
DISCHARGE AIR TEMPERATURE DAT	Х	Х								Х	Х			Х	
EXHAUST AIRFLOW EA FLW	X	Х								X	Х				T
LOCAL HEAT ELECTRIC SCR OUTPUT EH	X			X											$\dagger$
SPACE CO2 CONCENTRATION LOCAL SP CO2	X	X								X					_
SPACE HUMIDITY LOCAL SPH	X	X								X					
SPACE OCCUPANCY INPUT	X		Х												f
SP OCC SPACE TEMPERATURE LOCAL	X	X													ł
SPT SPACE TEMPERATURE SETPOINT LOCAL SPT SP	X	X													
SUPPLY AIRFLOW	X	X								Х	X				f
DA FLW BAS COMMUNICATION STATE						X									ļ
BAS COM DESIGN HEAT DISCHARGE AIR TEMP SETPOINT						X									
DSNG HT DAT SP MAXIMUM COOLING AIRFLOW SETPOINT						X									
MAX CLG FLW SP MINIMUM COOLING AIRFLOW SETPOINT						X									1
MIN CLG FLW SP MAXIMUM HEATING AIRFLOW SETPOINT						Х									
MAX HTG FLW SP MINIMUM HEATING AIRFLOW						X									
SETPOINT MIN HTG FLW SP OCCUPIED BYPASS TIMER OCC TMR	X					X									
OCCUPIED COOLING SETPOINT OCC CLG SP	X					Х									1
OCCUPIED HEATING SETPOINT OCC HTG SP	X					X									t
UNOCCUPIED COOLING SETPOINT	X					X									f
UNOCC CLG SP SPACE OCCUPANCY (COMMUNICATED)	X								X						-
OCC SP UNOCCUPIED HEATING SETPOINT UNOCC HTG SP	X					X									
SUPPLY FAN COMMAND SF CMD	X				Х										t

# DRYER COMBUSTION AIR CONTROL DIAGRAM

# TERMINAL UNITS WITH ELECTRIC HEAT CONTROL DIAGRAM

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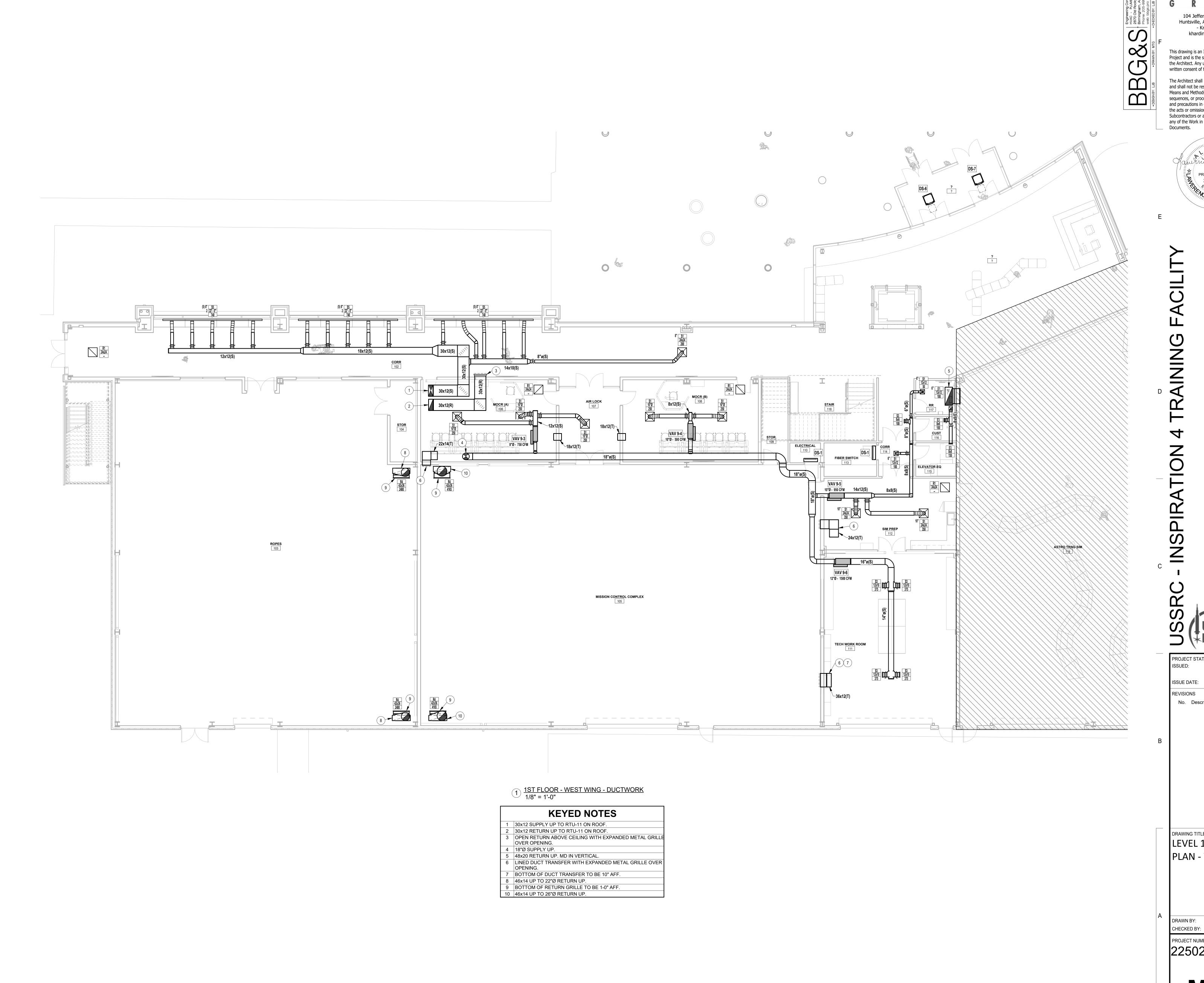
FOR CONSTRUCTION ISSUE DATE: FEBRUARY 05, 2024 REVISIONS No. Description

DRAWING TITLE AUTOMATION SYSTEM CONTROLS DIAGRAMS AND

SEQUENCES OF OPERATION DRAWN BY:

CHECKED BY: PROJECT NUMBER 225029-00

M1.05



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FOR CONSTRUCTION

FEBRUARY 05, 2024 No. Description

LEVEL 1 FLOOR PLAN - WEST WING

CHECKED BY:

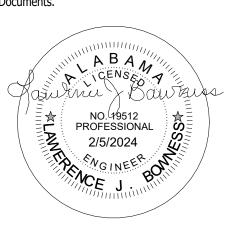
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- INSPIRATION 4 TRAINING FACILITY

U.S. Space & Rocket Center

PROJECT STATUS:
ISSUED:
FOR CONSTRUCTION

ISSUE DATE:
FEBRUARY 05, 2024

REVISIONS
No. Description
Date

DRAWING TITLE
LEVEL 1 FLOOR
PLAN - EAST WING

DRAWN BY: CHECKED BY:

PROJECT NUMBER 225029-00

M2 12

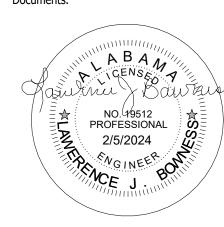
# 1) 2ND FLOOR - WEST WING - DUCTWORK 1/8" = 1'-0"

	<b>KEYED NOTES</b>
1	30x22 SUPPLY UP TO RTU-10 ON ROOF.
2	30x22 RETURN UP TO RTU-10 ON ROOF.
3	22"Ø RETURN DN.
4	30x12 SUPPLY UP TO RTU-11 ON ROOF.
5	30x12 RETURN UP TO RTU-11 ON ROOF.
6	30x12 SUPPLY DN.
7	30x12 RETURN DN.
8	DUCTWORK TO BE INSTALLED TIGHT TO STRUCTURE.
9	56x26 UP TO RTU-9 ON ROOF.
10	30x24 UP TO RTU-9 ON ROOF.
11	SPLIT IN VERTICAL FROM 56x26 TO (2) 26"Ø.
12	TAP 16Ø IN VERTICAL DROP.
13	26"Ø RETURN DN.
14	18"Ø SUPPLY DN.
15	18x18 SUPPLY UP TO RTU-7 ON ROOF.
16	22x18 RETURN UP TO RTU-7 ON ROOF.
17	BALANCE MANUAL DAMPER TO CFM SHOWN.
18	OPEN RETURN ABOVE CEILING WITH EXPANDED METAL GRILLE OVER OPENING
19	48x20 RETURN DN.
20	10x10 EXHAUST UP TO EF-1 ON ROOF.
21	38x18 SUPPLY UP TO RTU-8 ON ROOF.
22	38x18 RETURN UP TO RTU-8 ON ROOF.

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DRAWING TITLE LEVEL 2 FLOOR PLAN - WEST WING

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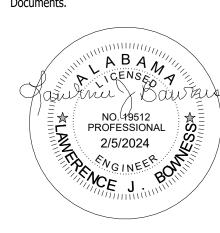
PROJECT NUMBER 225029-00

M2.13

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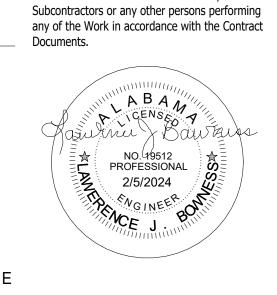
PROJEC ISSUED:	T STATUS:	BID SET FOR CONSTRUCTION
ISSUE D	ATE:	FEBRUARY 05, 2024
REVISIO	NS	
No.	Description	Date

DRAWING TITLE LEVEL 2 FLOOR PLAN - EAST WING

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PROJECT NUMBER 225029-00

M2.14



the acts or omissions of the Contractor,



INSPIRATION

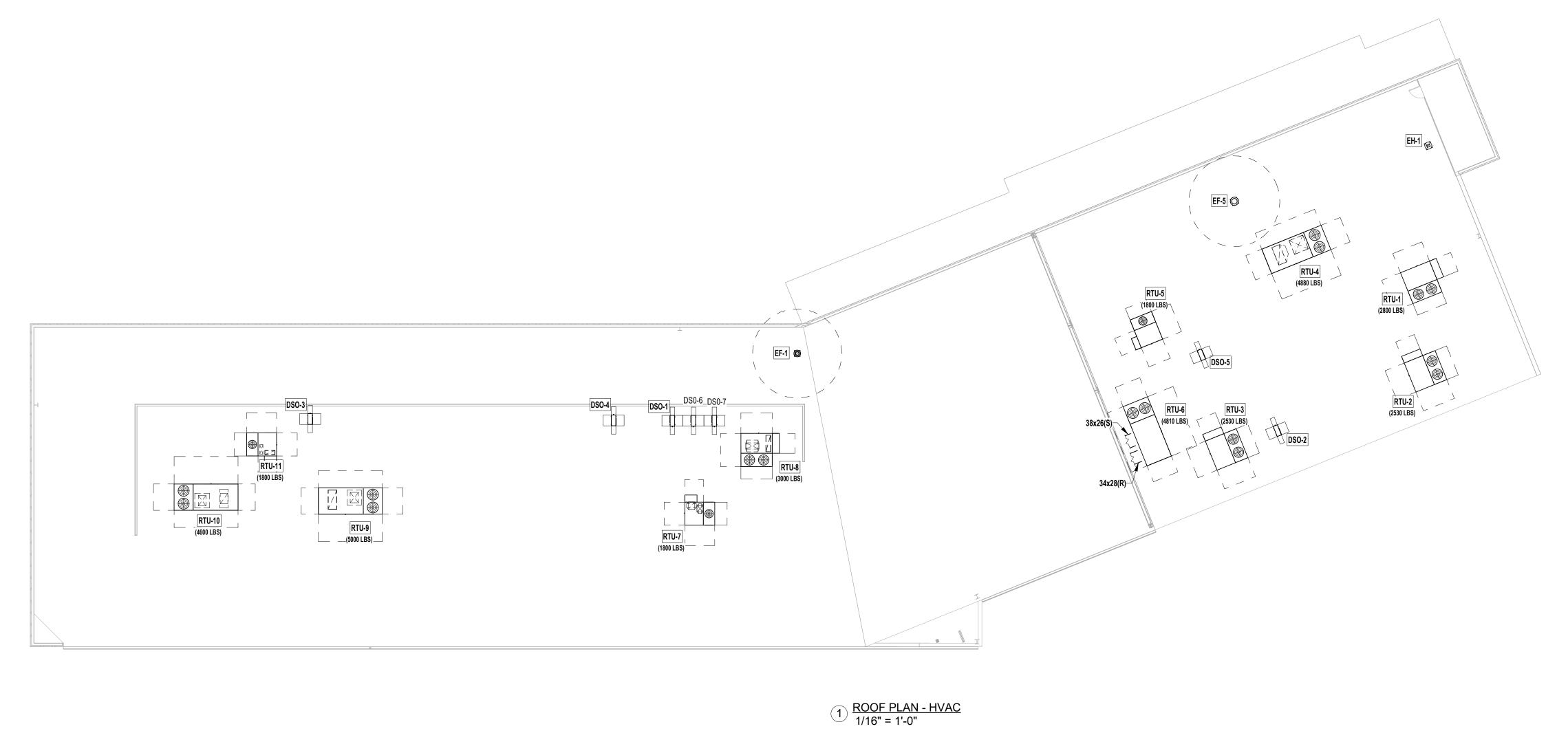
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ı	ISSUE D	ATE:	FEBRUARY 05, 2024
I	REVISIO	NS	
I	No.	Description	Date
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DRAWING TITLE
ROOF PLAN - HVAC

CHECKED BY:

PROJECT NUMBER 225029-00

M2.15



- LOCATIONS OF UTILITIES SHOWN ON PLANS ARE APPROXIMATE. VERIFY WITH LOCAL UTILITY PRIOR TO BIDDING.
- 2. CONTRACTOR SHALL VERIFY LOCATION, SIZE AND ELEVATION OF ALL EXISTING PIPING PRIOR TO INSTALLING ANY NEW PIPE.
- 3. WHEREVER DISSIMILAR METALS ARE CONNECTED ON WATER LINES, A DIELECTRIC UNION SHALL BE USED.
- 4. ALL HORIZONTAL WATER AND VENT PIPING IS RUN ABOVE CEILING AS SHOWN UNLESS OTHERWISE NOTED.
- 5. ALL HORIZONTAL SANITARY PIPING IS RUN BELOW FLOOR AS SHOWN UNLESS OTHERWISE NOTED.
- 6. ALL WATER PIPING BELOW SLAB ON GRADE SHALL BE BENT UP AT ENDS SO THAT NO JOINTS OCCUR BELOW FLOOR.
   7. COORDINATE ALL PIPE ROUTING TO AVOID CONFLICTS WITH, STRUCTURAL, MECHANICAL, AND ELECTRICAL FEATURES OF BUILDING.
- 8. ALL WALL HYDRANTS AND FREEZE PROOF BOX SHALL BE MOUNTED 24" ABOVE FINISH GRADE OR FINISH FLOOR UNLESS OTHERWISE NOTED
- OTHERWISE NOTED.

  9. ALL WATER PIPING INSTALLED IN EXTERIOR WALLS SHALL BE LOCATED ON THE INTERIOR SIDE OF THE EXTERIOR WALL INSULATION.
- 10. WATER HAMMER ARRESTORS SHALL BE PROVIDED ON THE COLD AND HOT WATER SUPPLIES TO ALL FIXTURES.
- 11. ALL WORK SHALL COMPLY WITH ALL APPLICABLE NFPA, STATE, COUNTY, AND LOCAL LAWS AND ORDINANCES.
- 12. ALL WATER PIPING BELOW SLAB SHALL BE ENCASED IN A POLYETHYLENE SLEEVE FOR ITS ENTIRE LENGTH. OATEY PIPE GUARD OR EQUAL.
- 13. ALL CEILING SPACES ARE TO BE CONSIDERED 'RETURN AIR PLENUM'. ANY AND ALL PIPING ROUTED IN A RETURN AIR PLENUM SHALL MEET ASTM E84.
- 14. PLUMBING DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW ALL DETAILS OF THE WORK. OBTAIN DIMENSIONS AND PERTINENT INFORMATION FROM ARCHITECTURAL DRAWINGS.
- 15. ALL FLOOR DRAINS TO BE INSTALLED WITH RIM/GRATE FLUSH WITH FINISH FLOOR.
- 16. SEAL ALL FIXTURES IN CONTACT WITH WALLS, FLOORS AND/OR COUNTERS WITH A SANITARY TYPE, MILDEW RESISTANT, ONE-PART SILICONE CAULK.
- 17. ALL DRAIN, WASTE AND VENT (DWV) PIPING THAT IS 2-1/2" AND SMALLER SHALL BE SLOPED AT 1/4-INCH PER FOOT (2%).
- 18. ALL DRAIN, WASTE AND VENT (DWV) PIPING THAT IS 3" AND LARGER SHALL BE SLOPED AT 1/8-INCH PER FOOT (1%), UNLESS OTHERWISE NOTED.
   19. ALL PIPING STUB-UP'S SHALL BE CAPPED, PLUGGED OR OTHERWISE PROTECTED TO PREVENT CONSTRUCTION DEBRIS FROM ENTERING THE INSTALLED PIPING. PIPING STUB-UP'S SHALL BE PROTECTED FOR THE DURATION OF CONSTRUCTION. ANY FOREIGN MATERIAL THAT ENTERS THE PIPING (CONSTRUCTION DEBRIS, DIRT, GRAVEL, CONCRETE, ETC) SHALL BE REMOVED AND

CLEANED. FOR ANY SECTIONS OF PIPING THAT CONTRAINS DEBRIS THAT CANNOT BE CLARED, THE SECTION OF PIPING SHALL BE

- REMOVED AND REPLACED AT NO ADDITIONAL COST TO THE OWNER.

  20. PRIOR TO SUBSTANTIAL COMPLETION, ALL SANITARY LINES 3-INCHES AND LARGER SHALL BE HYDRO-FLUSHED AND VIDEO INSPECTED TO 100 FEET BEYOND THE FOUNDATION WALL OR TO THE NEAREST MANHOLE, WHICH EVER IS CLOSER.
- 21. ALL WALL CLEANOUTS ( WCO) LOCATED IN BATHROOMS SHALL BE LOCATED MINIMUM 4'-0" ABOVE FINISHED FLOOR, EXCEPT FOR

MARK	FIXTURE	WASTE	VENT	CW	HW	REMARKS
WC-1	WATER CLOSET	4"	2"	1"	-	KOHLER 'HIGHCLIFF' #K-96057 FLOOR MOUNTED, VITREOUS CHINA, BOTTOM OUTLET WATER CLOSET, COMPLETE WITH SLOAN 111 #ESS-1.28-TMO-HW SENSOR ACTIVED FLUSH VALVE, 1.28 GPF AND SLOAN #EL-154 BOX MOUNT 120 VOLT AC TO 24 VOLT AC TRANSFORMER, SLOAN #J-312-A SPLIT RING PIPE SUPPORT, AND BEMIS #1955SSTFR HEAVY DUTY PLASTIC OPEN FRONT TOILET SEAT WITH SELF SUSTAINING CHECK. PROVIDE FLOOR FLANGE, WAX RING AND CLOSET BOLTS. RIM OF WATER CLOSET AT 16-5/8" ABOVE FINISHED FLOOR.
WC-2	WATER CLOSET (ADA)	4"	2"	1"	-	KOHLER 'HIGHCLIFF' #K-96057 FLOOR MOUNTED, VITREOUS CHINA, BOTTOM OUTLET WATER CLOSET, COMPLETE WITH SLOAN 111 #ESS-1.28-TMO-HW SENSOR ACTIVED FLUSH VALVE, 1.28 GPF AND SLOAN #EL-154 BOX MOUNT 120 VOLT AC TO 24 VOLT AC TRANSFORMER, SLOAN #J-312-A SPLIT RING PIPE SUPPORT, AND BEMIS #1955SSTFR HEAVY DUTY PLASTIC OPEN FRONT TOILET SEAT WITH SELF SUSTAINING CHECK. PROVIDE FLOOR FLANGE, WAX RING AND CLOSET BOLTS. RIM OF WATER CLOSET AT 16-5/8" ABOVE FINISHED FLOOR. MUST MEET ADA.
WC-3	WATER CLOSET (ADA)	4"	2"	1"	-	FLOOR MOUNTED - KOHLER K-96057 COMPLETE, SLOAN ROYAL 111-1.6 MANUAL FLUSH VALVE WITH YJ BRACKET, AND CHURCH 'DURA GUARD' #2155SCT OPEN FRONT SEAT. RIM OF WATER CLOSET AT 16-5/8" ABOVE FINISHED FLOOR. FLUS VALVE HANDLE TO BE LOCATED ON THE OPEN (WIDE) SIDE OF THE STALL. MUST MEET ADA.
UR-1	URINAL	3"	2"	3/4"	-	WALL HUNG - KOHLER K-5016-ET COMPLETE, SLOAN CROWN II 186 ESS EXPOSED SENSOR HARDWIRED URINAL FLUSHOMETER. PROVIDE SLOAN #EL-154 BOX MOUNT 120 VOLT AC TO 24 VOLT AC TRANSFORMER J.R. SMITH #637 FIXTURE SUPPORT WITH LIP 24" ABOVE FINISHED FLOOR.
UR-2	URINAL	3"	2"	3/4"	-	WALL HUNG - KOHLER K-5016-ET COMPLETE, SLOAN CROWN II 186 ESS EXPOSED SENSOR HARDWIRED URINAL FLUSHOMETER. PROVIDE SLOAN #EL-154 BOX MOUNT 120 VOLT AC TO 24 VOLT AC TRANSFORMER. J.R. SMITH #637 FIXTURE SUPPORT WITH LIP 17" ABOVE FINISHED FLOOR. MUST MEET ADA.
L-1	LAVATORY	2"	2"	1/2"	1/2"	WALL HUNG - SOLID SURFACE, 3 STATION SINK - SLOAN ELGR-83000, SLOAN EAF-100 FAUCET, AC-POWERED HARDWIRE FAUCET AND PROVIDE TRANSFORMER POWER SUPPLY. PROVIDE SLOAN SOAP DISPENSER ESD-2000-CP WITH AC ADAPTOR 0346090. MCGUIRE HD155WC OFFSET WASTE, MCGUIRE 8872C P-TRAP WITH CLEANOUT PLUG, MCGUIRE LFH2165 STOPS AND SUPPLIES, WATTS LFUSG-B-MS-SC THERMOSTATIC MIXING VALVE (ASSE 1070) WITH OUTLET TEMPERATURE SET AT 109°F. MUST MEET ADA.
L-2	LAVATORY	2"	2"	1/2"	1/2"	WALL HUNG - SLOAN ELGR-81000, SLOAN EAF-100 FAUCET, AC-POWERED HARDWIRED, MCGUIRE 155A OUTLET WITH TAILPIECE, JR SMITH #700-M31 FIXTURE SUPPORT, MCGUIRE LFH2165 STOPS AND SUPPLIES, MCGUIRE 8872C P-TRAP WITH CLEANOUT PLUG. INSULATE P-TRAP, STOPS AND SUPPLIES WITH MCGUIRE PROWRAP INSULATOR KIT. PROVIDE WATTS LFUSG-B-M2-SC THERMOSTATIC MIXING VALVE (ASSE 1070) WITH OUTLET TEMPERATURE SET AT 105°F.
SK-1	SINK	2"	2"	1/2"	1/2"	COUNTER SET - ELKAY #LR2219, STAINLESS STEEL SINGLE BOWL SINK COMPLETE, TS BRASS B-2865-05CR FAUCET WIT LK-35 BASKET AND STRAINER, KEENEY MCGUIRE 8912C P-TRAP WITH CLEANOUT PLUG, MCGUIRE LFH2165 STOP AND SUPPLY AND WATTS LFUSG-B-MS-SC THERMOSTATIC MIXING VALVE (ASSE 1070) WITH OUTLET TEMPERATURE SET AT 110°F.
SK-2	SINK	2"	2"	1/2"	1/2"	COUNTER SET - ELKAY #LR2219, STAINLESS STEEL SINGLE BOWL SINK COMPLETE, KOHLER K-596 FAUCET WITH, LK-35 BASKET AND STRAINER, KEENEY MCGUIRE 8912C P-TRAP WITH CLEANOUT PLUG, MCGUIRE LFH2165 STOP AND SUPPLY AND WATTS LFUSG-B-MS-SC THERMOSTATIC MIXING VALVE (ASSE 1070) WITH OUTLET TEMPERATURE SET AT 110°F.
SK-3	SINK	2"	2"	1/2"	1/2"	FREE STANDING - ELKAY 14-1C16X21-0X, ALL STAINLESS STEEL CONSTRUCTION, SINGLE COMPARTMENT SINK WITH 9-3/BACKSPLASH, LK18B - 3-1/2" DRAIN WITH BASKET AND TAILPIECE, TS BRASS #SMPG-8WLN-06 BACKSPLASH MOUNTED FAUCET WITH SPRAY VALVE, KEENEY MCGUIRE 8912C P-TRAP WITH CLEANOUT PLUG, MCGUIRE LFH2165 STOP AND SUPPLY AND WATTS LFUSG-B-MS-SC THERMOSTATIC MIXING VALVE (ASSE 1070) WITH OUTLET TEMPERATURE SET AT 110°F.
EWC-1	ELECTRIC WATER COOLER	2"	2"	1/2"	-	ELKAY #LVRCTL8WSK BI-LEVEL ELECTRIC WATER COOLER WITH SENSOR ACTIVATED BOTTLE FILLING STATION, WITH A STAINLESS STEEL CABINET AND WATERWAYS THAT ARE MANUFACTURED OF 100% LEAD FREE MATERIAL, JR SMITH #83 FIXTURE SUPPORT, MCGUIRE 8912C P-TRAP WITH MCGUIRE PROWRAP INSULATOR KIT AND MCGUIRE LFBV02 ALL BRAS QUARTER TURN STOP VALVE. INSTALL WITH LOWER SPOUT OUTLET MAXIMUM 36" ABOVE FINISHED FLOOR. MUST MEE ADA.
MB-1	MOP BASIN	-	-	1/2"	1/2"	STERN WILLIAMS HL-1800 (24"X24") COMPLETE, METAL RIM GUARD, STAINLESS STEEL BACKSPLASH, T-35 HOSE AND WALL HOOK, TC-3 DRAIN GASKET, AND CHICAGO FAUCETS #897CCP SERVICE FAUCET WITH INTEGRAL STOPS AND SPRING CHECK.
DW	DISHWASHER	-	-	-	1/2"	DISHWASHER FURNISHED BY GC ROUGH AND CONNECT COMPLETE. PROVIDE BALL VALVE STOP ON HOT WATER SUPPLY AND HAMMER ARRESTOR IN SUPPLY PIPING. PIPE WASTE TO ADJACENT SINK TAIL PIECE. SEE DETAIL.
UB-1	UTILITY BOX	-	-	1/2"	-	GUY GREY #MIB1HAAB WHITE POWDER COATED WALL SUPPLY BOX WITH LEAD FREE QUARTER TURN BALL VALVE AND WATER HAMMER ARRESTOR. PROVIDE 10'-0" OF SOFT TEMPER COPPER FOR CONNECTION TO EQUIPMENT.

2. ALL LAVATORIES AND SINKS SHALL BE PROVIDED WITH THERMOSTATIC MIXING VALVE, CONFORMING TO ASSE 1070, WATTS LFUSG-B-MS-SC.
3. ALL HAND WASHING STATIONS SET TMV OUTLET TO 105 DEG F.

5. PROVIDE QUARTER TURN BALL VALVE ABOVE CEILING IN BRANCH PIPING TO FIXTURE OR GROUP OF FIXTURES.
6. STOP VALVES WITH PLASTIC COMPONENTS ARE NOT ACCEPTABLE

4. ALL SINKS, SET TMV OUTLET TO 110 DEG F.

6. STOP VALVES WITH PLASTIC COMPONENTS ARE NOT ACCEPTABLE
PLUMBING FIXTURES - APPROVED EQUALS

WATER CLOSET, LAVATORY - KOHLER, ZURN, AMERICAN STANDARD, TOTO

ELECTRIC WATER COOLER - ELKAY, OASIS, HALSEY TAYLOR
STAINLESS STEEL SINKS - EKLAY, AMERICAN STANDARD, ZURN, JUST

LAVATORY FAUCET - SLOAN, ZURN, DELTA, MOEN

THERMOSTATIC MIXING VALVE, ASSE 1070 - WATTS, SYMMONS, POWERS, ZURN

SINK FAUCET - SYMMONS, KOHLER, TS BRASS, DELTA, MOEN

MARK	EQUIPMENT	DRAIN	VENT	CW	HW	REMARKS
IVIANN	EQUIFIVIENT	WASTE	VENI	CVV	ПVV	REWIARRO
FD-1	FLOOR DRAIN	SEE PLANS	SEE PLANS	-	-	J.R. SMITH #2005 WITH 6" ROUND NICKEL BRONZE REINFORCED GRATE. PROVIDE TRAP GUARD AND DEEP SEAL PTRAP. FOR FLOOR DRAINS COLLECTING CONDENSATE ONLY, PROVIDE OPTION #3580 FUNNEL FOR SINGLE CONDENSATE LINE OR FOR MULTIPLE CONDENSATE LINES, PROVIDE F37 OR F38 RAISED RIM.
MFD	MECHANICAL FLOOR DRAIN	SEE PLANS	SEE PLANS	-	-	J.R. SMITH #2230 WITH SEDIMENT BUCKET AND TRAP PRIMER CONNECTION. PROVIDE DEEP SEAL TRAP, TRAP GUARD AND COORDINATE EXACT LOCATION WITH HVAC EQUIPMENT. INSULATE SUSPENDED DRAIN BODY AND ALL HORIZONTAL PIPING SERVING MECHANCIAL ROOM DRAIN UNTIL PIPING TURNS VERTICAL.
TG	TRAP GUARD	SEE PLANS	-	-	-	J.R. SMITH #2692 QUAD CLOSE, MECHANICAL TRAP SEAL DEVICE. SIZED TO ACCOMMODATE FLOOR DRAIN. MUST MEET ASSE 1072.
FCO	FLOOR CLEANOUT	SEE PLANS	SEE PLANS	-	-	J.R. SMITH #4020 ROUND, CAST IRON BODY, ADJUSTABLE TOP, NICKEL BRONZE COVER, AND CLOSURE PLUG.
WH	WALL HYDRANT	-	-	3/4"	-	J.R. SMITH #5519 FREEZE RESISTANT WALL HYDRANT. INTEGRAL VACUUM BREAKER, DUAL CHECK, LOOSE T-HANDLE KEY, LOCKABLE NICKEL BRONZE FACE. CONTRACTOR TO VERIFY WALL THICKNESS BEFORE ORDERING.
FS-1	FLOOR SINK	3"	2"	-	-	JR SMITH #3060-13 12" ROUND FLOOR SINK WITH NICKEL BRONZE RIM AND 3/4 GRATE.
DSN-1	DOWNSPOUT NOZZLE	SEE PLANS	-	-	-	J.R. SMITH #1770-BS COMPLETE WITH WALL FLANGE AND BIRD SCREEN IN OPENING. SECURELY ANCHOR FLANGE TO WALL WITH BRASS SCREWS AND SEAL WEATHER TIGHT. MOUNT 24" ABOVE FINISHED GRADE AND PROVIDE SPLASH BLOCK

| PLUMBING FIXTURE CONNECTION SCHEDULE NOTES : | 1. SIZES NOTED ABOVE ARE FOR EQUIPMENT ROUGH-IN. | 2. PROVIDE QUARTER TURN BALL VALVE ABOVE CEILING IN BRANCH PIPING TO EQUIPMENT OR GROUP OF FIXTURES.

PLUMBING SPECIALITY - APPROVED EQUALS

FLOOR DRAIN - J.R. SMITH, JOSAM, MIFAB, WADE, ZURN

MECHANICAL FLOOR DRAIN - J.R. SMITH, JOSAM, MIFAB, WADE, ZURN FLOOR CLEANOUT - J.R. SMITH, JOSAM, MIFAB, WADE, ZURN

TRAP GUARD - J.R. SMITH, RECTOR SEAL, OATEY

HOSE BIBB / WALL HYDRANT - J.R. SMITH, ZURN, WOODFORD, CHICAGO FAUCETS

BACKFLOW PREVENTER - WATTS, AMES, ZURN

	TRIC WATE					SET	RECOVERY		ELEC1	TRICAL		
MARK	LOCATION	MODEL #	CW	HW	STORAGE	POINT	@ 80° ΔT	KW	VOLTS	VOLTS PHASE FLA		REMARKS
EWH-1	CUSTODIAL RM 130	LCA-10T3	3/4"	3/4"	10 GAL	130°F	15 GPH	3	208	3	8.3	
EWH-2	CUSTODIAL RM 116	LCA-20T3	3/4"	3/4"	20 GAL	130°F	15 GPH	3	208	3	8.3	
EWH-3	CUSTODIAL RM 222	LCA-20T6	3/4"	3/4"	20 GAL	130°F	31 GPH	6	208	3	16.7	
1. BASIS O	WATER HEATER SCHEI F DESIGN IS LOCHINVA FER HEATERS SHALL BE	R. AO SMITH, RHEEN	,	RD WHITE	ARE APPROVE	ED EQUALS			1			

EVDANCION TANK COLIEDLII	_
EXPANSION TANK SCHEDUL	.⊏

EXPA	ANSION TAI	NK SCH	IEDULE					
MARK	LOCATION	MODEL	VOLUME (GALLONS)	ACCEPT. (GALLONS)	WATER HEATER	CONN. SIZE	ASME RATED	REMARKS
ET-1	CUSTODIAL RM 130	ST-5C	2.1	0.9	EWH-1	1/2"	YES	
ET-2	CUSTODIAL RM 116	ST-5C	2.1	0.9	EWH-2	1/2"	YES	
ET-3	CUSTODIAL RM 222	ST-5C	2.1	0.9	EWH-3	1/2"	YES	
EVDANCIO	N TANK COUEDINE NO	TEC .	*	•			•	

EXPANSION TANK SCHEDULE NOTES:

1. BASIS OF DESIGN IS AMTROL. ELBI AND WATTS ARE APPROVED EQUALS.

RECI	RCULATING	3 PUMP SC	HEDUL	E									
MARK LOCATION MODEL#			SYSTEM	TVDE	PERFORMANCE			ELECTRICAL					DEMARKO
WARK	IARK LOCATION MODEL#	TYPE	TYPE	PSI	FLOW	FT. HD.	RPM	WATTS	VOLTS	PHASE	FLA	REMARKS	
RCP-1	CUSTODIAL RM 130	ASTRO 225BS	RECIRC.	IN-LINE	-	1	7		75	115	1	0.38	SEE DETAIL AND NOTES BELOW
RCP-2	CUSTODIAL RM 116	ASTRO 225BS	RECIRC.	IN-LINE	-	1	8		75	115	1	0.38	SEE DETAIL AND NOTES BELOW
RCP-3	CUSTODIAL RM 222	ASTRO 225BS	RECIRC.	IN-LINE	-	1	11		75	115	1	0.49	
RCP NOTE	S:				•		'				'		

RCP NOTES:

1. RECIRCULATION PUMP BASIS OF DESIGN IS ARMSTRONG. BELL & GOSSETT AND GRUNDFOS ARE APPROVED EQUALS.

2. ALL WETTED PARTS TO BE STAINLESS STEEL, LEAD FREE BRASS OR LEAD FREE BRONZE.

3. PROVIDE 7-DAY PROGRAMMABLE TIME CLOCK.

3. ALL WATER HEATERS SHALL BE PROVIDED WITH EXPANSION TANK AND VACUUM BREAKER ON THE CW SUPPLY.

ELEV	ATOR SI	JMP SY	STEM S	CHE	DULE										
SYSTEM MODEL SEPARATOR DATA				SUBMERSIBLE PUMP DATA											
YMBOL	DL SIZE MANUF.	MANUF. MODEL GPM	TOTAL	OIL SPILL	FLOW HEAD (FT)	DISCHARGE SIZE	RPM	ELECTRICAL DATA				PUMP			
	OIZL	100 11 101 .	WIODEL	0	CAPACITY	CAPACITY	CAPACITY	, ,	DIOONATOL OIZE	NZL KFIVI	H.P.	VOLTS	PH	HZ	1 Olvii
ESP-1	ELVS-100	PARK USA	ES-100	50	100 GAL	50 GAL	50 GPM	15'	1-1/2"	3450	.5	120	1	60	LIBERTY #280

GROUND BY 104 Jefferson St. S. Suite 200, Huntsville, AL 35801 p.o.c.
- Kristine Harding kharding@kpsgroup.com

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RC - INSPIRATION 4 TRAINING FACILIT

U.S. Space & Rocket Cente

PROJECT STATUS:
ISSUED:

FOR CONSTRUCTION

ISSUE DATE:

FEBRUARY 05, 2024

REVISIONS

No. Description

Date

DRAWING TITLE
PLUMBING

LEGEND, NOTES AND SCHEDULES

DRAWN BY: CHECKED BY:

PROJECT NUMBER 225029-00

P0.01

VACUUM BREAKER WATTS LFN36-M1

EXPANSION TANK

(TYPICAL)

AMTROL ST-5

2.0 GALLON VOLUME

— DIELECTRIC UNION

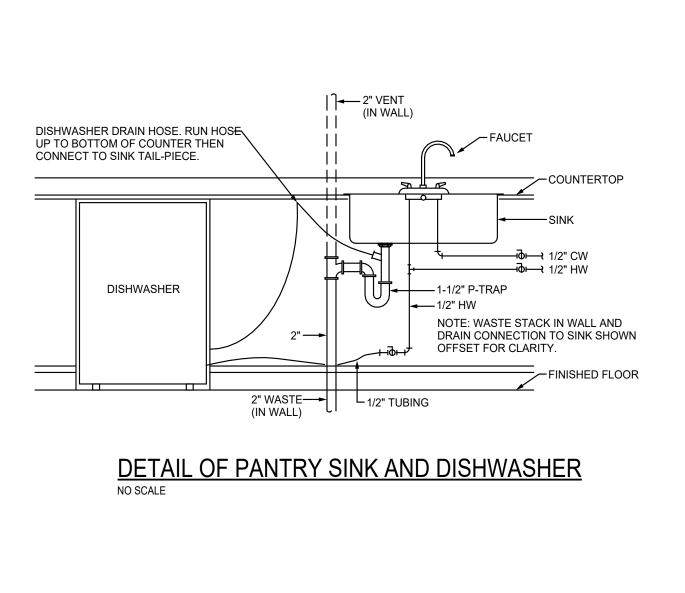
0.9 GALLON ACCEPTANCE

— COMBINATION MOUNTING SHELF AND DRAIN PAN. HOLD RITE

SWHP-WM SERIES OR EQUAL

OR EQUAL

RECEPTOR OR BUILDING EXTERIOR



SADDLE 18" LONG

SUSPENDED PIPE SUPPORT

┌ CIRCULATION PUMP

EXPANSION TANK

(TYPICAL)

— HOUSEKEEPING PAD

FINISH FLOOR

**DETAIL OF PIPING AT** 

**ELECTRIC WATER HEATER** 

NO SCALE

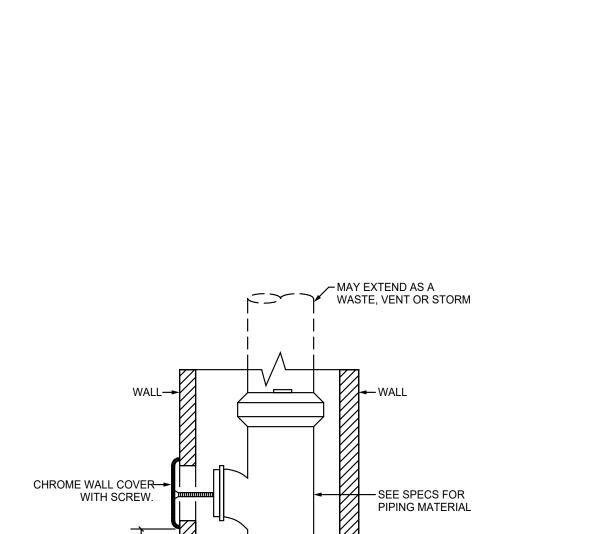
+ ← DIELECTRIC UNION

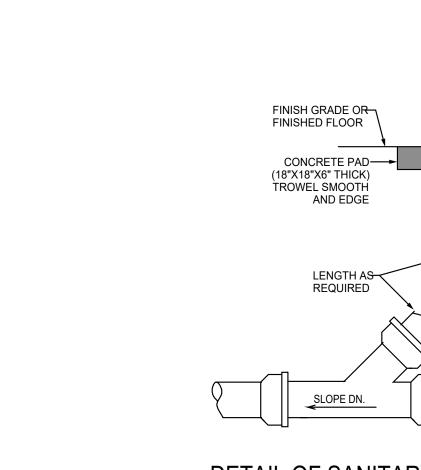
THERMOMETER

ASME P&T RELIEF ----

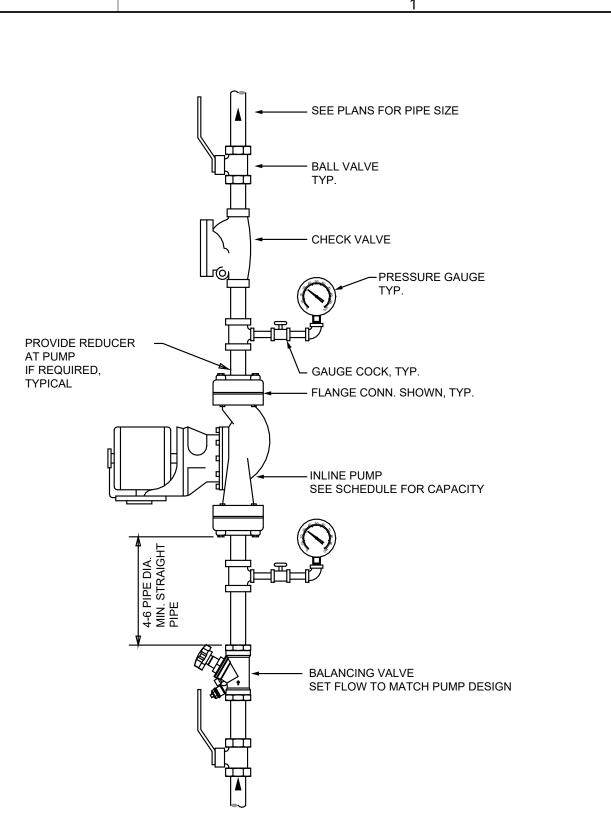
PIPE RELIEF FULL → ↓ SIZE TO OUTSIDE OF STRUCTURE, SPILL

TO GRADE





DETAIL OF SANITARY YARD / FLOOR CLEANOUT

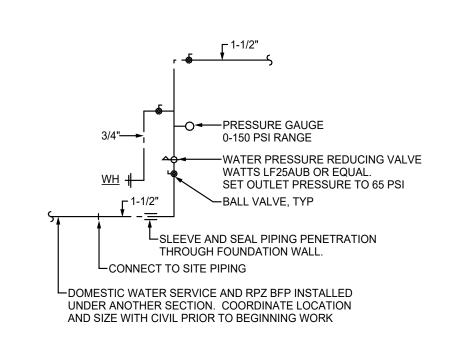


DETAIL NOTES: A. PRESSURE GAUGES - SELECT GAUGE RANGE TO PLACE MAXIMUM SYSTEM OPERATING PRESSURE IN MIDDLE ONE THIRD OF RANGE.

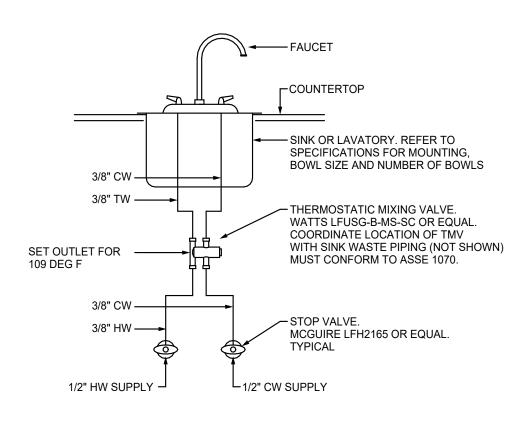
B. PROVIDE UNION ON PUMP INLET AND OUTLET IF PUMP IS NOT FLANGED.

C. INSTALL PUMP PER MANUFACTURER'S INSTALLATION INSTRUCTIONS D. INSTALL CHECK VALVE HORIZONTALLY OR VERTICALLY WITH FLOW UPWARD.

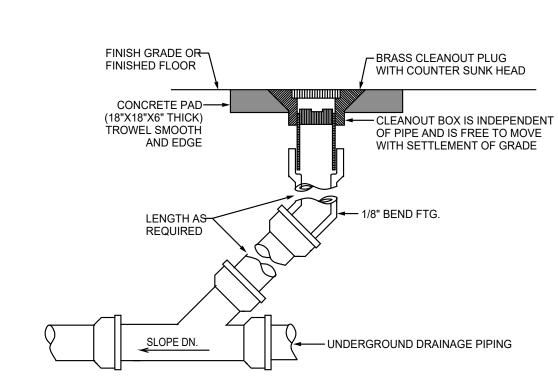
DETAIL OF IN-LINE PUMP NO SCALE



DETAIL OF DOMESTIC WATER SERVICE



**DETAIL OF THERMOSTATIC** PROTECTION AT HAND SINK



<u>R</u>

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any of the Work in accordance with the Contract

NO. 19512 PROFESSIONAL

and shall not be responsible for construction

Means and Methods, deviations, techniques,

the acts or omissions of the Contractor,

BID SET

FOR CONSTRUCTION

PROJECT STATUS:

SSUED:

UE D	ATE:	FEBRUARY 05, 2024
/ISIO	NS	
No.	Description	Date
	G TITLE	C DETAIL C
_U	MRIM	G DETAILS

DRAWN BY: CHECKED BY: PROJECT NUMBER 225029-00

AND 1/8 BEND SANITARY. SEE PLANS FOR SIZES DETAIL OF BACK TO BACK WATER CLOSETS

**→** WALL

ンプ 🗕 VENT IN WALL.

SEE PLANS FOR SIZES

OR FLUSH TANK STYLE.

SEE SPECIFICATIONS

-PROVIDE CAULK AROUND BASE OF

CLOSET FLANGE AND

**DETAIL OF ELEVATOR SUMP PUMP** 

SUMP PUMP CONTROL PANEL WITH SUMP AND SEPARATOR

HIGH LEVEL ALARMS

OIL SEPARATOR

PARK USA ELVS

SERIES OR EQUAL

TO SANITARY RECEPTOR, TERMINATE WITH AIR GAP

COIL HIGH LEVEL

DETAIL OF WALL CLEANOUT

- FINISHED FLOOR

EXTEND 4" STORM TO 5 FEET BEYOND FOUNDATION WALL FOR CONNECTION BY CIVIL. SEE CIVIL UTILITY DRAWINGS FOR CONTINUATION.

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 6" 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 4" ERL WITH DSN-1 AT 24" AFG

5 TERMINATE 4" ERL WITH DSN-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

G R U

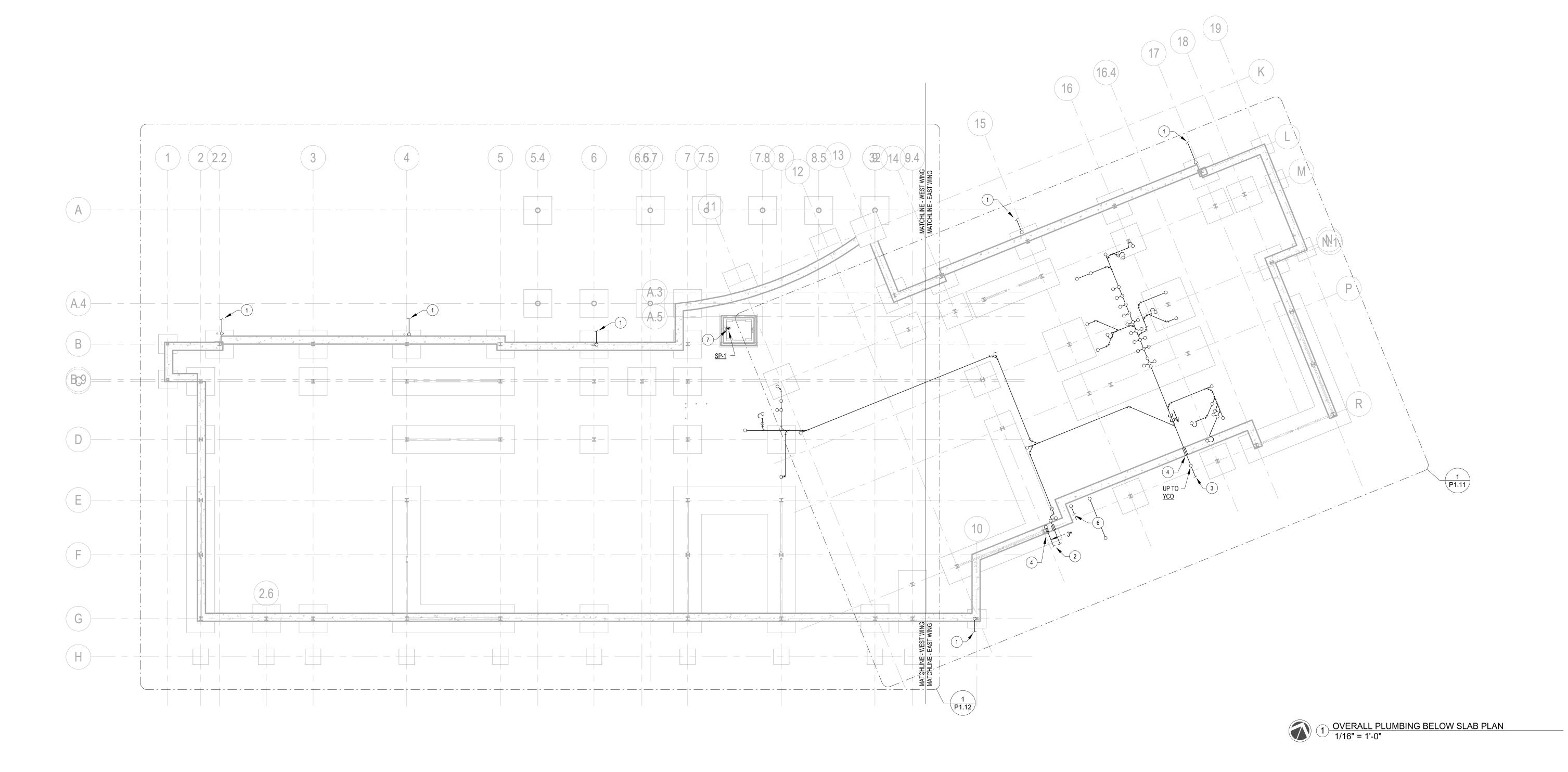
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NO.19512
PROFESSIONAL
2/5/2024
VGINEE

22.07.163



CSSRC - NSPRATION 4

Sowner Owner United States space and rocket center United States space and rocket center Space and rocket space and rock

ISSUED: FOR CONSTRUCTION

ISSUE DATE: FEBRUARY 05, 2024

REVISIONS

No. Description Date

DRAWING TITLE
PLUMBING
OVERALL BELOW
SLAB PLAN

DRAWN BY: CHECKED BY:

PROJECT NUMBER 225029-00

P1.10

**KEYNOTES - BELOW SLAB** 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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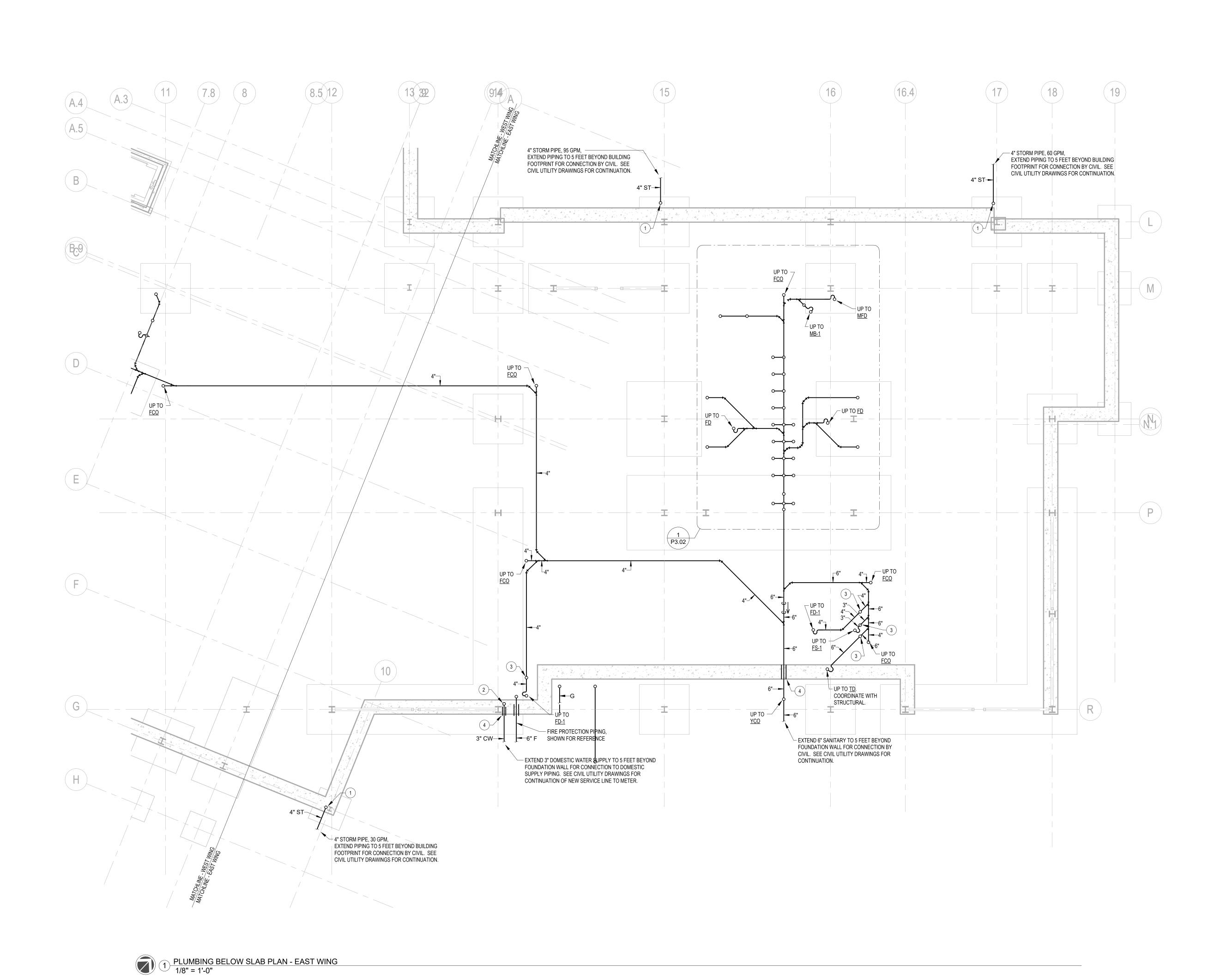
> authu Bawaiss NO. 19512 PROFESSIONAL

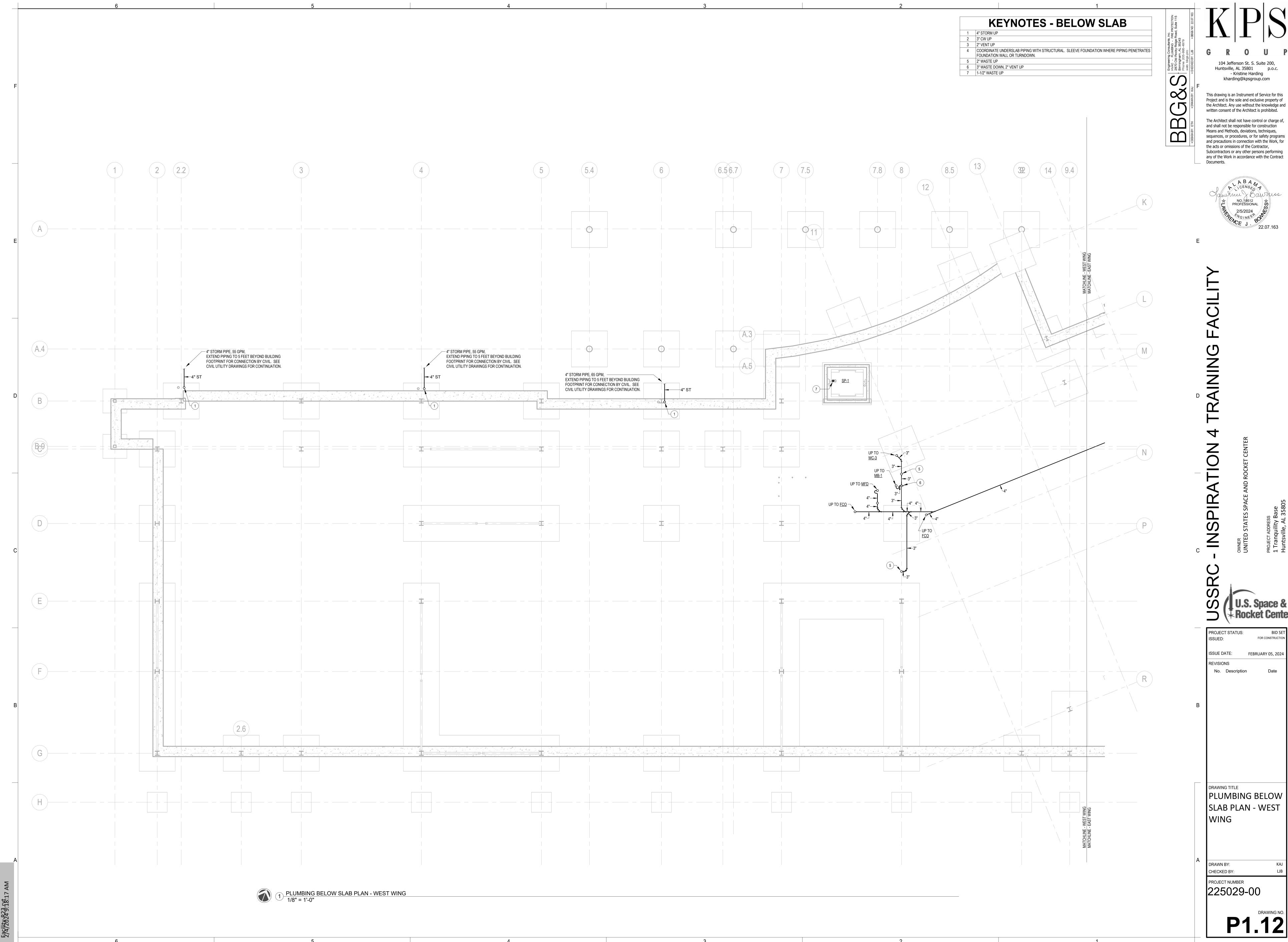
PROJECT STATUS: FOR CONSTRUCTION ISSUE DATE: FEBRUARY 05, 2024 REVISIONS No. Description

DRAWING TITLE PLUMBING BELOW SLAB PLAN - EAST WING

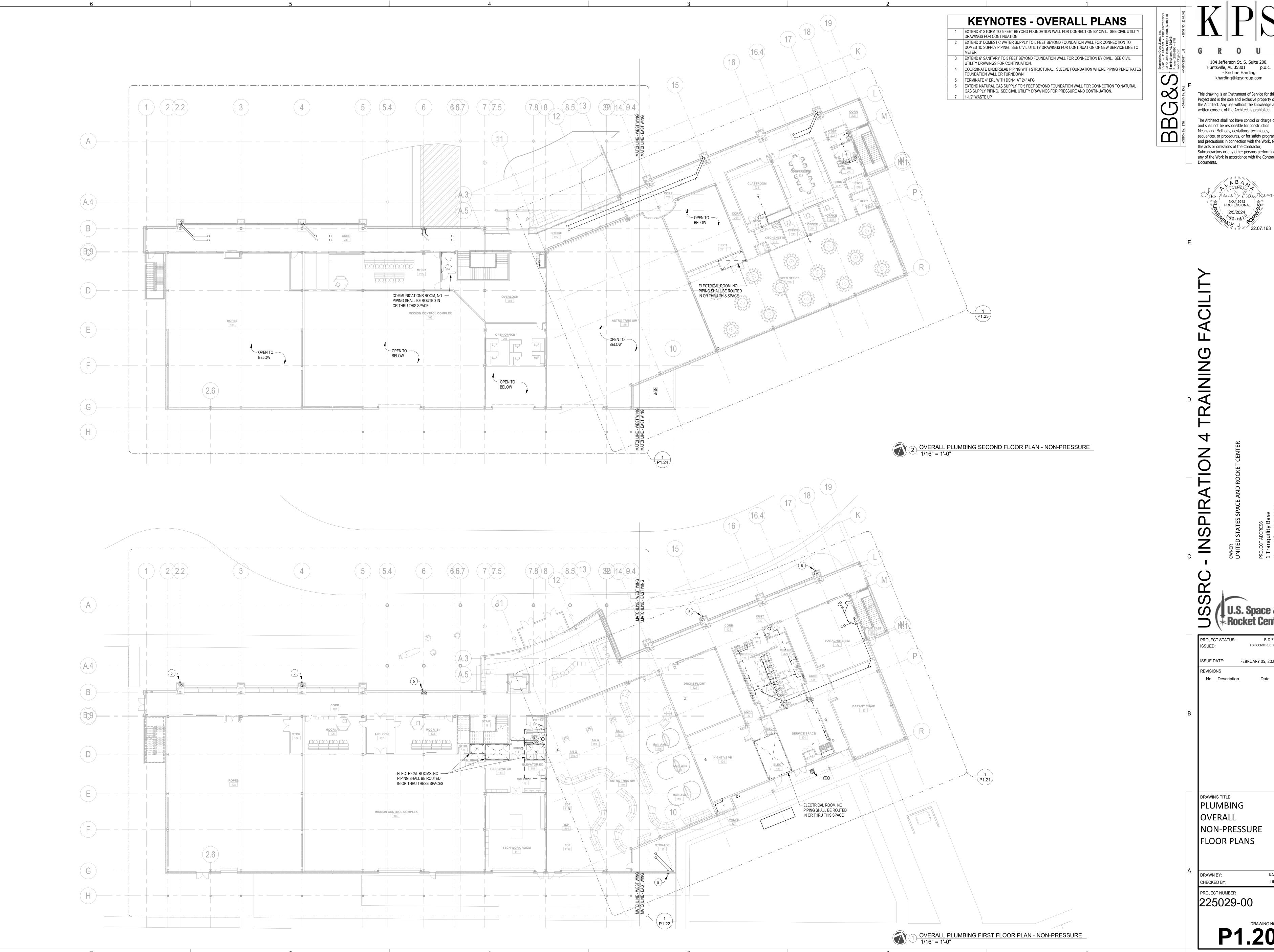
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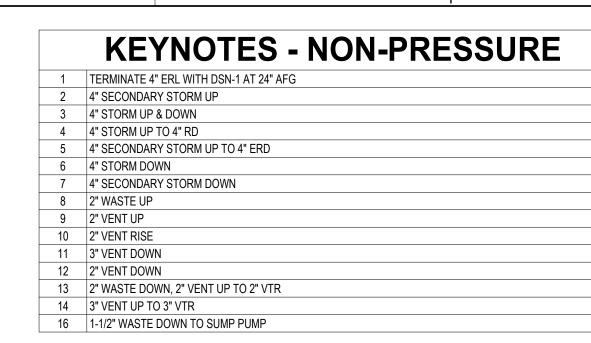
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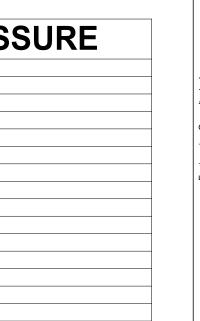
NO. 19512 PROFESSIONAL

FOR CONSTRUCTION FEBRUARY 05, 2024

NON-PRESSURE

	<b>KEYNOTES - NON-PRESSUR</b>
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 3" VTR
16	1-1/2" WASTE DOWN TO SUMP PUMP





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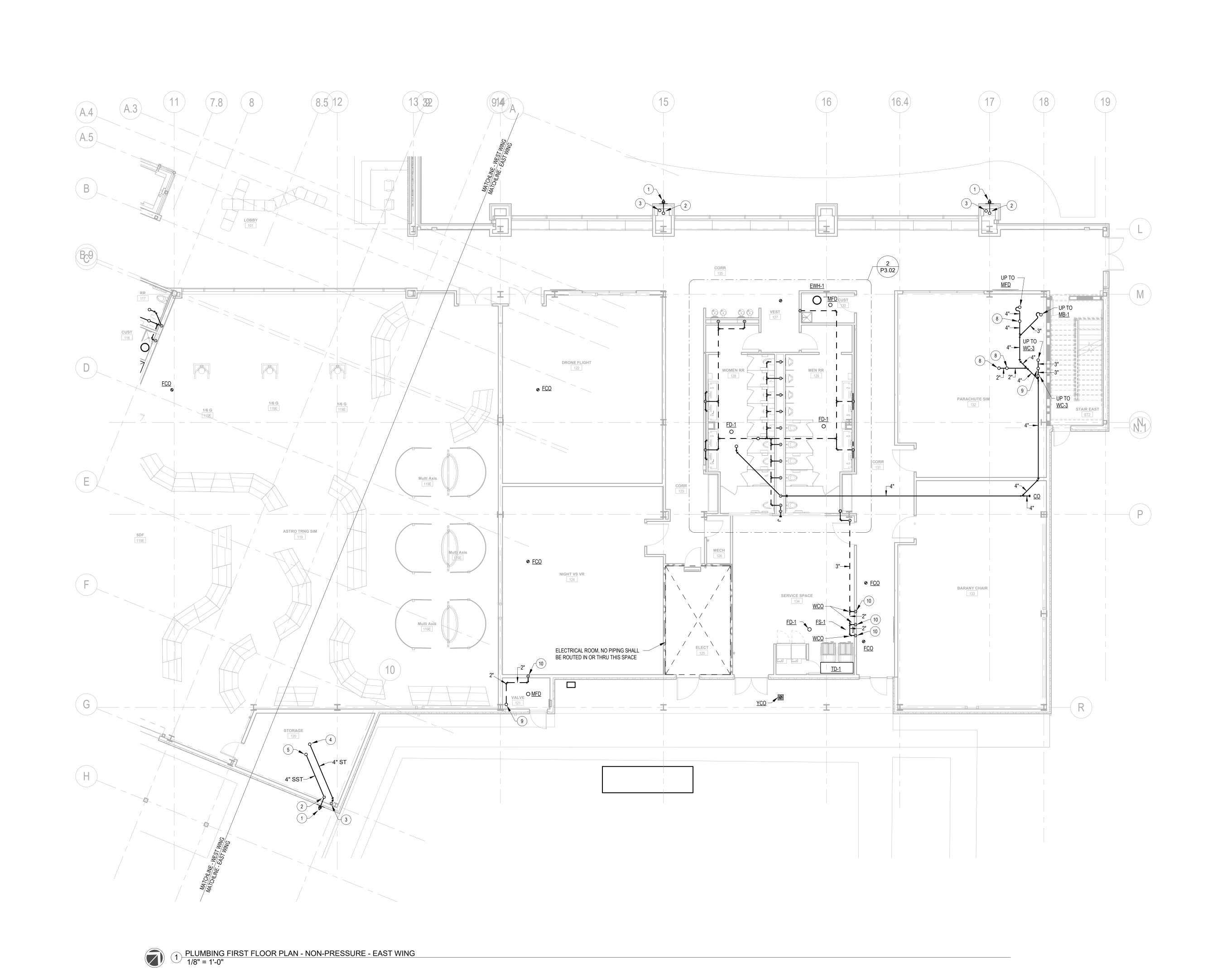


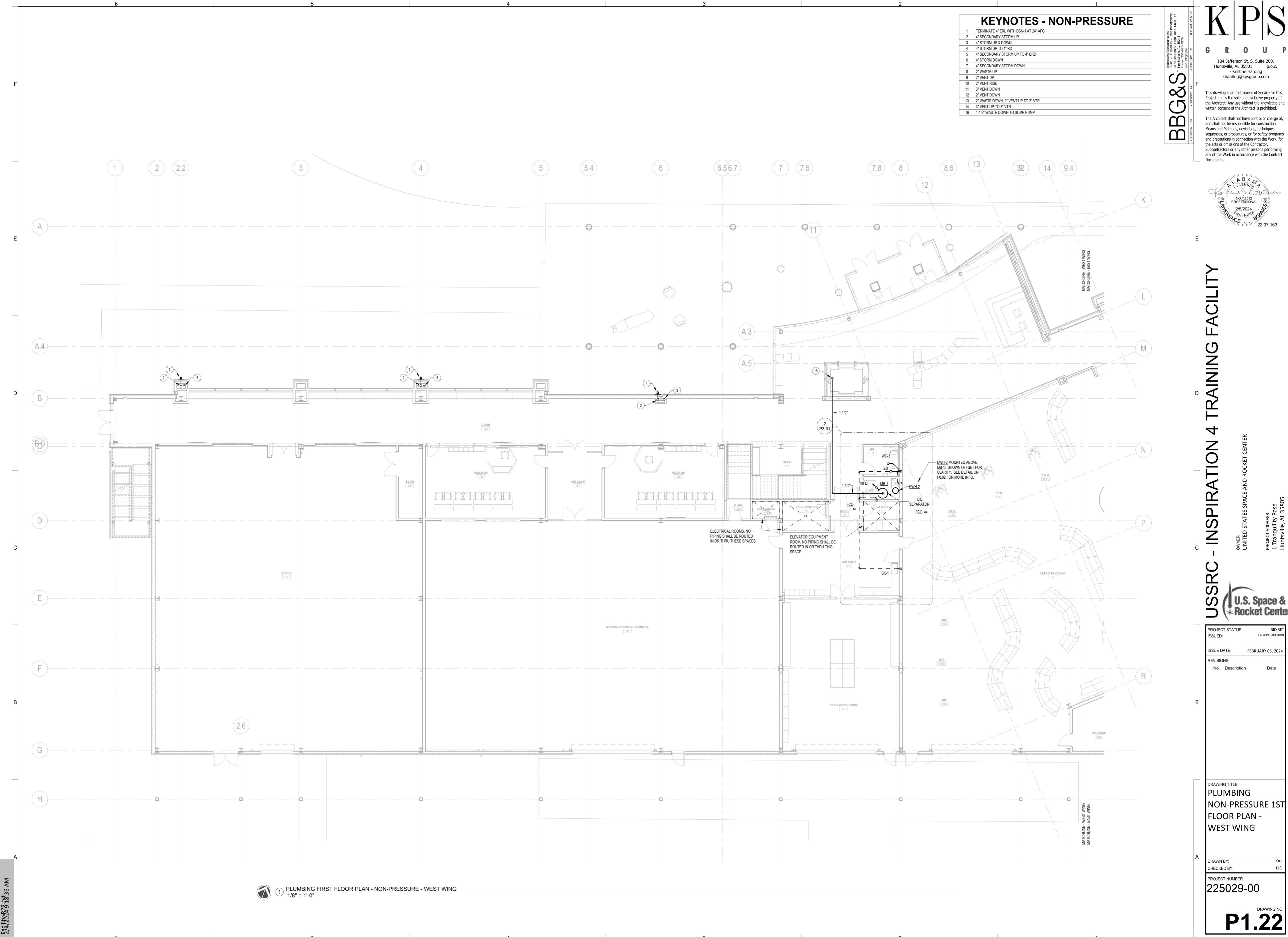
SUED:	1 01/1100.	FOR CONSTRUCTION
SUE D	ATE:	FEBRUARY 05, 2024
EVISIO	NS	
No.	Description	Date

PLUMBING NON-PRESSURE 1ST FLOOR PLAN - EAST WING

CHECKED BY:

PROJECT NUMBER 225029-00





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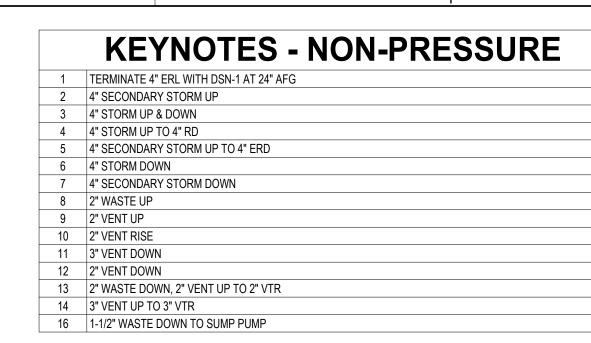
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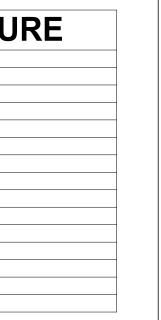


FEBRUARY 05, 2024

NON-PRESSURE 1ST

	<b>KEYNOTES - NON-PRESSURE</b>
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 3" VTR
16	1-1/2" WASTE DOWN TO SUMP PUMP







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NO. 19512
PROFESSIONAL

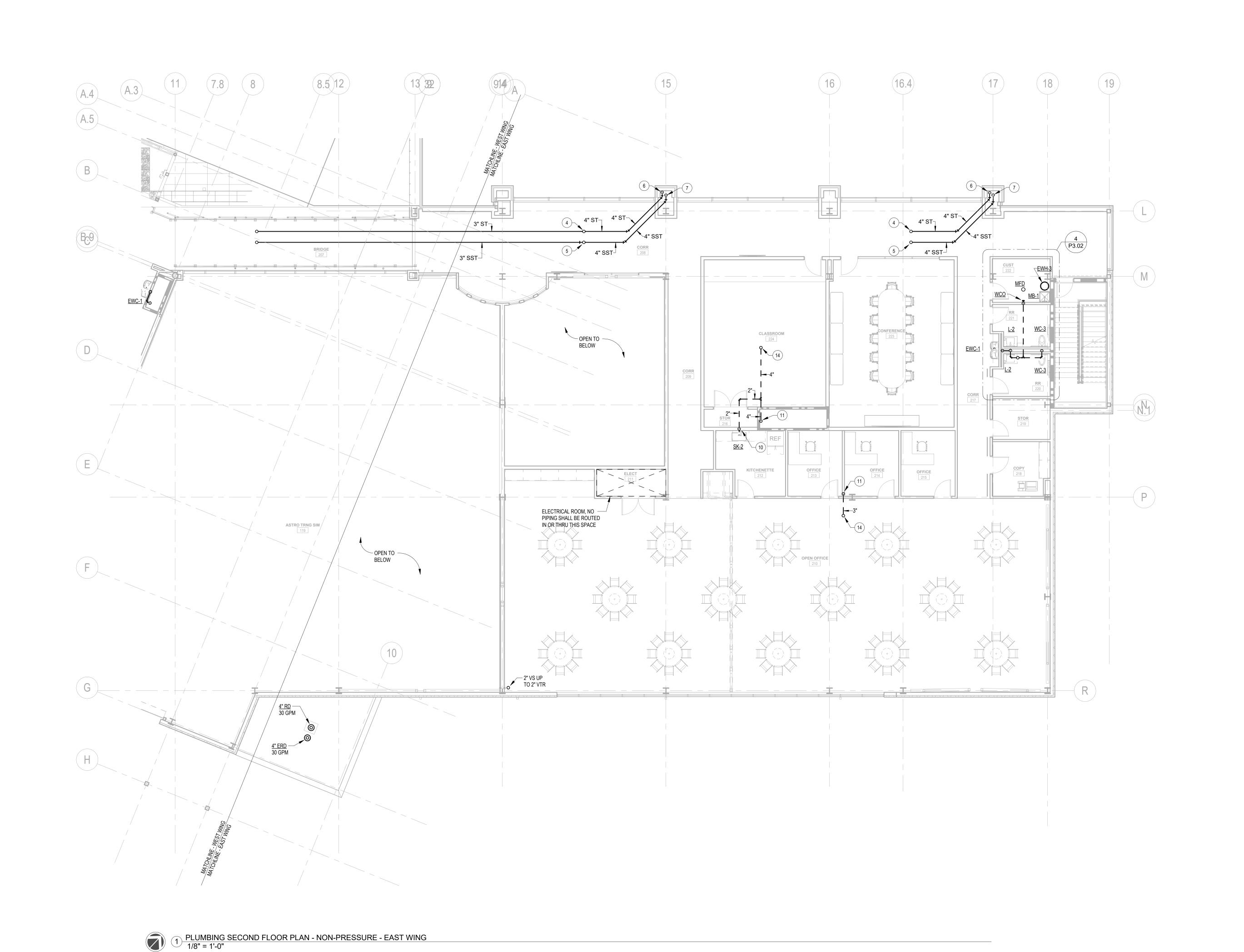
ISSUE DATE: FEBRUARY 05, 2024 REVISIONS No. Description

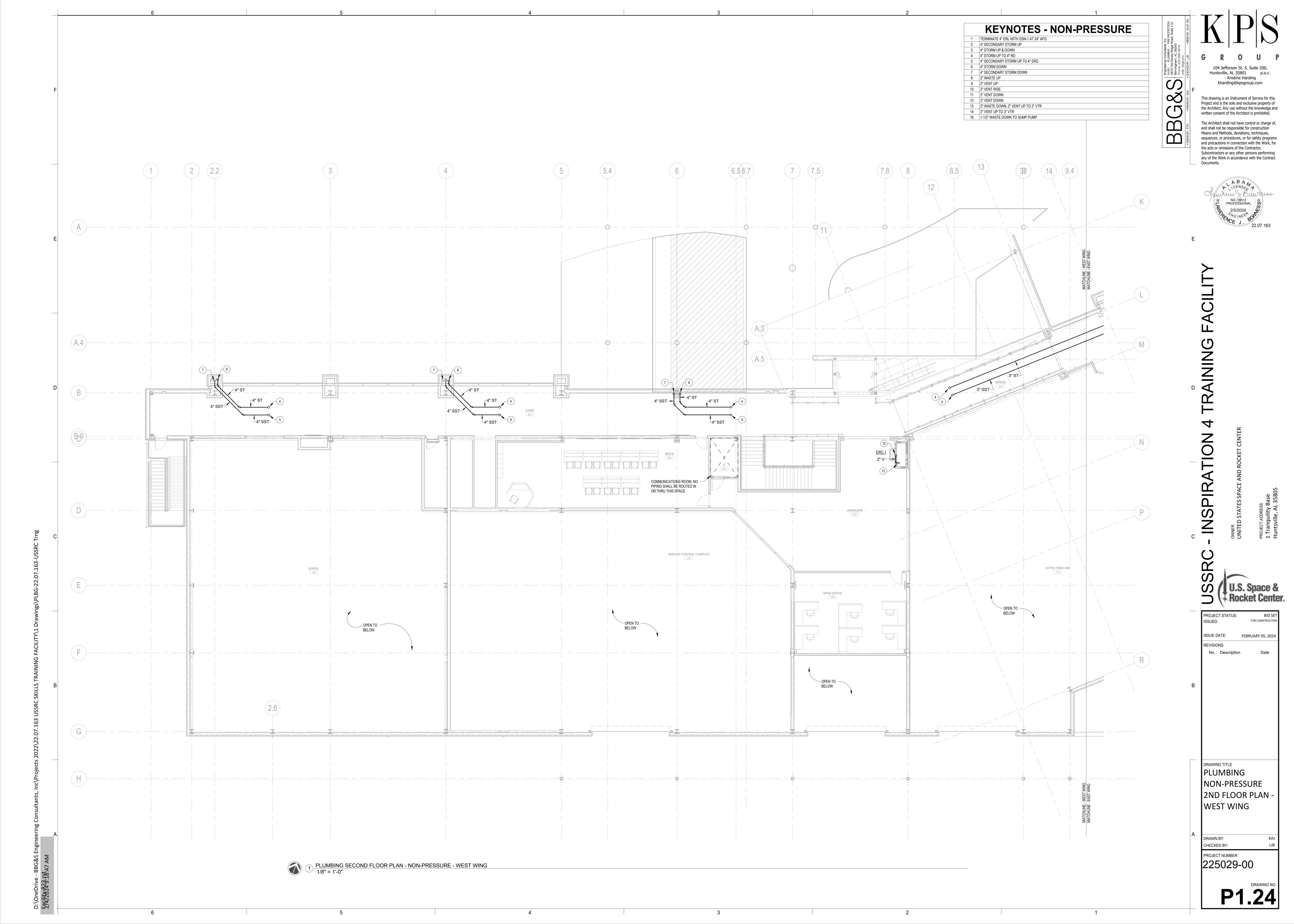
PLUMBING NON-PRESSURE 2ND FLOOR PLAN -

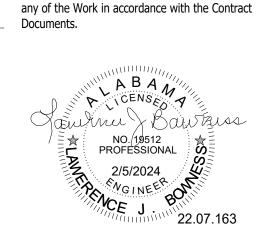
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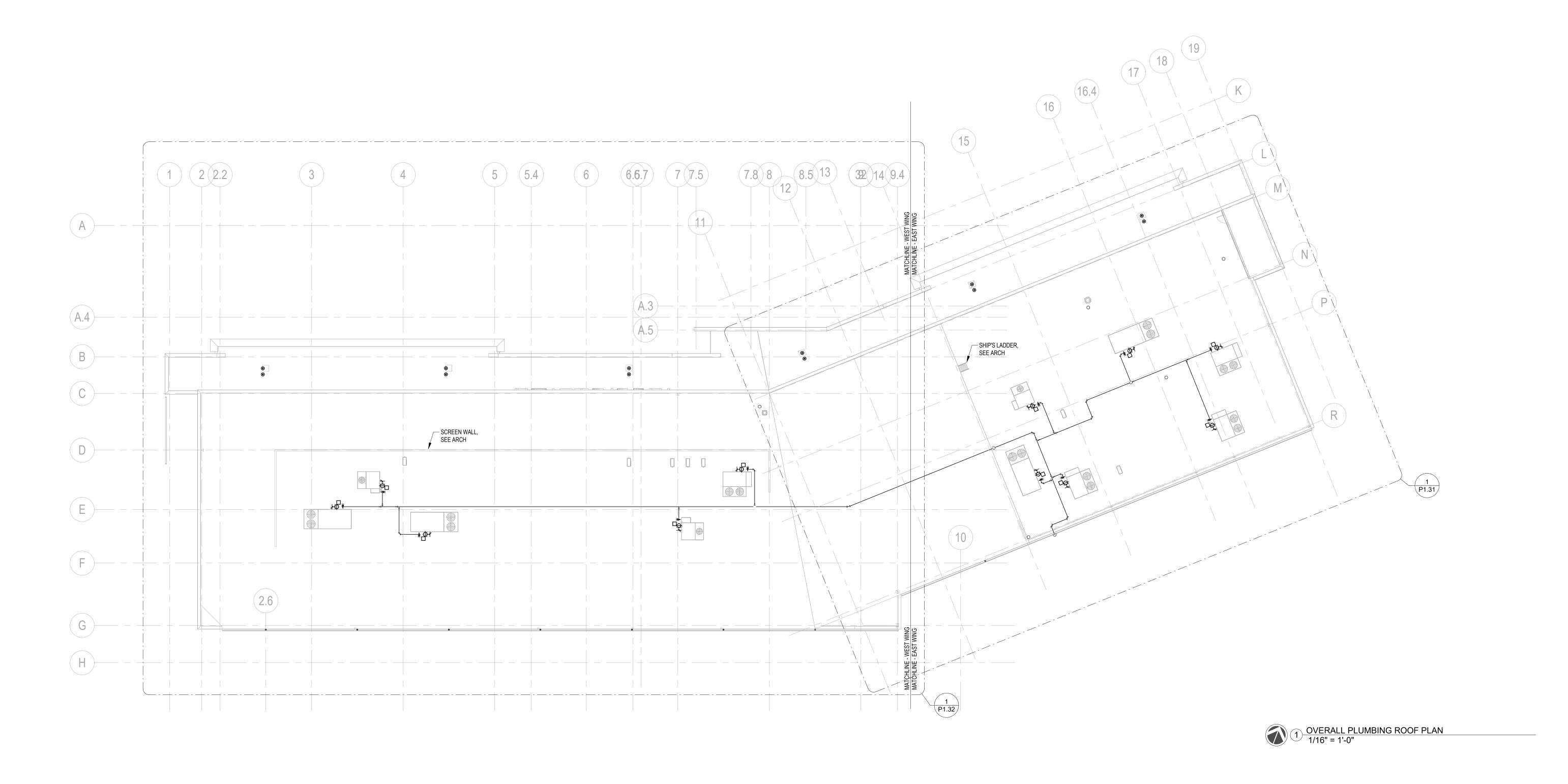
EAST WING

PROJECT NUMBER 225029-00









USSRC - INSPIRATION 4 TRAIN

OWNER

OWNER

UNITED STATES SPACE AND ROCKET CENTER

UNITED STATES SPACE AND ROCKET CENTER

UNITED STATES SPACE AND ROCKET CENTER

Tranquility Base

Huntsville, AL 35805

REVISIONS

No. Description

Date

PLUMBING ROOF
PLAN

DRAWN BY: CHECKED BY:

PROJECT NUMBER 225029-00

P1.30

1	3" CW DOWN
2	DROP 1/2" CW & HW IN WALL/CHASE
3	DROP 1/2" CW IN WALL/CHASE
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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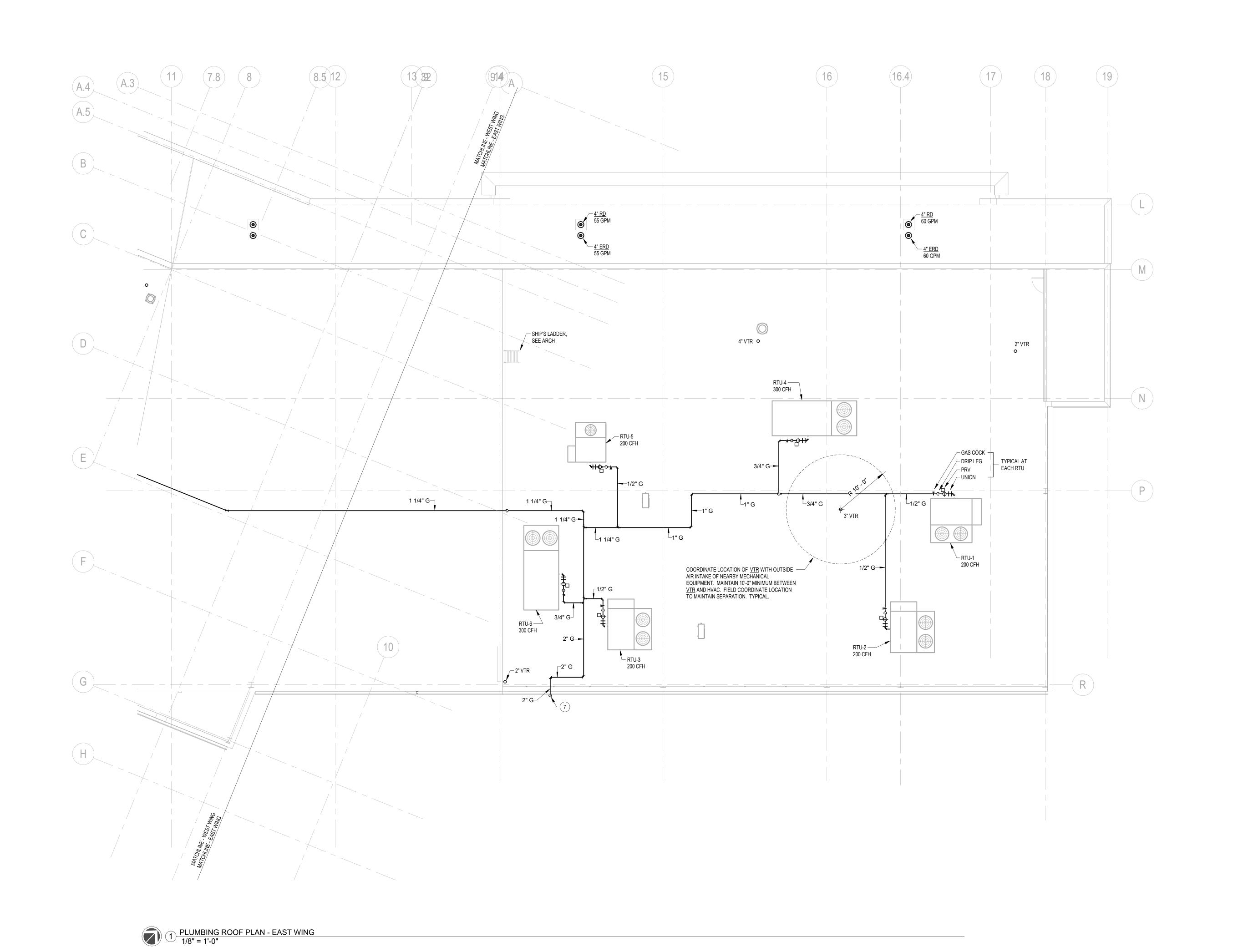
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PROFESSIONAL

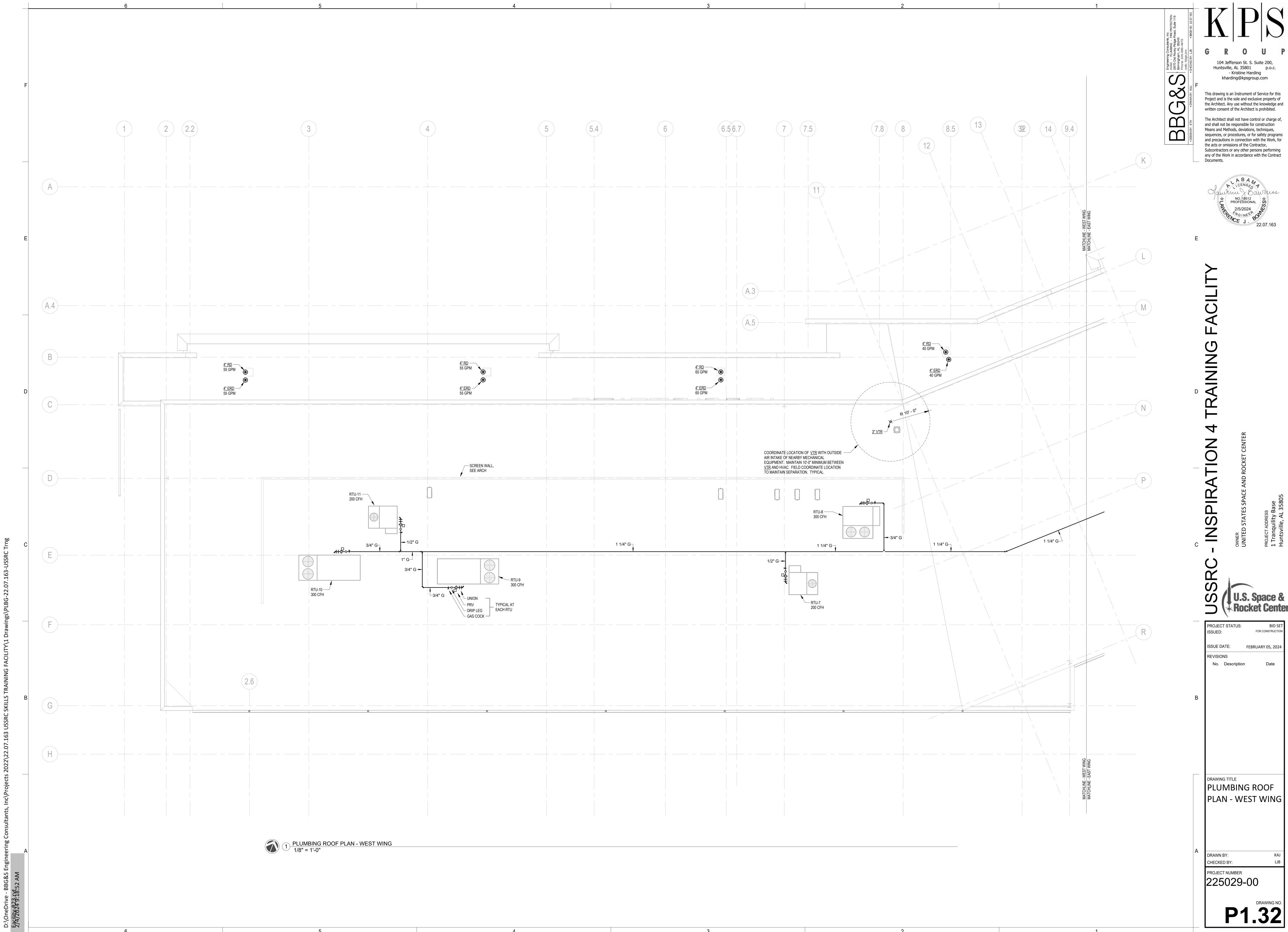
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PLUMBING ROOF PLAN - EAST WING

CHECKED BY:

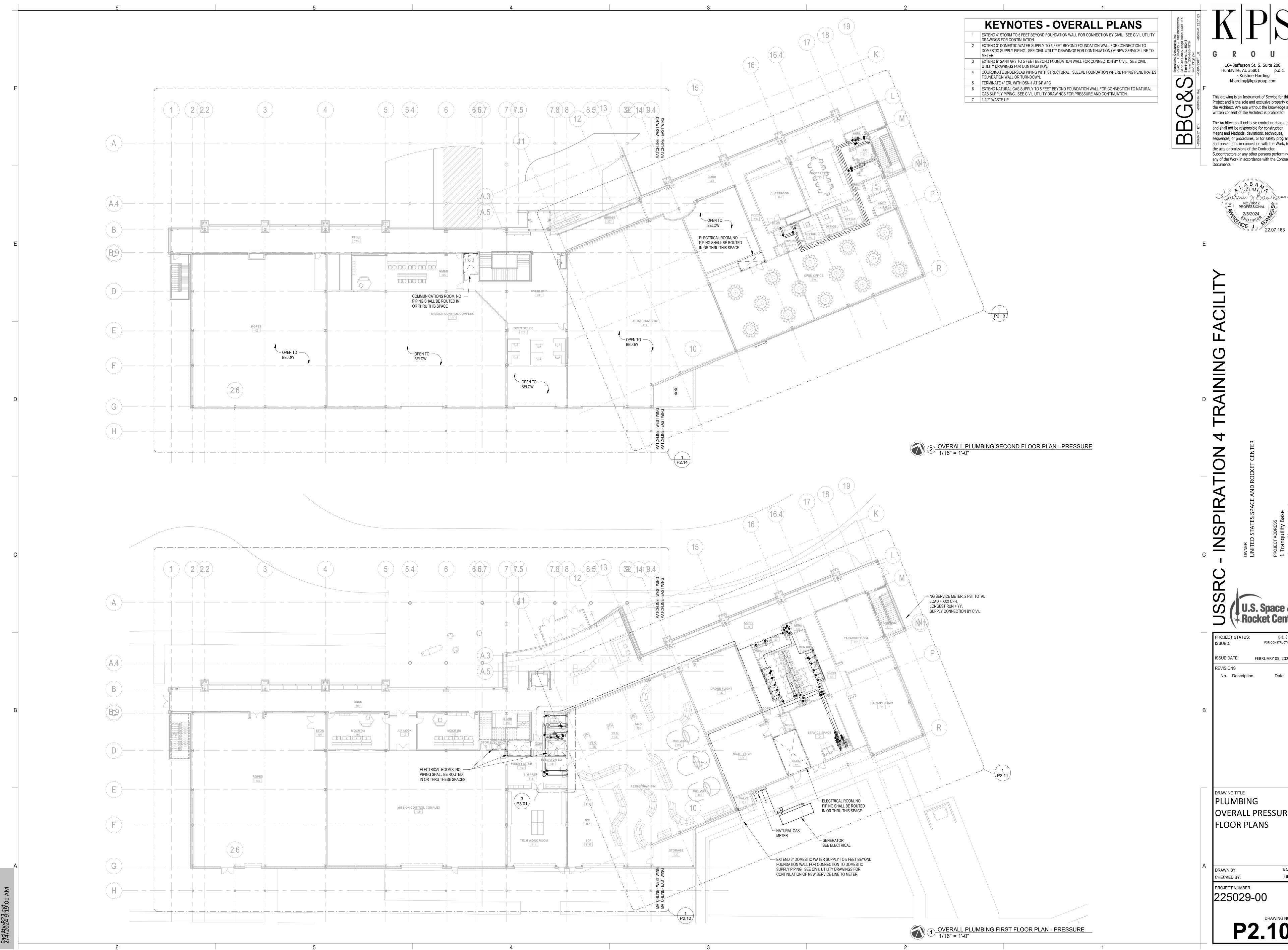
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FOR CONSTRUCTION FEBRUARY 05, 2024

OVERALL PRESSURE

<b>KEYNOTES - PRESSUR</b>
3" CW DOWN
DROP 1/2" CW & HW IN WALL/CHASE
DDOD 4/08 OW IN WALL OUT OF

3 DROP 1/2" CW IN WALL/CHASE 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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PROJECT STATUS:

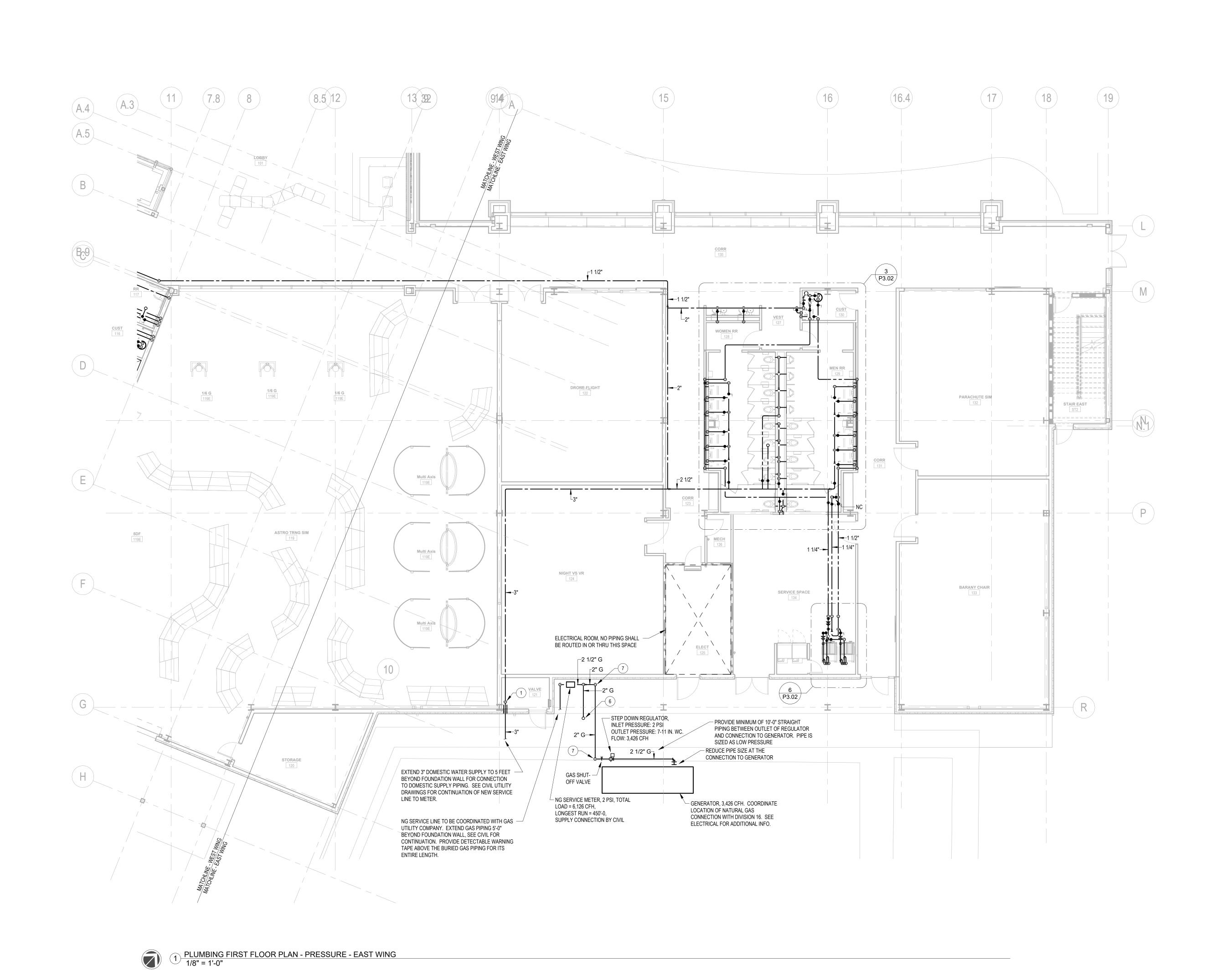
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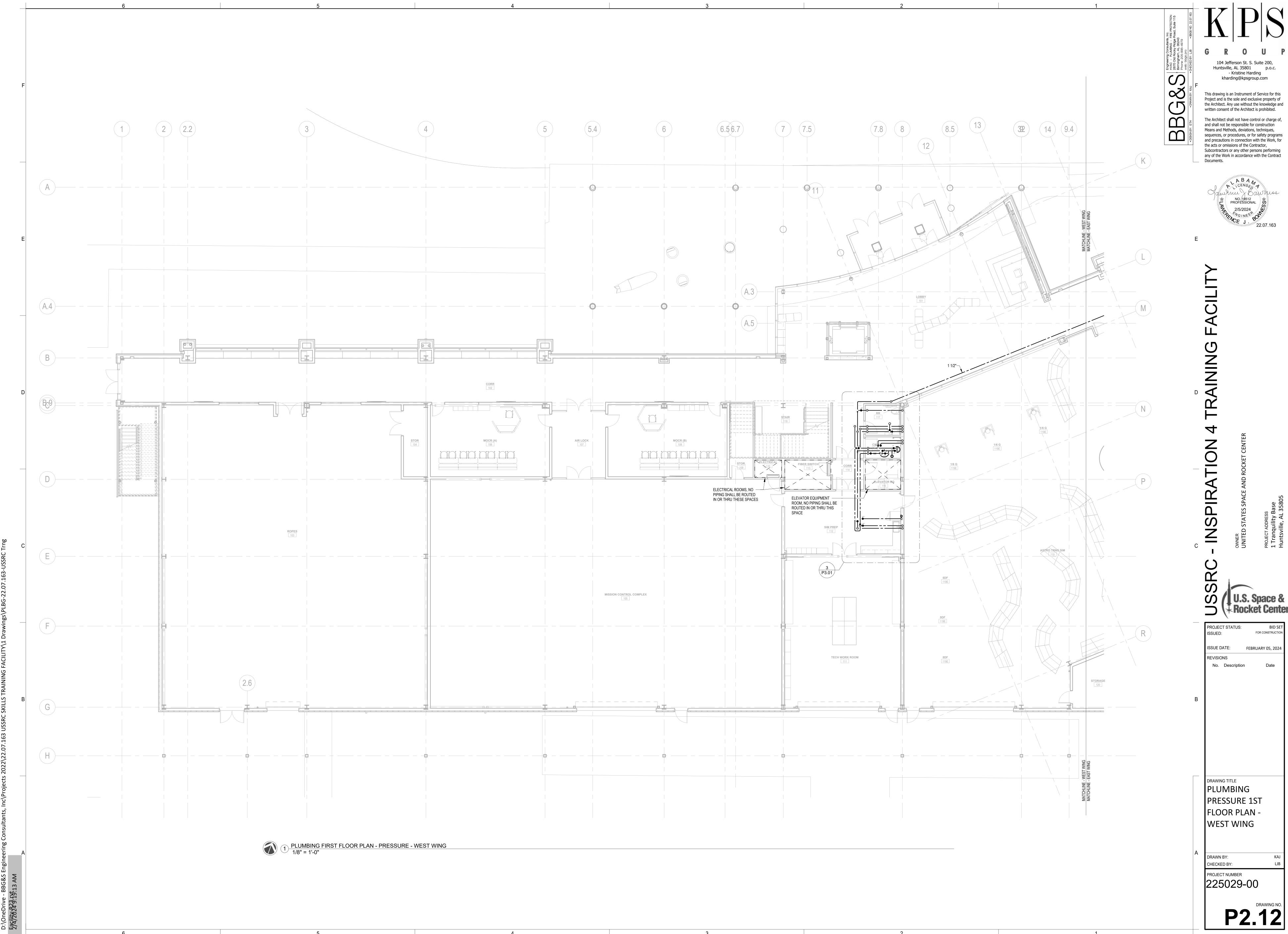
DRAWING TITLE PLUMBING PRESSURE 1ST FLOOR PLAN - EAST WING

CHECKED BY:

PROJECT NUMBER 225029-00

P2.11







FEBRUARY 05, 2024

<b>KEYNOTES - PRESSURE</b>
3" CW DOWN
DROP 1/2" CW & HW IN WALL/CHASE
DDOD 4/01/ONA IN MALL /OLIA OF

1 3 CW DOWN
2 DROP 1/2" CW & HW IN WALL/CHASE
3 DROP 1/2" CW IN WALL/CHASE
4 1-1/2" CW DOWN
5 1/2" CW DOWN
6 2" NATURAL GAS UP
7 2" NATURAL GAS DOWN

G R O U

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NSPIRATION 4 TRAINING FACILITY

U.S. Space & Rocket Cente

PROJECT STATUS: BID SET ISSUED: FOR CONSTRUCTION

ISSUE DATE: FEBRUARY 05, 2024

REVISIONS

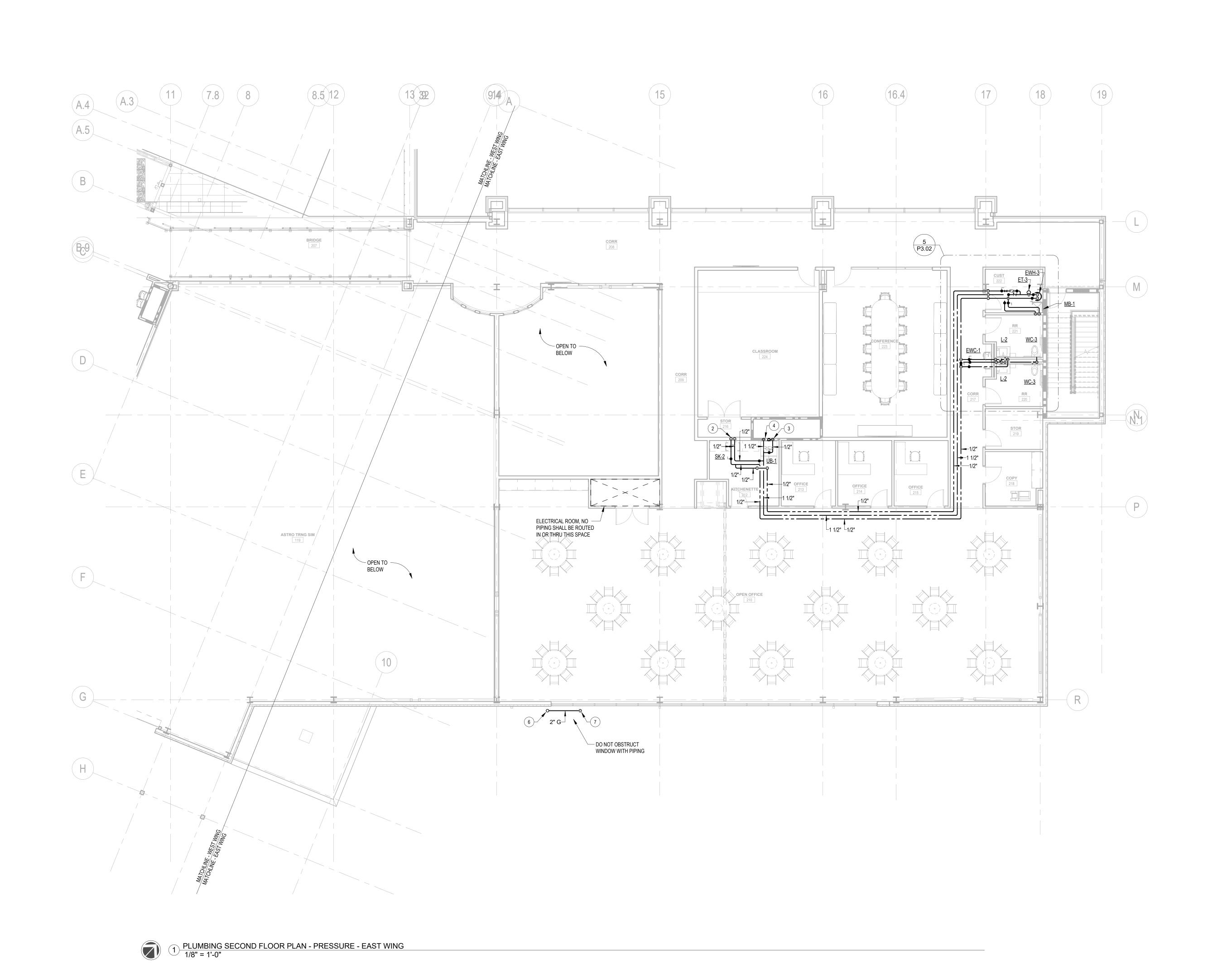
No. Description Date

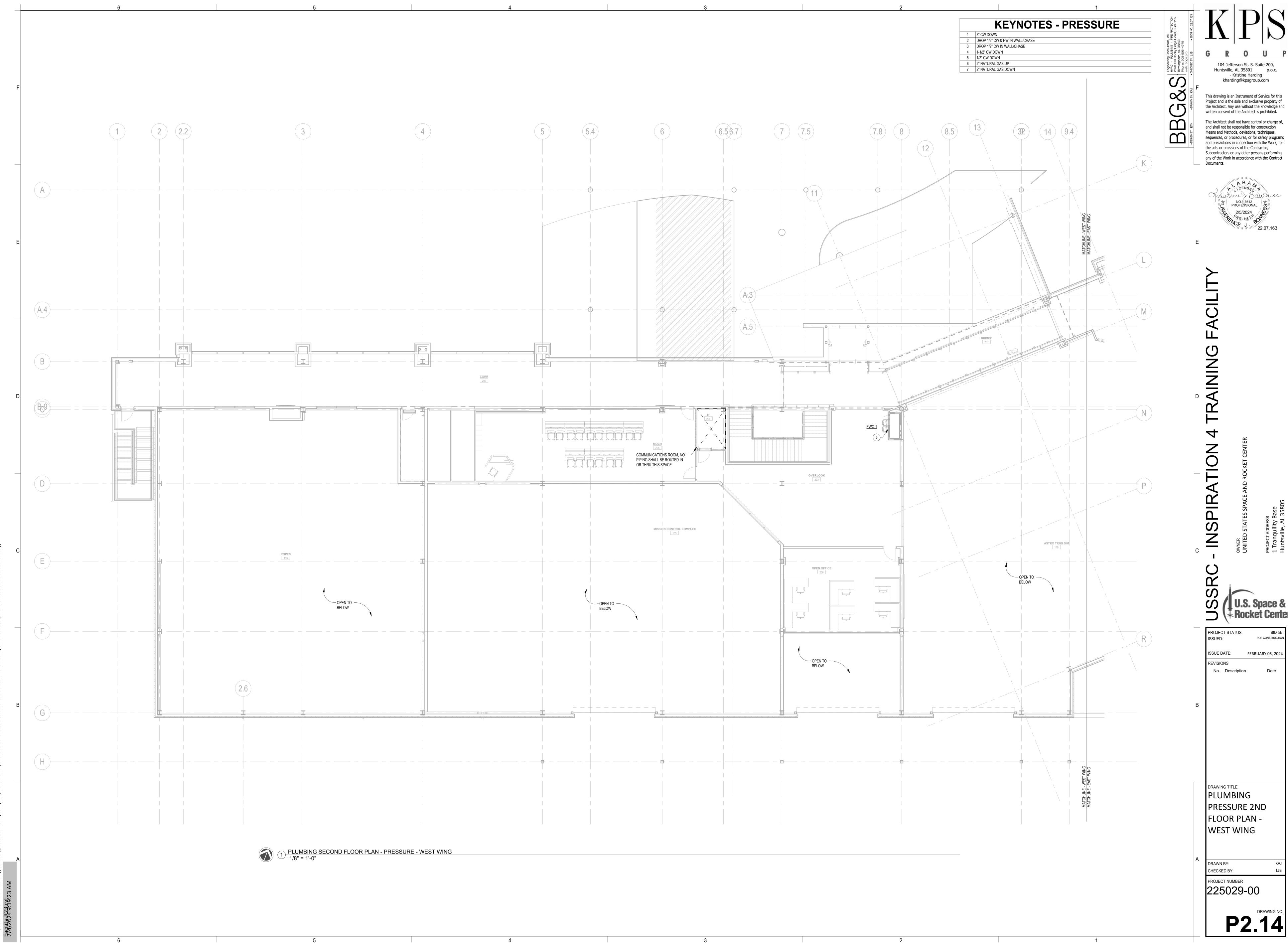
DRAWING TITLE
PLUMBING
PRESSURE 2ND
FLOOR PLAN - EAST
WING

DRAWN BY: CHECKED BY:

PROJECT NUMBER 225029-00

P2.13



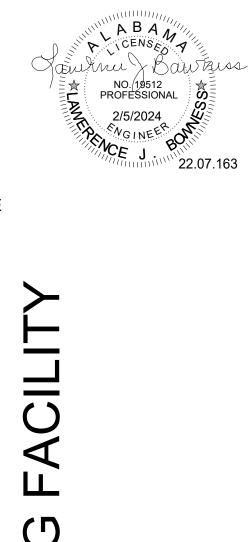


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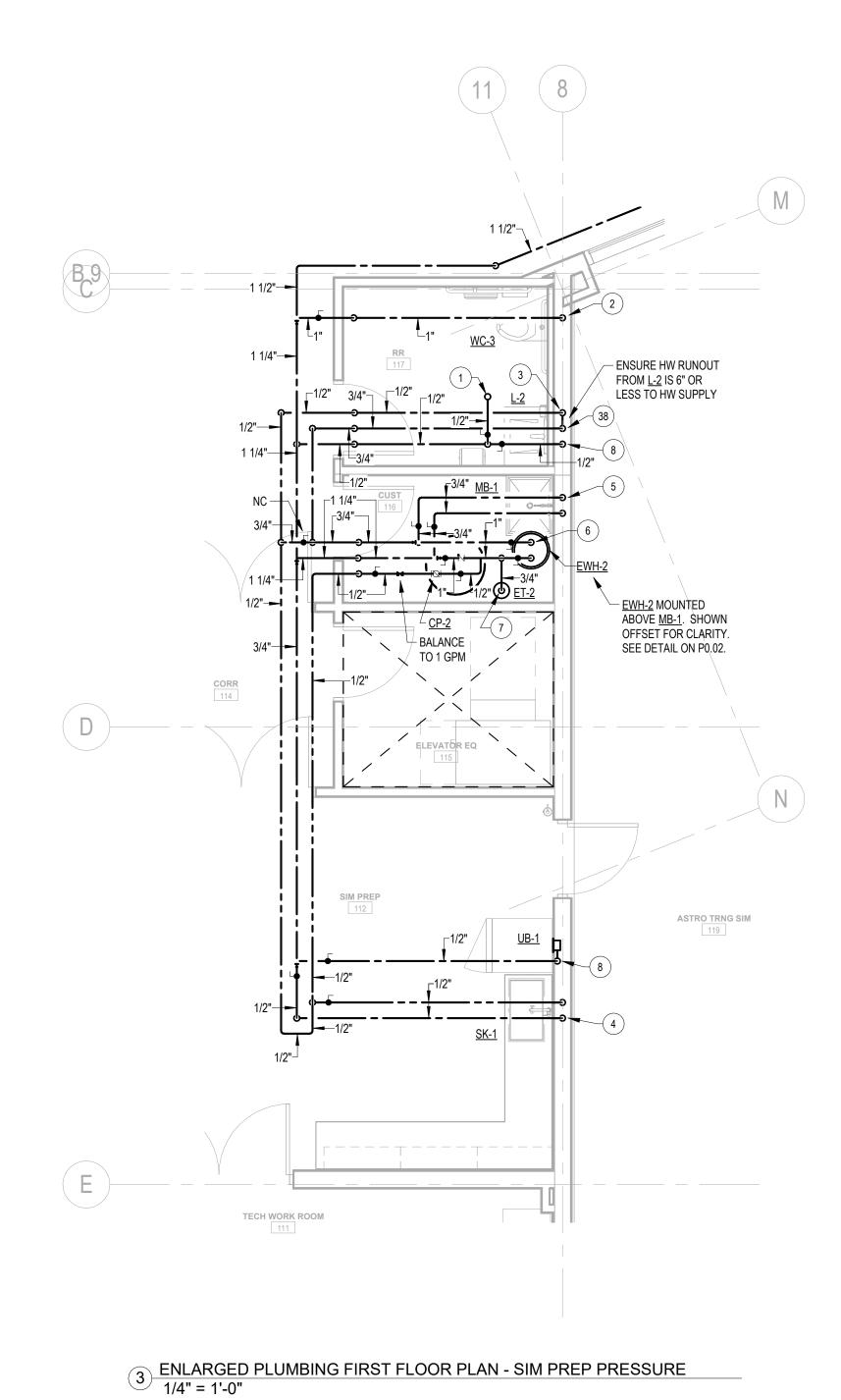
and precautions in connection with the Work, for

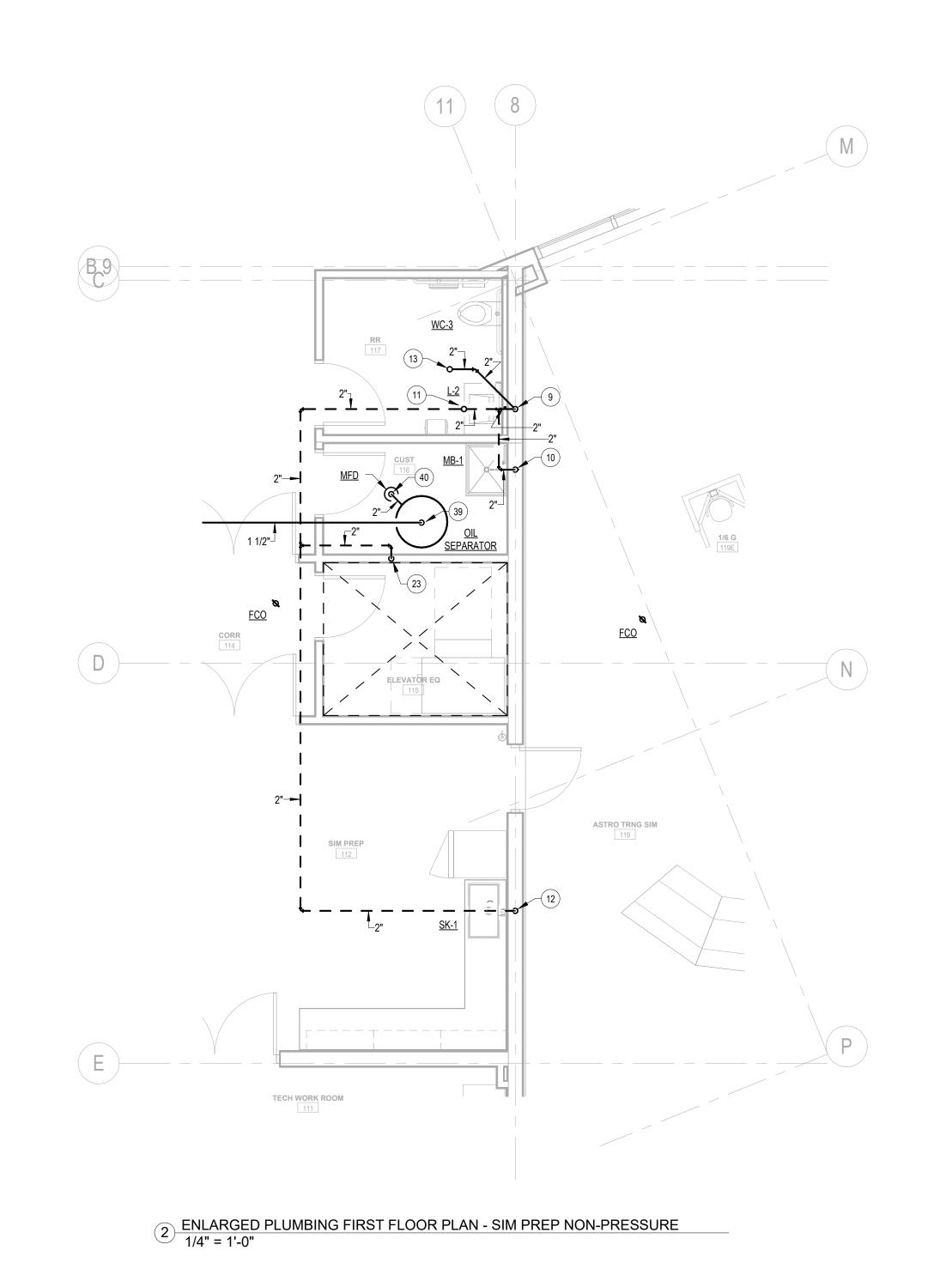
Subcontractors or any other persons performing any of the Work in accordance with the Contract

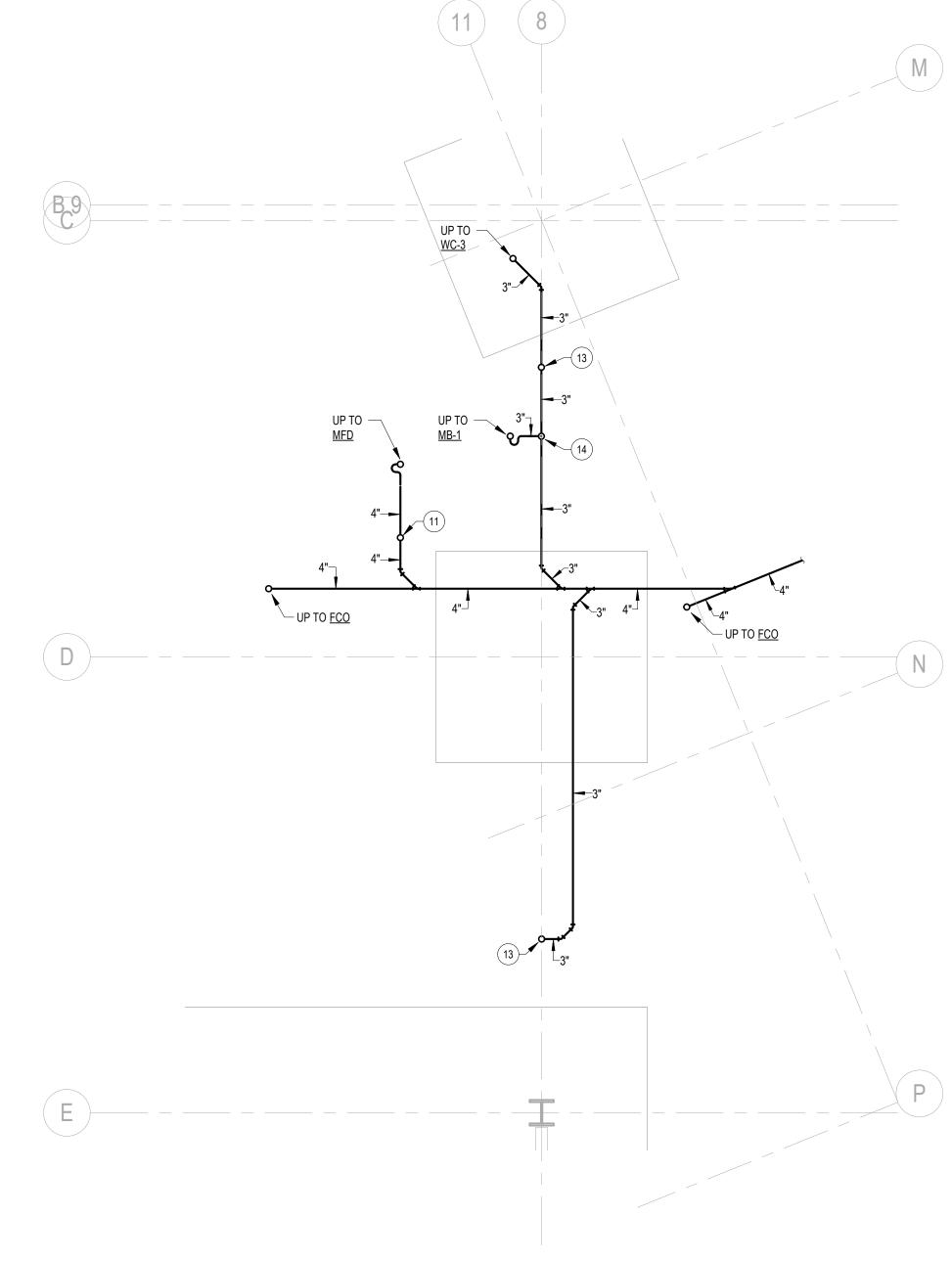
the acts or omissions of the Contractor,

 $\infty$ 

Huntsville, AL 35801 p.o.c.







1) ENLARGED PLUMBING BELOW SLAB PLAN - SIM PREP 1/4" = 1'-0"

REVISIONS No. Description

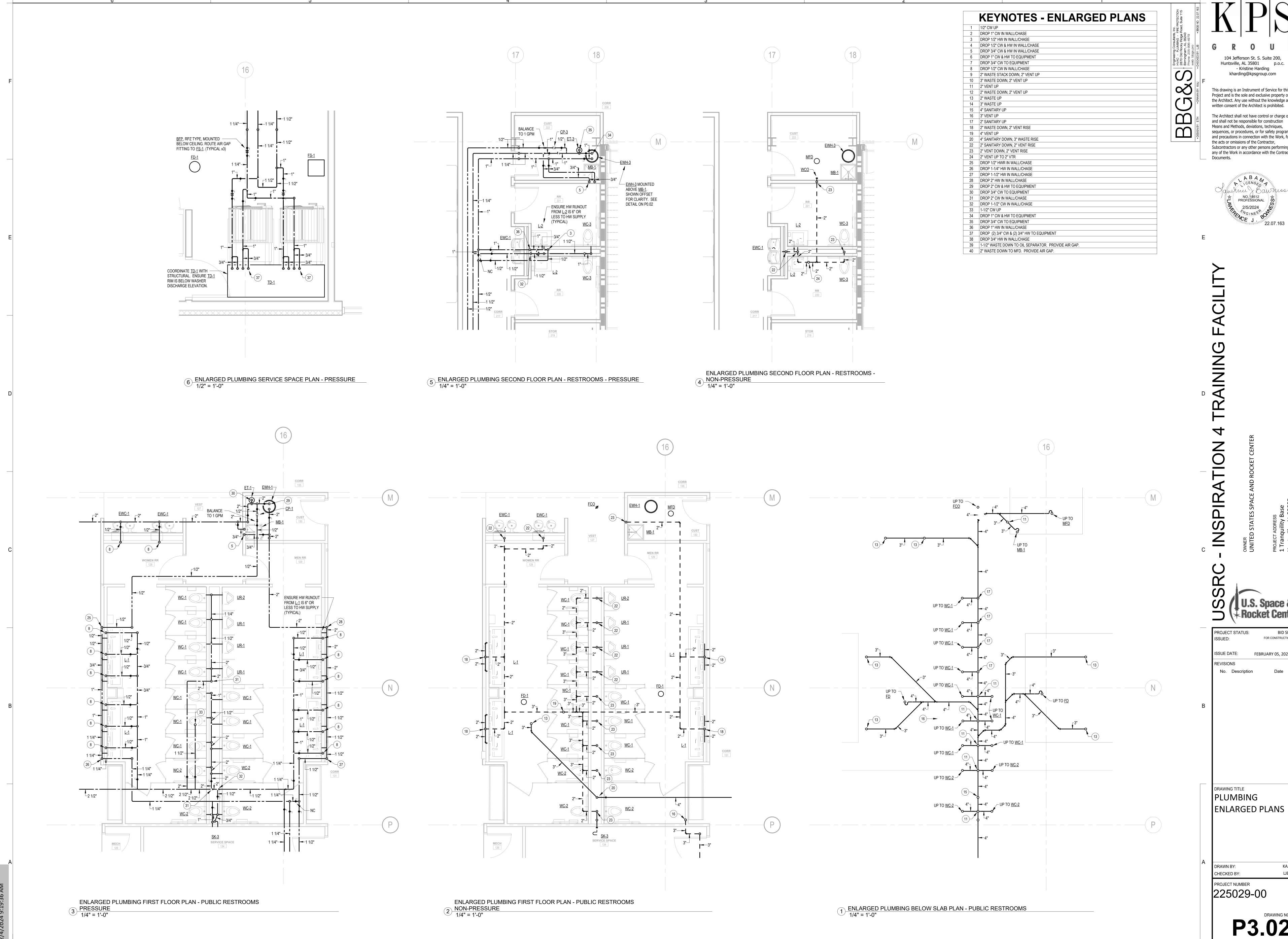
ISSUE DATE:

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PLUMBING ENLARGED PLANS

CHECKED BY:

PROJECT NUMBER 225029-00



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NO. 19512 PROFESSIONAL

PLUMBING ENLARGED PLANS

PROJECT NUMBER

225029-00

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Subcontractors or any other persons performing
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Documents.

PLUMBING RISER DIAGRAMS

CHECKED BY:

PROJECT NUMBER 225029-00

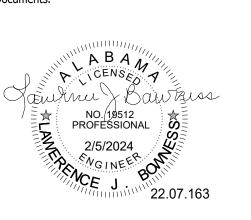
1 RISER DIAGRAM - NON-PRESSURE - FIRST FLOOR EAST WING

KPS

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SRC - INSPIRATION 4 TRAINING FACILITY

U.S. Space & Rocket Cente

PROJECT STATUS: ISSUED:	BID SET FOR CONSTRUCTION
ISSUE DATE:	FEBRUARY 05, 2024
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No. Description	Date

PLUMBING RISER
DIAGRAMS

DRAWN BY: CHECKED BY:

PROJECT NUMBER 225029-00

P4.02

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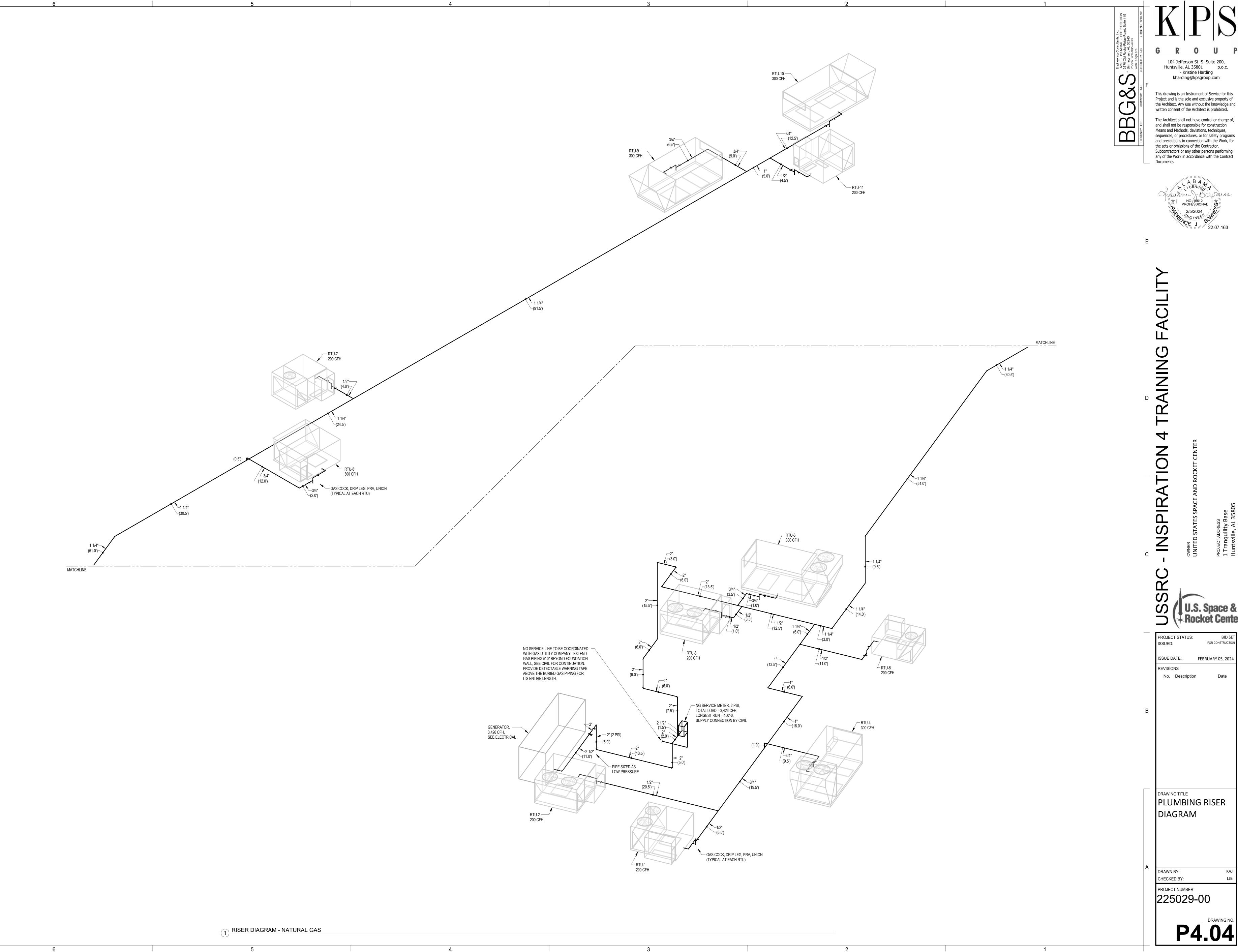
ISSUE DATE: FEBRUARY 05, 2024 REVISIONS

PLUMBING RISER DIAGRAMS

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1) RISER DIAGRAM - NON-PRESSURE - ENLARGED BATHROOM



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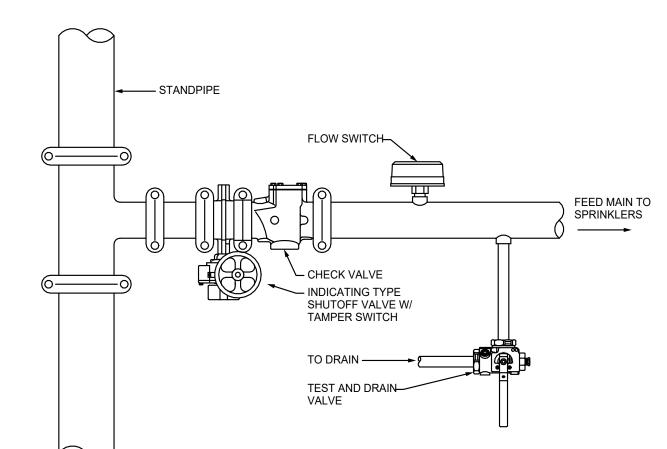
FOR CONSTRUCTION FEBRUARY 05, 2024 No. Description

PLUMBING RISER

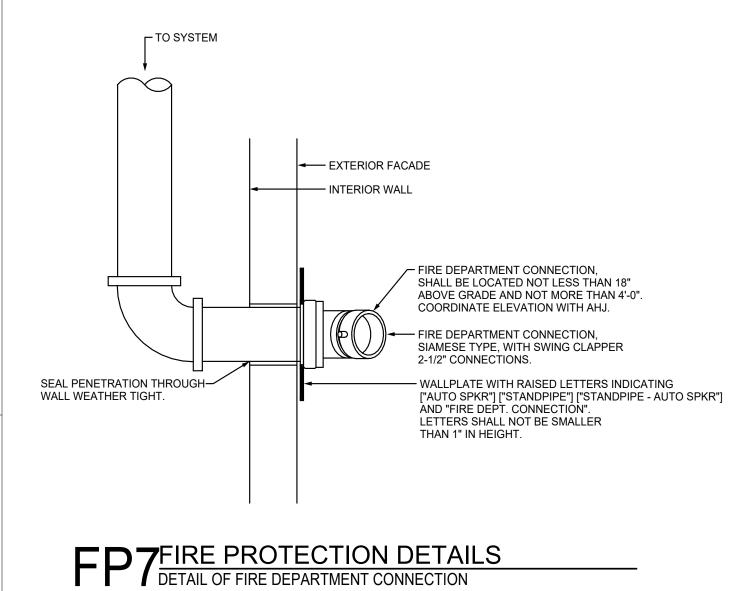
PROJECT NUMBER 225029-00

FP1 FIRE PROTECTION DETAILS

DETAIL OF JOIST CLEARANCE FOR UPRIGHT SPRINKLER

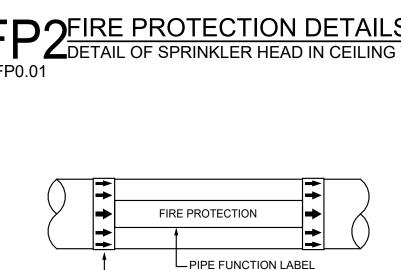


FP4FIRE PROTECTION DETAILS
DETAIL OF SPRINKLER ZONE CONTROL



— ○<del><</del> ALTERNATE LOCATION - ARCHITECTURAL APPROVAL SPRINKLER HEAD 7 REQUIRED FOR GEOMETRIC CENTER OF THE CEILING TILE SPRINKLER HEAD 2x2 ACOUSTICAL 2x4 ACOUSTICAL CEILING TILE CEILING TILE

FP2FIRE PROTECTION DETAILS
DETAIL OF SPRINKLER HEAD IN CEILING TILES



**DETAIL NOTES** 

A. PROVIDE A PIPE LABEL FOR EACH PIPE FUNCTION.

THE PIPE CONTENTS.

- FLOW DIRECTION LABEL.

B. PROVIDE AT LEAST ONE LABEL ON EACH PIPE FOR EVERY ROOM THE PIPE PASSES THROUGH.

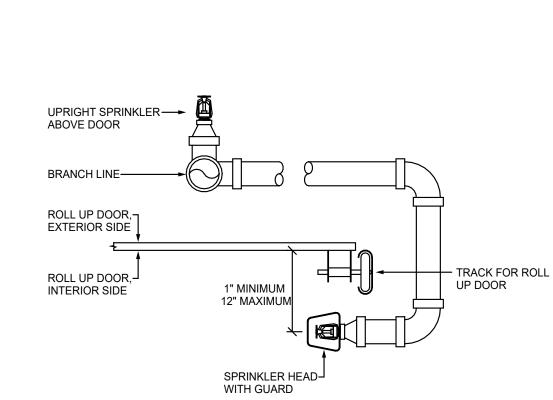
PROVIDE 360 DEGREE WRAP OVERLAPPING BOTH ENDS OF THE PIPE FUNCTION LABEL AND MATCHING THE FLOW DIRECTION OF

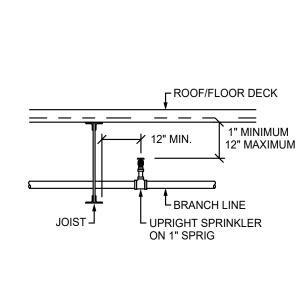
- PROVIDE LABELS IN LARGE SPACES ON MAXIMUM 20'-0" CENTERS FOR EVERY PIPE UNLESS OTHERWISE NOTED IN THE SPECIFICATIONS.
- D LABELS TO BE LOCATED IN AN EASILY VISIBLE LOCATION AS THEY
- WOULD NORMALLY BE SEEN. E.G.ON THE BOTTOM OF PIPES IN THE AIR AND ON THE TOP OF OR SIDES OF PIPES MOUNTED LOW.
- PRE-COILED, SEMIRIGID PLASTIC FORMED TO COVER THE FULL CIRCUMFERENCE OF PIPING WITH OUT THE USE OF ADHESIVES.

E. LABELS SHALL BE COLOR CODED, PRE-PRINTED, SELF ADHESIVE VINYL OR

F. SEE SPECIFICATIONS FOR OTHER REQUIREMENTS AND LIST OF PIPE FUNCTIONS. G. LABELS ON MULTIPLE PARALLEL LINES SHALL BE ALIGNED AND CENTERED.

FP5 FIRE PROTECTION DETAILS
DETAIL OF PIPE IDENTIFICATION





IF OFFSET LENGTH EXCEEDS 2'-0", PROVIDE

1" DROP-

MAINTAIN MINIMUM 18" CLEAR
BETWEEN BOTTOM OF DEFLECTOR
AND ANY OBSTRUCTIONS BELOW

FINISHED CEILINGS. ALL

PAINTED TO MATCH SURROUNDING SURFACE COLOR OF CEILING.

CONCEALED SPRINKLER COVER PLATE TO BE FACTORY

COORDINATE EXACT COLORS WITH

PIPE HANGER

√ ))

✓ BRANCHLINE

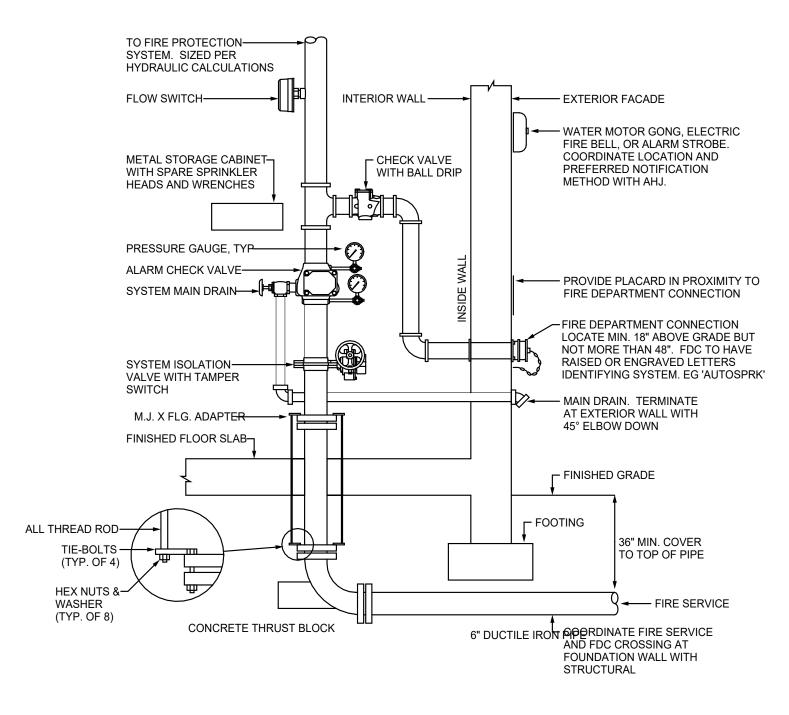
MAINTAIN MINIMUM 18" CLEAR

AND ANY OBSTRUCTIONS BELOW

CEILING TYPES.

FP3FIRE PROTECTION DETAILS
DETAIL OF SPRINKLER DROP

FP6 FIRE PROTECTION DETAILS
DETAIL OF JOIST CLEARANCE FOR UPRIGHT SPRINKLER HEADS



۷E٦	r spr	INKLER SYSTEM DESIGN AND INSTALLATION.
1.	DES THE	RAULIC CALCULATIONS AND SYSTEM DESIGN ARE A DELEGATED IGN AND SHALL BE BASED ON THE AREA/DENSITY METHOD USING FOLLOWING CRITERIA AND IN ACCORDANCE WITH THE CURRENT ALLY ADOPTED EDITION OF NFPA 13.
2.	SPR	INKLER PROTECTION:
	A.	ALL SHELL SPACES, OFFICES, CONFERENCE ROOMS, WAITING AREAS, EDUCATIONAL AREAS, DINING AREAS, GANG TOILET ROOMS, SINGLE OCCUPANT TOILET ROOMS OVER 50 SQ.FT, LOBBIES, VESTIBULES AND CORRIDORS.
		LIGHT HAZARD: 0.10 GPM/SQ.FT OVER THE HYDRAULICALLY MOST REMOTE 1,500 SQ.FT.
	B.	ALL MECHANICAL EQUIPMENT ROOMS, JANITORIAL CLOSETS, TRANSFORMER ROOMS, ELECTRICAL SWITCHGEAR ROOMS, ELECTRICAL CLOSETS, ELEVATOR SHAFTS (IF REQUIRED), ELEVATOR MACHINE ROOMS AND STORAGE BETWEEN 100 AND 250 SQ.FT.
		ORDINARY HAZARD, GROUP-1: 0.15 GPM/SQ.FT OVER THE HYDRAULICALLY MOST REMOTE 1,500 SQ.FT.
	C.	ALL LABORATORY, STORAGE ROOMS OVER 250 SQ.FT, LOADING DOCKS, SHIPPING AND RECEIVING, HIGH DENSITY (ROLLING RACK) STORAGE.
		ORDINARY HAZARD, GROUP-2: 0.20 GPM/SQ.FT OVER THE HYDRAULICALLY MOST REMOTE 1,500 SQ.FT.
3.	STR	WATER ALLOWANCE OF 100 GPM FOR INSIDE AND OUTSIDE HOSE EAM TO THE SPRINKLER REQUIREMENTS AT THE CONNECTION TO DISTRIBUTION MAIN.
4.	THE	RAULIC CALCULATIONS: THE CALCULATED DEMAND INCLUDING HOSE STREAM REQUIREMENTS SHALL FALL NO LESS THAN 10 CENT BELOW THE AVAILABLE SUPPLY CURVE.
5.	UP-	THE RESPONSIBILITY OF DIVISION 21 TO COORDINATE AN TO-DATE FLOW TEST WITH LOCAL AUTHORITIES AND CARRY ANY STS ASSOCIATED WITH PERFORMING THE TEST.
CON	//PLY	WITH THE FOLLOWING:
1.	INTE	ERNATIONAL BUILDING CODE, 2018 EDITION.
2.	INTE	ERNATIONAL FIRE CODE, 2018 EDITION.
3.	NFP	A 13 - SPRINKLER SYSTEMS, 2016 EDITION.
4.	NFP	A 14 - STANDPIPE AND HOSE SYSTEMS, 2016 EDITION.
5.	NFP	A 25 - TESTING AND MAINTENANCE OF FP, 2017 EDITION.
6.	NFP	A 45 - LABORATORY USING CHEMICALS, 2015 EDITION.
7.	NFP	A 70 - NATIONAL ELECTRIC CODE, 2017 EDITION.
8.	NFP	A 72 - FIRE ALARM AND SIGNALING CODE, 2016 EDITION.

ELECTRICAL COORDINATION NOTES 1. THE FIRE PROTECTION DESIGN IS A DELEGATED DESIGN. ELECTRICAL REQUIREMENTS HAVE BEEN GENERALLY COORDINATED WITH THE ELECTRICAL ENGINEER. IT IS THE RESPONSIBILITY OF THIS CONTRACTOR TO COORDINATE THE SPECIFIC ELECTRICAL REQUIREMENTS OF ITEMS PROVIDED WITH DIVISION 26. 2. QUANTITIES OF FLOW SWITCHES, TAMPER SWITCHES, PRESSURE SWITCHES ETC ARE APPROXIMATE AND MAY VARY BASED ON THE ACTUAL DELEGATED DESIGN. 3. ALL WIRING (CONTROL, POWER ETC) BETWEEN FIRE PROTECTION EQUIPMENT (TS, FS, ETC) AND THE FIRE ALARM PANEL SHALL BE

ENCASED IN A CONDUIT. COORDINATE WITH DIVISION 26.

	——FS——	FIRE SERVICE
	——F—	- FIRE PROTECTION LINE
	N	- SUPERVISED VALVE
	N	- CHECK VALVE
	H_A	FIRE DEPARTMENT VALVE
		ZONE CONTROL
		PIPE TURNING UP
	——— <del>—</del>	PIPE TURNING DOWN
		PIPE CONTINUED
		PIPE SLEEVE (AT FOUNDATION OR MASONRY WALL)
	(#)	DRAWING NOTE   KEY NOTE
	#	REVISION NUMBER
		CONNECT TO EXISTING
		DISCONNECTION POINT
		ALARM CHECK VALVE (ACV)
	AFF	ABOVE FINISHED FLOOR
	AHJ	AUTHORITY HAVING JOURISDICTION
	EST.	ESTIMATED
	ETR.	EXISTING TO REMAIN
_	EX. EXIST.	EXISTING
	FFE	FINISHED FLOOR ELEVATION
	FDV	FIRE DEPARTMENT VALVE
	FM	FACTORY MUTUAL
	<u>FS</u>	FLOW SWITCH
	GPM	GALLONS PER MINUTE
	ITC	INSPECTORS TEST CONNECTION
	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
	NIC	NOT IN CONTRACT
	PSI	POUNDS PER SQUARE FEET
	SF. SQ.FT.	SQUARE FEET
	SP	STANDPIPE
	<u>TS</u>	TAMPER SWITCH
	UL	UNDERWRITERS LABORATORY

FIRE PROT. SHOP DRAWING NOTES PRIOR TO SUBMITTING FIRE PROTECTION SHOP DRAWINGS AND HYDRAULIC CALCULATIONS FOR REVIEW, CONFIRM THE FOLLOWING.

- FIRE PROTECTION SHOP DRAWINGS AND THE COVER PAGE FOR EACH SET OF HYDRAULIC CALCULATIONS ARE SEALED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF ALABAMA. 2. ALL NODE POINTS IN THE HYDRAULIC CALCULATIONS APPEAR ON THE SHOP DRAWINGS AND THAT THE NOMENCLATURE BETWEEN THE TWO SETS OF DOCUMENTS MATCHES. THIS INCLUDES NODE POINTS LOCATED ON SITE SUCH AS THE BACKFLOW PREVENTER AND
- B. PIPE SIZES, LENGTHS AND ELEVATIONS NOTED IN THE HYDRAULIC CALCULATIONS MATCH PIPE SIZES, LENGTHS AND ELEVATIONS NOTED ON THE FIRE PROTECTION SHOP DRAWINGS.
- 4. SHOP DRAWINGS SHALL BE CLEARLY LEGIBLE. NODE POINTS, PIPE SIZES, LENGTHS, ELEVATIONS AND OTHER PERTINENT INFORMATION SHOULD NOT OVERLAP EACH OTHER OR OVERLAP ARCHITECTURAL FEATURES OR OTHER GRAPHIC ELEMENTS SO THEY BECOME DIFFICULT TO READ WHEN PLOTTED.
- . WHEN MULITPLE NODE POINTS ARE LOCATED IN VERY CLOSE PROXIMITY TO ONE ANOTHER THAT LEADER LINES ARE USED TO IDENTIFY WHERE THE NODE POINT IS LOCATED IN THE DESIGN.
- 6. REMOTE AREAS ARE TO BE CLEARLY OUTLINED AND IDENTIFIED ON THE FIRE PROTECTION SHOP DRAWINGS AND THAT THE NOMENCLATURE MATCHES THE HYDRAULIC CALCULATIONS.
- . PIPE SCHEDULE AND SPRINKLER HEAD K-FACTORS IN HYDRAULIC CALCULATIONS SHALL MATCH INFORMATION CONTAINED IN THE FIRE PROTECTION MATERIALS SUBMITTAL.

#### SPRINKLER NOTES

SOURCE.

- PROVIDE A NFPA 13R COMPLIANT SYSTEM TO PROVIDE TOTAL COVERAGE FOR THE ENTIRE BUILDING AS INDICATED ON THE
- 2. ALL PIPING SHALL BE SCHEDULE 40 CPVC, ASTM D1784, ASTM F442, UL/FM LISTED, BLAZEMASTER OR APPROVED EQUAL. JOINTS SHALL BE SOCKED TYPE AND SOLVENT WELDED, ASTM F493.
- SPRINKLER PIPING INSTALLED IN ATTICS SHALL BE INSTALLED ON THE THE BUILDING SIDE (HEATED SIDE) OF THE INSULATION.
- 4. PIPING SHALL BE INSTALLED IN A MANNER AS TO HIDE PIPING AS MUCH AS POSSIBLE.
- PROVIDE SHOP DRAWINGS INCLUDING A REFLECTED CEILING PLAN INDICATING SPRINKLER HEADS, LIGHTS AND HVAC DEVICES.
- 6. ALL SPRINKLER HEADS SHALL BE QUICK RESPONSE TYPE. AREA/DENSITY SHALL BE 0.10 GPM/SQFT PER NFPA 13R
- 7. PROVIDE UPRIGHT SPRINKLER HEADS IN ALL SPACES WITHOUT A FINISHED CEILING. HEADS TO BE LOCATED WITHIN 12" OF THE
- DECKING ABOVE.
- 8. ALL EXPOSED UPRIGHT SPRINKLER HEADS SHALL BE PROVIDED WITH SPRINKLER GUARDS. 9. | SPRINKLER PIPING LOCATED BELOW STAIRS AND STAIR LANDINGS
- SHALL BE KEPT AS HIGH AS POSSIBLE AND SHALL BE CENTERED ON ARCHITECTURAL FEATURES.
- 10. SPRINKLERS SHALL BE INSTALLED IN ANY CLOSET USED FOR HEATING OR AIR CONDITIONING EQUIPMENT, WASHERS, DRYERS OR
- WATER HEATERS. 1. ALL SITUATIONS REGARDING SPRINKLER LOCATIONS AND/OR
- POSITIONS THAT ARE NOT DIRECTLY COVERED BY NFPA 13R SHALL BE IN ACCORDANCE WITH NFPA 13.
- 12. CLOSELY COORDINATE SPRINKLER PIPE ROUTING WITH WOODEN STRUCTURE AND OTHER SYSTEMS (HVAC, PLUMBING ETC) LOCATED ABOVE THE CEILING. CUTTING, DRILLING, NOTCHING OR OTHER MODIFICATIONS TO THE STRUCTURE IS PROHIBITED. WHERE, BY
- NECESSITY, THE SPRINKLER PIPING NEEDS TO PENETRATE A STRUCTURAL ELEMENT, THE ARCHITECT AND STRUCTURAL ENGINEER SHALL BE CONSULTED FIRST. DO NOT MAKE ANY MODIFICATIONS TO STRUCTURAL ELEMENTS WITHOUT FIRST RECEIVING WRITTEN PERMISSION FROM THE ARCHITECT AND STRUCTURAL ENGINEER.
- 13. ALL SPRINKLER PIPING THAT BY NECESSITY CROSSES UNCONDITIONED SPACES SUCH AS BREEZEWAYS, OPEN CORRIDORS EXPOSED TO THE ELEMENTS, ETC, SHALL BE INSULATED AND HEAT TRACED . HEAT TRACING SHALL BE UL/FM LISTED.

FIRE PROTECTION	PIPE LAB	ELS
SYSTEM	BACKGROUND COLOR	TEXT COLOR
FIRE PROTECTION	RED	WHITE
MAIN DRAIN	RED	WHITE
STAND PIPE	RED	WHITE
DRAIN	RED	BLACK
NOTES: 1. PIPE LABELS FOR FIRE PROT. SYSTE 2. ALL PIPE LABELS SHALL HAVE ARRO		-

104 Jefferson St. S. Suite 200, Huntsville, AL 35801 p.o.c. Kristine Harding kharding@kpsgroup.com

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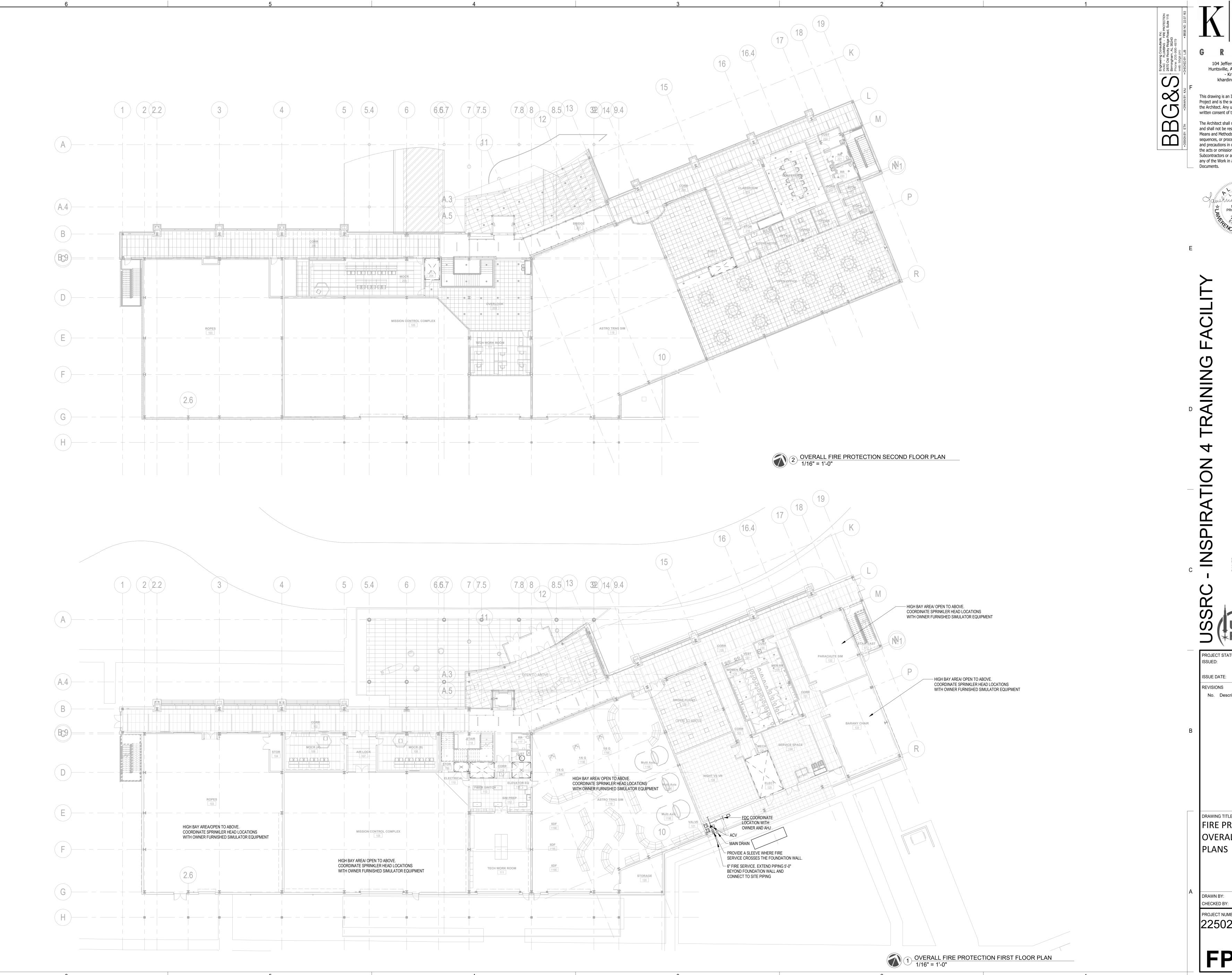
PROJECT STATUS: BID SET FOR CONSTRUCTION SSUED: ISSUE DATE: FEBRUARY 05, 2024 REVISIONS No. Description

DRAWING TITLE FIRE PROTECTION

LEGEND, SCHEDULES AND DETAILS

CHECKED BY: PROJECT NUMBER

225029-00



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NO. 19512 PROFESSIONAL

PROJECT STATUS: FOR CONSTRUCTION ISSUE DATE: FEBRUARY 05, 2024 REVISIONS No. Description

FIRE PROTECTION OVERALL FLOOR

CHECKED BY:

PROJECT NUMBER 225029-00

**EXISTING - REMOVE** 

EXISTING - RELOCATED

EXISTING - REMOVE AND RELOCATE

#### NOTES

- 1. 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.
- 2. CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH ALL DETAILS OF THE WORK AND ALL
- CONTRACTOR SHALL PROVIDE A COMPLETE ELECTRICAL INSTALLATION INCLUDING ALL WORK CUSTOMARILY
- INCLUDED EVEN IF NOT SPECIFICALLY CALLED OUT.
- 4. THE ELECTRICAL CONTRACTOR SHALL CAREFULLY COORDINATE HIS WORK WITH OTHER CONTRACTORS THROUGH THE GENERAL CONTRACTOR FOR SPACE REQUIREMENTS, ETC.
- 5. 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.
- 6. 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
- 8. 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.
- 9. DO NOT MOUNT OUTLETS BACK-T0-BACK. PROVIDE MINIMUM 24" SEPARATION IN FIRE RATED WALLS.
- 10. ALL OUTLETS IN EXPOSED CONCRETE BLOCKS SHALL BE ADJUSTED AS REQUIRED TO ALLOW CUTTING OF ONLY
- 11. VERIFY ALL DOOR SWINGS WITH ARCHITECT PRIOR TO ROUGHING LIGHT SWITCHES.

ONE BLOCK. MAINTAIN UNIFORM HEIGHTS THROUGHOUT THE BUILDING.

- 12. CONTRACTOR SHALL CHECK ALL LIGHT FIXTURES FOR EXACT TYPE MOUNTING AND SPACE REQUIRED BEFORE
- 13. BRANCH CIRCUITS #12 A.W.G. AND 3/4" CONDUIT (GALVANIZED) MINIMUM. CONDUCTORS SHALL BE 98% CONDUCTIVITY COPPER, SEE SPECIFICATIONS FOR TYPE INSULATION.
- 14. 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.
- 15. ALL CONDUITS CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION TYPE FITTINGS.
- 16. 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
- 17. 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.
- 18. LABEL PANELS PER NEC11024.

WITH WORK.

19. 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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ROJECT STATUS: FOR CONSTRUCTION SSUED: SSUE DATE: FEBRUARY 5, 2024 REVISIONS No. Description

LEGEND AND NOTES

RAWING TITLE

ROJECT NUMBER 225029-00

HECKED BY:

**EXISTING** 

GROUND

GROUND FAULT INTERRUPTING

FUSE

G, GRD

HYDE ENGINEERING, INC. 1525 Perimeter Parkway Huntsville, Alabama 35801 (P) 256.270.8013 E-MAIL: MORGAN@HYDE-EGR.COM PROJECT#

23166.1

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.
- 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, EASYPOWER, 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.
- PROVIDE FINAL STUDY REPORT AS PART OF CLOSE-OUT DOCUMENTATION (BOTH HARD COPY AND ELECTRONIC PDF FORM).

TRANSFO	RMER TAB	LE - 480V F	PRIMARY -	208/120V,	SECONDARY	<u> </u>			
		FL	BKR		TRANSF	TRANSFORMER FL BKR GROUNDING AMPS SIZE FDR ELECTRODE (3) WIRE CONDUIT 208V (1) (2)			
	KVA	AMPS	SIZE	FDR	GROU	GROUNDING AMPS SIZE FDR ELECTRODE (3)  WIRE CONDUIT 208V (1) (2)			
					ELECTR	RODE (3)			
NAME	3PH	480V	(1)	(2)	WIRE	CONDUIT	208V	(1)	(2)
					AWG	IN			
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
	•							•	•

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.

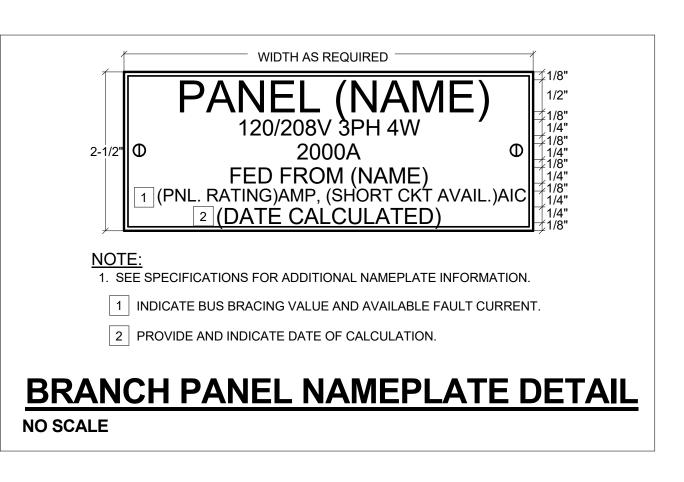


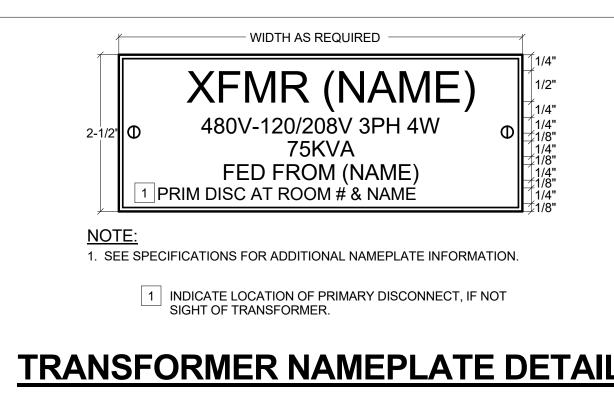
#### **SERVICE NOTES:**

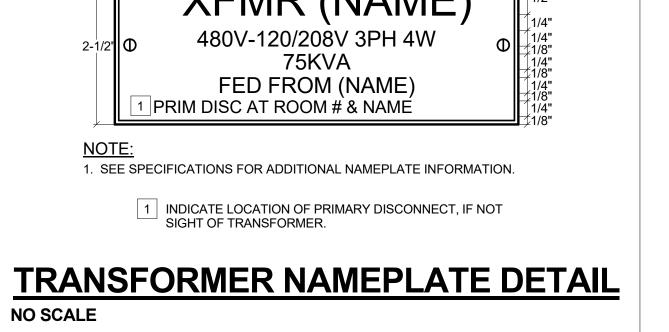
- 1. THE SECONDARY SERVICE: 270/480V, 30, 4W., GROUNDED NEUTRAL, WYE CONNECTED AS SHOWN ON SINGLE LINE DIAGRAM.
- 2. ARRANGE WITH LOCAL ELECTRICAL SERVICE COMPANY FOR SERVICE TO BE BROUGHT TO BUILDING, AND FOR THE INSTALLATION OF METER. PAY ALL CHARGES (IF ANY) IN CONNECTION THEREWITH, INCLUDING PERMANENT METER DEPOSIT, WHICH DEPOSITS WILL BE REFUNDED TO CONTRACTOR AT TIME OF OWNER'S OCCUPANCY IN THE BUILDING.
- 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.
- 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.
- 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.

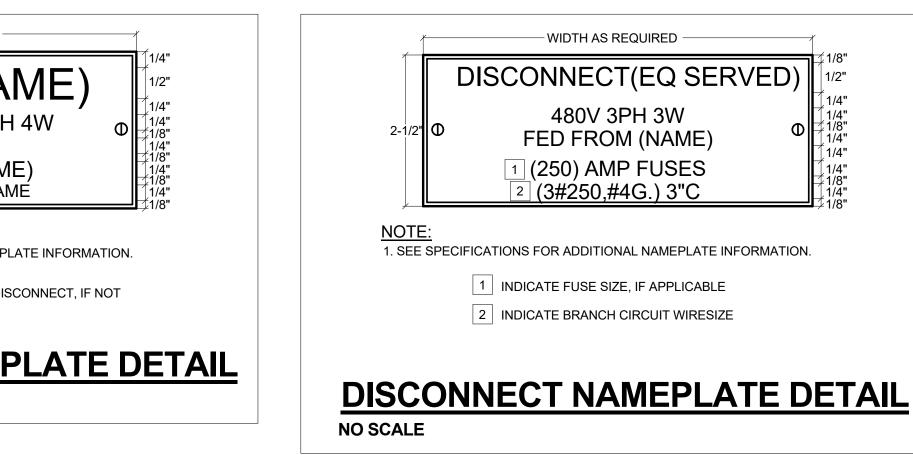
#### **RISER NOTES**

- 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).
- PROTECTIVE DEVICES RATED 800A & GREATER AND ALL DEVICES IN THE EMERGENCY AND STANDBY SYSTEM(S) SHALL BE STATIC TRIP TYPE WITH LSI SETTINGS.
- 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.
- 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.
- 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.









**NO SCALE** 

WIDTH AS REQUIRED

1 (PNL. RATING)AMP, (SHORT CKT AVAIL.)AIC

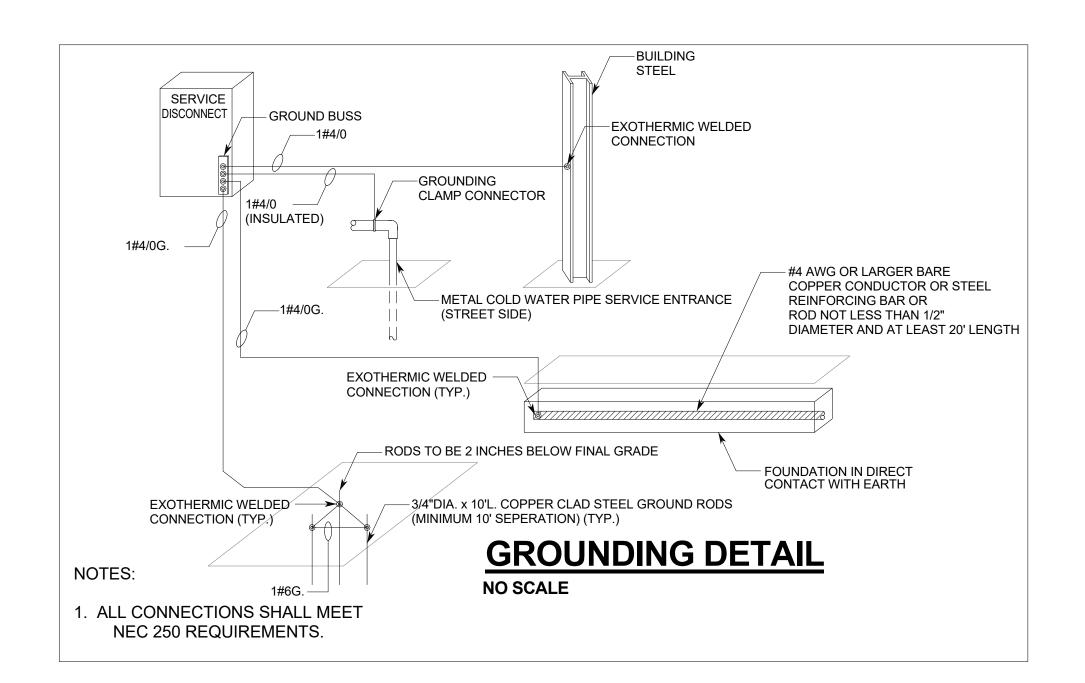
2 (DATE CALCULATED)

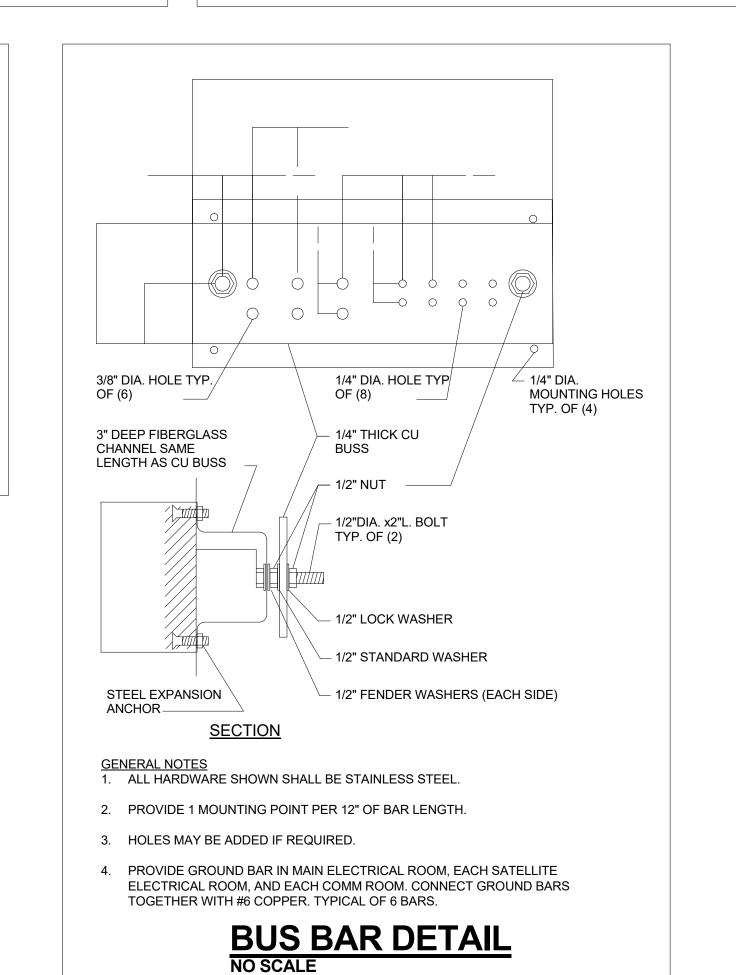
1. SEE SPECIFICATIONS FOR ADDITIONAL NAMEPLATE INFORMATION.

2 PROVIDE AND INDICATE DATE OF CALCULATION.

1 INDICATE BUS BRACING VALUE AND AVAILABLE FAULT CURRENT.

MAIN DIST. CENTER NAMEPLATE DETAIL





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ROJECT STATUS: FOR CONSTRUCTION SUE DATE: FEBRUARY 5, 2024 EVISIONS No. Description

RAWING TITLE RISER DIAGRAM AND DETAILS

HECKED BY:

ROJECT NUMBER 225029-00

HYDE ENGINEERING, INC.

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

1525 Perimeter Parkway

Huntsville, Alabama 35801

Suite 275

ENGINEER Morgan B. Reyes (P) 256.270.8013

23166.1

PROJEC SSUED:	CT STATUS:	BID SET FOR CONSTRUCTION
SSUE D	ATE:	FEBRUARY 5, 2024
REVISIO	NS	
No.	Description	Date

PANEL SCHEDULES 480V

CHECKED BY: PROJECT NUMBER

225029-00

	6				F	1				4	
	0				0					4	3
PANEL: MPA								PANEL	_: HPA		
VOLTAGE:	277/480	PHASE/WIRE: 3P., 4W.	MAIN BUS RATING:	2000A	MAIN CB TRIP: MLO			VOLTA		277/480	PHASE/WIRE: 3P., 4W. MAIN BUS RATING: 400A MAIN CB TRIP: MLO
MOUNTING: SURF	ACE	,		INTERRUPTING CAPACITY	( (RMS SYM AMPS): 65000				TING:SURFA	CE	MINIMUM BREAKER INTERRUPTING CAPACITY (RMS SYM AMPS): 42000
DEVICE:		ANCH CIRCUIT	PHASE LOAD (VA)		RANCH CIRCUIT	DE	VICE:	DEVIC			RANCH CIRCUIT PHASE LOAD (VA) BRANCH CIRCUIT DEVIC
AMPS DOLES	DESIGNATION	VOLT-AMPS	NO DA DE DC	VOLT-AMPS	DESIGNATION		AMPS TRIP	AMPS		DESIGNATION	
TRIP POLES	DEGIGNATION	LTS RCPT HVAC MISC	ΛΟ. ΨΑ ΨΒ ΨΕ	MISC HVAC RCPT	LTS	1 OLLS	TRIP	TRIP	1 OLLS	DESIGNATION	
400			1 0	2	ODADE		000			V/AV/ A A	2600 1 15070 2 12470
100 3	SPARE		3 0	4	SPARE	3	200	20	3	VAV 4-1	2600 3 15070 4 12470 GD-1 3
			5 0	6							2600 5 15070 6 12470
		21401 29940		8							3767 7 16237 8 12470
400 3	HPA	21401 29940		10	SPARE	3	200	30	3	VAV 4-2	3767 9 16237 10 12470 GD-2 3
		21401 29940	51341	12							3767 11 16237 12 12470
		65416	13   65416	14							2267 13 4767 14 2500
400 3	HPB	65416	15 65416	16	SPARE	3	200	20	3	VAV 4-3	2267   15   4767   16   2500   GW-1 3
		65416	17 65416	18							2267   17   4767   18   2500
		27714 49500	19 77214	20							1500 19 4000 20 2500
400 3	HPC	27714 49500	77214	22	SPARE	3	200	20	3	VAV 4-4	1500 21 4000 22 2500 GW-2 3
		27714 49500	77214	24							1500 23 4000 24 2500
		19600 10929 8700	25 39229	26							7400 25 7400 26
225 3	TA/PPA	18600 8864 8640		28	PREPARED SPACE UP TO 200/	A 3		40	3	VAV 4-5	7400 27 7400 28 SPARE 3
		19000 10423 6700									7400 29 7400 30
			31 21459	32							3867 31 3867 32
125 3	ATS-LS/LPA		33 19191	34	PREPARED SPACE UP TO 200/	Δ 3		20	3	VAV 4-6	3867 33 3867 34 SPARE 3
120 0	7110 20/21 71		35 12900		THE THE STREET TO 2007					V/(V 4 0	3867 35 3867 36
			0 37 77266	38							37 0 38
400 3	DP-SB			40	PREPARED SPACE UP TO 200/	۸ 2		20	2	SPARE	39 0 40 SPARE 3
400   3	DF-3B				PREPARED SPACE OF 10 200/	A 3		20	3	SFARE	39 0 40 SPARE 3
		7400 39866 31500				DEO	NUDED.				
					С 220): ФА ФВ ФС		QUIRED				DIVERSIFICATION SUBTOTALS TOTAL PHASE LOAD DEMAND CALCULATIONS (NEC 220):
		(VA)	331925326532321760		0 0 0		PACITY	-			(VA) 51341 51341 LARGEST MOTOR 0 0 AMPAG
		LIGHTS SUBTOTALS 33			14416.5 13916.5 14866.5	1285.6	62 AMPS				LIGHTS SUBTOTALS         0         0         0         0         RECEPT         0         0         0         212.37 F
		RECEPT. SUBTOTALS 76			17698.75   14863.75   9125						RECEPT. SUBTOTALS 0 0 0 0 LIGHTS 0 0
			407 165326163261164820		158675 158600 154050						HVAC SUBTOTALS 64203 21401 21401 MISC 37425 37425 37425
		MISC SUBTOTALS 377	060   126940   126880   123240	TOTAL DEMAND:	356116.25 350641.25 342861.5						MISC SUBTOTALS         89820         29940         29940         29940         TOTAL DEMAND:         58826         58826         58826
PANEL: HPB								PANEL:			
VOLTAGE:	277/480	PHASE/WIRE: 3P., 4V			MAIN CB TRIP: MLO			VOLTA		277/480	PHASE/WIRE: 3P., 4W. MAIN BUS RATING: 400A MAIN CB TRIP: MLO
MOUNTING: SUR					TY (RMS SYM AMPS): 42000				ΓING: SURFA		MINIMUM BREAKER INTERRUPTING CAPACITY (RMS SYM AMPS): 42000
DEVICE:	E	RANCH CIRCUIT	PHASE LOAD (VA	/	RANCH CIRCUIT	DEV		DEVICE	Ξ:	BRAI	ANCH CIRCUIT PHASE LOAD (VA) BRANCH CIRCUIT DEVIC
AMPS POLES	DESIGNATION	VOLT-AMPS	NO. $\Phi A \Phi B \Phi$	C NO. VOLT-AMPS		POLES	AMPS	AMPS TRIP	POLES	DESIGNATION	$\begin{array}{c c c c c c c c c c c c c c c c c c c $
IRIF		LTS RCPT HVAC MIS	,,,	WISC HVAC ROP	I LIS		INP	IRIP			
		6319	1 7786	2 1467							3880 1 20380 2 16500
30 3	RTU-1	6319	3 7786	4 1467	VAV 1-2	3	20	20	3	RTU-7	3880 3 20380 4 16500 SIMULATOR 3
		6319	5 7786								3880 5 20380 6 16500
		4351	7 6185	8 1834							9229 7 25729 8 16500
20 3	RTU-2	4351	9 6185	10 1834	VAV 1-3	3	20	45	3	RTU-8	9229 9 25729 10 16500 SIMULATOR 3
		4351	11 6185	5 12 1834							9229 11 25729 12 16500
		4351	13 5885	14 1534							10725 13 27225 14 16500
20 3	RTU-3	4351	15 5885	16 1534	VAV 1-4	3	20	60	3	RTU-10	10725 15 27225 16 16500 SIMULATOR 3
		4351	17 5885								10725 17 27225 18 16500
		7001	3000								

RTU-11

SPACE SPACE

SPACE SPACE SPACE

SPACE SPACE

SPACE SPACE

PANEL:																			
VOLTAC		277/480		PHASE/	WIRE: 3P	P., 4W.			BUS RA							TRIP: ML	)		
	ING: SURFA										INTERRUP	TING CA		`		PS): 42000			
DEVICE		BR	ANCH CIR	CUIT				PHAS	SE LOA	D (VA)			BRA	ANCH CIRC	CUIT			DEV	/ICE:
AMPS	POLES	DESIGNATION			Γ-AMPS		NO.	ФА	ДΡ	ΦС	NO.		-AMPS		г	DESIGNAT	ON	POLES	AMPS
TRIP	1 OLLO	DEGIGIANTIGIA	LTS	RCPT	HVAC	MISC	110.	Ψ , ,	ΨΒ	ΨС	MISC	HVAC	RCPT	LTS				1 OLLO	TRIP
					6319		1	7786			2	1467							
30	3	RTU-1			6319		3		7786		4	1467				VAV 1-2		3	20
					6319		5			7786	6	1467							
					4351		7	6185			8	1834							
20	3	RTU-2			4351		9		6185		10	1834				VAV 1-3		3	20
					4351		11			6185	12	1834							
					4351		13	5885			14	1534							
20	3	RTU-3			4351		15		5885		16	1534				VAV 1-4		3	20
					4351		17			5885	18	1534							
	_				18623		19	19523			20	900							
90	3	RTU-4			18623		21		19523		22	900				VAV 1-5		3	20
					18623		23	0=11		19523		900							
00		DTU 5			3880		25	6514	0544		26	2634							00
20	3	RTU-5			3880		27		6514	0544	28	2634				VAV 1-6		3	20
					3880		29	40000		6514	30	2634							
00		DTUA			18623		31	18623			32					ODADE			00
90	3	RTU-6			18623		33		18623		34					SPARE		3	20
					18623			900		18623									
20	3	VAV 1-1			900		37	900	900		38 40					SPARE		3	20
20	) S	VAV I-I			900		41		900	900	40					SPARE		3	20
			רוו ער		TION SI		1	TOTAL	L PHASE		DEMAND C		ONS (NEC	220):	ФА	ФВ	ФС	DEO	⊥ JIRED
			DIVE	KOIFICA	(VA)	וטומט	ALS		65416			RGEST N	•	0	ΨΑ	0	Ο	-	ACITY
			LICH	TS SI IB	TOTALS	0	<u> </u>	00410	03410	00410	LAI	RECEF		0		0	0		AMPS
					BTOTALS			0	0	0		LIGHT		0		0	0	230.10	AIVIFO
				C SUBT		1962			65416			MISC		0		0	0	-	
				C SUBT		1902		03410	03410	03410		TAL DE		654	116	65416	65416	-	
			IVIIO	0 0001	OTALO		1	U	U	U	10		VI/TIND.	0.02	+10	00410	00410		

PANEL:	LPA																		
VOLTA	SE:	277/480	PHAS	E/WIRE: 3F	P., 4W.		MAIN E	BUS RA	TING:	125A					MAIN CB	TRIP: ML	)		
MOUNT	ING: SUR	FACE					MINIMU	JM BRI	EAKER	INTER	RRUPTI	NG CA	PACITY	′ (RMS	SYM AMP	S): 42000			
DEVICE	:	BRA	NCH CIRCUIT				PHASI	E LOAI	O (VA)				BR	ANCH	CIRCUIT			DE\	/ICE:
AMPS	POLES	DESIGNATION	VO	LT-AMPS		NO.	Φ Δ	фρ	Φ.	NO.		VOLT-	AMPS			ESIGNAT	IONI	POLES	AMPS
TRIP	POLES	DESIGNATION	LTS RCP1	HVAC	MISC	NO.	ФА	ΦВ	ФС	NO.	MISC	HVAC	RCPT	LTS	] 0	ESIGNAT	ION	POLES	TRIP
20	1	CANOPY LIGHTING	2000			1	2109			2				109	STAIF	RWELL LIC	SHTING	1	20
20	1	PLANE LIGHTING	488			3		1134		4				646	CORF	RIDOR LIG	SHTING	1	20
20	1	BOLLARD LIGHTING	374			5			433	6				59	ELE'	VATOR E	Q. 115	1	20
20	1	SITE LIGHTING	2792			7	4728			8				1936	INTE	RIOR LIG	HTING	1	20
20	1	SITE LIGHTING	1640			9		4559		10				2919	INTE	RIOR LIG	HTING	1	20
20	1	EXTERIOR LIGHTING	385			11			494	12				109	STAIF	RWELL LIC	SHTING	1	20
20	1	LTG CONTROL PANEL				13	300			14				300	EXTE	RIOR LIG	HTING	1	20
20	1	EXTERIOR LIGHTING	342			15		3091		16				2749	INTE	RIOR LIG	HTING	1	20
20	1	EXTERIOR LIGHTING	800			17			2034	18				1234	INTE	RIOR LIG	HTING	1	20
20	1	SPARE				19	1499			20				1499	INTE	RIOR LIG	HTING	1	20
20	1	SPARE				21		0		22						SPACE			
20	1	SPARE				23			0	24						SPACE			
20	1	SPARE				25	0			26						SPACE			
20	1	SPARE				27		0		28						SPACE			
20	1	SPARE				29			0	30						SPACE			
20	1	SPARE				31	0			32						SPACE			
20	1	SPARE				33		0		34						SPACE			
20	1	SPARE				35			0	36						SPACE			
20	1	SPARE				37	13541			38			7300	6241					
20	1	SPARE				39		10746		40			7300	3446		LPB		3	80
20	1	SPARE				41			11124	42			5600	5524					
			DIVERSIFI	CATION S	UBTOTA	ALS	TOTAL	PHASE	LOAD	DEM	AND CAL	CULATIO	ONS (NEC	220):	ΦА	ФВ	ФС		JIRED
				(VA)			22177					SEST M			0	0	0	AMP	ACITY
			LIGHTS SU	IBTOTALS	3559	92	14877	12230	8485			RECEP	'T		5316.5	5316.5	4466.5	86.33	AMPS
			RECEPT. SI	JBTOTALS	2020	00	7300	7300	5600			LIGHT	S		18596.25	15287.5	10606.25		
			HVAC SU	BTOTALS	0		0	0	0			MISC			0	0	0		
			MICOCUE		_		_	^	2	_		VI DEV			00040.75	00004	45070.75	1	

				4C 30D		U	,	U	U	U			IVIISC			U	U	U		
			MIS	SC SUBT	OTALS	C	)	0	0	0		TOT	AL DEN	MAND:		23912.75	20604	15072.75		
	.: DP-SB							_												
VOLT		277/480		PHASE	/WIRE: 3P	., 4W.		MAIN E								MAIN CB				
	TING: SUR										INTE	RRUPTI	ING CA		•	SYM AMP	S): 42000			
DEVIC		BRA	ANCH CIR					PHAS	E LOAD	O (VA)					NCH C	CIRCUIT			DE/	/ICE:
AMPS TRIP	POLES	DESIGNATION	LTS	VOL <sup>-</sup>	T-AMPS	MISC	NO.	ФА	ΦВ	ФС	NO.	MISC	VOLT-	-AMPS RCPT	LTS	DI	ESIGNAT	ION	POLES	AMPS TRIP
IIXIF			LIS	RCPT	HVAC 6034	MISC	1	35934	-	-	2	24000	HVAC	5900	LIS					HINE
30	3	VAV 9-1			6034		1		35934		4	24000		5900		r	PP-SB/T-S	SD.	3	300
30	) S	VAV 9-1					3			27424	<u> </u>	24000				r	P-3D/1-3	<b>5</b> D	3	300
					6034 6034		5 7	13534		37434	6 8	7500		7400						
30	3	VAV 9-2			6034		9		13534		10	7500					ELEVATO	)R	3	60
					6034		11			13534	_	7500								
					1600		13	1600			14									
20	3	VAV 9-3			1600		15		1600		16						SPARE		3	100
					1600		17			1600	18									
					1600		19	1600			20						SPACE			
20	3	VAV 9-4			1600		21		1600		22						SPACE			
					1600		23			1600	24						SPACE			
					1834		25	1834			26						SPACE			
20	3	VAV 9-5			1834		27		1834		28						SPACE			
					1834		29			1834	30						SPACE			
					2700		31	2700			32						SPACE			
20	3	VAV 9-6			2700		33		2700		34						SPACE			
					2700		35			2700	36						SPACE			
					20064		37	20064			38						SPACE			
100	3	RTU-9			20064		39		20064		40						SPACE			
					20064		41			20064	42						SPACE			
			DIVE	RSIFICA	ATION SI	JBTOT	ALS	TOTAL	PHASE	LOAD	DEM	IAND CAL	CULATIO	ONS (NEC	220):	ΦА	ФВ	ФС	REQI	JIRED
					(VA)			77266	77266	78766		LARG	SEST M	IOTOR		0	0	0	AMP	ACITY
	<b>*</b> - C□□ INIT	TTRIP TYPE BREAKER	LIGH	ITS SUB	TOTALS	0		0	0	0			RECEP	T		4616.5	4616.5	5366.5	305.45	AMPS
	•• = SHUN	I IRIP ITPE DREAKER	RECE	PT. SUE	BTOTALS	192	00	5900	5900	7400			LIGHT	S		0	0	0		
			HVA	AC SUBT	TOTALS	1195	598	39866	39866	39866			MISC			39375	39375	39375		
			MIS	C SUBT	OTALS	945	00	31500	31500	31500		TOT	AL DEN	//AND:		83857.5	83857.5	84607.5	1	

																		<u> </u>			
				HVA	C SUBT	OTALS	8314	2	27714	27714	27714			MISC			61875	61875	61875		
				MISC	SUBT	OTALS	14850	00	49500	49500	49500		TOTA	L DEM	AND:		89589	89589	89589		
	PANEL:	LPB																			
	VOLTAG		277/480		PHASE	/WIRE: 3F	2 4W.		MAIN	BUS RA	ATING: 1	100A					MAIN CB	TRIP: MLC	)		
		ING: SURF					-,						RRUPTI	NG CA	PACITY	(RMS	SYM AMP		<u> </u>		
	DEVICE	:	BRAN	ICH CIR	CUIT					SE LOAI							CIRCUIT	,		DEV	/ICE:
S	AMPS					T-AMPS					` ,			VOLT-				=======================================	<b></b>		
	TRIP	POLES	DESIGNATION	LTS	RCPT	HVAC	MISC	NO.	ΦΑ	ФВ	ФС	NO.	MISC	HVAC	RCPT	LTS	ן ט	ESIGNATIO	ON	POLES	TRIP
	25	1	ROPES 103	4410				1	4410			2						SPACE			
	20	1	INTERIOR LIGHTING	2604				3		2604		4						SPACE			
	20	1	MISSION CONTROL 105	3448				5			3448	6						SPACE			
	20	1	INTERIOR LIGHTING	993				7	993			8						SPACE			
	20	1	INTERIOR LIGHTING	842				9		842		10						SPACE			
	20	1	INTERIOR LIGHTING	2076				11			2076	12						SPACE			
	20	1	CEILING SYSTEM J-BOX				1992	13	1992			14						SPACE			
	20	1	ASTRO TRNG SIM 119	3308				15		3308		16						SPACE			
	20	1	CEILING SYSTEM J-BOX				1992	17			1992	18						SPACE			
	20	1	WALL SYSTEM	1733				19	1733			20						SPACE			
	20	1	LTG CONTROL PANEL					21		0		22						SPACE			
	20	1	INTERIOR LIGHTING	986				23			986	24						SPACE			
	20	1	LOBBY LIGHTING	554					554			26						SPACE			
	20	1	DRONE FLIGHT 122	1015				27		1015		28						SPACE			
	20	1	INTERIOR LIGHTING	668				29			668	30						SPACE			
	20	1	RESTROOM LIGHTING	150					150			32						SPACE			
	20	1	SPARE					33		0		34						SPACE			
	20	1	SPARE					35			0	36						SPACE			
	20	1	SPARE						7300			38			7300						
	20	1	SPARE					39		7300		40			7300			T-LS/RP-L	S	3	30
	20	1	SPARE					41			5600	42			5600		_	1 -			
				DIVE	RSIFICA	ATION S	UBTOT	ALS		L PHASE		DEM			ONS (NEC	220):	ФА	ФВ	ФС		JIRED
						(VA)			17132	15069	14770		LARG	SEST M	IOTOR		0	0	0	AMP	ACITY

			OI / IOL					71			١	72					017100			
D				DIVE	RSIFICA	ATION SU	JBTOTA	ALS	TOTAL	PHASE	LOAD	DEMA	AND CAL	CULATIONS (	NEC 220):	ΦА	ФВ	ФС	REQU	IRED
Υ						(VA)			77214	77214	77214		LARG	EST MOTO	)R	0	0	0	AMPA	CITY
PS				LIGH	TS SUB	TOTALS	0		0	0	0		F	RECEPT		0	0	0	323.43	AMPS
				RECE	PT. SUE	BTOTALS	0		0	0	0		l	LIGHTS		0	0	0		
				HVA	C SUBT	OTALS	8314	12	27714	27714	27714			MISC		61875	61875	61875		
				MIS	C SUBT	OTALS	1485	00	49500	49500	49500		TOTA	AL DEMAN	D:	89589	89589	89589		
											1								1	
	DANIEL	1.00																		
	PANEL:		077/400		DUAGE	/\/\DE_0E	110/		N 4 A 1 N 1	DI 10 D	A TINIO	4004				NAAINI OF	TDID MI			
	VOLTA		277/480		PHASE	/WIRE: 3P	'., 4VV.				ATING:		DDUDT	INIO OADA	OLTA (DA)		RIP: ML			
		ΓING: SURF			OLUT							INIE	RRUPI	ING CAPAC		IS SYM AMI	PS): 42000			<b>"</b>
<u>:</u>	DEVICE	=:	BRAN	ICH CIR		T 414D0		T	PHAS	E LOA	D (VA)			\/OLT ANA		CIRCUIT			DEV	/ICE:
IPS	AMPS	POLES	DESIGNATION			T-AMPS	1,1100	NO.	ΦА	ФВ	ΦС	NO.		VOLT-AM			DESIGNAT	ION	POLES	AMPS
IP	TRIP		D0DE0 400	LTS	RCPT	HVAC	MISC		-		+ -		MISC	HVAC RC	PT LTS					TRIP
20	25	1 1	ROPES 103	4410				1	4410			2					SPACE			
20	20	1	INTERIOR LIGHTING	2604				3		2604	0.1.15	4					SPACE			
20	20	1 1	MISSION CONTROL 105	3448				5	000		3448	6					SPACE			
20	20	1	INTERIOR LIGHTING	993					993		1	8					SPACE			
20	20	1	INTERIOR LIGHTING	842				9	1	842		10					SPACE			
20	20	1	INTERIOR LIGHTING	2076			125-	11	455-		2076	12					SPACE			
20	20	1	CEILING SYSTEM J-BOX				1992	13	1992	000		14					SPACE			
20	20	1	ASTRO TRNG SIM 119	3308				15		3308		16					SPACE			
20	20	1	CEILING SYSTEM J-BOX				1992	17			1992	18					SPACE			
20	20	1	WALL SYSTEM	1733				19	1733			20					SPACE			
	20	1	LTG CONTROL PANEL					21		0		22					SPACE			
	20	1	INTERIOR LIGHTING	986				23			986	24					SPACE			
	20	1	LOBBY LIGHTING	554					554			26					SPACE			
	20	1	DRONE FLIGHT 122	1015				27		1015		28					SPACE			
	20	1	INTERIOR LIGHTING	668				29			668	30					SPACE			
	20	1	RESTROOM LIGHTING	150					150			32					SPACE			
	20	1	SPARE					33		0		34					SPACE			
	20	1	SPARE					35			0	36					SPACE			
	20	1	SPARE					37	7300			38			00					
30	20	1	SPARE					39		7300		40			00		T-LS/RP-L	_S	3	30
	20	1	SPARE					41			5600	42			00					
D				DIVE	RSIFIC	ATION S	UBTOT	ALS			E LOAD			LCULATIONS			ФВ	ФС		JIRED
Υ						(VA)					14770			GEST MOT	OR	0	0	0		ACITY
PS						STOTALS	227		7840	7769				RECEPT		5316.5	5316.5	4466.5	63.57	AMPS
						BTOTALS	202		7300	7300	5600			LIGHTS		9800	9711.25	8972.5		
						TOTALS	0		0	0	0			MISC		2490	0	2490		
				MIS	C SUBT	OTALS	398	34	1992	0	1992		TOT	AL DEMAN	ID:	17606.5	15027.75	15929		
PS																				
P																				
-																				
00																				
00																				

HYDE ENGINEERING, INC.
1525 Perimeter Parkway
Suite 275
Huntsville, Alabama 35801
(P) 256.270.8013
E-MAIL: MORGAN@HYDE-EGR.COM
PROJECT #
23166.1

SPARE

SPARE

SPARE

SPACE

SPACE SPACE

ENGINEER Morgan B. Reyes

VOLTA	GE:	120/208		PHASE/	WIRE: 3P., 4	4W.		MAIN I	BUS RA	TING:	200A			MAIN CE	TRIP: MLC	)		
TOUNT	ING: SURF	FACE			,							ING CA	PACITY (RM	S SYM AM	PS): 35000			
DEVICE	:	BRAN	CH CIR	CUIT				PHAS	E LOAI	D (VA)			BRANCH	CIRCUIT	,		DEV	/ICE:
AMPS	DOI 50	DECIONATION		VOLT	Γ-AMPS		NO	Φ Δ	ф.р.	Φ.	NO	VOLT-	-AMPS			ON	DOL E0	AMPS
ΓRIP	POLES	DESIGNATION	LTS	RCPT	HVAC M	/ISC	NO.	ΦА	ФВ	ФС	NO. MISC	HVAC	RCPT LTS	_	DESIGNATI	ON	POLES	TRIP
30	2	BARANY CHAIR 133					1	0			2				SPARE		1	20
30		DARANT CHAIR 133					3		0		4				SPARE		1	20
20	1	GANTRY CORRIDOR 200A		400			5			400	6				SPARE		1	20
20	1	SPARE					7	0			8				SPARE		1	20
20	1	SPARE					9		0		10				SPARE		1	20
20	1	SPARE					11			0	12				SPARE		1	20
20	1	SPARE					13	0			14				SPARE		1	20
20	1	SPARE					15		0		16				SPARE		1	20
20	1	SPARE					17			0	18				SPARE		1	20
20	1	SPARE					19	0			20				SPARE		1	20
20	1	SPARE					21		0		22				SPARE		1	20
20	1	5DF 119E		200			23			200	24				SPACE			
20	1	5DF 119E		200				200			26				SPACE			
20	1	5DF 119E		200			27		200		28				SPACE			
20	1	MULTI AXIS 119E		200			29			200	30				SPACE			
20	1	MULTI AXIS 119E		200				200			32				SPACE			
20	1	MULTI AXIS 119E		200			33		200		34				SPACE			
20	1	250 KVA GENERATOR		500			35			500	36				SPACE			
20	1	250 KVA GENERATOR		500				500			38				SPACE			
20	1	75 KVA GENERATOR		500			39		500		40				SPACE			
20	1	75 KVA GENERATOR		500			41			500	42				SPACE			
			DIVE	RSIFICA	ATION SUB	STOTA	ALS		PHASE				ONS (NEC 220):	<b>T</b> · ·	ФВ	ФС		JIRED
					(VA)			900	900	1800	LAR	GEST M		0	0	0		ACITY
					TOTALS	0		0	0	0		RECEP		900	900	1800	15 A	MPS
					BTOTALS	360	0	900	900	1800		LIGHT		0	0	0		
					OTALS	0		0	0	0		MISC		0	0	0		
			MISC	C SUBT	OTALS	0		0	0	0	TOT	AL DEN	//AND:	900	900	1800		

V	OLTAG	SE:	120/208	Р	HASE/V	VIRE: 3	P., 4W		MAIN E	BUS RA	TING: 6	30A					MAIN CE	3 TRIP: 50 <i>A</i>	A MB		
Ν	10UNT	ING: SURF	ACE						MINIM	JM BRI	EAKER	INTER	RRUPTI	ING CAF	ACITY	(RMS	SYM AM	PS): 35000			
D	EVICE	:	BRANG	CH CIRC	UIT				PHAS	E LOA	O (VA)				BRA	NCH (	CIRCUIT			DE/	VICE:
	MPS	POLES	DESIGNATION		VOLT-	AMPS		NO.	ФА	ФВ	ФС	NO.		VOLT-	MPS			DESIGNAT	ION	POLES	AMPS
T	RIP	1 OLLO	DEGIGITATION	LTS	RCPT	HVAC	MISC	140.		ΨΒ	Ψ	110.	MISC	HVAC	RCPT	LTS		JE01014711	1011	1 OLLO	TRIP
	30	2	PARACHUTE SIM 132		2200			1				2						SPARE		1	20
			TAINGHOTE GIW 132		2200			3		2200		4						SPARE		1	20
	30	2	PARACHUTE SIM 132		2200			5			2200	6						SPARE		1	20
			1711 VIOLIGIE GIWI 102		2200			7	2200			8						SPARE		1	20
	30	2	PARACHUTE SIM 132		2200			9		2200		10						SPARE		1	20
	30	2	TAINCHOTE SIM 132		2200			11			2200	12						SPARE		1	20
	30	2	PARACHUTE SIM 132		2200			13	2200			14						SPACE			
			TAINGHOTE GIW 132		2200			15		2200		16						SPACE			
	20	1	1/6 G 119E		200			17			200	18						SPACE			
	20	1	1/6 G 119E		200				200			20						SPACE			
	20	1	1/6 G 119E		200			21		200		22						SPACE			
	20	1	FACP		500			23			500	24						SPACE			
	20	1	FA NAC		500				500			26						SPACE			
	20	2	SPARE					27		0		28						SPACE			
		_	OI / II C					29			0	30						SPACE			
						SIFICA				PHASE		DEM		.CULATIO	,	220):	ΦА	ФВ	ФС		UIRED
						OTALS	<u> </u>		7300	6800	5100			SEST MO			0	0	0		ACITY
					S SUBT				0	0	0			RECEP1			5316.5	5066.5	4216.5	44.31	AMPS
			R	ECEPTA			LS192	00	7300	6800	5100			LIGHTS			0	0	0		
					SUBTO		0		0	0	0			MISC			0	0	0		
				MISC	SUBTO	TALS	0		0	0	0		TOT	AL DEM	AND:		5316.5	5066.5	4216.5		

Number   Substitute   Substit	PANEL:	RP-SB2															
DEF   POLES	VOLTAC	SE:	120/208	PHASE/WIRE: 3	3P., 4W.	MAIN	BUS RA	ATING:	200A				MAIN CE	B TRIP: ML	)		
Part	MOUNT	ING: SURF	FACE			MINIM	IUM BR	EAKER	INTER	RRUPTI	ING CAP	ACITY (RM	IS SYM AM	PS): 35000			
POLES   DESIGNATION   POLES   STATE	DEVICE		BRANC	CH CIRCUIT		PHAS	SE LOA	D (VA)					H CIRCUIT			DEV	ICE:
	AMPS	POLES	DESIGNATION	VOLT-AMPS	NO.	Φ Δ	ДΒ	Ф.С	NO		VOLT-A	MPS		DESIGNAT	ION	POLES	
1	TRIP	1 OLLO			MISC 110.	<b>T</b>	ΨΒ	Ψζ	140.	MISC			3			1 OLLO	TRIP
1	20	1			1	800										1	
20	20	1	MISSION CONTROL 105		3		600							MOCR (B)	108	1	
1	20	1						600						. ,		1	
20 1 1 MISSION CONTROL 105	20	1			7	600										1	
1	20	1	MISSION CONTROL 105	400	9		600					200		MOCR (B)	108	1	20
20 1 MISSION CONTROL 105 200 157 400 18 200 MOCR (B) 108 1 20 1 MOCR (A) 108 200 177 400 18 200 MOCR (B) 108 1 20 20 1 MISSION CONTROL 105 200 177 400 18 200 MOCR (B) 108 1 20 20 1 MOCR (A) 108 400 22 1 MOCR (A) 108 600 22 1 MOCR (A) 108 200 25 200 26 SPARE 1 20 20 20 1 MOCR (A) 108 200 27 200 28 SPARE 1 20 20 20 1 MOCR (A) 108 200 27 2 200 28 SPARE 1 20 20 20 1 MOCR (A) 108 200 27 2 20 20 30 SPARE 1 20 20 20 1 MOCR (A) 108 200 27 2 20 20 30 SPARE 1 20 20 20 1 MOCR (A) 108 200 31 200 30 SPARE 1 20 20 20 1 MOCR (A) 108 200 31 200 30 SPARE 1 20 20 20 1 MOCR (A) 108 200 31 200 32 SPARE 1 20 20 20 1 MOCR (A) 108 200 33 200 34 SPARE 1 20 20 20 1 MOCR (A) 108 200 33 200 34 SPARE 1 20 20 20 1 MOCR (A) 108 200 37 20 38 SPARE 1 20 20 20 1 MOCR (A) 108 200 37 20 38 SPARE 1 20 20 20 1 MOCR (A) 108 200 37 20 38 SPARE 1 20 20 20 1 MOCR (A) 108 200 37 20 38 SPARE 1 20 20 20 1 MOCR (A) 108 200 37 20 38 SPARE 1 20 20 20 1 MOCR (A) 108 200 37 20 38 SPARE 1 20 20 20 1 MOCR (B) 108 200 37 20 38 SPARE 1 20 20 20 1 MOCR (B) 108 200 37 20 38 SPARE 1 20 20 20 1 MOCR (B) 108 200 37 20 38 SPARE 1 20 20 20 1 MOCR (B) 108 200 37 20 38 SPARE 1 20 20 20 1 MOCR (B) 108 200 37 20 38 SPARE 1 20 20 20 1 MOCR (B) 108 200 37 20 38 SPARE 1 20 20 20 1 MOCR (B) 108 200 37 20 38 SPARE 1 20 20 20 38 SPARE 1 20 20 38 SPARE 1 20 20 20 38 SPARE 1 20 20 38 SPARE	20	1	MISSION CONTROL 105	400				600						MOCR (B)	108	1	20
20 1 MISSION CONTROL 105 200 17	20	1			13	400										1	
1	20	1					400					200		MOCR (B)	108	1	
1	20	1						400				200		. ,	108	1	20
1	20	1	MISSION CONTROL 105	200	19	200								SPARE		1	20
1	20	1					400									1	
1	20	1	MOCR (A) 106	600	23			600	24					SPARE		1	20
1	20	1				200										1	
1	20	1	MOCR (A) 106	200	27		200		28					SPARE		1	20
1	20	1	MOCR (A) 106	200	29			200	30					SPARE		1	20
1	20	1	MOCR (A) 106	200	31	200			32					SPARE		1	20
MOCR (A) 106	20	1	MOCR (A) 106	200	33		200		34					SPARE		1	20
MOCR (A) 106	20	1	MOCR (A) 106	200	35			200	36					SPARE		1	20
1	20	1	MOCR (A) 106	200	37	200			38					SPARE		1	20
20 1 MISSION CONTROL 105	20	1	MOCR (A) 106	200	39		200		40					SPARE		1	20
1	20	1	MOCR (B) 108	600	41			600	42					SPARE		1	20
1	20	1	MISSION CONTROL 105	200	43	1200			44			1000	S	TAR CURT	AINS	1	20
1	20	1	MISSION CONTROL 105	200	45		1200		46			1000	S	TAR CURT	AINS	1	20
1	20	1	MISSION CONTROL 105	200	47			1200	48			1000	S	TAR CURT	AINS	1	20
20	20	1	MISSION CONTROL 105	200	49	1200			50			1000	S	TAR CURT	AINS	1	20
The color of the	20	1	MISSION CONTROL 105	200	51		1200		52			1000	S	TAR CURT	AINS	1	20
1	20	1	AIR LOCK 107	600	53			1600	54			1000	S	TAR CURT	AINS	1	20
SPACE   SPAC	20	1	ELECTRICAL 110	200	55	200			56					SPACE			
SPARE	20	1	SPARE		57		0		58					SPACE			
1	20	1	SPARE		59			0	60					SPACE			
1	20	1	SPARE		61		0		62					SPACE			
1	20	1	SPARE		63			0	64					SPACE			
1	20	1	SPARE		65		0		66					SPACE			
1	20	1	SPARE		67			0	68					SPACE			
20	20	1	SPARE		69		0		70					SPACE			
1	20	1	SPARE		71			0	72					SPACE			
1	20	1	SPARE		73		0		74					SPACE			
1	20	1						0	76								
1	20	1					0										
1   SPARE     81   0   82     SPACE	20	-					-	0									
1   SPARE     83   0   84     SPACE	20	-					0										
ONE SINGLE SECTION    DIVERSIFICATION   SUBTOTALS   TOTAL PHASE LOAD   DEMAND CALCULATIONS (NEC 220):   ① A		-						0									
ONE SINGLE SECTION (VA) 5200 5000 6000 LARGEST MOTOR 0 0 AMPACITY  LTS SUBTOTALS 0 0 0 0 RECEPT 4266.5 4166.5 4666.5 38.89 AMPS  RCPT SUBTOTALS 9000 5200 5000 6000 LIGHTS 0 0 0  HVAC SUBTOTALS 0 0 0 0 MISC 0 0		ı	OI AIL	DIVEDOITIOATION		TOTAL	□□∧сг				CUIL ATION	IS (NEC 220):				DEC:	
ONE SINGLE SECTION  LTS SUBTOTALS 0 0 0 0 RECEPT 4266.5 4166.5 4666.5 38.89 AMPS  RCPT SUBTOTALS 9000 5200 5000 6000 LIGHTS 0 0 0  HVAC SUBTOTALS 0 0 0 0 MISC 0 0				l .	SUBTUTALS				DEIVI.				• • •				
RCPT SUBTOTALS   9000   5200   5000   6000   LIGHTS   0   0   0				, ,	^	_							_				
HVAC SUBTOTALS 0 0 0 0 MISC 0 0 0		ONE	SINGLE SECTION													38.89	AMPS
																_	
MISC SUBTOTALS 0 0 0 TOTAL DEMAND: 4266.5 4166.5 4666.5				MISC SUBTOTALS	0	0	0	0		TOT	AL DEMA	AND:	4266.5	4166.5	4666.5		

104 Jefferson St. S. Suite 200, Huntsville, AL 35801 p.o.c. Kristine Harding kharding@kpsgroup.com

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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.



SSUE DATE: FEBRUARY 5, 2024 REVISIONS No. Description

PANEL SCHEDULES

PROJECT NUMBER 225029-00

HYDE ENGINEERING, INC.
1525 Perimeter Parkway
Suite 275
Huntsville, Alabama 35801
(P) 256.270.8013
E-MAIL: MORGAN@HYDE-EGR.COM
PROJECT #
23166.1

PANEL: PPA

30 3

MOUNTING: SURFACE

POLES

120/208

DESIGNATION

ELECTRIC WALL HEATER

EWH-1

RCP-1

**SPACE** 

SPACE

**SPACE** 

**SPACE** 

SPACE

SPACE

SPACE

SPACE

SPACE

SPACE

SPACE

SPACE

**SPACE** 

SPACE

VOLTAGE:

DEVICE:

AMPS

TRIP

Morgan B. Reyes

CHECKED BY:

**EQUIPMENT SCHEDULE** 

PANEL

FEEDER

REMARKS

ELECTRICAL CHARACTERISTICS
VOLT/PHASE | KW | HP | FLA

DESCRIPTION

		FLECTRICAL		TEDIO	TICC		DICCONNI	TOT CIA/		
MARK	DESCRIPTION	ELECTRICAL C	KW	HP	FLA	PANEL	DISCONNI	FUSE	FEEDER	REMARK
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,
EWH 1	ELECTRIC WATER HEATER	208/3	3		8.3	PPA	30	30	30DG	1.2.4.
EWH 2	ELECTRIC WATER HEATER	208/3	3		8.3	RPD	30	30	30DG	1.2.4.
EWH 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	MOTOR RATED SWITCH		20SG	1.2.4.
RCP 2	CIRCULATING PUMP	120/1	0.075		0.38	RPD	MOTOR RATED SWITCH		20SG	1.2.4.
RCP 3	CIRCULATING PUMP	120/1	0.075		0.49	RPB	MOTOR RATED SWITCH		20SG	1.2.4.

1. VERIFY NAMEPLATE DATA PRIOR TO ROUGH-IN.

3. ALL OUTDOOR EQUIPMENT TO BE NEMA 3R.

4. FUSE TO BE DUAL ELEMENT TYPE.

2. PROVIDE REQUIRED WORKING CLEARANCE FOR ALL DISCONNECTS.

5. I	NDOOR UNI	TS ARE POWERED BY OUTDO	OR UNITS	S. COOR	DINATE	WITH M	1ECHA	ANICAL (	CONTRA	ACTOR.									
PANEL:	DDA																		
VOLTA		120/208		HASE/V	VIRE: 3	P 4W/		ΜΔΙΝΙ	RIIS RA	ATING:	200Δ				MAIN CE	B TRIP: ML	$\cap$		
	ING: SURF		<u> </u>	I IAOL/V	VIIXE. 3	) ., <del>4</del> v v	•					RRI IPTI	ING CAPACIT	V (RMS					
DEVICE			CH CIRC	IIIT					SE LOAI			KIKOI II		•	CIRCUIT	1 <i>0)</i> . 33000	J	DE	VICE:
AMPS		DIVAN			-AMPS			TTIAC					VOLT-AMPS					— <u>D</u> L	AMP
TRIP	POLES	DESIGNATION	LTS	RCPT	HVAC	MISC	NO.	ФА	ФВ	ФС	NO.	MISC	HVAC RCPT		- [	DESIGNAT	ΓΙΟΝ	POLES	TRIP
20	1	STORAGE 120		800			1	1200			2		400		AS	STRO TRN	IG 119	1	20
20	1	CORRIDOR 135		1200			3		1600		4		400		AS	STRO TRN	IG 119	1	20
20	1	CORRIDOR 135		1200			5			1400	6		200		AS	STRO TRN	IG 119	1	20
20	1	EWC		200			7	600			8		400		AS	STRO TRN	IG 119	1	20
20	1	EWC		200			9		400		10		200		AS	STRO TRN	IG 119	1	20
20	1	EWC		200			11			1200	12	1000			MIF	RROR LIG	HTING	1	20
20	1	EWC		200			13	1200			14	1000			MIF	RROR LIG	HTING	1	20
20	1	DRONE FLIGHT 122		600			15		600		16				JBC	OX RESTF	ROOMS	1	20
20	1	DRONE FLIGHT 122		800			17			800	18				JBC	OX RESTF	ROOMS	1	20
20	1	NIGHT VS VR		600			19	1200			20		600		PAR	ACHUTE	SIM 132	1	20
20	1	NIGHT VS VR		800			21		1600		22		800		PAR	ACHUTE	SIM 132	1	20
20	1	MECH 126		400			23			1200	24		800		EXT	ERIOR R	ECEPT.	1	20
20	1	CORRIDORS		800			25	800			26					SPARE		1	20
20	1	GFI RECEPT.		1000			27		1000		28					SPARE		1	20
20	1	SERVICE SPACE 134		600			29			600	30					SPARE		1	20
20	1	SERVICE SPACE 134		400			31	400			32					SPARE	<u> </u>	1	20
20	1	BARANY CHAIR 133		600			33		600		34					SPARE		1	20
20	1	BARANY CHAIR 133		600			35			600	36					SPARE		1	20
20	1	BARANY CHAIR 133		800			37	800			38					SPARE	<u> </u>	1	20
20	1	LOBBY 101		400			39		400		40					SPARE		1	20
20	1	LOBBY 101		400			41			400	42					SPARE		1	20
20	1	VALVE 121		200			43	200			44					SPARE		1	20
		SPACE					45		0		46					SPARE		1	20
		SPACE					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	<u> </u>	1	20
		SPACE					59			0	60					SPARE		1	20
				SUBT	SIFICA	(VA)		6400	6200	6200		LARG	CULATIONS (NI		Φ A 0	ФВ 0	ΦC	AMP	UIRED PACITY
	ONES	SINGLE SECTION -		S SUBT				0	0	0			RECEPT		4366.5	4766.5	4266.5	46.81	1 AMPS
	ONES	F	RECEPTA					5400	6200	5200			LIGHTS		0	0	0	_	
				SUBTO	JIALS	0	1	0	0	0			MISC		1250	0	1250	_	

| MISC SUBTOTALS | 0 | 1000 | 0 | 1000 |

| MISC SUBTOTALS | 3200 | 2000 | 2440 | 1200 |

/OLTA	GE:	120/208	PHASE/\	VIRE: 3	3P., 4W		MAIN	BUS RA	ATING:	200A				MAIN CB	TRIP: ML	<b>O</b>		
MOUNT	ING: SUR	FACE					MINIM	UM BR	EAKER	INTER	RRUPT	ING CA	PACITY (RM	S SYM AMF	PS): 35000			
DEVICE	:	BRAN	CH CIRCUIT				PHAS	E LOAI	D (VA)				BRANCH	CIRCUIT			DEV	/ICE:
AMPS TRIP	POLES	DESIGNATION	LTS RCPT	-AMPS HVAC	MISC	NO.	ΦА	ФВ	ФС	NO.	MISC	VOLT-	AMPS RCPT LTS		ESIGNAT	ION	POLES	AMPS TRIP
20	1	EF-1		28		1	828			2			800	С	ORRIDOR	102	1	20
20	1	EF-2		21		3		621		4			600	EXT	ERIOR RE	CEPT.	1	20
20	1	CORRIDOR 102	1200			5			1800	6			600	EXT	ERIOR RE	CEPT.	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	FIB	ER SWITC	H 113	1	20
20	1	ROPES 103	400			21		800		22			400	FIB	ER SWITC	H 113	1	20
20	1	ROPES 103	400			23			800	24			400		GFI RECEI		1	20
20	1	SIM PREP 112	600			25	800			26			200	ELE	VATOR E	Q. 115	1	20
20	1	TECH WORK 111	400			27		1200		28			800		CH WORK		1	20
20	1	TECH WORK 111	400			29			1000	30			600		CH WORK		1	20
20	1	MIRROR LIGHTING			1000	31	1600			32			600		CH WORK		1	20
20	1	ESP-1			1440	33		2040		34			600	TE	CH WORK	< 111	1	20
20	1	RCP-2			200	35			200	36					SPARE		1	20
					1000	37	1000			38					SPARE		1	20
30	3	EWH-2			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
			DIVER	SIFICA	TION		TOTAL	_ PHASE			AND CAI	LCULATIO	DNS (NEC 220):	ФА	ФВ	ФС	REQU	
				OTALS			7428	6661		1		GEST M		0	0	0	AMP	
			LIGHTS SUBT	OTALS	0		0	0	0			RECEP	T	4366.5	3766.5	4066.5	57.46	AMPS
	ONE	SINGLE SECTION R	RECEPTACLE SU	JBTOT/	ALS 60	0	5400	4200	4800			LIGHTS		0	0	0		
			HVAC SUBTO		0		28	21	0			MISC		2500	3050	1500		
			1.00001						1000					10001 -	2007 7	=====	$\dashv$	

VOLTA		120/208	P	PHASE/\	NIRE: 3	P., 4W.				ATING: 2						TRIP: MLC	)		
	ING: SURF							MINIM	UM BR	EAKER	INTERRUP	TING CA				PS): 35000			
DEVICE	:	BRAN	ICH CIRC					PHAS	E LOA	D (VA)				ANCH (	CIRCUIT			DE\	VICE:
AMPS TRIP	POLES	DESIGNATION	LTS	VOLT RCPT	-AMPS HVAC	MISC	NO.	ФА	ФВ	ФС	NO. MISC		-AMPS RCPT	LTS	- [	DESIGNATI	ON	POLES	AM TRI
40	2	DSO-2			2080		1	2480			2		400		OF	EN OFFICE	E 210	1	2
40		DSO-2			2080		3		2480		4		400		OF	EN OFFICE	E 210	1	2
40	2	DSO-5			2080		5			2480	6		400		OF	EN OFFICE	E 210	1	2
40					2080		7	2480			8		400		OF	EN OFFICE	E 210	1	2
20	1	EF-3			21		9		421		10		400		OF	EN OFFICE	E 210	1	2
20	1	EF-4			21		11			421	12		400			EN OFFICE		1	:
20	1	MIRROR LIGHTING				1000	13	1400			14		400			EN OFFICE		1	
20	1	CORRIDOR 208		1200			15		1400		16		200			USTODIAN		1	1
20	1	CORRIDOR 208		1000			17			1200	18		200			CHENETTI		1	1
20	1	CLASSROOM 222		1200			19	1400			20		200			CHENETTI		1	1
20	1	CONFERENCE 221		1200			21		1400		22		200			CHENETTI		1	2
20	1	CONFERENCE 221		800			23			1200	24		400			CHENETTI		1	2
20	1	OPEN OFFICE 210		400			25	1200			26		800		R	OOF RECE	PT.	1	1
20	1	ELECT. 211		200			27		600		28		400		OF	EN OFFICE	E 210	1	2
20	1	RECEPT.		1000			29			1400	30		400		OF	EN OFFICE	E 210	1	2
20	1	GFI RECEPT		400			31	400			32					SPARE		1	:
20	1	EWC		200			33		200		34					SPARE		1	1
20	1	EWC		200			35			200	36					SPARE		1	1
20	1	COPY 216		400			37	400			38					SPARE		1	1
20	1	COPY 216		200			39		200		40					SPARE		1	:
20	1	OFFICE 213/214		1200			41			1200	42					SPARE		1	:
20	1	OFFICE 215		600			43	600			44					SPARE		1	2
					0.2		45		0.2		46					SPARE		1	2
20	3	EF-5			0.2		47			0.2	48					SPARE		1	2
					0.2		49	0.2			50					SPARE		1	2
						2000	51		2000		52					SPARE		1	2
60	3	EWH-3				2000	53			2000	54					SPARE		1	2
						2000	55	2000			56					SPARE		1	2
20	1	RCP-3				200	57		200		58					SPARE		1	:
		SPACE					59			0	60					SPARE		1	
		SPACE					61		0		62					SPACE			
		SPACE					63			0	64					SPACE			
		SPACE					65		0		66					SPACE			
		SPACE					67			0	68					SPACE			
		SPACE					69		0		70					SPACE			
		SPACE					71			0	72					SPACE			
		SPACE					73		0		74					SPACE			
		SPACE					75			0	76					SPACE			
		SPACE					77		0		78					SPACE			
		SPACE					79			0	80					SPACE		1	
		SPACE					81		0		82					SPACE			
		SPACE					83		1	0	84					SPACE			
		OI /\OL	הוער ריים - הו		TION! 1			TOTAL	DHVC				ONS (NE	) )	Φ 4		Φ.	DEO	
			DIVER	RSIFICA		PORIO	IALS				DEMAND CA			J 22U):	ФА	ФВ	ФС	REQI AMP	
				0 01 15-	(VA)					10101.2	LAR	GEST M			0	0	0		
	ONE S	INGLE SECTION		S SUBT				0	0	0		RECEF			4266.5	3966.5	4666.5	101.48	3 AM
				SUBTO		260		5200	4600 2101.2			LIGHT			0	0	2500	4	
					~=										3750	2750		1	

			IVIIOC	, 30010	JIALO	0200	3000	2200	2000		101	AL DLI	VIAIND.		12170.7	0017.7	32	01.1		
PANEL:																				
/OLTA	GE:	120/208	Р	PHASE/\	WIRE: 3	P., 4W.	MAIN	BUS RA	TING: 2	200A					MAIN CB	TRIP: ML	LO			
MOUNT	ING: SURF	FACE					MINIM	1UM BRE	EAKER	INTE	RRUPT	NG CA	PACITY	′ (RMS	SYM AMF	PS): 3500	0			
DEVICE	:	BRAN	NCH CIRC	UIT			PHAS	SE LOAD	) (VA)				BR	ANCH	CIRCUIT				DEV	/ICE:
AMPS	POLES	DESIGNATION		VOLT-	-AMPS	NO.	Φ Δ	Фр	Φ.	NO.		VOLT-	AMPS			ESIGNA	TION		POLES	AMPS
TRIP	POLES	DESIGNATION	LTS	RCPT	HVAC	MISC INC.	ФА	ФВ	ФС	NO.	MISC	HVAC	RCPT	LTS	]	ESIGNA	HON		POLES	TRIP
40	2	DSO-1			2080	1	2680			2			600			MOCR 2	205		1	20
40		D3O-1			2080	3		2480		4			400			IT 204	1		1	20
40	2	DSO 3			2080	5			2480	6			400			IT 204	1		1	20
40	2	DSO-3			2080	7	2280			8			200			EWC			1	20
40	2	DSO-4			2080	9		2280		10			200			EWC			1	20
40	2	DSO-4			2080	11			2480	12			400		O,	VERLOO	K 203		1	20
20	1	CORRIDOR 200		1200		13	1400			14			200		O,	VERLOO	K 203		1	20
20	1	CORRIDOR 200		800		15		1000		16			200		O,	VERLOO	K 203		1	20
20	1	GFI RECEPT.		400		17			600	18			200		O'	VERLOO	K 203		1	20
20	1	MOCR 205		800		19	1000			20			200		O,	VERLOO	K 203		1	20
20	1	MOCR 205		800		21		1000		22			200		O,	VERLOO	K 203		1	20
20	1	MOCR 205		200		23			800	24			600		OP	EN OFFI	CE 206	<u> </u>	1	20
20	1	MOCR 205		200		25	1000			26			800		C	ORRIDO	R 200		1	20
20	1	MOCR 205		200		27		1700		28	1500					SIGNAC	3E		1	20
20	1	MOCR 205		200		29			1700	30	1500					SIGNAC	GE		1	20
20	1	MOCR 205		200		31	1700			32	1500					SIGNAC	3E		1	20
20	1	MOCR 205		200		33		1700		34	1500					SIGNAC	GE		1	20
20	1	MOCR 205		200		35			1781	36		1581				D00 (			_	20
20	1	MOCR 205		200		37	1781			38		1581				DSO-6	0		2	30
20	1	MOCR 205		200		39		1781		40		1581				DCO 7	7		2	20
20	1	MOCR 205		200		41			1781	42		1581				DSO-7	1		2	30
20	1	OPEN OFFICE 206		600		43	1400			44			800		R	OOF REC	CEPT.		1	20
20	1	OPEN OFFICE 206		800		45		800		46						SPARE	E		1	20
20	1	OPEN OFFICE 206		600		47			600	48						SPARE	E		1	20
		SPACE				49	0			50						SPARE	E		1	20
		SPACE				51		0		52						SPARE	E		1	20
		SPACE				53			0	54						SPARE	Ε		1	20
		SPACE				55	0			56						SPARE	E		1	20
		SPACE				57		0		58						SPARE	E		1	20
		SPACE				59			0	60						SPARE	E		1	20
				DIVER	SIFICA		TOTA	L PHASE			AND CAL	.CULATIO	DNS (NEC	220):	ФА	ФВ		ФС	REQU	JIRED
					OTALS			12741			LARG	SEST M	OTOR		0	0	0			ACITY
			LTS	SUBTO	TALS	0	0	0	0			RECEP	Т		4666.5	3666.5	336	36.5	109.65	AMPS
	ONE	SINGLE SECTION	DODT	OUDT	O T A L O	0000	2000	4000	0.400			LIGUE			1					

LIGHTS

MISC

TOTAL DEMAND:

1875 3750

12282.5 | 13157.5 | 12563.5

1875

| RCPT. SUBTOTALS | 3600 | 6000 | 4000 | 3400

HVAC SUBTOTALS 6324 5741 5741 7322

| MISC SUBTOTALS | 0 | 1500 | 3000 | 1500 |

104 Jefferson St. S. Suite 200, Huntsville, AL 35801 p.o.c. Kristine Harding kharding@kpsgroup.com

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# ACILIT **NING** 4 MOIL INSPIRA

SRC

ROJECT STATUS: FOR CONSTRUCTION SSUED: SSUE DATE: FEBRUARY 5, 2024 REVISIONS No. Description

DRAWING TITLE PANEL SCHEDULES 208V AND EQUIPMENT SCHEDULES

CHECKED BY:

PROJECT NUMBER 225029-00

HYDE ENGINEERING, INC. 1525 Perimeter Parkway Suite 275 Huntsville, Alabama 35801 (P) 256.270.8013 E-MAIL: MORGAN@HYDE-EGR.COM PROJECT# 23166.1

6894.5 6837.5 5566.5

TOTAL DEMAND:

TOTAL DEMAND:

5616.5 4766.5 5516.5

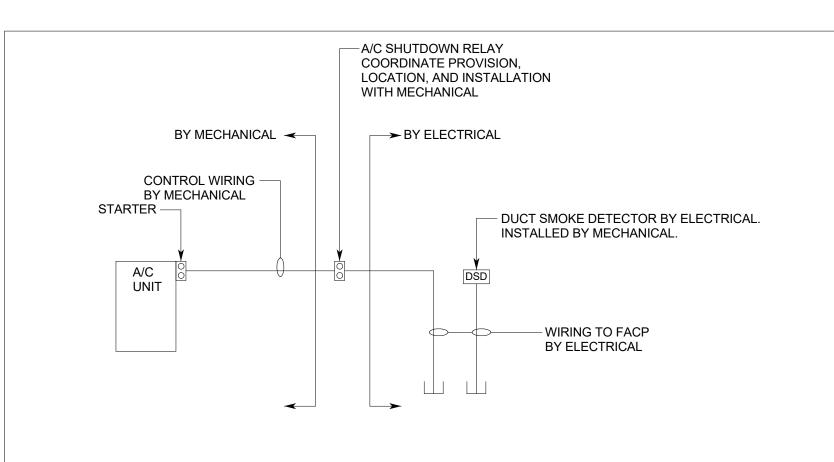
ONE SINGLE SECTION

ENGINEER Morgan B. Reyes

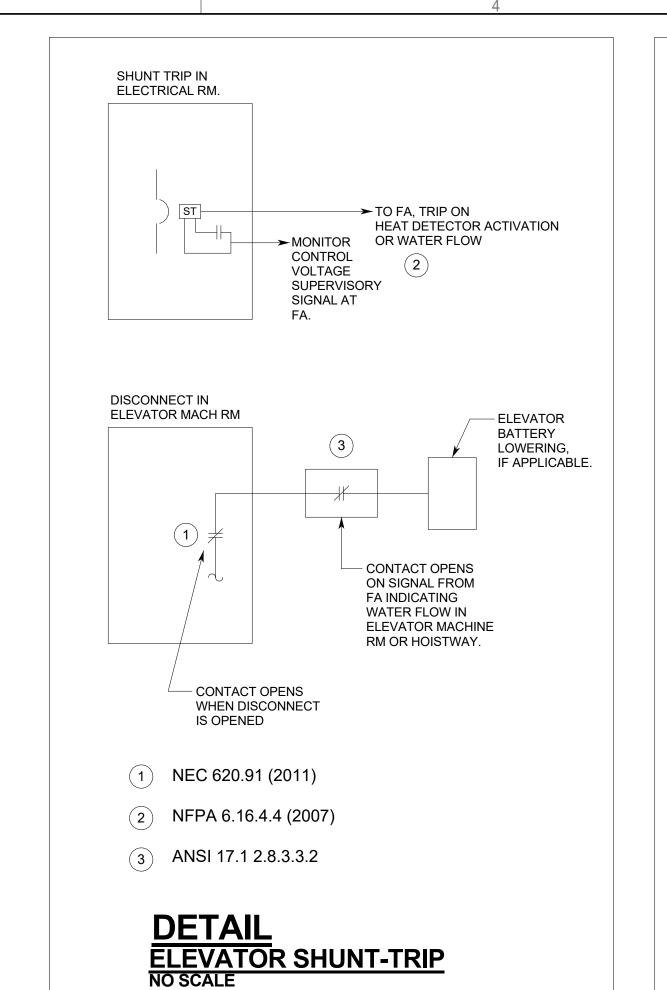
#### **DETAIL** ELEVATOR ELECTRICAL REQUIREMENTS NO SCALE

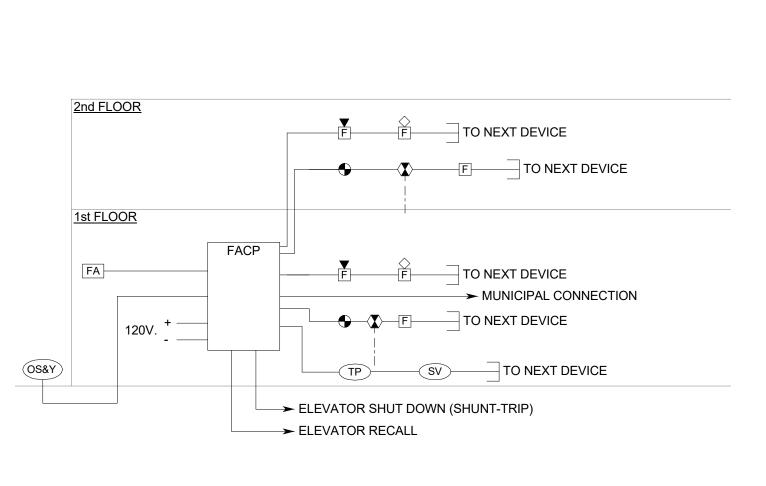
#### **KEYNOTES:**

- WEATHERPROOF GFCI RECEPTACLE ON DEDICATED [STANDBY] CIRCUIT, LED WET LOCATION LENSED STRIPLIGHTS CONTROLLED BY SPST\_SWITCH. PROVIDE FIXTURES TO ACHIEVE A MINIMUM OF 10FC IN PIT. TYPICAL AT TOP AND BOTTOM OF HOISTWAY.
- LOBBY SMOKE DETECTOR AT ALL LEVELS, LOBBY, AND EQUIPMENT ROOM SMOKE DETECTORS SHALL INITIATE RECALL
- 135 DEG HEAT DETECTOR ALL HEAT DETECTORS TO AUTOMATICALLY DISCONNECT POWER TO ELEVATOR PRIOR TO THE APPLICATION OF WATER, LOCATE HEAT DETECTOR ADJACENT TO EACH SPRINKLER HEAD.
- 4 SMOKE DETECTOR FOR FULL COVERAGE PER NFPA, DETECTORS SHALL INITIATE RECALL
- PROVIDE LED STRIPLIGHTS WITH WIREGUARD WITHIN MACHINE AND CONTROL ROOMS, PROVIDE FIXTURES TO ACHIEVE A MINIMUM OF 19FC IN ROOM OR CLOSET. COORDINATE LOCATION OF STRIPLIGHTS WITH ELEVATOR EQUIPMENT.
- PROVIDE ADDITIONAL FIXTURES OUTSIDE OF CLOSET AS NEEDED TO ACHIEVE 19FC AT FRONT OF CONTROLLER. MATCH FIXTURES TYPICAL OF THIS SPACE.
- PROVIDE SMOKE DETECTOR FOR SMOKE RELIEF DAMPER OR RELIEF HATCH. HATCH TO RELEASE ON SHAFT DETECTOR ALARM IF REQUIRED.
- PROVIDE ADDITIONAL FIXTURES AT ELEVATOR LOBBY AS NEEDED TO ACHIEVE 10FC AT THE ELEVATOR SILL.



## **DUCT SMOKE DETECTOR CONNECTION DETAIL**





# **RISER DIAGRAM**

#### NOTES:

PROVIDE WIRING IN CONDUIT.

AUTHORITIES.

RECALL SYSTEM.

ALARM SYSTEM.

DEVICES AS REQUIRED BY CODE AND LOCAL

4. COORDINATE LOCATIONS AND

6. PROVIDE INTERFACE TO ELEVATOR

7. PROVIDE VOICE EVAC SYSTEM.

8. PROVIDE ADDRESSABLE SYSTEM.

FLOW SWITCHES AND OS&Y VALVE. SEE

CIVIL/PLUMBING PLANS FOR LOCATIONS

11. IF NOT SHOWN ON FLOOR PLANS

BREAKER SHALL BE RED IN COLOR AND

12. PROVIDE TERMINAL CABINETS, NAC

PANELS AS REQUIRED PER PROPOSED FIRE

LABELED AS "FIRE ALARM CIRCUIT".

PROVIDE 120V. CIRCUIT FOR FACP POWER.

10. PROVIDE FOR 15% GROWTH.

9. PROVIDE CONNECTION FOR TAMPER &

WITH HVAC/CONTROLS VENDOR.

ACTIVATION OF SPRINKLERS.

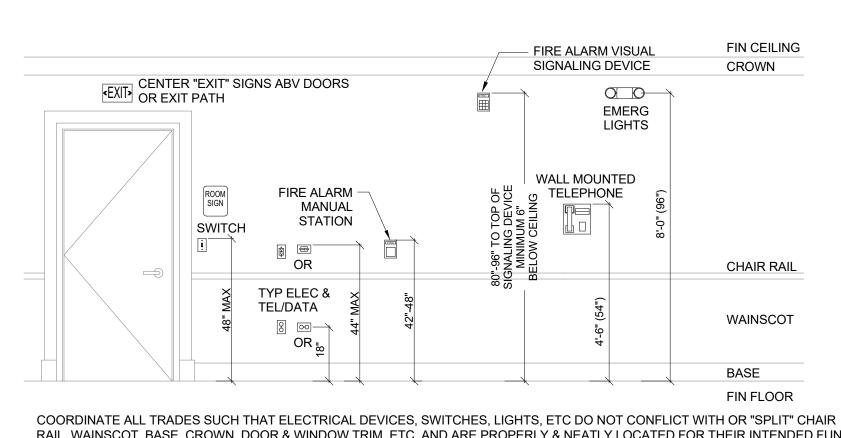
- POWER TO NAC PANELS FROM FLOOR RECEPTACLE 2. SEE FLOOR PLAN FOR LOCATION AND PANEL (AS REQUIRED). QUANTITY OF DEVICES.
- 15. PROVIDE REMOTE STATUS & TEST LOCATION 3. FIRE ALARM SYSTEM LAYOUT IS FOR DEVICES NOT READILY VISIBLE OR ACCESSIBLE. DIAGRAMMATIC ONLY. PROVIDE ADDITIONAL
  - 16. INTERFACE TO SECURITY SYSTEM, PROVIDE DRY CONTACT CLOSURE. PROVIDE CABLING IN CONDUIT.

14. IF NOT SHOWN ON FLOOR PLAN, PROVIDE

13. PROVIDE WALK TEST SYSTEM.

- CONNECTIONS OF HVAC SHUTDOWN RELAYS 17. ON ALARM, ALL DOORS IN EGRESS PATH TO UNLOCK. COORDINATE PROVISION OF POTS PHONELINES WITH OWNER/COM PROVIDER. 5. PROVIDE SHUTDOWN OF ELEVATOR ON COORDINATE PROVISION OF POTS PHONELINES WITH OWNER/COM PROVIDER.
  - 18. PROVIDE SMOKE DETECTORS AND INTERFACE TO SMOKE/FIRE DAMPERS AND SMOKE DAMPERS. COORDINATE QUANTITIES AND LOCATIONS WITH HVAC VENDOR.
  - 19. VERIFY FINISH OF ALL FIRE ALARM DEVICES WITH ARCHITECT PRIOR TO ORDERING.
  - 20. FIRE ALARM VENDOR IS RESPONSIBLE FOR REVIEWING ENTIRE CONSTRUCTION DOCUMENT PACKAGE FOR ADDITIONAL FIRE ALARM REQUIREMENTS THAT MAY BE INCLUDED ON OTHER DISCIPLINES' DRAWINGS AND SPECIFICATIONS, TO INCLUDE BUT NOT LIMITED TO, PLUMBING, CIVIL, MECHANICAL, ELEVATOR, A/V, THEATRICAL LIGHTING, FOOD SERVICE, AND SECURITY.
  - 21. CONTRACTOR SHALL INCLUDE PRICE IN BID FOR TESTING OF THE EMERGENCY RESPONDER COMMUNICATION COVERAGE WITHIN THE BUILDING PER IFC 2021 SECTION 510.

FIRE ALARM SYSTEM



RAIL, WAINSCOT, BASE, CROWN, DOOR & WINDOW TRIM, ETC. AND ARE PROPERLY & NEATLY LOCATED FOR THEIR INTENDED FUNCTION IN FINISHED MATERIALS. ALL ITEMS SHALL BE LOCATED WITHIN ONE FINISH MATERIAL ONLY.

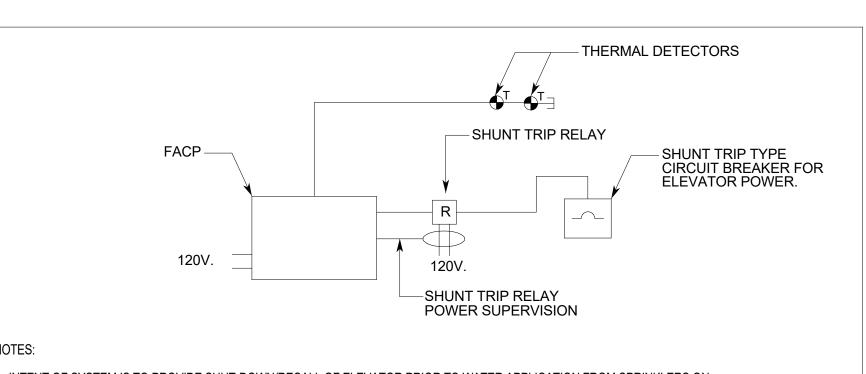
DEVICE HEIGHT TO CENTER LINE OF BOX FOR WIRING DEVICES AT LOWER HEIGHT. HEIGHTS TO TOP OF BOX FOR LIGHTING CONTROLS, PULL STATIONS, ETC. TO BE NO MORE THAN 48".

ALL DEVICES, FIXTURES & ACCESSORIES SHALL CONFORM TO THE CURRENT EDITIONS OF THE INTERNATIONAL CODE CONGRESS' (ICC) MODEL CODES, AMERICAN NATIONAL STANDARDS INSTITUTE'S (ANSI) A117.1, "ACCESSIBLE & USABLE BUILDING & FACILITIES", THE "AMERICANS' WITH DISABILITIES ACT" (ADA) & THE STANDARDS OF THE LOCAL AUTHORITIES HAVING JURISDICTION.

COMPLY WITH THE REQUIREMENTS FOR GANGED &/OR BACK TO BACK J-BOXES IN FIRE RATED OR SMOKE PROOF PARTITIONS AS REQ'D TO MAINTAIN THE INTEGRITY OF THE ASSEMBLY.

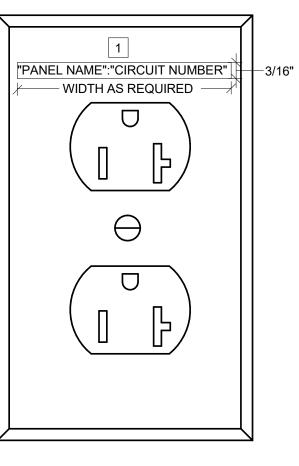
SEE ALSO INTERIOR ELEVATIONS FOR COORDINATION W/ MILLWORK, TRIM, EQUIPMENT, ETC.

## DEVICE MOUNTING HEIGHT DETAIL NO SCALE



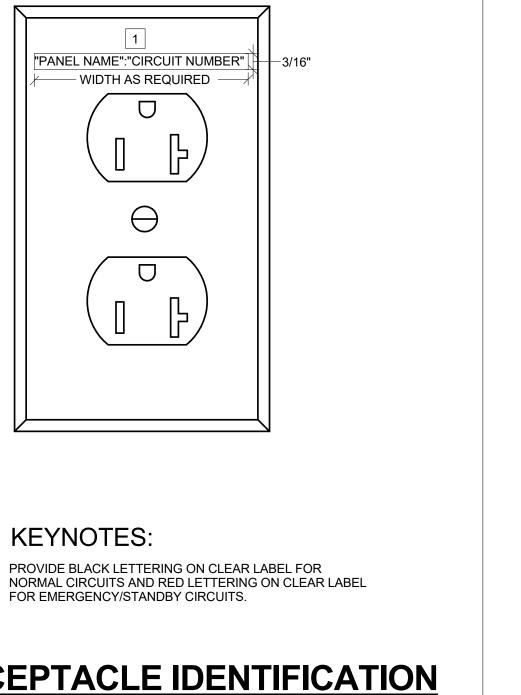
- 1. INTENT OF SYSTEM IS TO PROVIDE SHUT-DOWN/RECALL OF ELEVATOR PRIOR TO WATER APPLICATION FROM SPRINKLERS ON ELEVATOR EQUIPMENT AND BRAKES, PER NFPA 72 3-9.4.
- 2. THERMAL DETECTORS SHALL HAVE BOTH A LOWER TEMPERATURE RATING AND HIGHER SENSITIVITY COMPARED TO THE SPRINKLER. THERMAL DETECTORS SHALL BE LOCATED WITHIN 2 FEET OF EACH SPRINKLER HEAD. PROVIDE NUMBER OF DETECTORS TO MATCH NUMBER OF SPRINKLER HEADS IN ELEVATOR MACHINE ROOM AND HOISTWAY.
- 3. SHUNT TRIP RELAY POWER TO BE SUPERVISED BY ELEVATOR RECALL CONTROL AND SUPERVISORY PANEL.
- 4. ELEVATOR EQUIPMENT SHALL USE SHUNT-TRIP TYPE CIRCUIT BREAKER.
- 5. COORDINATE ALL WORK WITH SPRINKLER AND ELEVATOR VENDORS.

SPRINKLER INITIATED ELEVATOR SHUT DOWN DETAIL



PROVIDE BLACK LETTERING ON CLEAR LABEL FOR NORMAL CIRCUITS AND RED LETTERING ON CLEAR LABEL

## RECEPTACLE IDENTIFICATION



Huntsville, AL 35801 p.o.c. Kristine Harding kharding@kpsgroup.com

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FOR CONSTRUCTION SUE DATE: FEBRUARY 5, 2024 EVISIONS No. Description

FIRE RISER DIAGRAM AND DETAILS

HECKED BY:

ROJECT NUMBER 225029-00

Morgan B. Reyes

HYDE ENGINEERING, INC. 1525 Perimeter Parkway Suite 275 Huntsville, Alabama 35801 (P) 256.270.8013 PROJECT#

23166.1

E-MAIL: MORGAN@HYDE-EGR.COM

LUMENWERX #VIA4RPAT-D-HLO-FH-SW-80CRI-500LMF-

35K-15FT4IN(#11FT4IN-4FT0IN)-#INN2C(90)-(90)-UNV-D1-

1C-XXX-XXX-FINISH-(#EMB1)

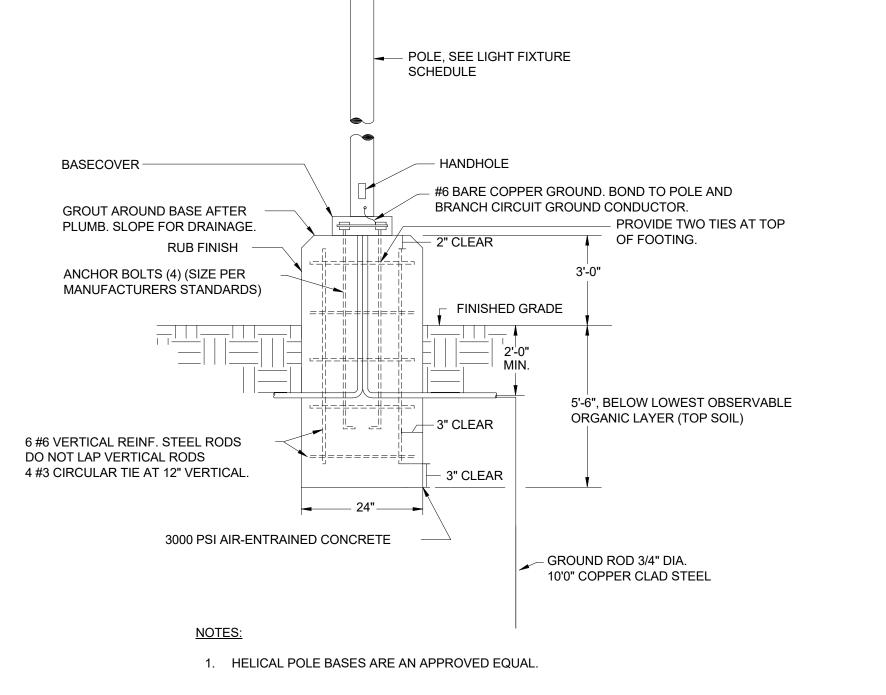
OR PRE-APPROVED EQUAL

LED RECESSED LINEAR FIXTURE THAT TURNS DOWN WALL,

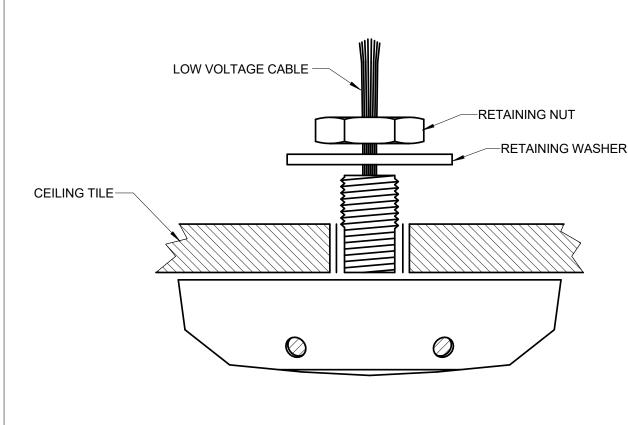
11'4" VERTICAL AND 4' HORIZONTAL

(WITH EMERGENCY BATTERY)

PL LED ELEVATOR SHAFT/PIT LIGHT, 277V, WET LOCATION RATED, METALUX #4VT3-LD5-5-W-277-L835-CD1-HBE11-U SWITCHABLE LUMENS AND CCT 50W OR PRE-APPROVED EQUAL COOPER #GALN-SA4C-740-U-T4FT-FINISH-F LED AREA POLE MOUNTED FIXTURE, 277V, 4000K, TYPE 4 FORWARD 27,000LM DISTRIBUTION MOUNTED ON 27' TALL SQUARE STEEL POLE ON 3' A.F.G. CONCRETE BASE. SEE DETAIL. 213W OR PRE-APPROVED EQUAL LED AREA POLE MOUNTED FIXTURE, 277V, 4000K, TYPE 3 SPILL LIGHT 27,000LM COOPER #GALN-SA4C-740-U-SL3-FINISH-F ELIMINATOR DISTRIBUTION MOUNTED ON 27' TALL SQUARE STEEL POLE ON 3' A.F.G. CONCRETE BASE. SEE DETAIL. 213W OR PRE-APPROVED EQUAL LED AREA POLE MOUNTED FIXTURE, 277V, 4000K, TYPE 5 WIDE 27,000LM COOPER #GALN-SA4C-740-U-5WQ-FINISH-F DISTRIBUTION MOUNTED ON 27' TALL SQUARE STEEL POLE ON 3' A.F.G. CONCRETE BASE. SEE DETAIL. 213W OR PRE-APPROVED EQUAL LED AREA POLE MOUNTED FIXTURE, 277V, 4000K, TYPE 2 SPILL COOPER #GPC-SA1A-740-U-SL2-QM-FINISH-F LIGHT DISTRIBUTION MOUNTED ON 12' TALL SQUARE STEEL POLE ON 4' A.F.G. CONCRETE BASE. SEE DETAIL. OR PRE-APPROVED EQUAL 4' STAIRWELL FIXTURE LED, 3500K, 277V, WITH INTEGRAL AUTO DIM 3200LM METALUX #4SWLED-32SL-LW-UNV-GTR2-L835-CD-1-5VPD2-TO 50% AND DUAL TECH MOTION SENSOR U-ISHH-02-(EL7W) ON GENERATOR CIRCUIT (WITH EMERGENCY BATTERY) OR PRE-APPROVED EQUAL UGA LED IN GRADE FIXTURE, 277V, 4000K + RGB, WIDE BEAM LUMASCAPE #LS3080-30-D-4BW-G-D-84-WF-25-Q-09-PS OR PRE-APPROVED EQUAL UGB LED IN GRADE FIXTURE, 277V, 4000K + RGB, NARROW BEAM 1760LM LUMASCAPE #LS3080-30-D-4BW-G-D-84-NM-25-Q-09-PS OR PRE-APPROVED EQUAL WPA WALL SCONCE COOPER INVUE #ENC-SAIC-740-U-T4FT-FINISH-(EBP) (WITH EMERGENCY BATTERY) 33.3W OR PRE-APPROVED EQUAL XA EXIT SIGN, AC ONLY, 277V, SINGLE FACE, UNIVERSAL MOUNTING SURE-LITES #EUX6-1-R OR PRE-APPROVED EQUAL XB EXIT SIGN, AC ONLY, 277V, DOUBLE FACE, UNIVERSAL MOUNTING SURE-LITES #EUX6-2-R OR PRE-APPROVED EQUAL 1. MANUFACTURER'S PART NUMBERS ARE FOR LEVEL OF QUALITY AND PERFORMANCE. E.C. IS TO PROVIDE ALL OPTIONS AND ACCESSORIES TO COMPLY WITH DESCRIPTION AS WELL AS MODEL NOS. 2. 10 DAY PRIOR APPROVAL IS REQUIRED ON ALL FIXTURES NOT SPECIFICALLY CALLED OUT OR LISTED AS "OR EQUAL." 3. E.C. IS TO COORDINATE FIXTURE COLORS WITH ARCHITECT PRIOR TO ORDERING. 4. E.C. IS TO VERIFY CEILING TYPE AND COMPATIBILITY WITH FIXTURES PRIOR TO ORDERING. 5. FUSE EXTERIOR FIXTURES IN FIELD. ALL LIGHTING IS ON GENERATOR. INCLUDE GENERATOR TRANSFER DEVICES FOR EACH LIGHTING CIRCUIT 7. XA AND XB FIXTURE WILL MOUNT IN VARIOUS WAYS (WALL, CEILING, END, ETC.) UNIVERSAL MOUNTING OPTION IS REQUIRED.



## POLE MOUNTED FIXTURE DETAIL (PL1, PL2, PL3, PL4) NO SCALE

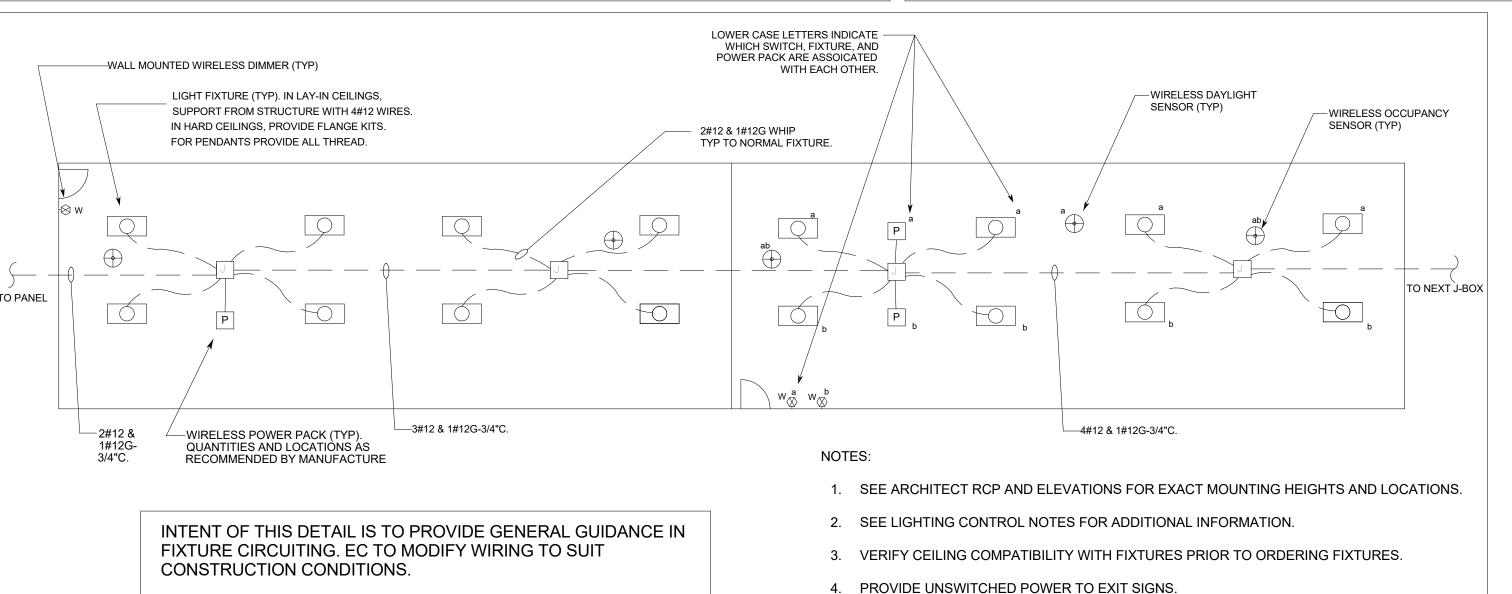


## **SENSOR - CEILING MOUNTED**

5. PROVIDE NEUTRAL CONDUCTORS AT WIRED SWITCH LOCATIONS.

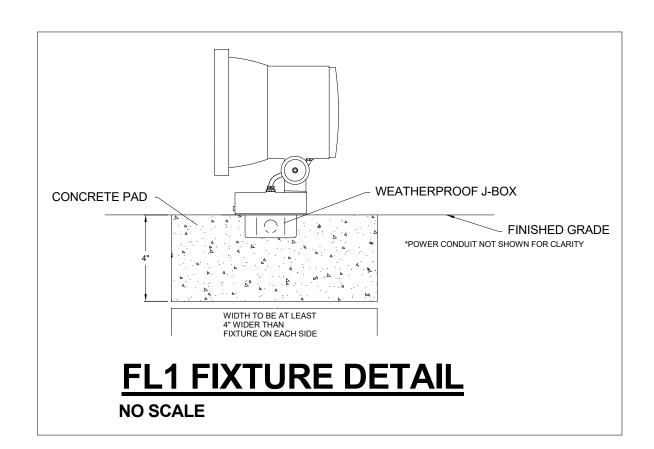
LIGHTING CONTROLS MAY BE WIRED OR WIRELESS.

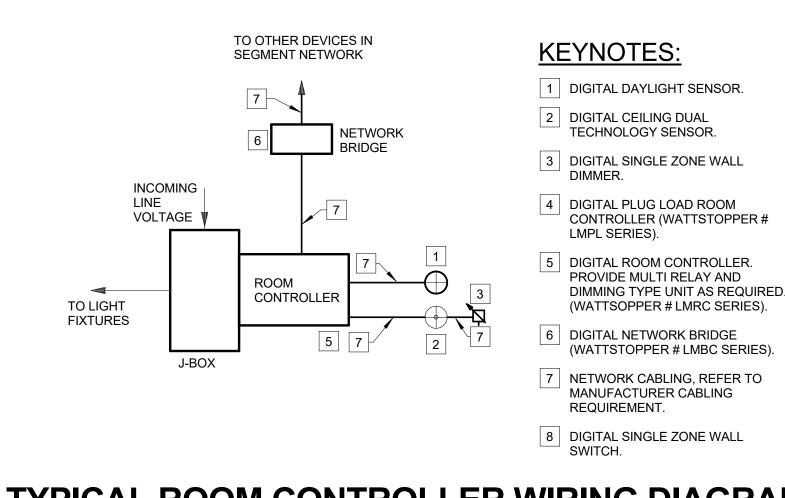
ALL LIGHTS ON GENERATOR, PROVIDE TRANSFER DEVICES AS NECESSARY.



LIGHTING CONTROL NOTES:

- ALL LIGHTING SHALL MEET ASHRAE 90.1 (2013) REQUIREMENTS
- LIGHTING SHALL BE CONTROLLED AS FOLLOWS. EC SHALL PROVIDE ALL NECESSARY CABLING, POWER PACKS, OCCUPANCY SENSORS, DAYLIGHT SENSORS, AND WALL CONTROLS AS REQUIRED.
  - A. ALL CORRIDORS AND AIR LOCK SHALL BE SCHEDULED ON DURING OPERATING HOURS. THEY SHALL AUTO DIM WITH NO MOTION TO 50% AND BACK TO FULL BRIGHT WHEN MOTION IS DETECTED. FIXTURES ADJACENT TO CURTAIN WALLS SHALL AUTO DIM WITH DAYLIGHT SENSOR TO APPROPRIATE LEVELS. AN OVERRIDE SWITCH TO MANUALLY CONTROL DIMMING OF CORRIDOR SHALL BE PROVIDED WHERE SHOWN. BUT AT LEAST ONE PER CORRIDOR.
  - B. ALL STORAGE ROOMS, FIBER SWITCH ROOM, SINGLE RESTROOMS, CUSTODIAN, AND MECHANICAL SHALL BE MANUAL ON, AUTO OFF WITH WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR SWITCH. A RELAY IN RESTROOMS WILL BE REQUIRED TO ALSO CONTROL 120V MIRROR LIGHTING.
  - C. ALL ELECTRICAL ROOMS SHALL BE MANUAL ON/OFF WITH A STANDARD TOGGLE SWITCH
  - LARGE RESTROOMS SHALL BE MANUAL ON, AUTO OFF WITH CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSORS AND A WALL OVERRIDE SWITCH AT THE DOOR. A RELAY WILL BE REQUIRED TO ALSO CONTROL 120V MIRROR LIGHTING.
  - LOBBY LIGHTING SHALL BE SCHEDULED ON DURING NORMAL BUSINESS HOURS. THEY SHALL AUTO DIM WITH NO MOTION TO 50% AND BACK TO FULL BRIGHT WHEN MOTION IS DETECTED. FIXTURES ADJACENT TO CURTAIN WALLS SHALL AUTO DIM WITH DAYLIGHT SENSOR TO APPROPRIATE LEVELS. LOBBY LIGHTING CONTROLS SHALL INCLUDE 3 ZONES OF LIGHTING. (1) THE EAST WALL PANEL SYSTEM, (2) THE CEILING PANEL SYSTEM, AND (3) THE CYLINDER LIGHTS. LOBBY IS A 2 STORY SPACE. OCCUPANCY SENSORS SHALL BE APPROPRIATE FOR HEIGHT INSTALLED.
  - ROPES COURSE, MISSION CONTROL COMPLEX, ASTRO TRAINING SIM, AND DRONE SHALL BE MANUAL ON, AUTO OFF WITH DUAL TECHNOLOGY CEILING OCCUPANCY SENSORS (SPACES ARE 2 STORY HEIGHT). PROVIDE A WALL OVERRIDE SWITCH FOR FULL DIMMING CONTROL
  - NIGHT VS VR HAS RGBW FIXTURES AND STATIC RED FIXTURES. LIGHTING SHALL BE MANUAL ON/AUTO OFF/ FULL DIMMING WITH WALL OVERRIDE SWITCH AND DUAL TECHNOLOGY CEILING OCCUPANCY SENSORS. IN ADDITION INCLUDE A NICOLAUDIE STICK-DE3 FOR CONTROL OF THE RGBW FIXTURES. IT IS THE INTENT THAT DURING A POWER LOSS (GENERATOR RUNNING) EVENT THAT THE STATIC RED (LRE FIXTURES) TURN ON AND THE LTA FIXTURES TURN OFF.
  - EXTERIOR CANOPY LIGHTING (AT FRONT AND REAR CANOPIES) SHALL BE DIMMABLE. CONTROL FOR THE FRONT CANOPY SHALL BE INCLUDED WITH THE LOBBY TOUCH PANEL. CONTROL FOR THE REAR CANOPIES SHALL BE LOCATED IN THE TECH ROOM. FRONT CANOPY LIGHTING TO INCLUDE 5 ZONES: UGA FIXTURES BELOW PLANE, CLD FIXTURES (16), CLC FIXTURES (4), BLA FIXTURES AND UGB FIXTURES ALONG FRONT OF BUILDING. CLD, UGA, AND UGB ARE RGBW FIXTURES. INCLUDE A NICOLAUDIE STICK-DE3 CONTROLLER IN LOBBY CONTROL LOCATION. EACH FIXTURE TYPE SHALL BE A DIFFERENT ZONE.
  - MOCR ROOMS (TYP. OF 3) TO HAVE 3 ZONES OF LIGHTING: THE LINEARS IN THE CENTER OF THE ROOM, THE RGBW ALONG THE MONITOR WALL AND THE RGBW AROUND THE REST OF THE ROOM. PROVIDE A NICOLAUDIE STICK-DE3 IN EACH ROOM TO CONTROL RGBW FIXTURES. GENERALLY SPEAKING THE LIGHTS SHALL BE MANUAL ON/AUTO OFF WITH DUAL TECHNOLOGY CEILING OCCUPANCY SENSORS AND FULL DIMMING AT WALL CONTROL STATION.
  - GANTRY CORRIDOR SHALL BE SCHEDULED ON DURING OPERATING HOURS. THEY SHALL AUTO DIM WITH NO MOTION TO 50% AND BACK TO FULL BRIGHT WHEN MOTION IS DETECTED. IN ADDITION INCLUDE A NICOLAUDIE STICK-DE3 FOR CONTROL OF THE RGBW FIXTURES. INSTALL CONTROL SWITCHES WHERE NOTED.
  - K. OPEN OFFICE SHALL BE SCHEDULED ON DURING OPERATING HOURS. THEY SHALL AUTO DIM WITH NO MOTION TO 50% AND BACK TO FULL BRIGHT WHEN MOTION IS DETECTED. INCLUDE DAYLIGHT CONTROL ZONE BY WINDOWS.
  - CLASSROOM AND CONFERENCE ROOM SHALL BE MANUAL ON/AUTO OFF/FULL DIMMING WITH CEILING DUAL TECHNOLOGY OCCUPANCY SENSORS AND WALL OVERRIDE SWITCH. EACH ROOM SHALL HAVE 2 ZONES OF LIGHTING CONTROL.
  - M. OFFICES, KITCHENETTE, COPY ROOM SHALL BE MANUAL ON/AUTO OFF/FULL DIMMING FROM WALL MOUNTED DUAL TECHNOLOGY
  - OCCUPANCY SENSOR DIMMER SWITCH.
  - N. ALL EXTERIOR LIGHTING SHALL OPERATE DUSK TO DAWN.
  - ALL CONTROL CABLING IS NOT SHOWN. CONTRACTOR IS RESPONSIBLE FOR ROUTING CABLING (POWER, DIMMING DMX, ETC) TO ALL FIXTURES FOR OPERATIONS AS DESCRIBED. ALL FIXTURES ARE TO HAVE DIMMING CABLING. ALL EXTERIOR BUILDING/CANOPY MOUNTED FIXTURES TO HAVE DIMMING CABLE
- ALL LIGHTING IS ON THE GENERATOR. INCLUDE GTD FOR EACH 20A LIGHTING CIRCUIT AND AS REQUIRED. SEE NOTES FOR SPECIAL REQUIREMENTS IN NIGHT VS VR ROOM. SOME FIXTURES HAVE BATTERY PACKS TO MEET NEC 700.17.
- INCLUDE ALL POWER PACKS, RELAYS, ETC FOR LIGHTING TO FUNCTION AS DESCRIBED.
- LIGHTING CONTROLS MAY BE A CENTRALIZED PANEL OR INDIVIDUAL ROOM CONTROLS. A FULL CONTROL SUBMITTAL INCLUDING PLANS WILL BE REQUIRED DURING CONSTRUCTION. LIGHTING MUST OPERATE AS DESCRIBED AND AS SHOWN ON THE PLANS





TYPICAL ROOM CONTROLLER WIRING DIAGRAM **NO SCALE** 

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Morgan B. Reyes

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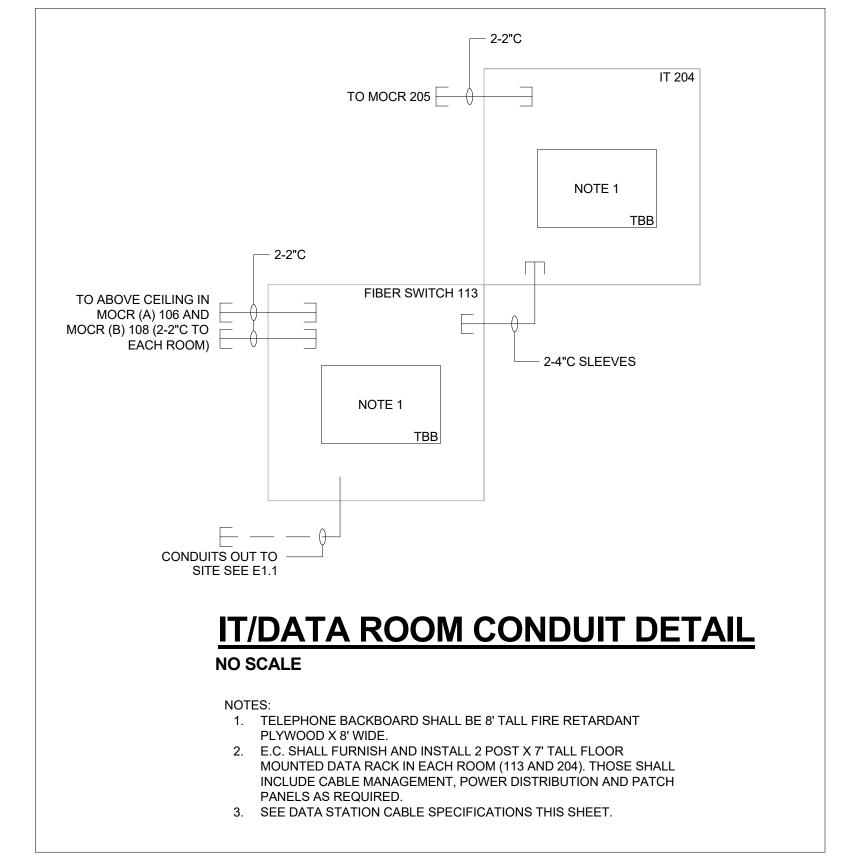
Documents.

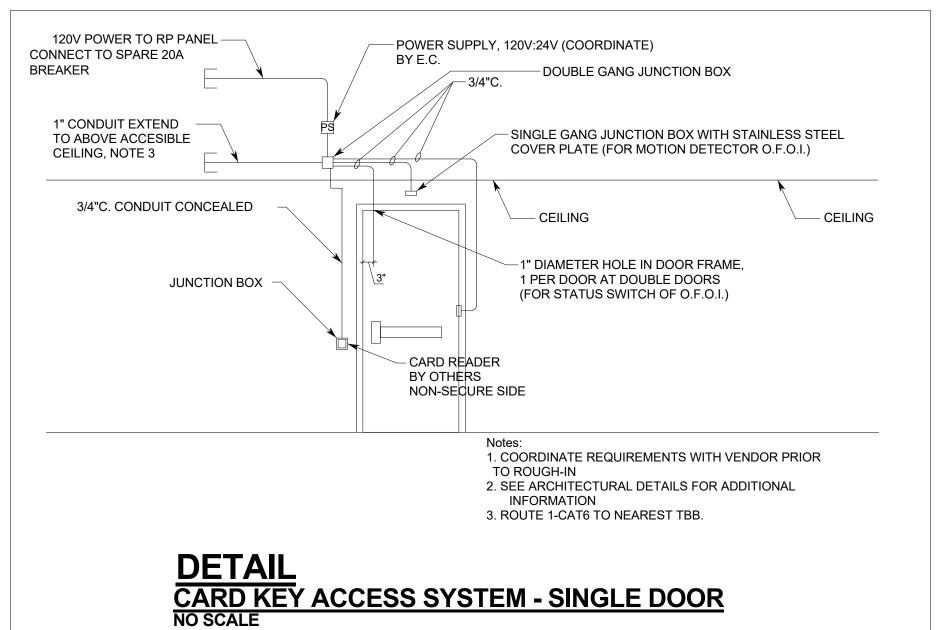


ROJECT STATUS FOR CONSTRUCT SUE DATE: FEBRUARY 5, 2024 EVISIONS No. Description

LIGHT FIXTURE **SCHEDULE AND** DETAILS

HECKED BY: ROJECT NUMBER 225029-00







8. CONTRACTOR SHALL PROVIDE PATCH CORDS AS FOLLOWS: 1-6FT FOR EVERY WALL OUTLET, 100-6", 100-12", AND 100-18".

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

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

IS INTERCOM SPEAKER - WALL MOUNTED WITH VOLUME

1. PROVIDE PUBLIC ADDRESS SYSTEM THROUGHOUT BUILDING. 2. COORDINATE LOCATION OF SPEAKERS WITH SPECIALTY WALL

3. ALLOW FOR CALL TO ALL SPEAKERS FROM THE RECEPTION DESK (PROVIDE A HEADSET FOR THIS USE) AND TO INDIVIDUAL

TYPES AND CEILINGS. CARE SHALL BE TAKEN TO AVOID SPECIALTY

4. ALLOW CLASSROOMS TO RESPOND TO CALL WITH TALKBACK

5. ALLOW VOLUME CONTROL IN LARGE SPACES.

6. ALLOW CALL TO RECEPTION FROM VOIP PHONES IN OFFICES.

Camera # Location Camera # | Location 1-001 INTERIOR CORR 102 1-028 INTERIOR EAST STAIRWELL 1-002 INTERIOR CORR 102 2-001 INTERIOR WEST STAIRWELL 1-003 INTERIOR WEST STAIRWELL 2-002 INTERIOR CORR 200 1-004 INTERIOR ROPES 103 2-003 INTERIOR CORR 200 1-005 INTERIOR ROPES 103 2-004 INTERIOR MOCR 205 1-006 INTERIOR ROPES 103 2-005 INTERIOR OVERLOOK 203 1-007 INTERIOR MISSION CC 105 2-006 INTERIOR CORR 208 1-008 INTERIOR MISSION CC 105 2-007 INTERIOR CORR 208 2-008 INTERIOR CORR 208 1-009 INTERIOR MISSION CC 105 2-009 INTERIOR CLASSROOM 224 1-010 | INTERIOR MOCR (A) 106 2-010 INTERIOR OPEN OFFICE 210 1-011 INTERIOR AIR LOCK 107 2-011 INTERIOR OPEN OFFICE 210 1-012 | INTERIOR MOCR (B) 108 2-012 INTERIOR CORR 217 1-013 INTERIOR STAIR 118 1-014 INTERIOR LOBBY 101 2-013 INTERIOR EAST STAIRWELL 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

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

**CAMERA SYSTEM NOTES:** 

1-027 INTERIOR PARACHUTE SIM 132

1. 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. 2. ADDITIVE ALTERNATE: FOR ALTERNATE CONTRACTOR SHALL INSTALL OWNER FURNISHED CAMERAS AND

CONNECT TO CABLING PROVIDED IN BASE BID. 3. ALL CAMERAS, LICENSES, AND SOFTWARE ARE PROVIDED BY OWNER.

Card Reader#	Location	Card Reader#	Location
CR-1	EXTERIOR VESTIBULE	CR-15	INTERIOR MOCR(B) 108
CR-2	INTERIOR VESTIBULE	CR-16	INTERIOR ASTRO TRNG SIM 119
CR-3	EXTERIOR WEST BUILDING EXIT	CR-17	INTERIOR DRONE FLIGHT 122
CR-4	EXTERIOR ROPES 104	CR-18	INTERIOR NIGHT VS VR 124
CR-5	EXTERIOR MCC 105	CR-19	INTERIOR ELECTRICAL 125
CR-6	EXTERIOR TECH WORK ROOM 111	CR-20	INTERIOR SERVICE SPACE 134
CR-7	EXTERIOR ASTRO TRNG SIM 119	CR-21	INTERIOR BARANY CHAIR 133
CR-8	EXTERIOR ELECTRICAL RM 125	CR-22	INTERIOR PARACHUTE SIM 132
CR-9	EXTERIOR SERVICE SPACE 134	CR-23	INTERIOR FIBER SWITCH 115
CR-10	EXTERIOR CORR 131	CR-24	INTERIOR ELECTRICAL 211
CR-11	EXTERIOR EAST BUILDING EXIT	CR-25	INTERIOR IT 204
CR-12	INTERIOR ROPES 103	CR-26	INTERIOR MOCR 205
CR-13	INTERIOR MOCR(A) 106	CR-27	INTERIOR ELECTRICAL 201
CR-14	INTERIOR AIR LOCK 107	CR-28	INTERIOR ELECTRICAL 110

**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.



Means and Methods, deviations, techniques,

the acts or omissions of the Contractor,

sequences, or procedures, or for safety programs

and precautions in connection with the Work, for

Subcontractors or any other persons performing any of the Work in accordance with the Contract

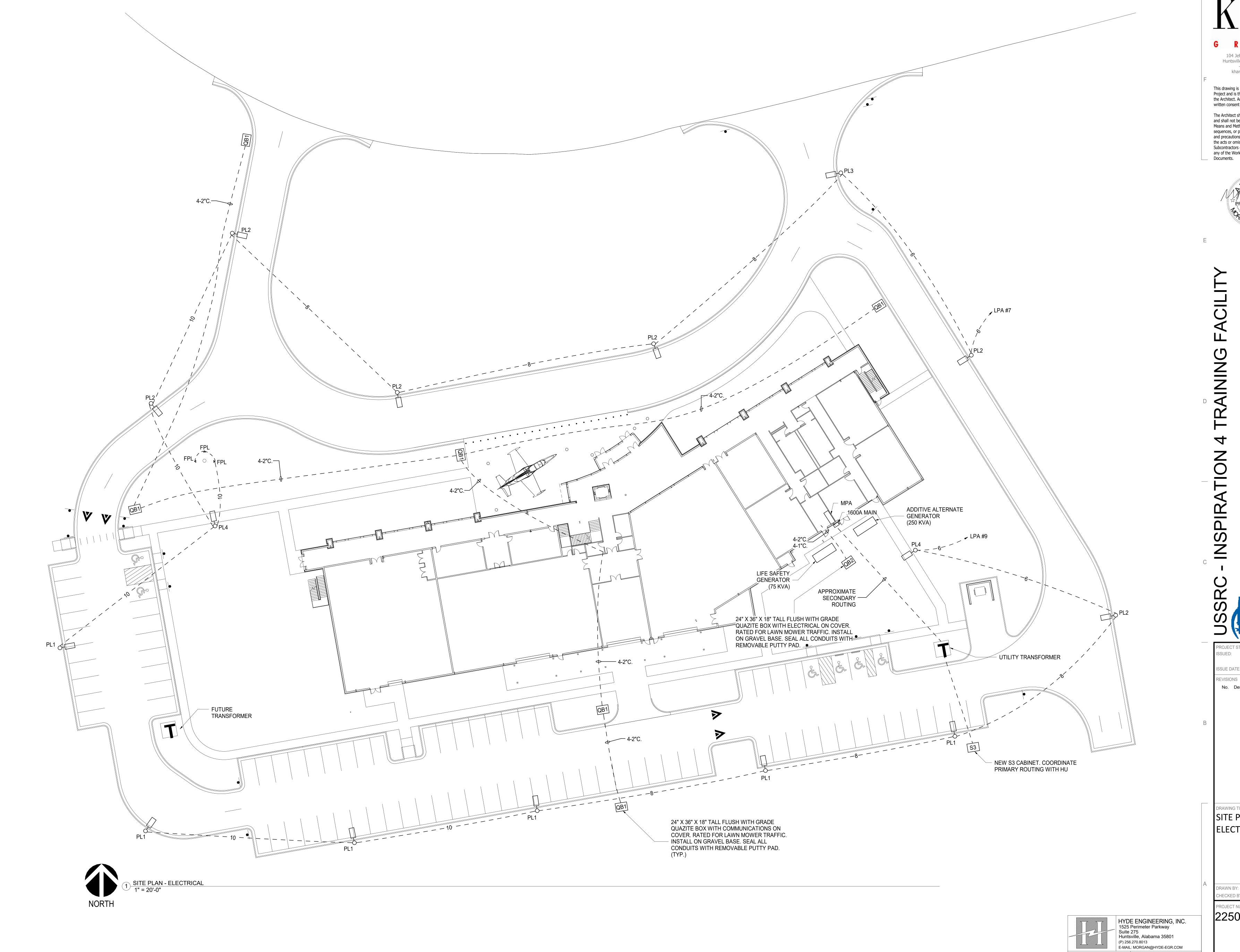
FOR CONSTRUCTION SUED: SSUE DATE: FEBRUARY 5, 2024 EVISIONS No. Description

DATA DETAILS

HECKED BY:

ROJECT NUMBER 225029-00

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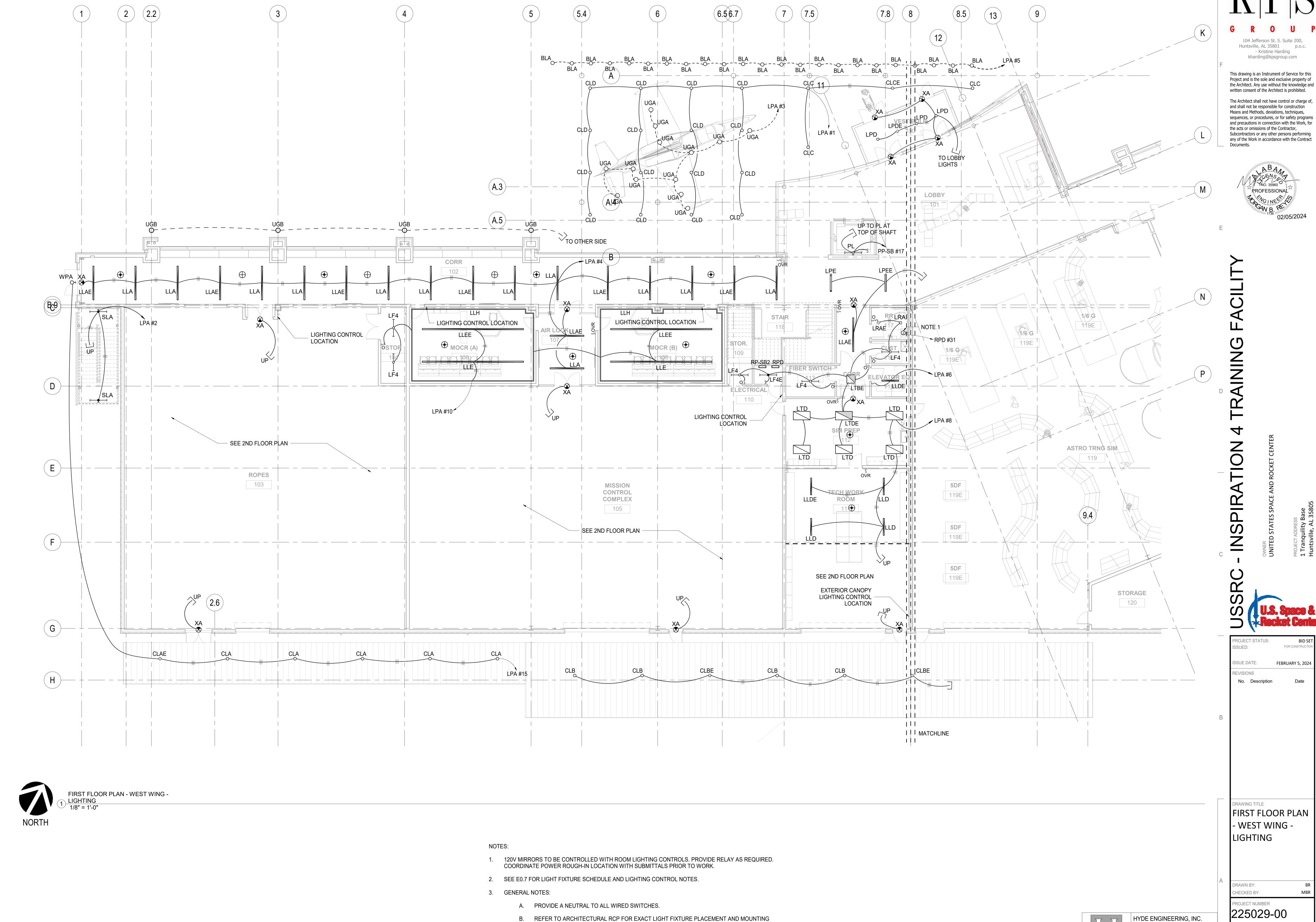
SITE PLAN -ELECTRICAL

CHECKED BY:

PROJECT NUMBER

225029-00

PROJECT # 23166.1



REQUIREMENTS.

C. BYPASS LIGHTING CONTROLS ON EMERGENCY.

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Morgan B. Reyes

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PROJECT #

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E2



C. BYPASS LIGHTING CONTROLS ON EMERGENCY.

ENGINEER

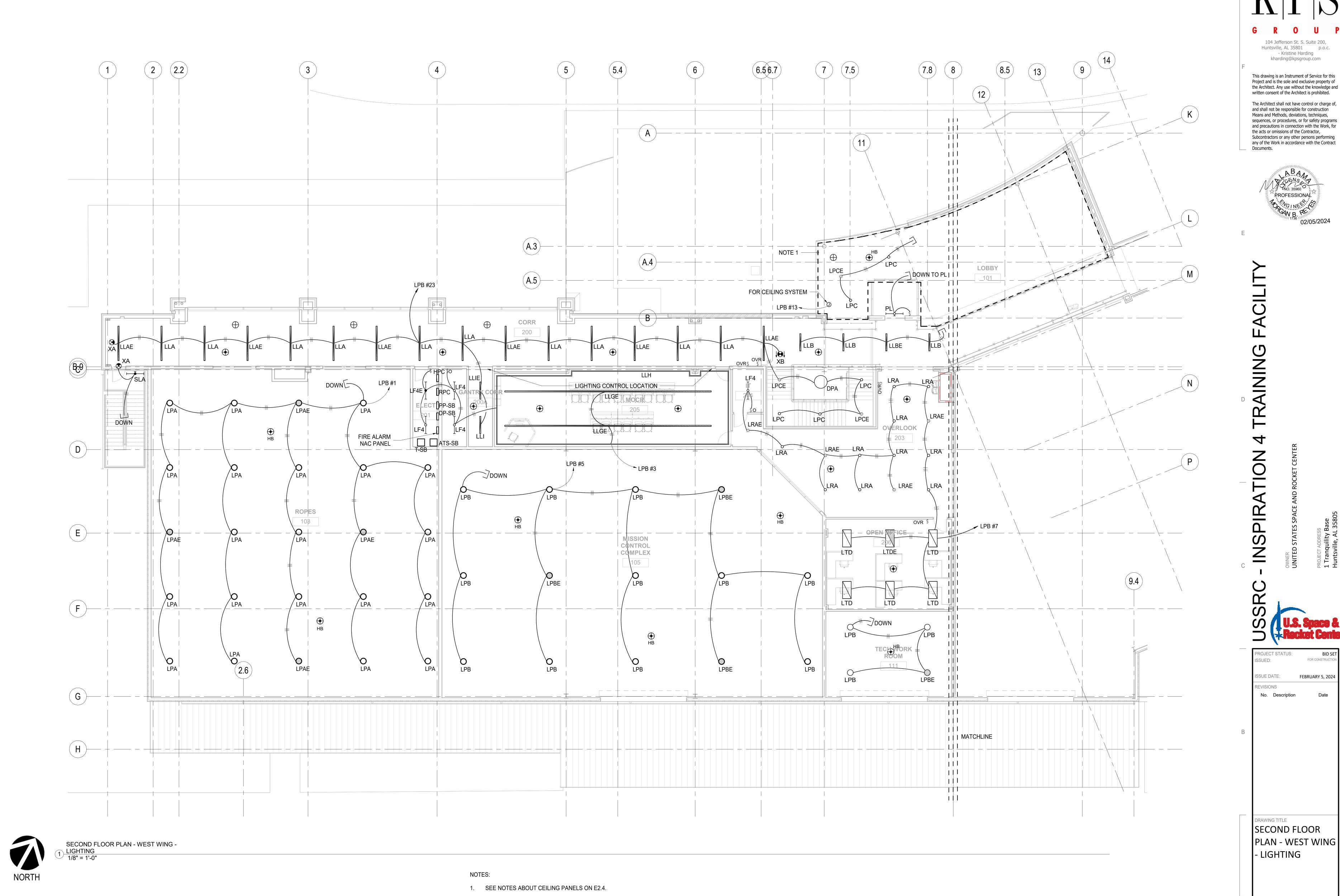
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FEBRUARY 5, 2024

- Kristine Harding kharding@kpsgroup.com



2. SEE E0.7 FOR LIGHT FIXTURE SCHEDULE AND LIGHTING CONTROL NOTES.

B. REFER TO ARCHITECTURAL RCP FOR EXACT LIGHT FIXTURE PLACEMENT AND MOUNTING REQUIREMENTS.

A. PROVIDE A NEUTRAL TO ALL WIRED SWITCHES.

C. BYPASS LIGHTING CONTROLS ON EMERGENCY.

GENERAL NOTES:

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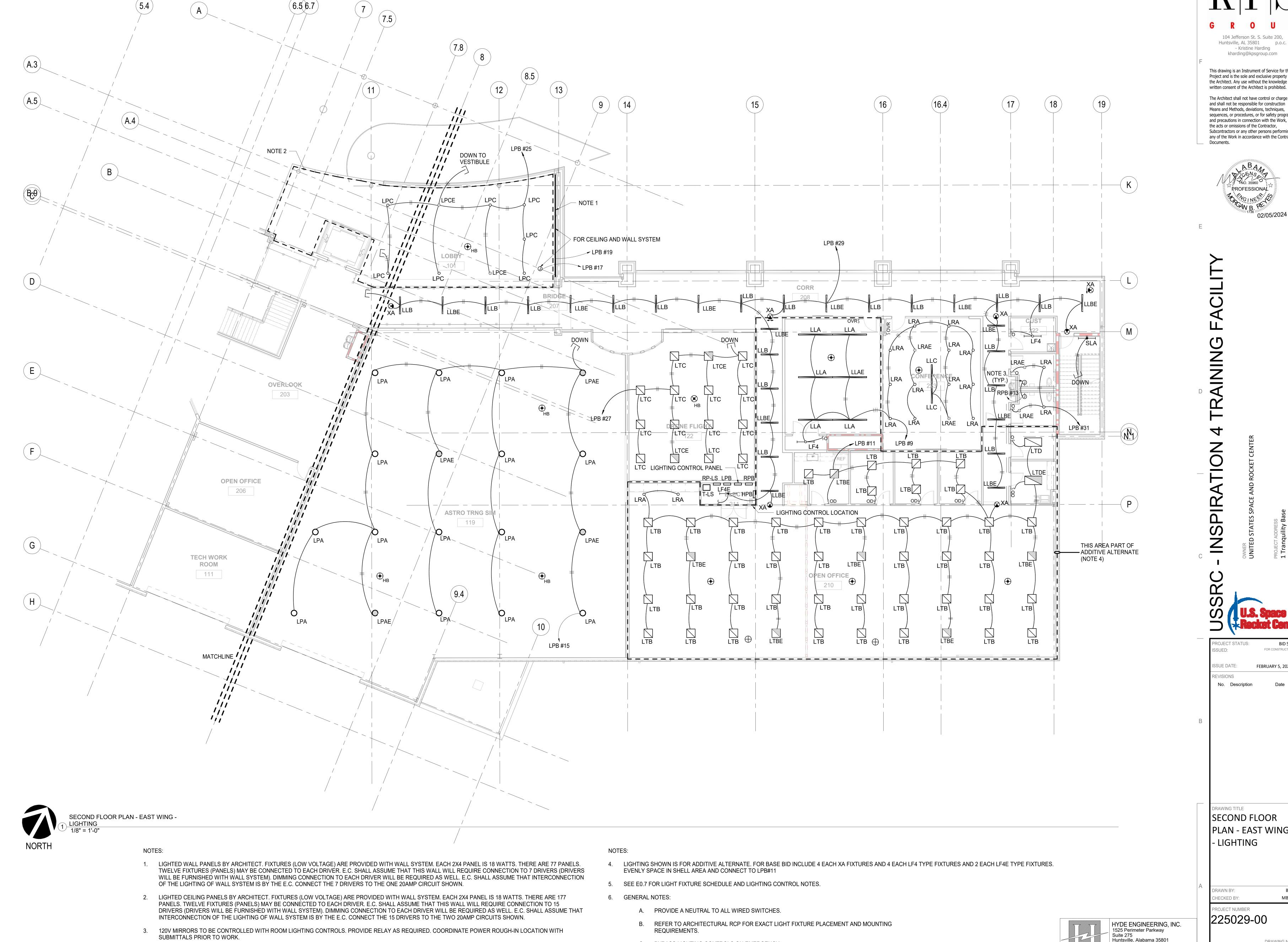
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- Kristine Harding kharding@kpsgroup.com



C. BYPASS LIGHTING CONTROLS ON EMERGENCY.

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SECOND FLOOR PLAN - EAST WING - LIGHTING

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PROJECT NUMBER

225029-00

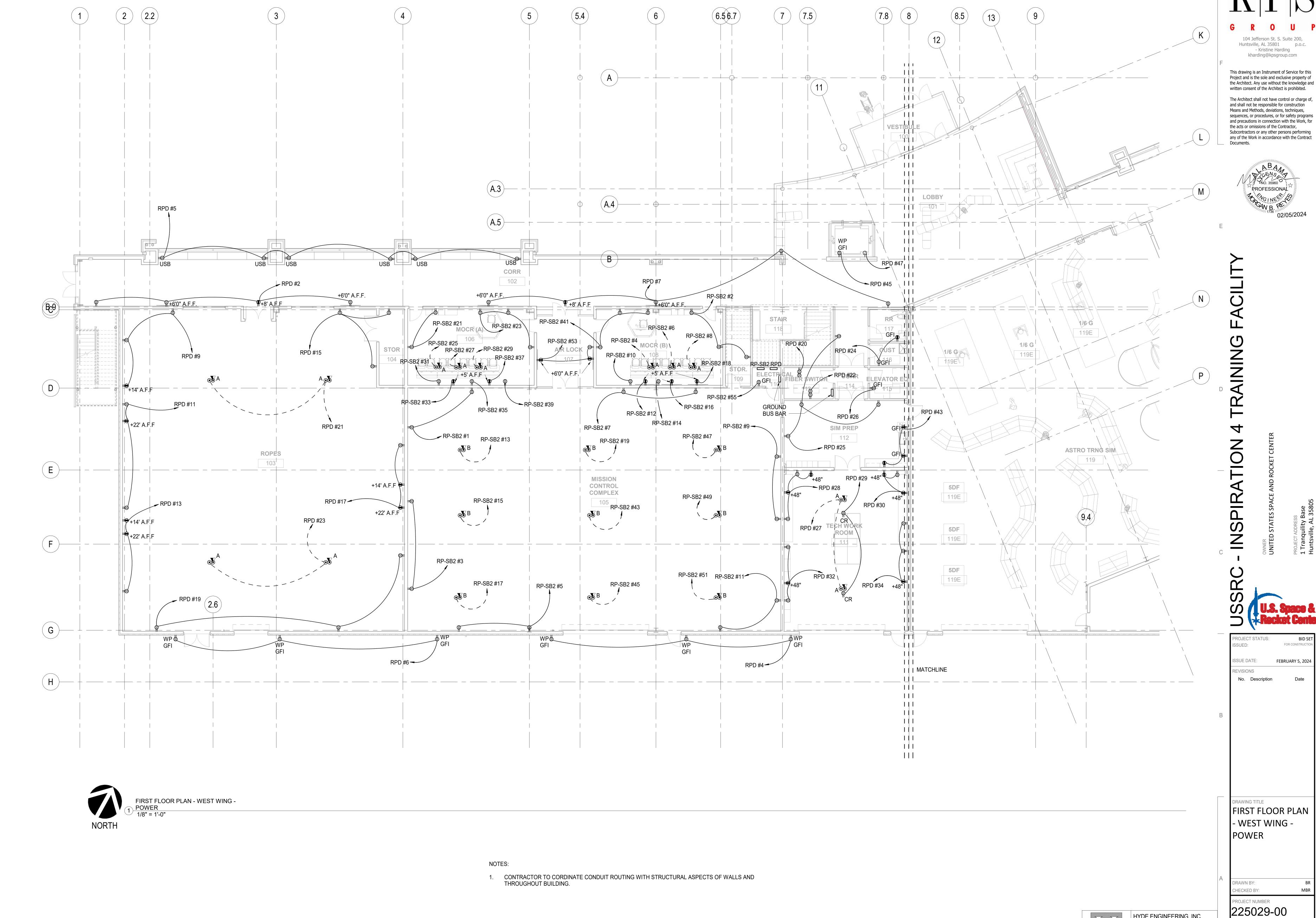
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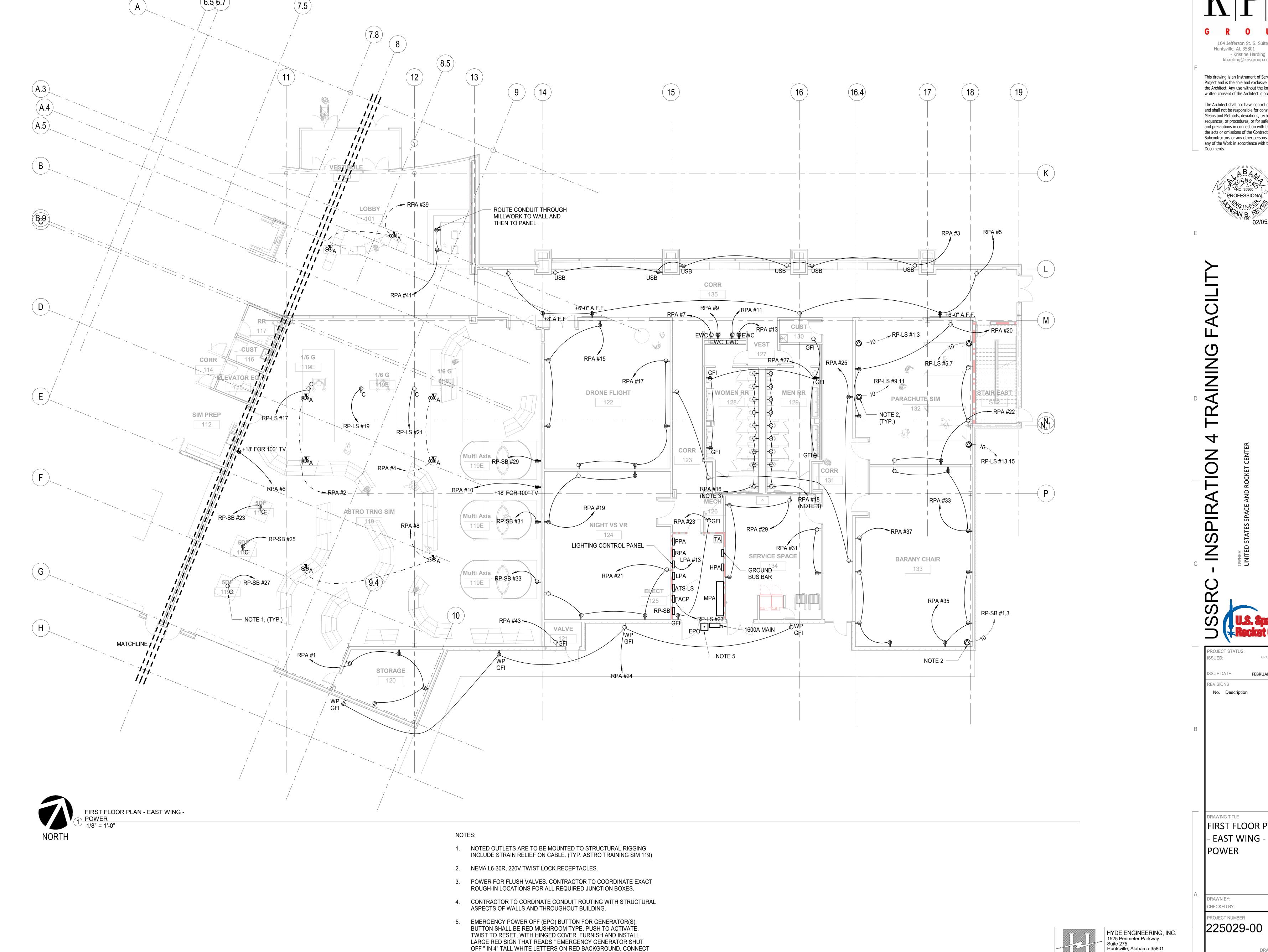
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E3.1



TO GENERATOR(S) CONTROLS AS REQUIRED. UNDER ADDITIVE

ALTERNATE EPO SHALL SHUT DOWN BOTH GENERATORS.

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SSUE DATE: FEBRUARY 5, 2024 REVISIONS No. Description

FIRST FLOOR PLAN

HECKED BY: PROJECT NUMBER

225029-00

(P) 256.270.8013

**ENGINEER** 

Morgan B. Reyes

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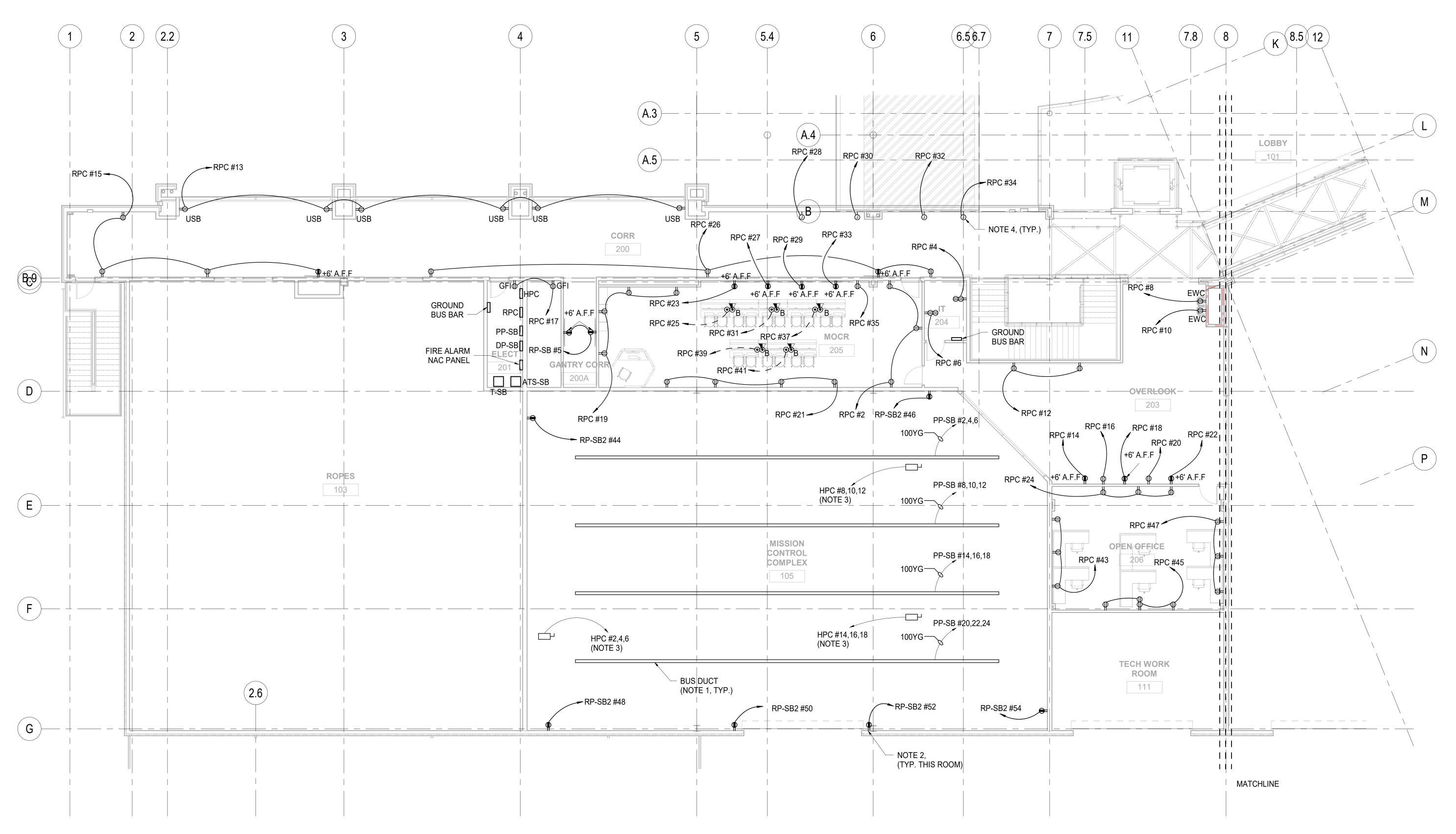
PROJECT#

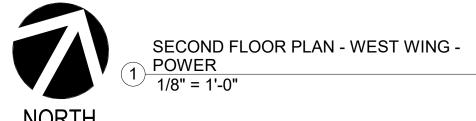
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PLAN - WEST WING - POWER

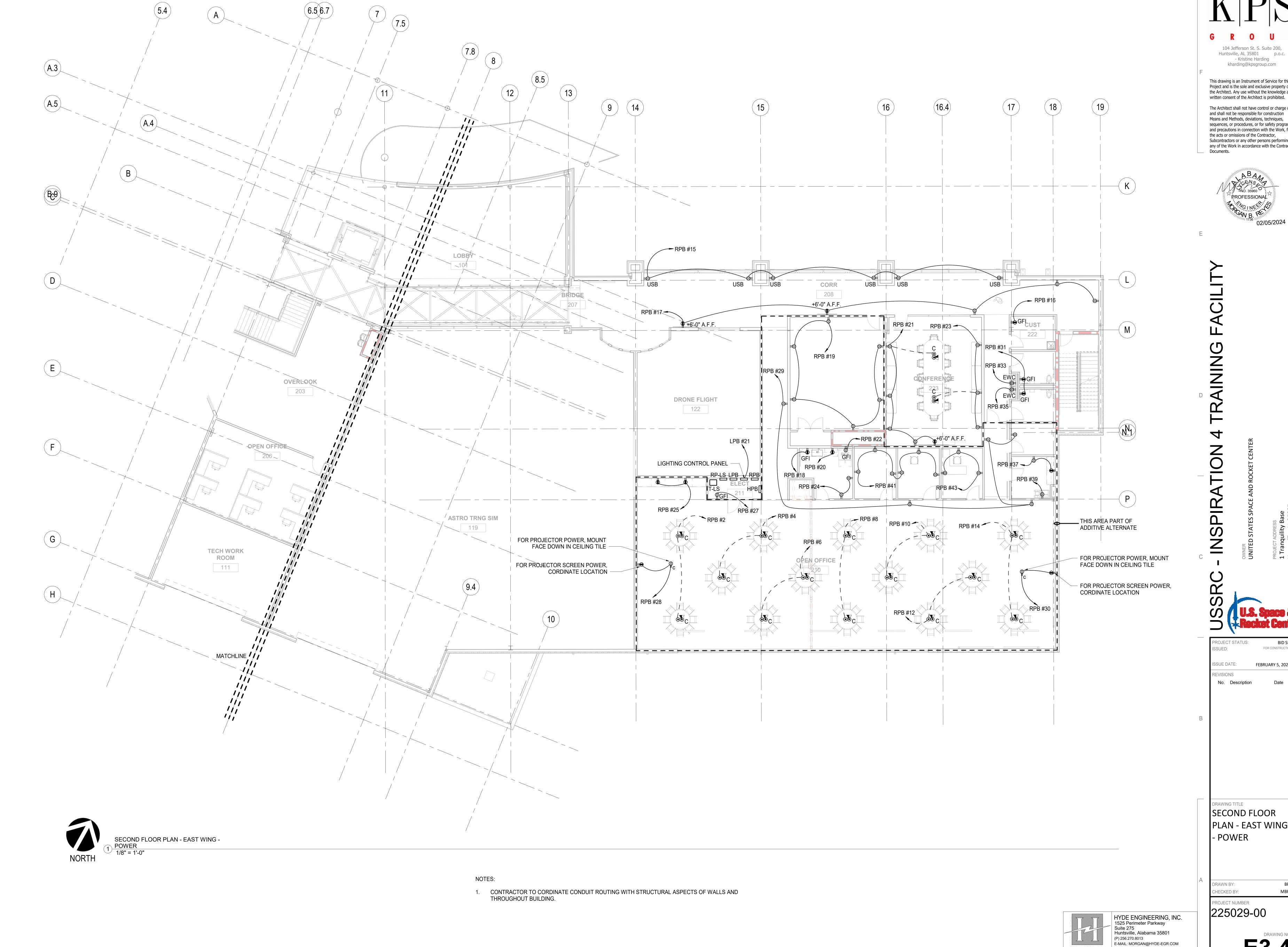
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225029-00





- 1. 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.
- 2. 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.
- 3. POWER FOR SIMULATOR. CORDINATE EXACT ROUGH-IN LOCATION. FURNISH AND INSTALL 100A/3P/FUSED @100 SAFETY SWITCH AT CEILING.
- 4. POWER FOR BUILDING MOUNTED SIGNAGE. COORDINATE EXACT LOCATION PRIOR TO ROUGH-IN.
- CONTRACTOR TO CORDINATE CONDUIT ROUTING WITH STRUCTURAL ASPECTS OF WALLS AND THROUGHOUT BUILDING.



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ROJECT STATUS: FOR CONSTRUCTION SSUE DATE: FEBRUARY 5, 2024 No. Description

RAWING TITLE SECOND FLOOR

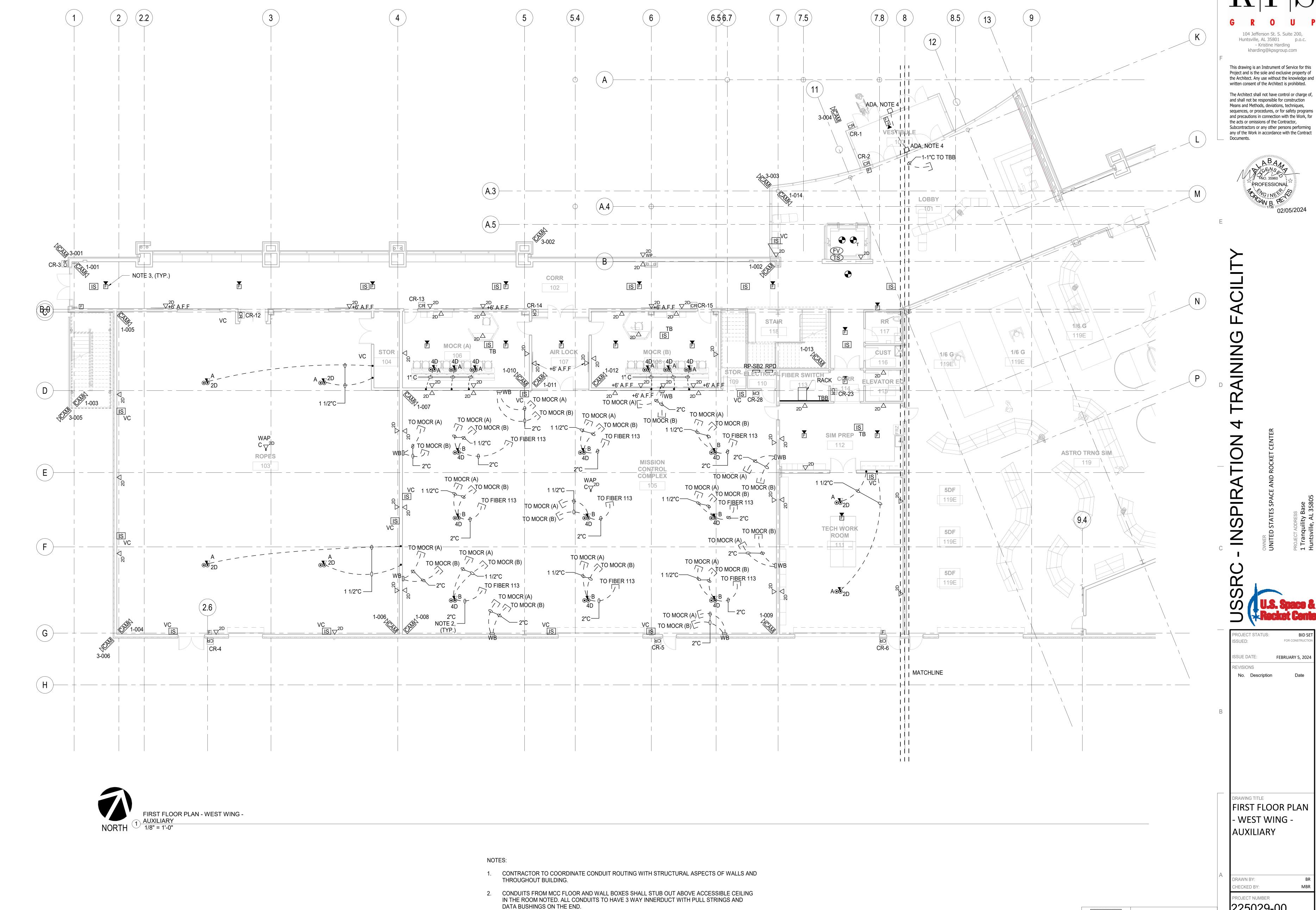
PLAN - EAST WING - POWER

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PROJECT#

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3. FIRE ALARM SPEAKER STROBES SHALL BE CEILING MOUNTED UNLESS SHOWN ON WALL.

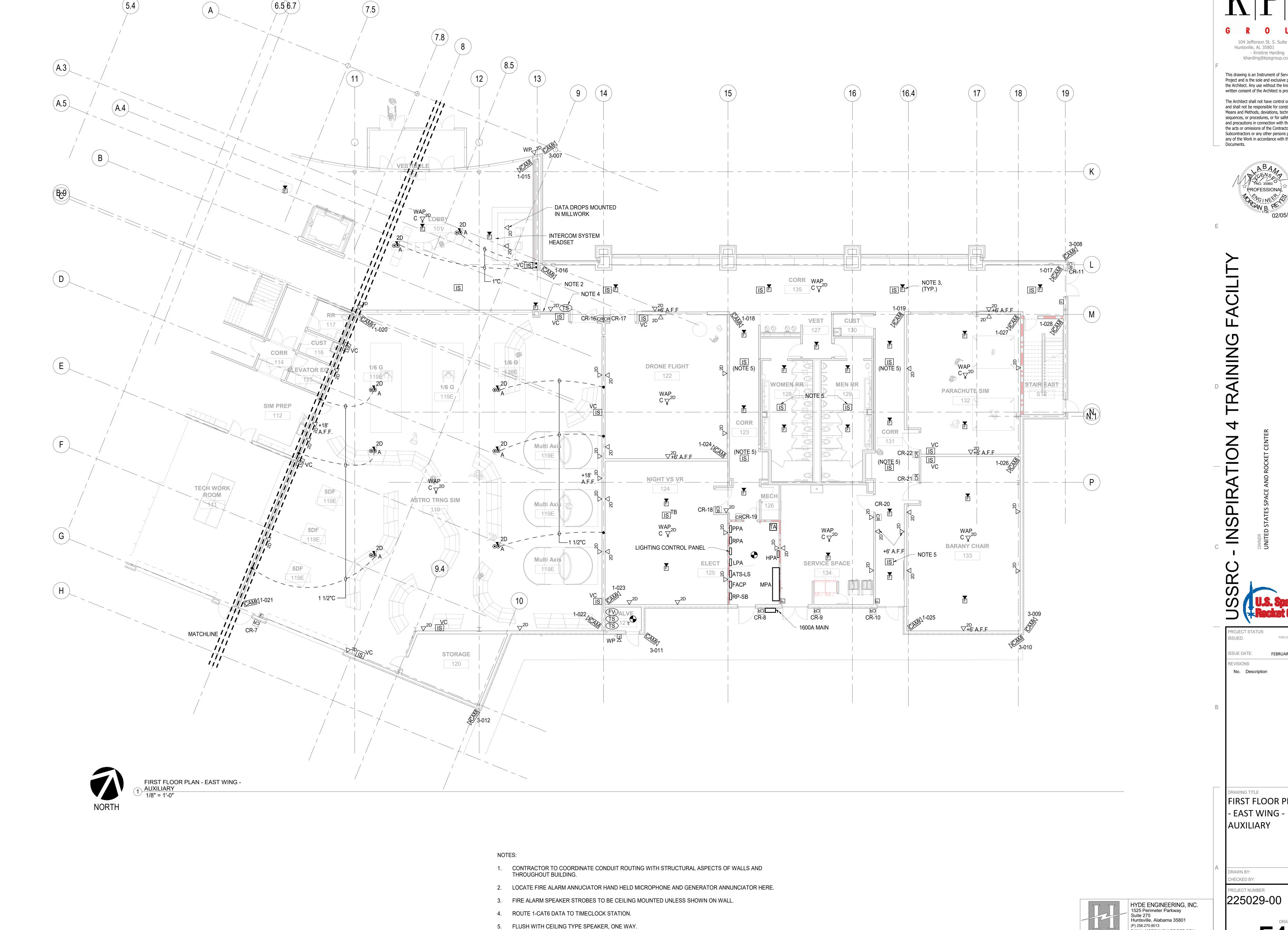
WITH FINAL SUBMITTALS.

4. PROVIDE ROUGH-IN FOR ADA DOOR OPERATOR CONTROLS. COORDINATE ALL REQUIREMENTS

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5. FLUSH WITH CEILING TYPE SPEAKER, ONE WAY.

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SSUE DATE: FEBRUARY 5, 2024 REVISIONS No. Description

FIRST FLOOR PLAN

AUXILIARY

CHECKED BY:

PROJECT NUMBER

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the acts or omissions of the Contractor,

SECOND FLOOR PLAN - WEST WING - AUXILIARY

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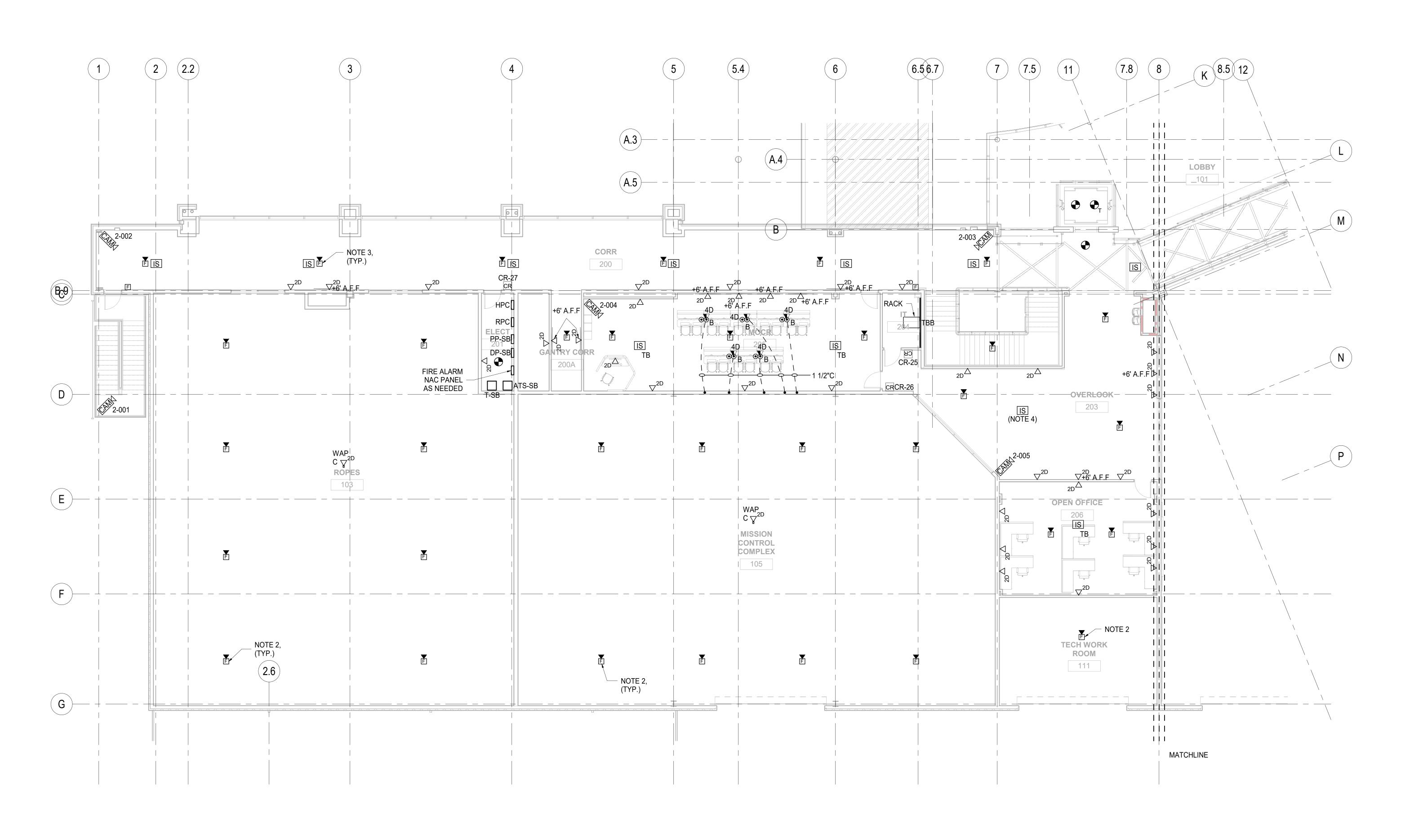
PROJECT NUMBER 225029-00

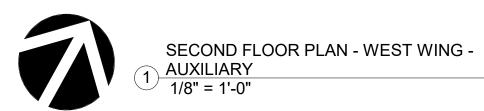
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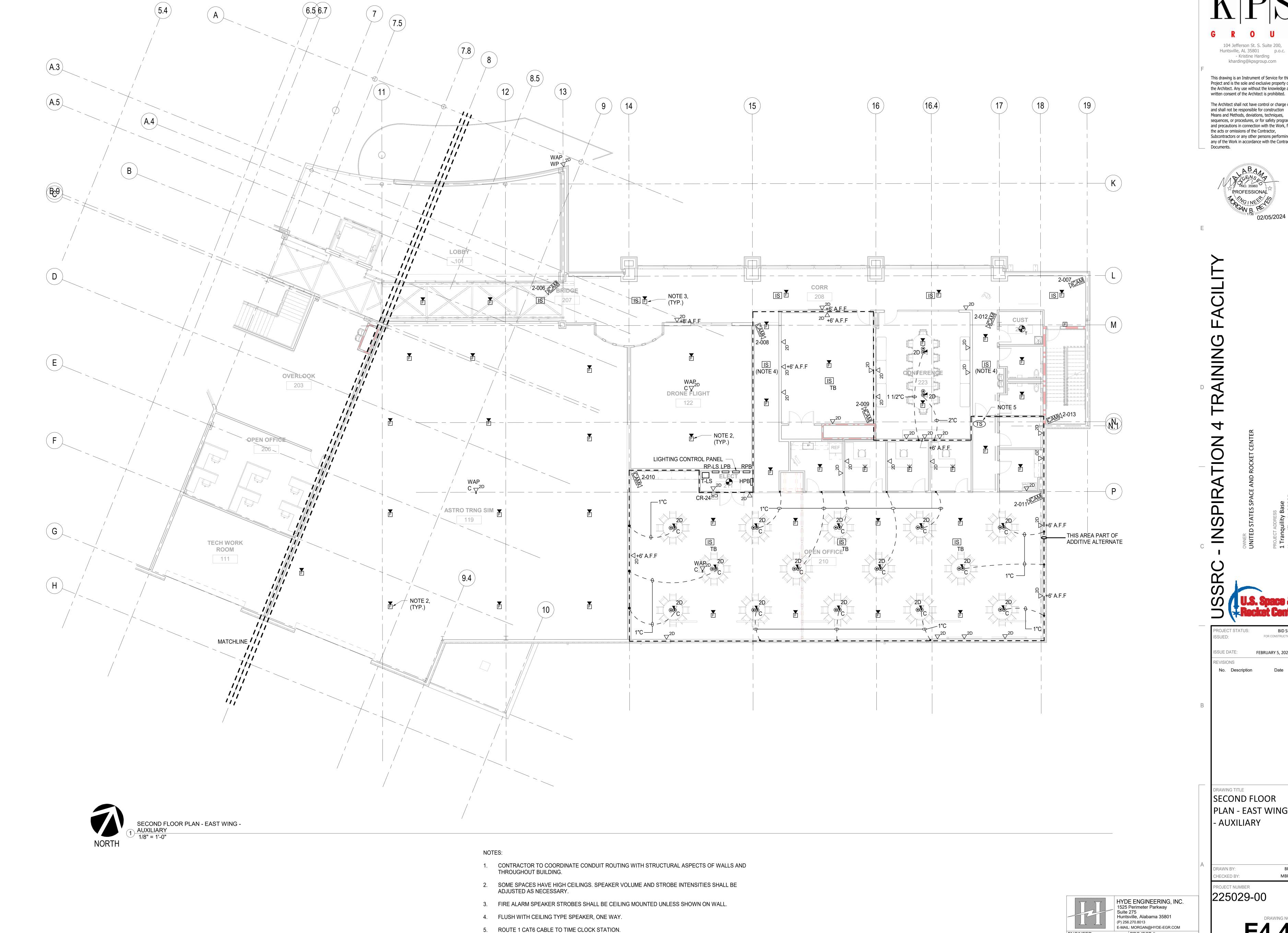
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- CONTRACTOR TO COORDINATE CONDUIT ROUTING WITH STRUCTURAL ASPECTS OF WALLS AND THROUGHOUT BUILDING.
- 2. SOME SPACES HAVE HIGH CEILINGS. SPEAKER VOLUME AND STROBE INTENSITIES SHALL BE ADJUSTED AS NECESSARY.
- 3. FIRE ALARM SPEAKER STROBES SHALL BE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



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SECOND FLOOR

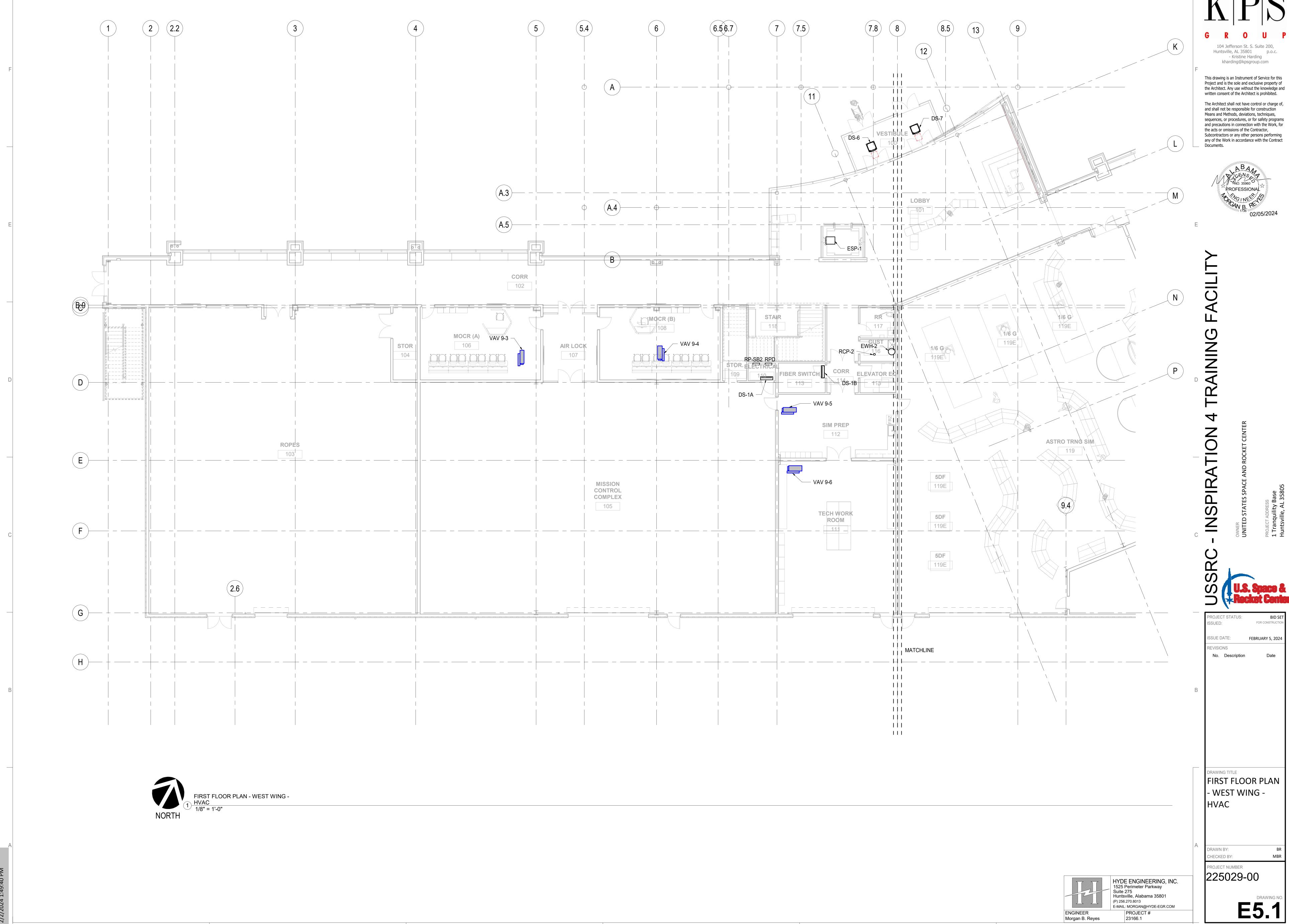
PLAN - EAST WING - AUXILIARY

CHECKED BY:

PROJECT NUMBER 225029-00

PROJECT#

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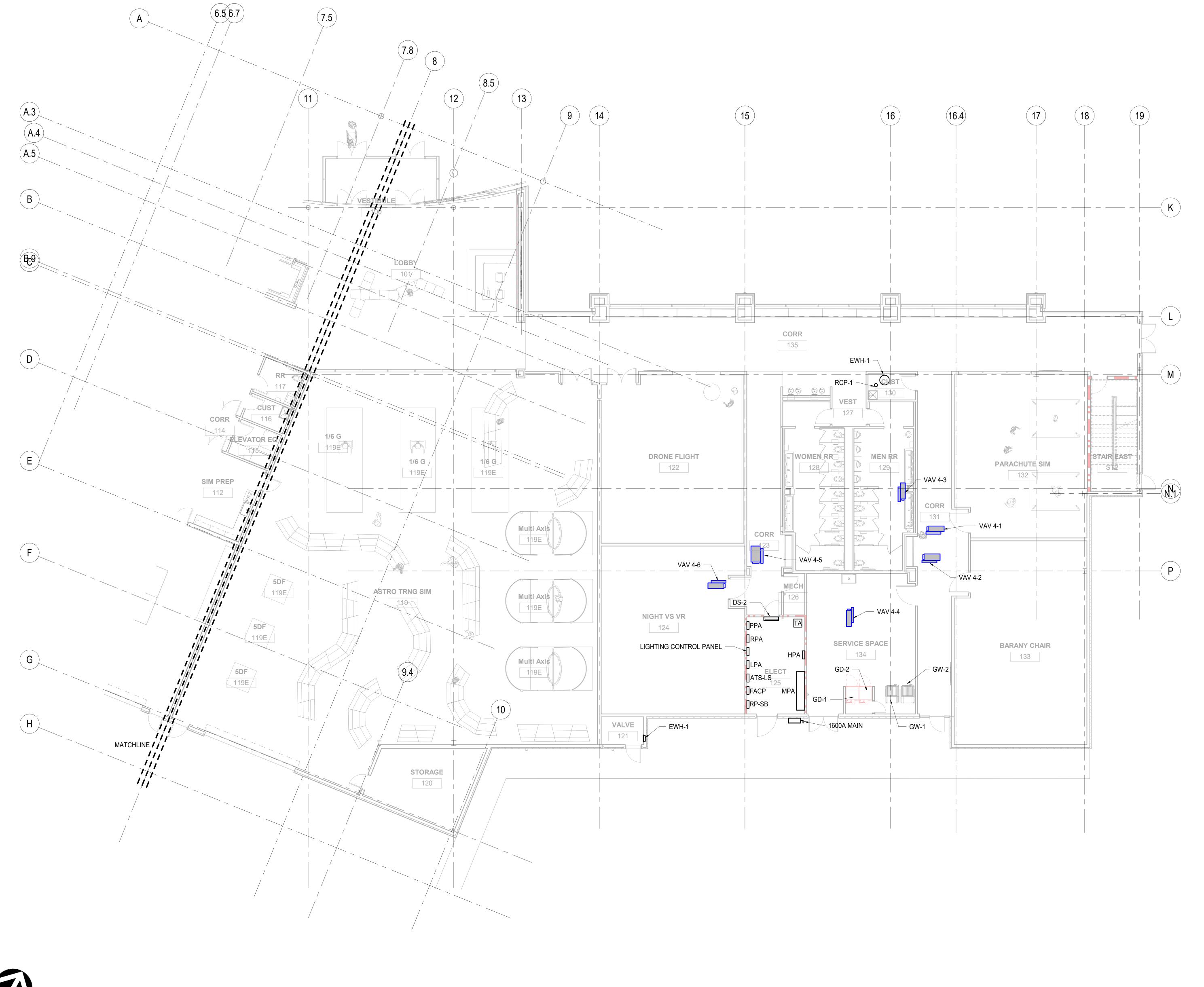


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E5.1



SSUE DATE: FEBRUARY 5, 2024 REVISIONS No. Description FIRST FLOOR PLAN - EAST WING -

INSPIRATION

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HVAC

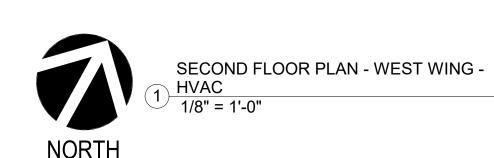
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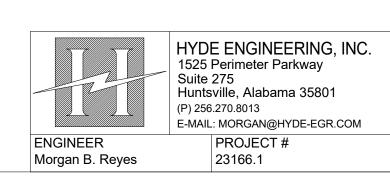
PROJECT NUMBER 225029-00

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

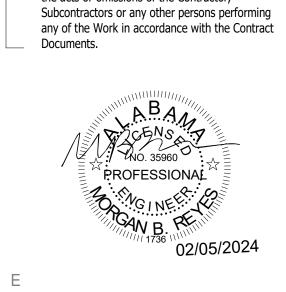
ENGINEER Morgan B. Reyes

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PROJECT #
23166.1











U.S. Space & Recket Canals

PROJECT STATUS:
SSUED:

SSUE DATE:

FEBRUARY 5, 2024

REVISIONS

DRAWING TITLE
SECOND FLOOR
PLAN - WEST WING
- HVAC

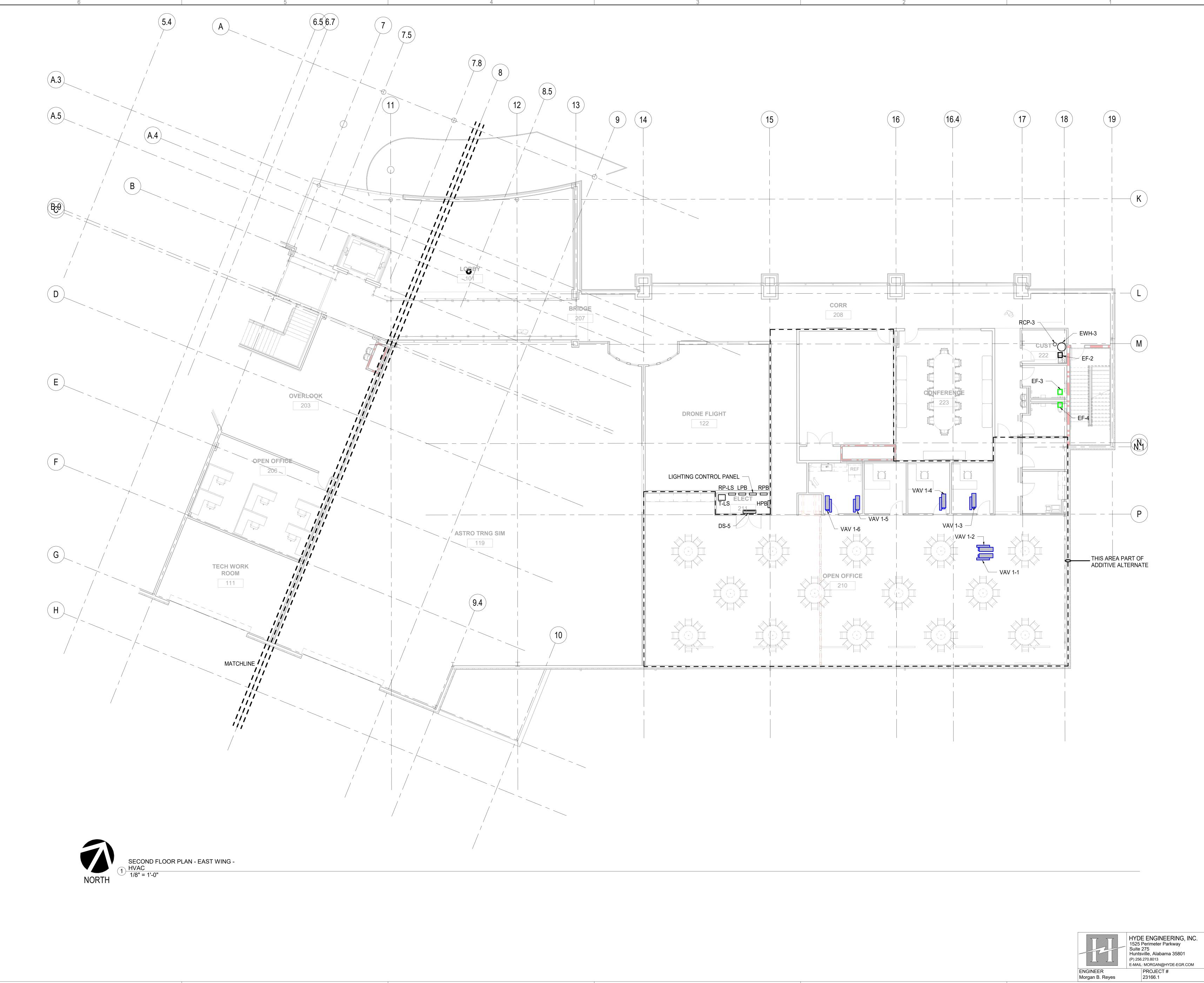
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DRAWING N

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INSPIRATION

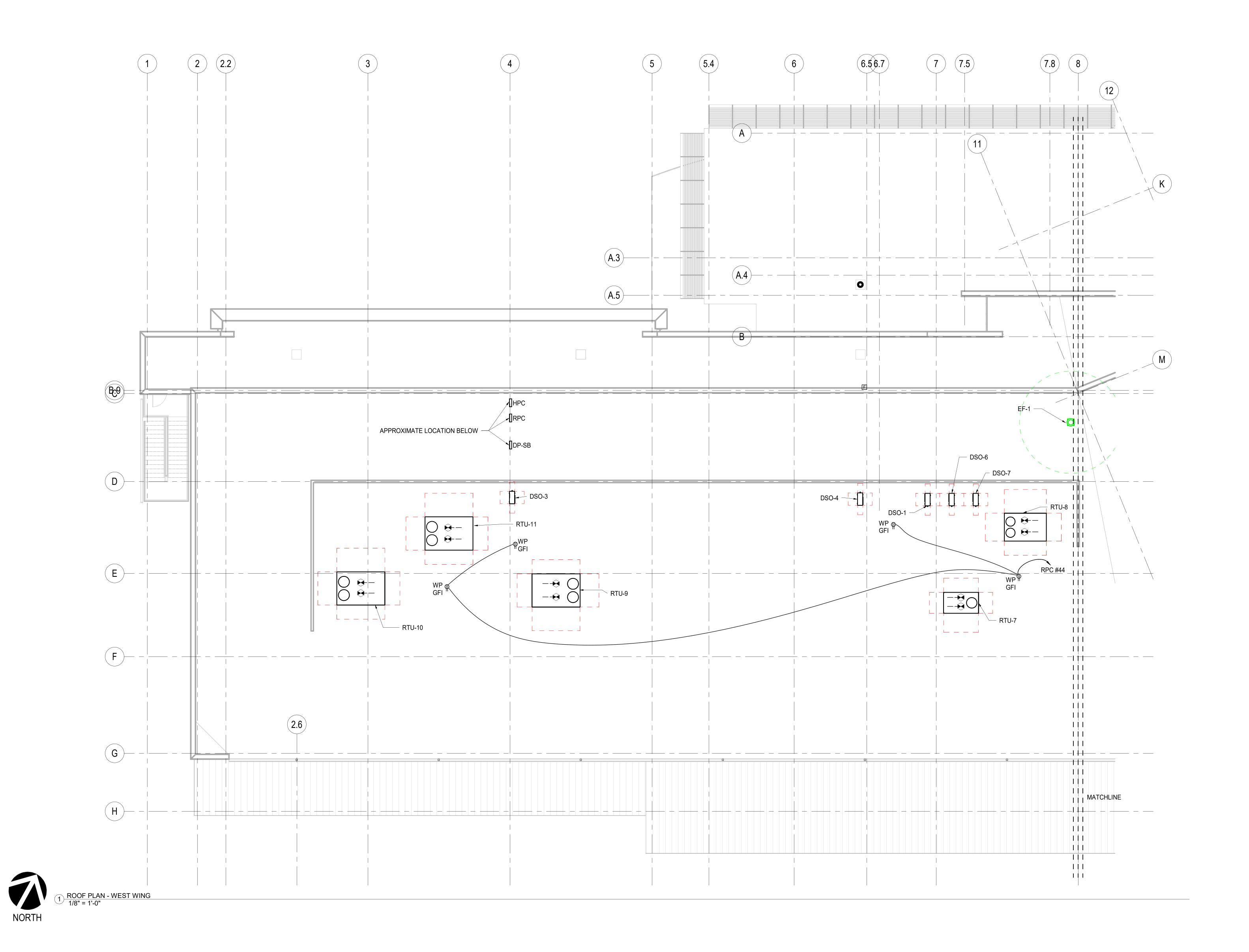
SSUE DATE: FEBRUARY 5, 2024 REVISIONS No. Description

SECOND FLOOR
PLAN - EAST WING
- HVAC

CHECKED BY:

PROJECT NUMBER 225029-00

ENGINEER Morgan B. Reyes



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- Kristine Harding

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SSUE DATE: REVISIONS

ROOF PLAN - WEST WING - ELECTRICAL

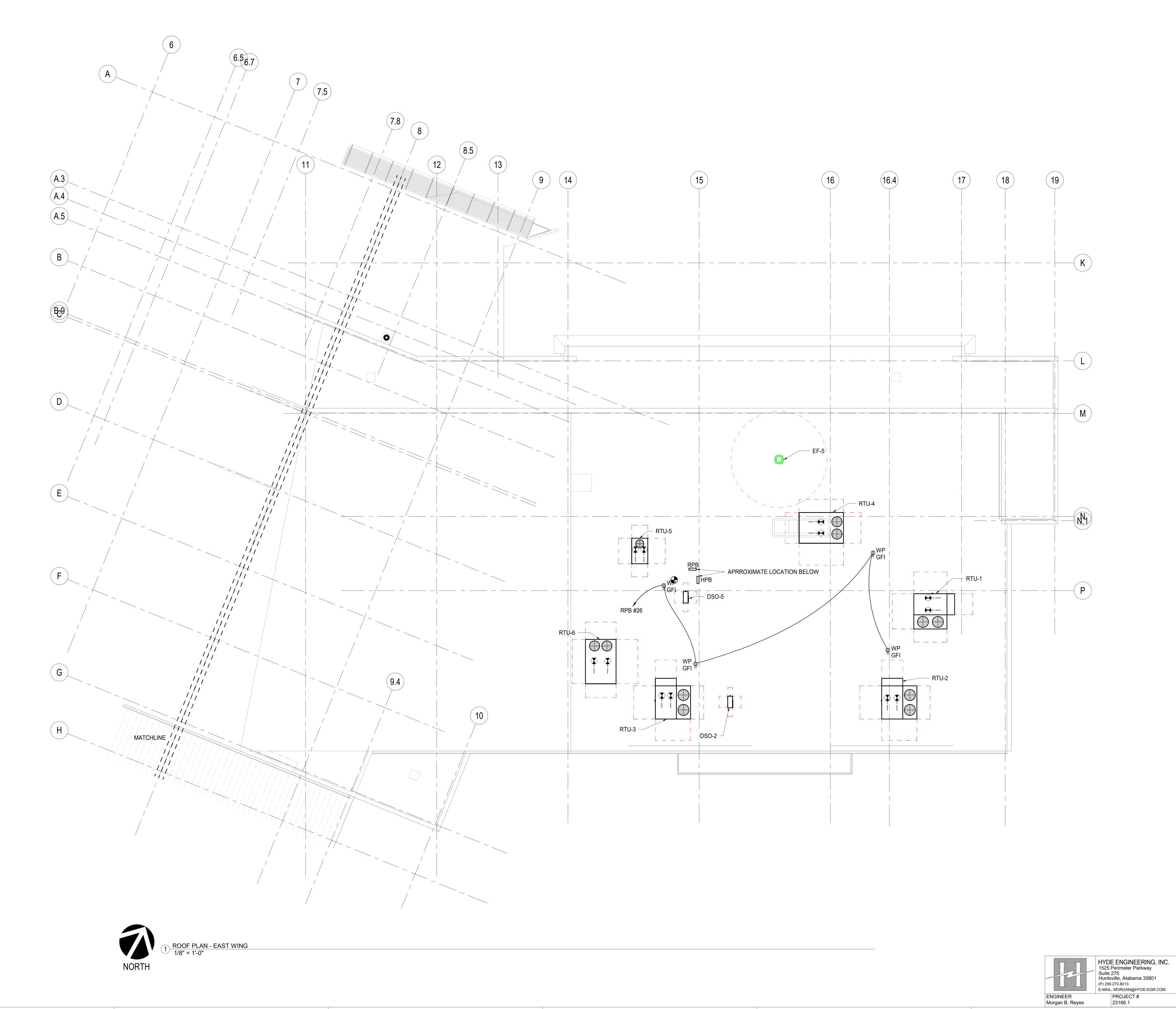
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PROJECT NUMBER

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**E6.1** 

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PROJECT #
23166.1 ENGINEER Morgan B. Reyes



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REVISIONS

ROOF PLAN - EAST WING - ELECTRICAL

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PROJECT NUMBER 225029-00

ENGINEER Morgan B. Reyes

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any of the Work in accordance with the Contract
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#4/0 COPPER GROUND LOOP MINIMUM OF 24" DEEP

DRAWN BY:
CHECKED BY:

PROJECT NUMBER 225029-00

DRAWING

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PROJECT # 23166.1

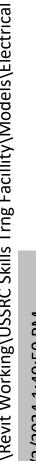
Morgan B. Reyes

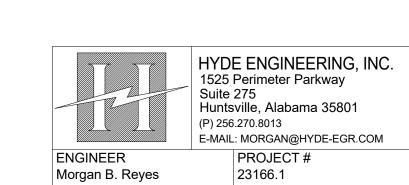
1. LIGHTNING PROTECTION SYSTEM SHALL BE MASTER LABEL CERTIFIED BY LIGHTING PROTECTION COMPANY.

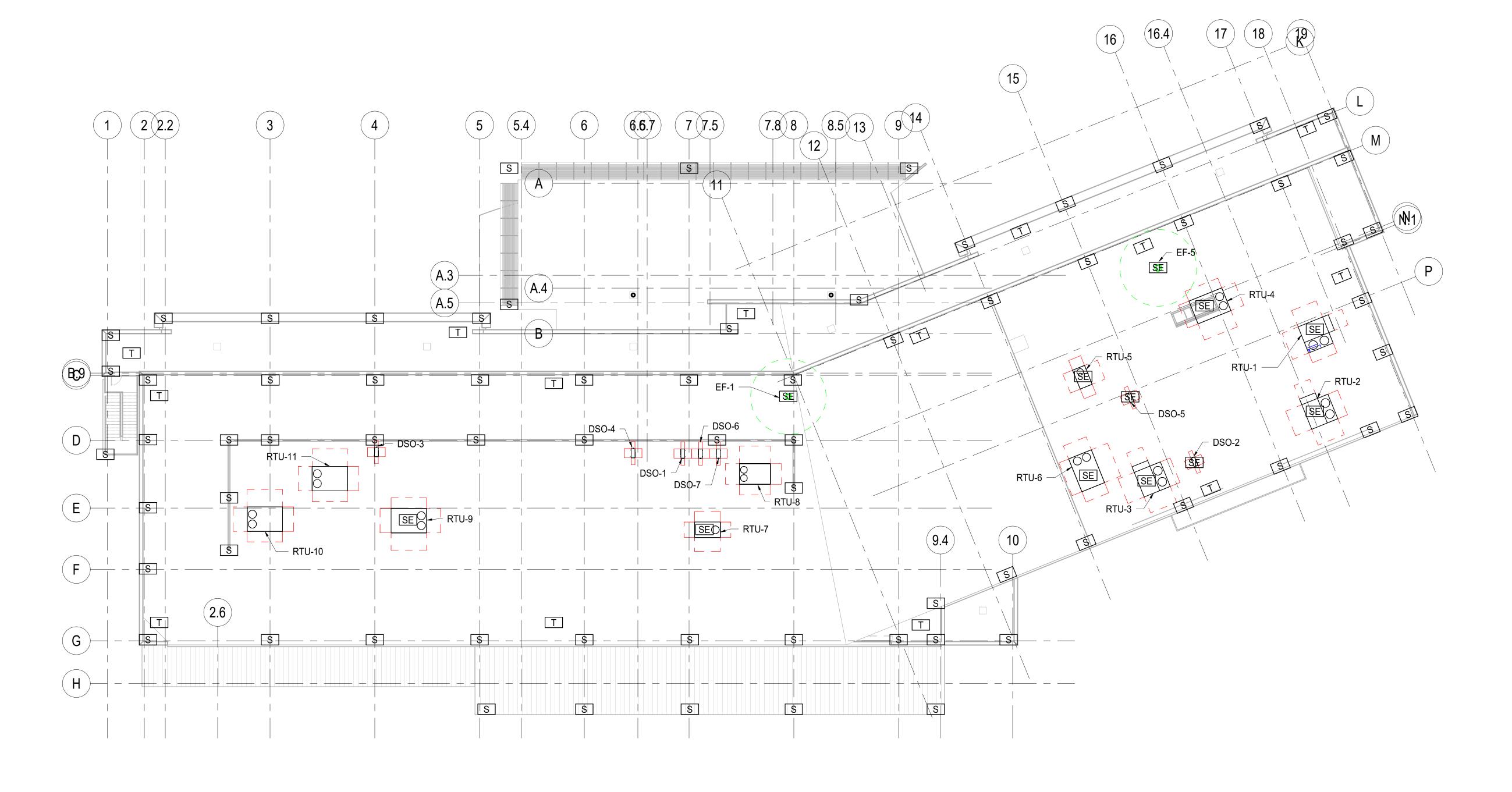
2. LIGHTNING PROTECTION COMPANY SHALL PROVIDE FINAL DETAILS AND DESIGN DRAWINGS DURING SUBMITTALS. SYSTEM SHOWN IS BASIS OF DESIGN.

NOTES:

3. SEE DETAILS ON E7.3.







## NOTES:

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104 Jefferson St. S. Suite 200, Huntsville, AL 35801 p.o.c. - Kristine Harding kharding@kpsgroup.com

This drawing is an Instrument of Service for this Project and is the sole and exclusive property of the Architect. Any use without the knowledge and written consent of the Architect is prohibited.

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.

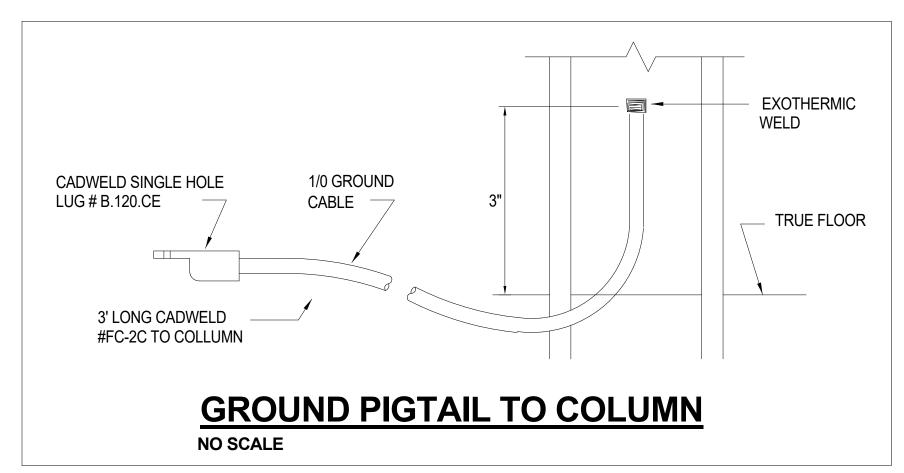


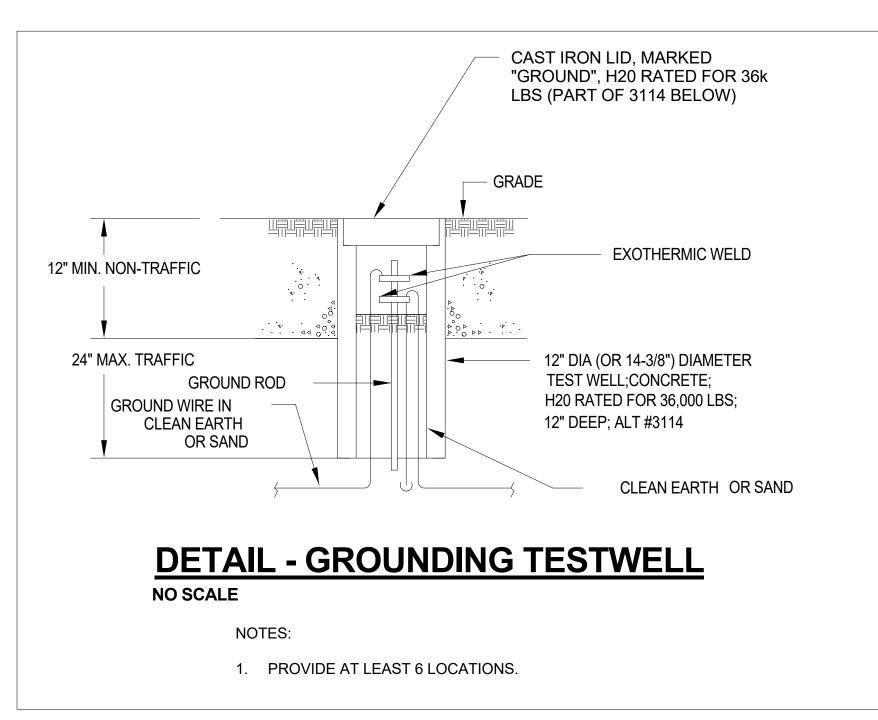
SSUE DATE: FEBRUARY 5, 2024 REVISIONS

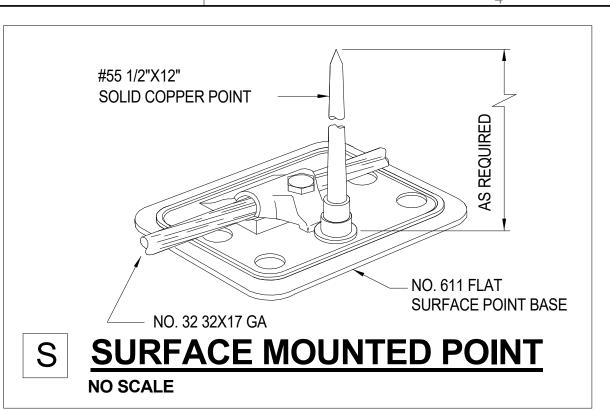
ROOF PLAN -LIGHTNING PROTECTION

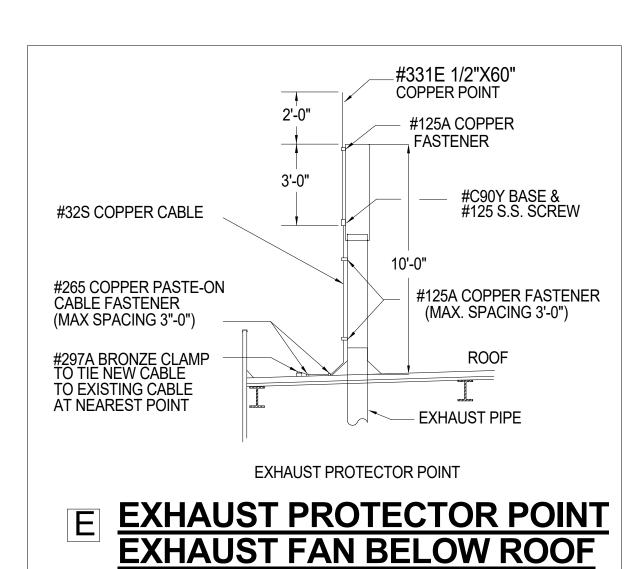
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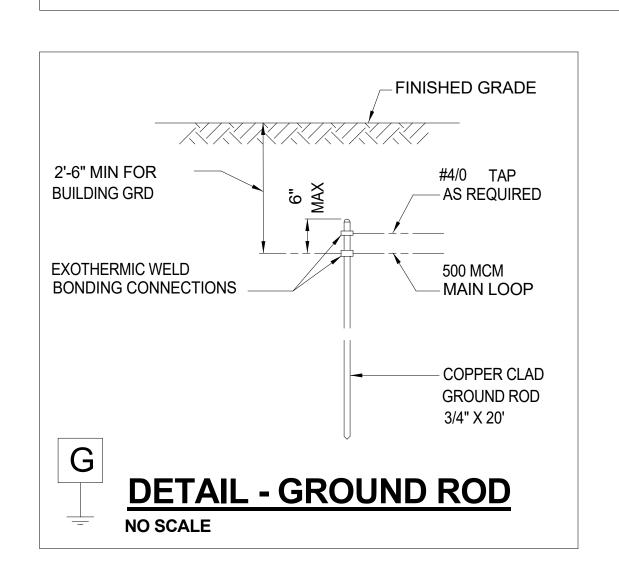
PROJECT NUMBER 225029-00



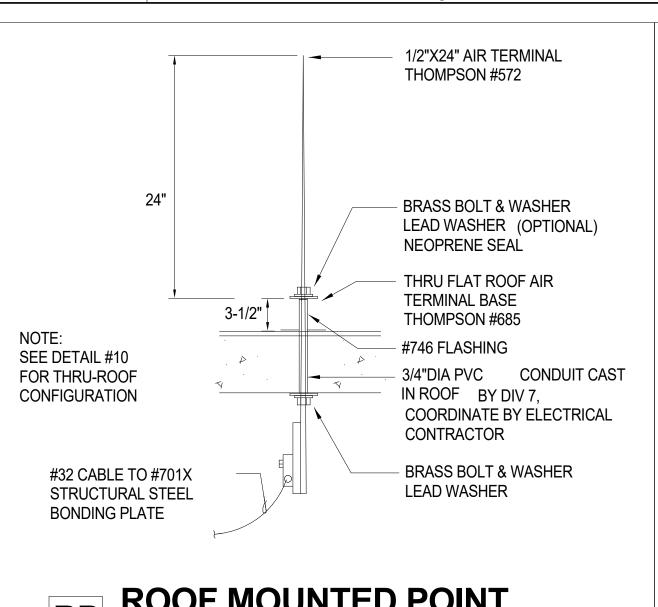




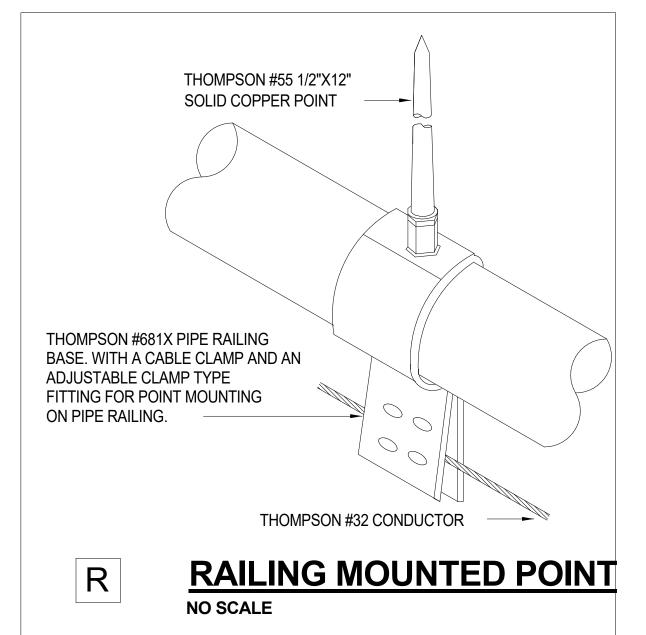


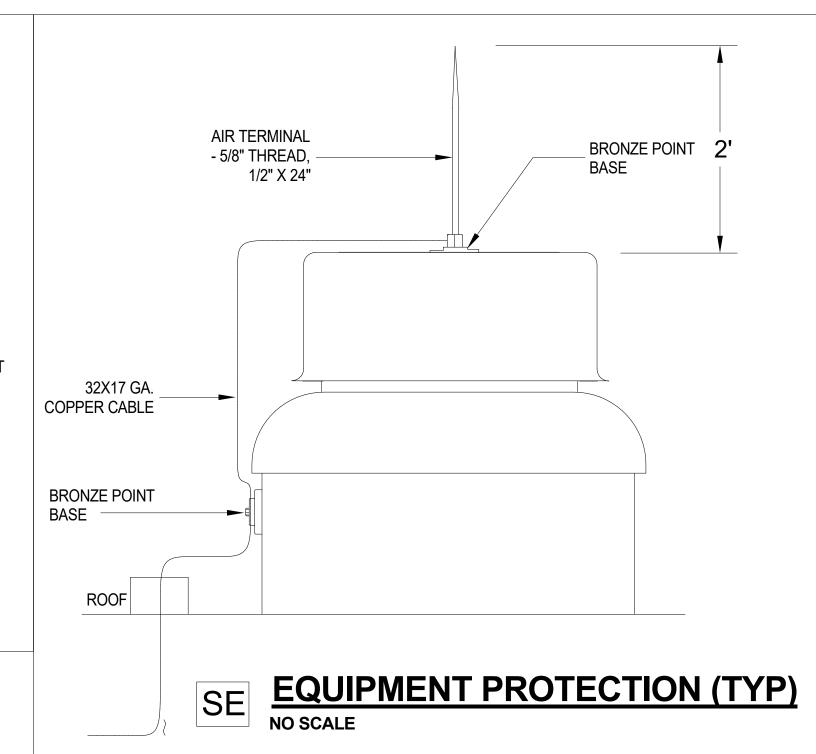


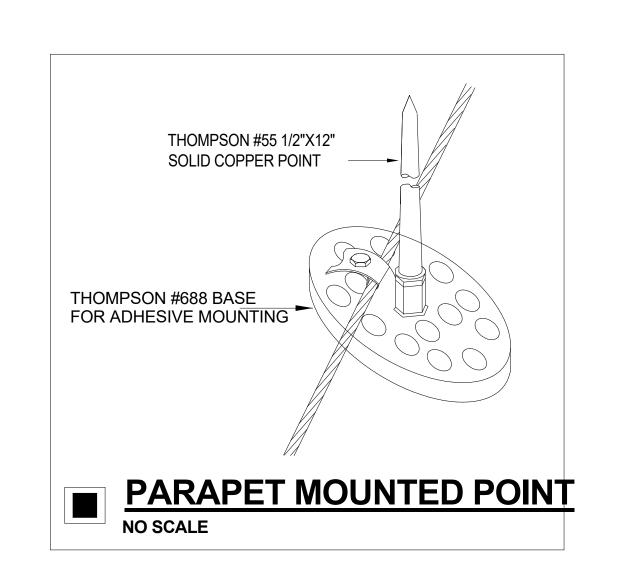
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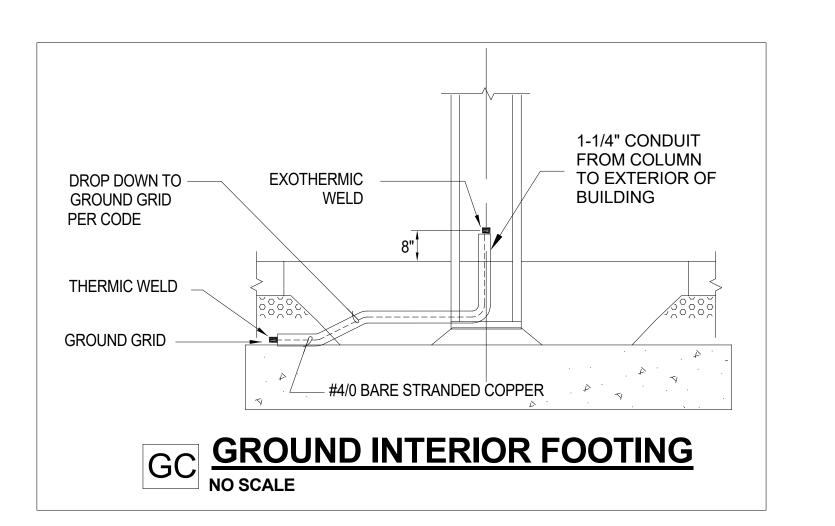














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SSRC - INSPIRATION 4 TRAINING FACILITY

OUS. Space & Date Out of Contract Contr

ISSUE DATE: FEBRUARY 5, 2024

REVISIONS

No. Description Date

DRAWING TITLE
LIGHTNING
PROTECTION
DETAILS

DRAWN BY:
CHECKED BY:
PROJECT NUMBER

225029-00

DRAWING N

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PROJECT #
23166.1

