ADDENDUM #2

DATE: 02/23/2024 Page 1

PROJECT MANUAL FOR: DANGEROURS MATERIALS STORAGE FACILITY

PROJECT NUMBER: RC000212

ADVERTISEMENT DATE: February 5, 2024

PREPARED FOR: The Curators of the University of Missouri

Missouri University of Science and Technology

CONSULTANT: CDG ENGINEERS

1 Campbell Plaza #3a, St. Louis MO 63139

DAN SCHNEFKE

Drawings and Specifications for the above noted project and the work covered thereby are herein modified as follows, and except as set forth herein, otherwise remain unchanged and in full force and effect:

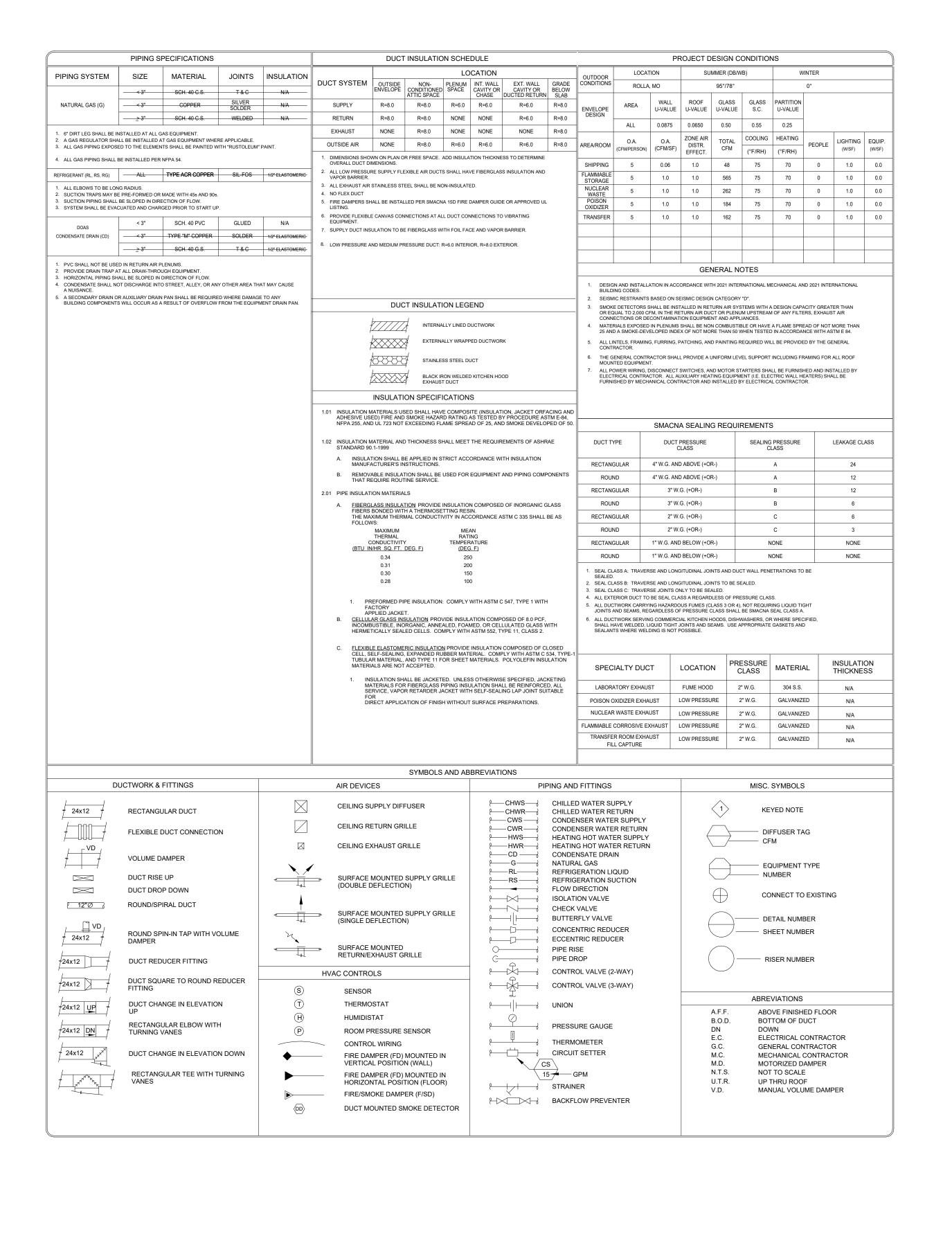
Drawings:

- 1. Sheet M-600 Mechanical Schedules:
 - a. In seismic code block, change Category "C" to Category "D".
- 2. Sheet M-601 Mechanical Details:
 - a. Remove the word "SOX" from Detail 5.
- 3. Sheet M-602 HVAC Air Flow Diagram
 - a. Revised Sequence of Control and sheet layout to accommodate revised sequence.
- 4. Sheet M-604 JCI Controls
 - a. Relocate visual pressure device location adjacent to door/entrance of the space being monitored.

Project Manual:

Substitutions:

END OF ADDENDUM #2



HVAC NOTES

NOTE: MANUFACTURERS' NAMES ON WHICH THIS SPECIFICATION IS BASED INDICATE THE MINIMUM QUALITY OF PRODUCT REQUIRED. SUBSTITUTION MAY BE MADE TO THOSE SPECIFIED IF DEEMED EQUIVALENT BY THE OWNER'S REPRESENTATIVE. ALL WORK AND PRODUCTS SHALL MEET THE REQUIREMENTS OF THE

OWNER/LANDLORD AND GOVERNING CODES. ALL WORK SHALL BE PERFORMED IN CONFORMANCE WITH ALL STATED HEREIN OR OTHERWISE INDICATED BY THE OWNER/LANDLORD. SHALL BE STANDING SEAM GORELOCK CONSTRUCTION AND BASIC MECHANICAL REQUIREMENTS:

ALL EQUIPMENT AND MAJOR MATERIAL ITEMS. SUBMIT SHOP DRAWINGS AND PRODUCT INFORMATION FOR ENGINEER'S REVIEW. BASIC INSTRUCTIONS FOR ROUGH-INS, CUTTING AND PATCHING AND CONTRACTOR COORDINATION WITH OTHER TRADES FOR INSTALLATION ALL FITTINGS THAT ARE OF EITHER SPOT WELDED OR BUTTON OF MECHANICAL EQUIPMENT.

MULTIPLE PRODUCTS, TO ALL BE PROVIDED NEW AND BY SAME MANUFACTURER.

CONTRACTOR WILL PROVIDE COMPLETE O&M MANUALS FOR ALL EQUIPMENT AND SELECTED MATERIALS PROVIDED. MANUALS TO INCLUDE INSTALLATION, OPERATION AND REPAIR MANUALS FOR ALL EQUIPMENT INSTALLED TO INCLUDE PARTS LISTING, LOCAL SUPPLIERS,

CONTRACTOR AND SELECTED SUPPLIERS ARE REQUIRED TO PROVIDE d. SHAFT MOUNTED, LOAD BEARING BUSHINGS SITE TRAINING SESSIONS FOR ALL MAJOR EQUIPMENT AND CONTROL

SEE ARCHITECTURAL GENERAL AND SPECIAL CONDITIONS. ALL CONDITION REQUIREMENTS SHALL APPLY UNLESS OTHERWISE NOTED. FIELD CONDITIONS REQUIRE MINOR CHANGES BE MADE, MINOR CHANGES SHALL BE MADE WITH NO ADDITIONAL COST.

ALL WORK SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR AFTER ADDED STRENGTH AND RIGIDITY. FINAL ACCEPTANCE OF THE WORK BY THE OWNER. VERIFIED. CHANGES TO CONFORM TO ACTUAL POINTS OF CONNECTION ALONG THE SPIRAL SEAM. SHALL BE MADE AT NO ADDITIONAL COST.

CONTRACTOR SHALL PREPARE AND SUBMIT AS-BUILT DRAWINGS TO THE OWNER AND THE LANDLORD. AS-BUILT DRAWINGS SHALL INDICATE WITH WIRE REINFORCEMENT. THE INNER DUCT SHALL BE COVERED THE ACTUAL MANUFACTURER OF THE EQUIPMENT THAT WAS CAPACITIES FOR HEATING, COOLING, ETC.

EQUIPMENT, FIXTURES, AND ACCESSORIES SHALL NOT BE SUPPORTED OF THE OWNER/LANDLORD. FROM CEILING, SOFFIT, NEUTRAL PIERS, PIPING, DUCTWORK, METAL FITTINGS TO CONNECT THE FLEX DUCT TO THE TRUNK DUCT SHALL BE ROOF DECK, LATERAL BRACING, BRIDGING OR CONDUIT. ITEMS SHALL OF THE 45° LEAD-IN TYPE PER THE LATEST OF SMACNA STANDARDS ONLY BE SUPPORTED FROM STRUCTURE WHICH HAS BEEN APPROVED AND SHALL HAVE AN OPPOSED BLADE VOLUME DAMPER, BY THE OWNER/LANDLORD FOR SUPPORT.

ALL ROOF WORK PENETRATIONS AND REPAIRS SHALL BE TOTALLY PERFORMED BY ONLY THOSE ROOFING CONTRACTORS APPROVED BY FLEX DUCT SHALL BE THE PRODUCT OF AN ESTABLISHED THE OWNER/LANDLORD. THIS CONTRACTOR SHALL ONLY EMPLOY ROOFING CONTRACTORS APPROVED BY THE LANDLORD FOR ALL ROOF CERTAINTEED MODEL G-25, WIREMOLD WGC, OR PPG GOSSFLEX. WORK REQUIRED BY THE TENANT'S APPROVED DESIGN. INSTALLATION OF ROOF MOUNTED EQUIPMENT SHALL BE

COORDINATED WITH THE LANDLORD'S DESIGNATED REPRESENTATIVE. DEFICIENCIES AND NON-CONFORMING ITEMS SHALL BE CORRECTED BY PIPING SUPPORTS PER MSS-69. ADJUSTABLE CLEVIS-TYPE HANGERS THE CONTRACTOR. FAILURE TO CORRECT SUCH ITEMS SHALL PERMIT THE OWNER/LANDLORD TO CORRECT SAME AT A COST TO THE CONTRACTOR.

THE OWNER SHALL BE RESPONSIBLE FOR SECURING ALL PERMITS AND INSPECTIONS. CONTRACTOR COORDINATES INSPECTION AND SCHEDULING WITH

THE CPM.

MATERIALS

ALL MATERIALS SHALL BE NEW AND OF RECOGNIZED COMMERCIAL QUALITY. USED MATERIALS WILL NOT BE PERMITTED.

DUCTWORK

RECTANGULAR DUCTWORK: ALL DUCTWORK (EXCEPT FLEXIBLE DUCTWORK) SHALL BE GALV-ANIZED SHEET METAL FABRICATED AND INSTALLED IN STRICT ACCORDANCE WITH THE LATEST EDITION OF SMACNA - "HVAC DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE' DUCTWORK 18" WIDTH AND LARGER SHALL BE CROSSBROKEN OR RIBBED AND STIFFENED SO THAT IT WILL NOT "BREATHE". RATTLE. VIBRATE OR SAG.

ROUND DUCTWORK ALL ROUND SUPPLY, RETURN AND EXHAUST DUCTWORK SHALL BE SEALED GRIP TITE. IRON GRIP OR EQUAL THE CONTRACTOR MAY, AT HIS OPTION, CONVERT ANY OR ALL

RECTANGULAR DUCT WORK TO ROUND PROVIDED THAT THE PROJECT BE INSULATED EXTERNALLY UNLESS SPECIFICALLY NOTED OTHERWISE SPACE LIMITAIONS ARE PROPERLY ADDRESSED AND THAT THE OVERALL SYSTEM DESIGN STATIC PRESSURE NOT BE EXCEEDED.

UNLESS OTHERWISE NOTED, ALL DUCT AND FITTINGS SHALL BE CONSTRUCTED PER SMACNA'S DUCT CONSTRUCTION STANDARDS (+10 IN W.G.) SHOWN IN THE FOLLOWING TABLE

DIAMETER GALVANIZED GALVANIZED (INCHES) SPIRAL DUCT FITTINGS 3 - 14 26 24

16 - 26 24 22 28 - 36 22 20

38 - 50 20 20

ALL FITTINGS ENDS SHALL BE CALIBRATED TO MANUFACTURER'S PUBLISHED DIMENSIONAL TOLERANCE STANDARD AND ASSOCIATED SPIRAL DUCT

ALL FITTING ENDS FROM 3" TO 24" DIA. SHALL HAVE ROLLED OVER EDGES FOR ADDED STRENGTH AND RIGIDITY. ALL ELBOWS FROM 3" AND 12" DIA SHALL BE 2 PIECE DIE STAMPED AND APPLICABLE CODES AND THE LANDLORD'S MINIMUM REQUIREMENTS AS CONTINUOUSLY STITCH WELDED. ALL ELBOWS 14" DIA AND LARGER INTERNALLY SEALED

SHOP DRAWINGS AND PRODUCT INFORMATION WILL BE REQUIRED FOR THE RADIUS OF ALL 90°AND 45°ELBOW SHALL BE 1.5 TIMES THE ELBOW DIAMETER, UNLESS OTHERWISE NOTED ON THE CONTRACT DOCUMENTS TO BE 1.0 TIMES THE ELBOW DIAMETER. THE RADIUS OF ALL 15°,30°AND 60°ELBOWS SHALL BE 1.0 TIMES THE ELBOW DIAMETER. PUNCHED CONSTRUCTION SHALL BE INTERNALLY SEALED. WHEN CONTRACT DOCUMENTS REQUIRE DIVIDED FLOW FITTINGS, ONLY FULL BODY FITTINGS WILL BE ACCEPTED.

> DAMPER SHALL HAVE THE FOLLOWING FEATURES: a. LOCKING QUADRANT WITH BLADE POSITION INDICATOR

DAMPER SHALL BE FITTING SIZED TO SLOP INTO SPIRAL DUCT

b. 2" SHEET METAL INSULATION STAND-OFF c. INTEGRAL SHAFT/BLADE ASSEMBLY

e. GASKET SHAFT PENETRATIONS TO MINIMIZE LEAKAGE

ALL WORK SHALL BE PERFORMED AS INDICATED ON DRAWINGS UNLESS SPIRAL DUCT SHALL BE CALIBRATED TO MANUFACTURER'S PUBLISHED DIMENSIONAL TOLERANCE STANDARD. ALL SPIRAL DUCT 14" DIA. AND LARGER SHALL BE CORRUGATED FOR

SPIRAL SEAM SLIPPAGE SHALL BE PREVENTED BY MEANS OF A FLAT ACTUAL LOCATIONS OF OWNER/LANDLORD'S SERVICES MUST BE FIELD SEAM AND A MECHANICALLY FORMED INDENTATION EVENLY SPACED FLEXIBLE DUCTWORK

ALL FLEXIBLE DUCTWORK SHALL HAVE AN IMPERVIOUS INNER CORE WITH 1.5" THICK FIBERGLASS DUCT INSULATION WITH A POLYETHYLENE INSTALLED, THE EXACT LOCATION OF THE EQUIPMENT AND PERTINENT VAPOR-PROOF JACKET. FLEXIBLE DUCT SHALL BE UL-181 LISTED, CLASS 1. AND SHALL MEET ALL APPLICABLE CODES AND THE REQUIREMENTS

> SQUARE-TO-ROUND TRANSITION AND SHALL HAVE THE SAME FREE AREA AS THE SPECIFIED FLEX DUCT.

MANUFACTURER OF SUCH PRODUCTS AND EQUIVALENT TO

FOR SINGLE PIPES, TRAPEZE-TYPE FOR MULTIPLE PIPE RUNS. REQUIRED PIPING, DUCTWORK, AND EQUIPMENT TO BE SEISMIC-BRACED.

PRE-MANUFACTURED MATERIALS BY B-LINE, MASON INDUSTRIES, LOOS, GRIPLE, OR APPROVED EQUAL.

PIPING TO HAVE VINYL LABELS IDENTIFYING SYSTEM AND DIRECTION OF FLOW. LABELS PLACED EVERY 25 FEET IN EQUIPMENT ROOMS, AT MAJOR EQUIPMENT. AT WALLS, AND AT ACCESS PANELS. HEAT PUMP LOOP PIPING TO BE TYPE "L" HARD-DRAWN COPPER CAN BE

SUBSTITUTED FOR 2 INCHES AND SMALLER, WHEN SOLDERED WITH SILVER-BEARING SOLDER. VALVES TO BE BRONZE BALL BODY, 1/4-TURN BALL VALVES FOR 2 INCHES AND BELOW. STRAINERS TO BE CAST IRON BODY, "Y" TYPE WITH STAINLESS STEEL

SCREENS.

INSULATION

ALL RECTANGULAR SUPPLY AND RETURN AIR DUCTS SHALL BE INSULATED INTERNALLY UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS. INTERNAL INSULATION SHALL BE 1" THICK FIBERGLASS DUCT LINER WITH A K-FACTOR OF .25 AT 75°F MEAN, A DENSITY OF 2.75 LB./C.F., BE SUIT- ABLE FOR UP TO 2500 FPM VELOCITY AND HAVE A MINIMUM 6.0 INSTALLED R-VALUE.

ALL DUCT DIMENSIONS ON DRAWINGS ARE FREE AREA AND SHALL BE INCREASED FOR DUCT LINES ALL ROUND SUPPLY AIR DUCTWORK (EXCEPT FLEXIBLE DUCTS) SHALL

ON THE DRAWINGS, EXTERNAL DUCT INSULATION (DUCT WRAP) SHALL BE 2" THICK FIBERGLASS DUCT WRAP WITH VINYL OR FSK FACING. DUCT

WRAP SHALL HAVE A K-FACTOR OF .27 AT 75°F MEAN, A DENSITY OF 1.0 LB./C.F AND A MINIMUM 6.0 INSTALLED R-VALUE.

ALL DUCT INSULATION SHALL BE UL LABELED FOR FIRE AND SMOKE RATINGS WITH A MAXIMUM FLAME SPREAD RATING OF 25 AND A MAXIMUM SMOKE DEVELOPED RATING OF 50. DUCT INSULATION SHALL COMPLY WITH ALL APPLICABLE ASHRAE AND SMACNA STANDARDS.. ALL DUCTWORK EXTERIOR TO THE CONDITIONED SPACE SHALL BE LINED, WRAPPED OR KOOLDUCT WITH AN EQUIVALENT VALUE OF R=8.0 AS REQUIRED BY THE ENERGY CODE.

DUCT INSULATION SHALL BE EQUAL TO PRODUCTS MANUFACTURED BY CERTAINTEED AND SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. EQUIPMENT MOUNTING BE HUNG FROM SLAB ABOVE WITH FLEXIBLE

CONNECTIONS TO DUCT AND PIPING. ALL PIPING TO BE INSULATED USING RIGID MOLDED. GLASS FIBER INSULATION CONFORMING TO ASTM C547 WITH "K" VALUE OF 0.24 AT

INSULATION JACKETING TO BE TYPE I, MULTI-PURPOSE, PER ASTM C921. WHITE KRAFT PAPER REINFORCED WITH GLASS FIBER YARN AND BONDED TO ALUMINIZED FILM.

MAXIMUM FLAME SPREAD: ASTM E84; 25. MAXIMUM SMOKE DEVELOPED: ASTM 384; 50.

CEILING DIFFUSERS SHALL HAVE LOUVERED FACE WITH A FRAME STYLE COMPATIBLE WITH THE TYPE OF CEILING USED. IN GENERAL DIFFUSERS SHALL BE SUITABLE FOR LAY-IN T- BAR CEILING. THE DIFFUSER FACE SIZE OR FACE PLATE SIZE SHALL BE OF THE SAME NOMINAL SIZE AS THE CEILING MODULE. DIFFUSERS SHALL HAVE ANTI-SMUDGE CHARACTERISTICS.

SIDEWALL AND DUCT MOUNTED SUPPLY GRILLES SHALL HAVE A FRAME SUITABLE FOR SURFACE MOUNTING AND INDIVIDUAL ADJUSTABLE BLADES ARRANGED ON 3/4" CENTERS TO PROVIDE A FULLY ADJUSTABLE DOUBLE DEFLECTION AIR FLOW PATTERN. THE FRONT BLADES SHALL BE PARALLEL TO THE LONG DIMENSION OF

CEILING RETURN AIR GRILLES SHALL HAVE AN EGG-CRATE FACE WITH A FRAME STYLE SUITABLE FOR LAY-IN T-BAR CEILING OR SURFACE MOUNTING IN ACOUSTICAL TILE OR DRYWALL CEILING. SIDEWALL AND DUCT MOUNTED RETURN AIR OR TRANSFER AIR GRILLES SHALL HAVE A FRAME SUITABLE FOR SURFACE MOUNTING AND 0° FIXED BLADE DEFLECTION WITH BLADES ARRANGED ON 3/4" CENTERS. THE GRILLE BLADES SHALL BE PARALLEL TO THE LONG DIMENSION OF THE GRILLE. AN OPPOSED BLADE VOLUME DAMPER SHALL BE PROVIDED AT ALL SUPPLY AIR AND DUCTED RETURN AIR DEVICES. NO DAMPER IS REQUIRED AT NON-DUCTED RETURN OR

ALL AIR DEVICES SHALL BE FURNISHED IN STANDARD WHITE FINISH AND SHALL BE PAINTED TO MATCH ADJACENT SURFACES. SEE SCHEDULE

CONTROLS SHALL BE JOHNSON CONTROLS METASYS

CONTROLS FOR SYSTEMS SHALL BE COMPATIBLE WITH EQUIPMENT INSTALLED, SUPPLIED, OR SPECIFIED IN THESE DRAWINGS.

CONTROLS FOR BUILDING AUTOMATION SYSTEMS SHALL BE COMPATIBLE WITH INSTALLED EQUIPMENT. FOR SYSTEMS THAT ARE PROGRAMMABLE, THE INSTALLING CONTRACTOR SHALL COORDINATE WITH THE OWNER/GC FOR SPECIFIC REQUIREMENTS FOR OCCUPIED AND UNOCCUPIED SPACES. BAS SYSTEMS SHALL BE INSTALLED AND PROGRAMMED TO MEET ASHRAE AND ENERGY CODE STANDARDS.

STAND ALONE SYSTEMS TO BE CONTROLLED BY PROGRAMMABLE TYPE T-STATS SUCH AS ECOBEE OR NEST AND COORDINATED WIT OWNER REQUIREMENTS

TESTING AND BALANCING:

FINAL SYSTEM TESTING AND BALANCING TO BE ACCOMPLISHED BY OWNERS AABC-CERTIFIED CONTRACTOR.
INSTALLING MECHANICAL CONTRACTOR TO MANGE, COORDINATE, AND ASSSIT TEST AND BALANCE CONTRACTOR

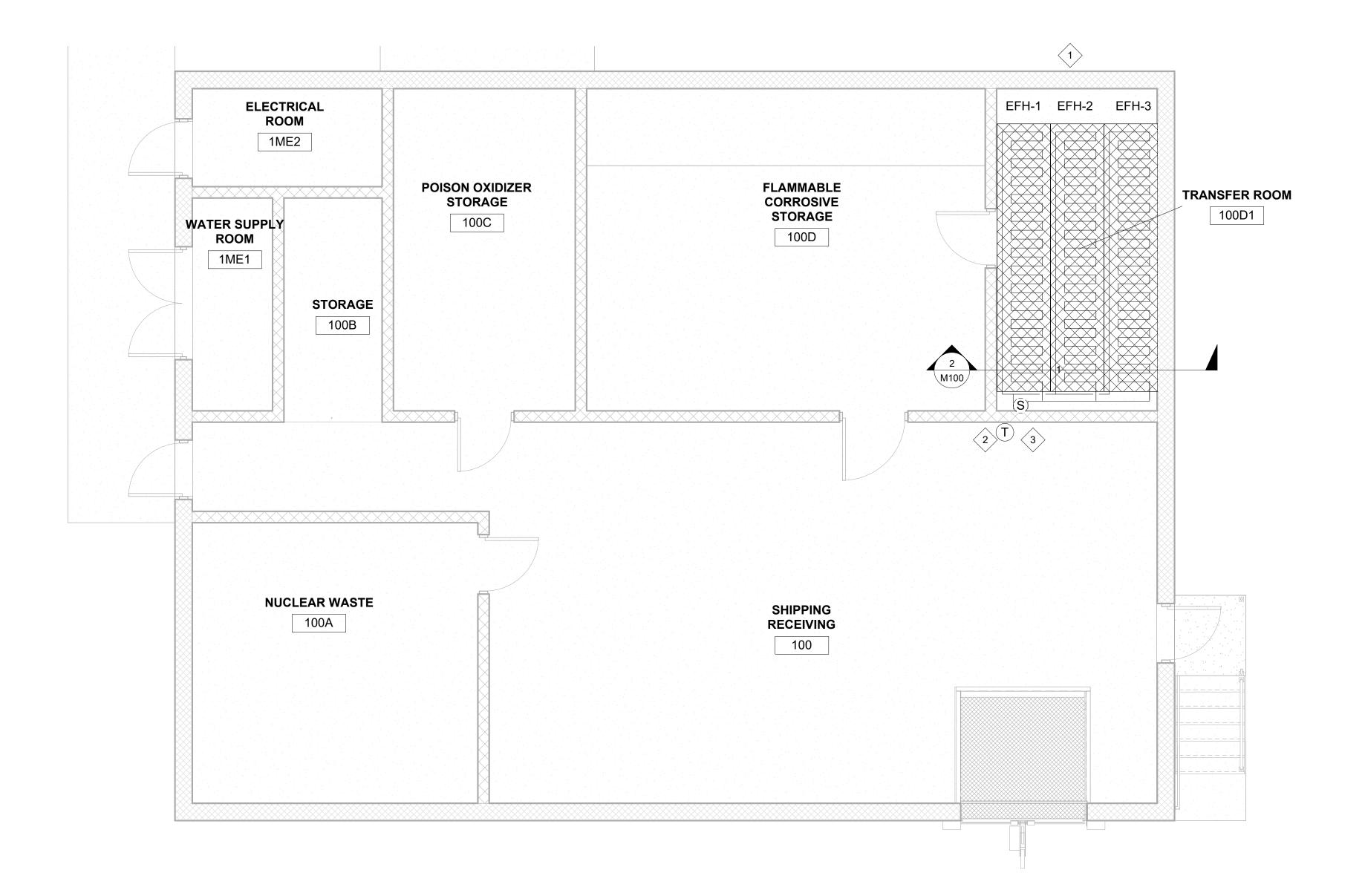
TESTING TO INCLUDE VERIFICATION OF PROPER OPERATION OF ALL SYSTEMS, PRESSURE RELATIONSHIPS, AND DESIGN QUANTITIES. FINAL REPORT TO BE INCLUDED IN O&M MANUALS FOR FUTURE

NO. DATE DESCRIPTION DESIGR ENGR PM SCALE 12/07/23 ISSUED FOR BID POB/BM POB SHEET FULL SIZE 34x22 ANSI D Copyright © 2023 Dynamic Engineered Systems 02/14/24 ADDENDUM 2 POB/BM POB CDG PROJECT MISSOURI CERTIFICATE OF AUTHORITY #: E-2011001315 PROJ MGR PROFESSIONAL ENGINEER #: MO-25069

MECH SYMBOLS LEGENDS MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY ROLLA, MISSOURI DANGEROUS MATERIALS STORAGE FACILITY

12" = 1'-0" | SITE: ROLLA, MISSOURI DRAWING NO. M000 ENGINEERS One Campbell Plaza 314.781.7770 St. Louis, Missouri, 63139 314.781.9075 REVISION NO. 2

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1 ELECTRIC RADIANT FLOOR HEATING 1/4" = 1'-0"

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GENERAL NOTES

REMARKS.

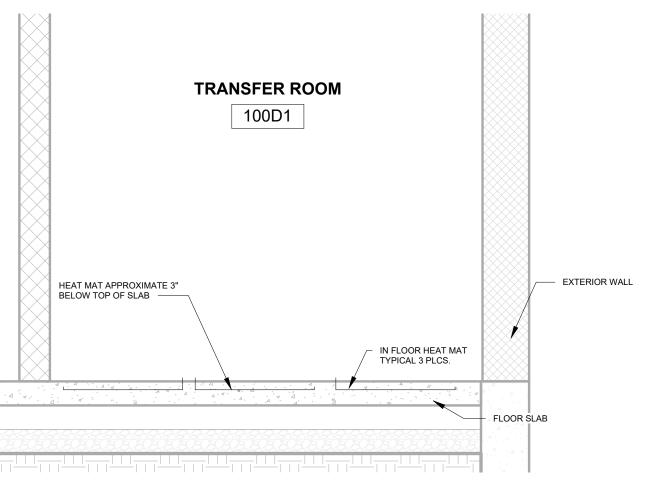
- 1. UNDER FLOOR RADIANT HEAT TO BE COORDINATED WITH CONCRETE SLAB POUR.
- THERMOSLAB BRAND OR EQUAL HEAT MAT.
- COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER REQUIREMENTS.

KEYED NOTES

- PROVIDE IN FLOOR ELECTRIC RADIANT HEATING MAT (3) 36" X15' WITH IN FLOOR SENSOR TO REMOTE THERMOSTAT. INSTALL PER MANUFACTURERS INSTRUCTIONS.
- PROVIDE WALL MOUNTED RADIANT FLOOR HEAT THERMOSTAT. TO BE INSTALLED OUTSIDE OF C1D1 ROOM. COORDINATE FINAL LOCATION WITH GC.
- REMOTE SENSOR TO BE ADHERED TO FLOOR SLAB.

FLOOR HEAT SEQUENCE OF CONTROL

- WHEN FLOOR HEAT THERMOSTAT IS TURNED TO ON, THE SYSTEM SHALL ACTIVATE ALL THREE HEAT MATS SIMULTANEOUSLY.
- 2. THERMOSTAT SHALL ENERGIZE A 4 CIRCUIT LIGHTING CONTACTOR COIL SO THAT THE SPACE IS PROVIDED EVEN HEATING.
- 3. THE THERMOSTAT SHALL CYCLE POWER TO HEAT THE SLAB TO MAINTAIN SET POINT ON THERMOSTAT. SLAB TEMPERATURE SHALL NOT BE GREATER THAN 85° F



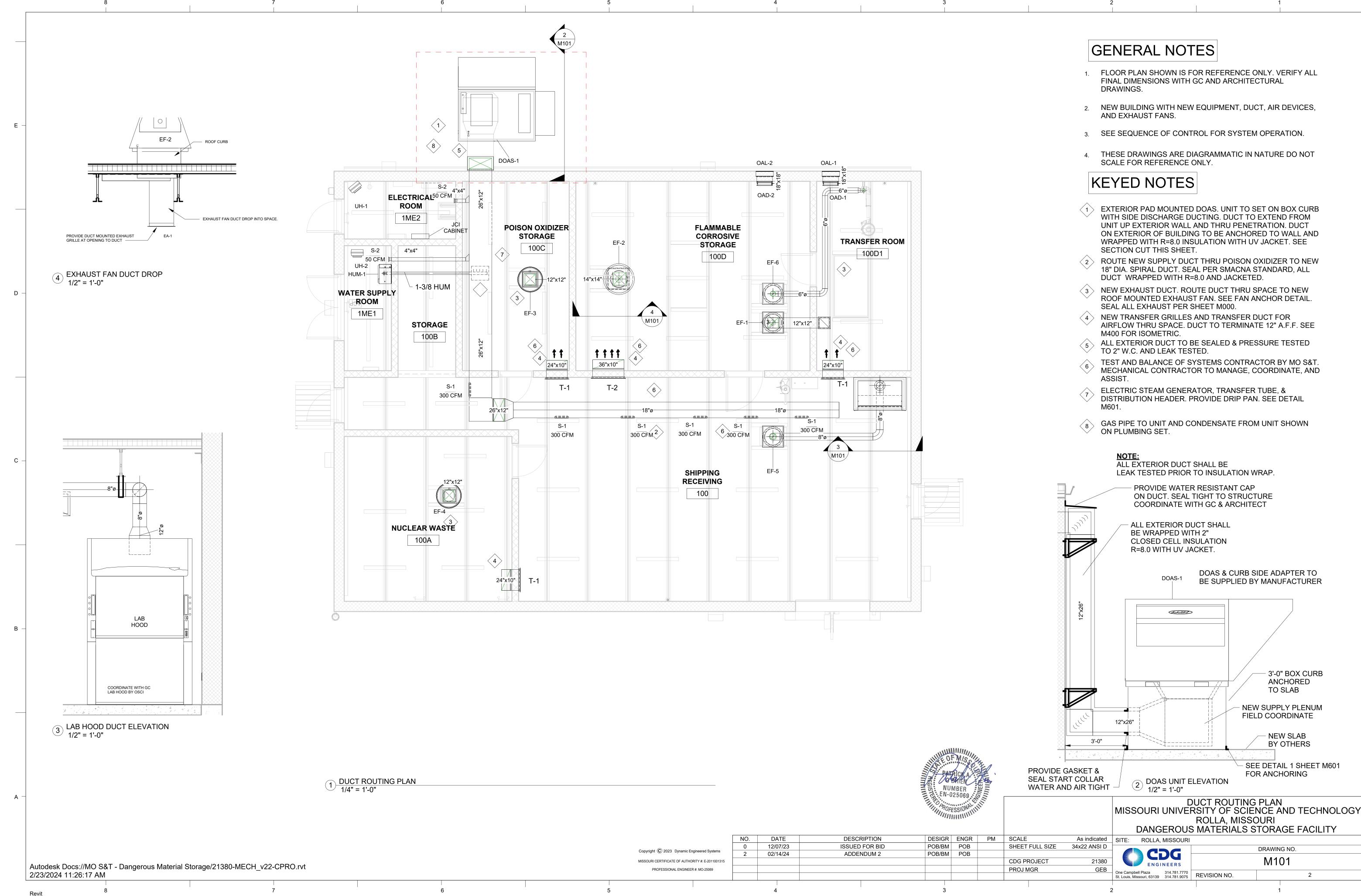
2 INFLOOR HEAT MAT SECTION 1/2" = 1'-0"

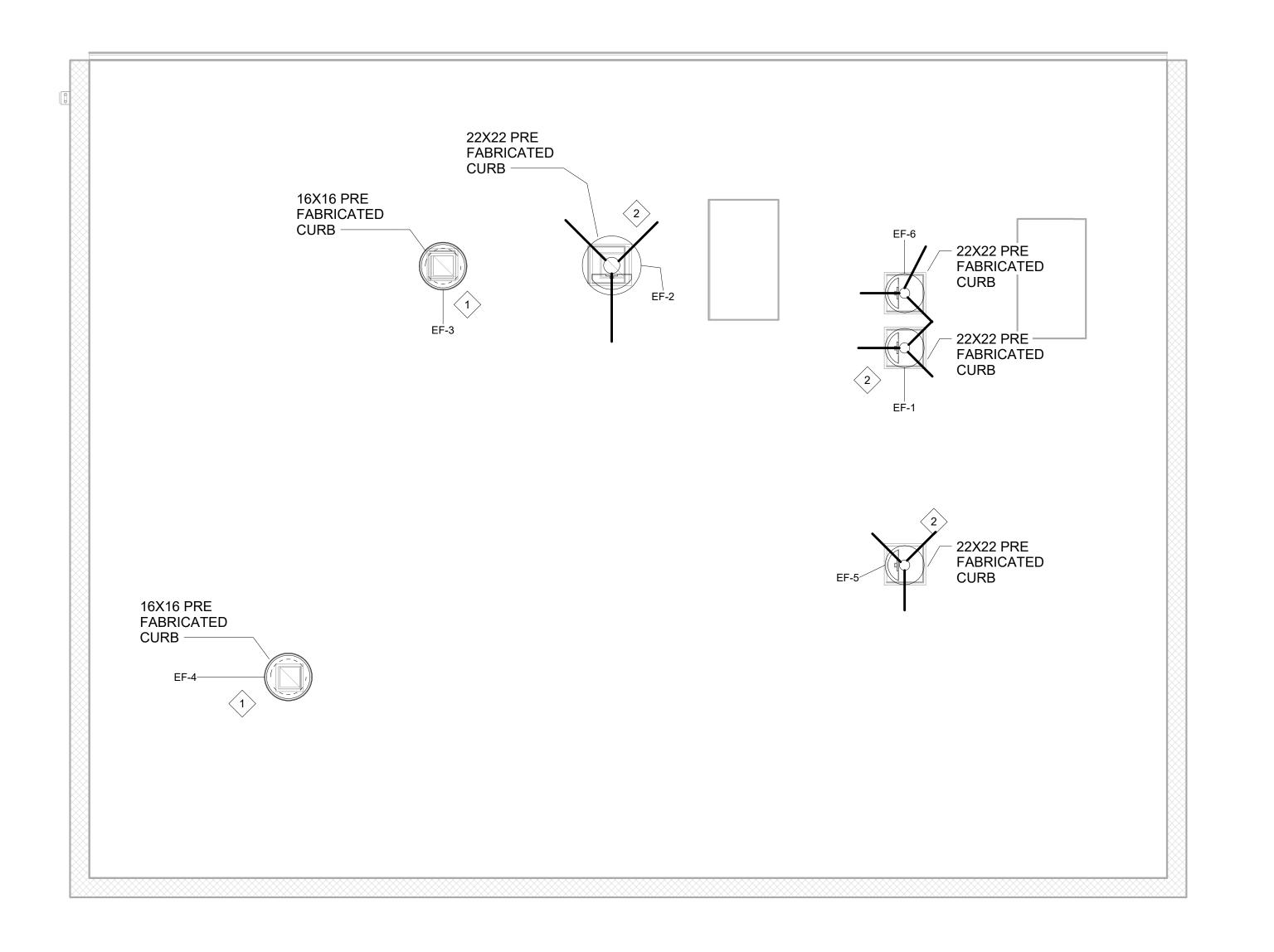
ELECTRIC RADIANT FLOOR HEAT PLAN MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY ROLLA, MISSOURI DANGEROUS MATERIALS STORAGE FACILITY

As indicated SITE: ROLLA, MISSOURI

DRAWING NO. CDG M100 One Campbell Plaza 314.781.7770 St. Louis, Missouri, 63139 314.781.9075 REVISION NO.

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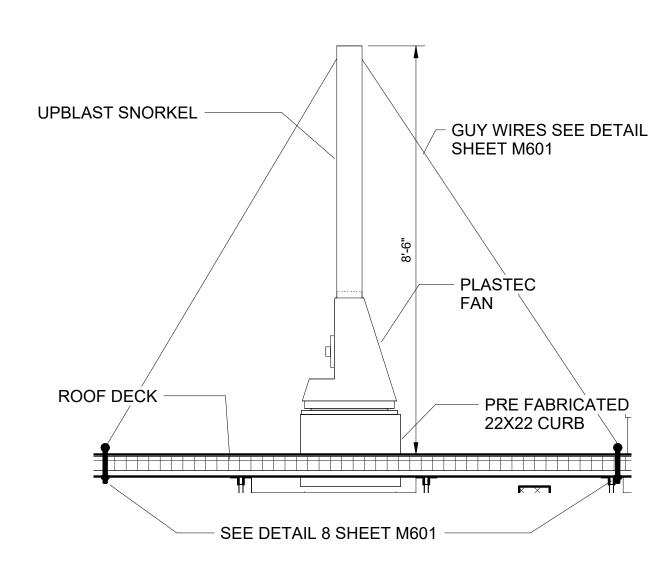


GENERAL NOTES

- 1. FLOOR PLAN SHOWN IS FOR REFERENCE ONLY. VERIFY ALL FINAL DIMENSIONS WITH GC AND ARCHITECTURAL DRAWINGS.
- 2. NEW BUILDING WITH NEW EQUIPMENT, DUCT, AIR DEVICES, AND EXHAUST FANS.
- 3. SEE SEQUENCE OF CONTROL FOR SYSTEM OPERATION.
- 4. VISUAL INSPECTION IS REQUIRED PRIOR TO INSULATION AS THIS DUCT IS TO BE SEAL CLASS 4. SEAL PER SMACNA SEALING REQUIREMENT M000

KEYED NOTES

- NEW ROOF MOUNTED UPBLAST EXHAUST FAN. PROVIDE MANUFACTURE PRE FABRICATED CURB. SEAL PENETRATION WEATHER TIGHT. SEE DETAIL 7 SHEET M601 FOR ANCHORING.
- NEW PLASTEC EXHAUST FAN. PROVIDE MANUFACTURER PRE FABRICATED CURB. SEAL PENETRATION WEATHER TIGHT. SEE DETAIL 2 THIS SHEET FOR ANCHORING.



2 PLASTEC FAN SECTION 1/2" = 1'-0"

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MECHANICAL ROOF PLAN MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY ROLLA, MISSOURI

DANGEROUS MATERIALS STORAGE FACILITY As indicated SITE: ROLLA, MISSOURI DRAWING NO. CDG

M102

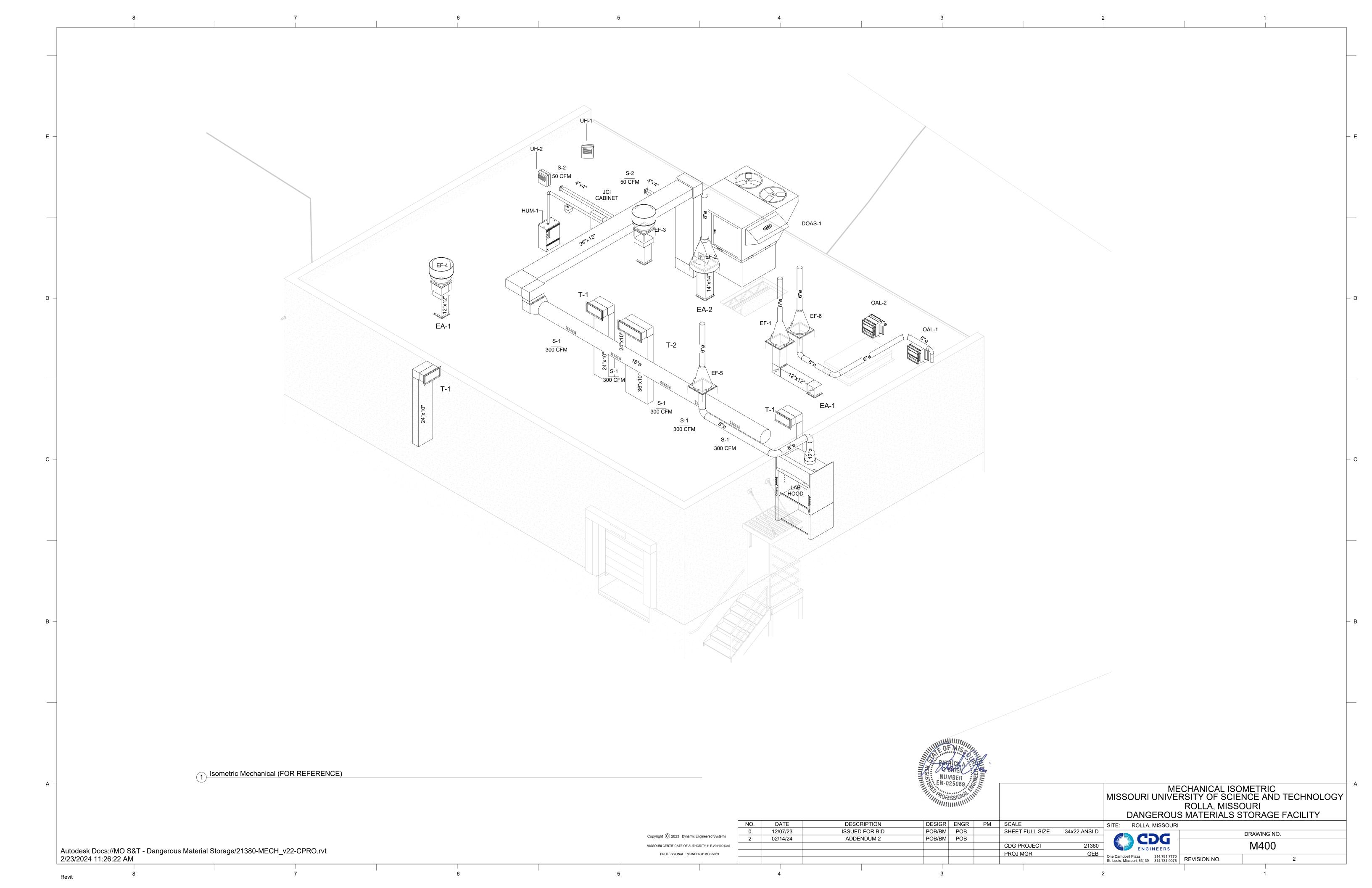
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Roof Plan Mechanical
1/4" = 1'-0"



SEISMIC CODE BLOCK FOR MECHANICAL SYSTEMS EQUIPMENT AND COMPONENT ANCHORAGE EARTHQUAKE LOAD RESISTANCE

OCCUPANCY CATEGORY IV										SEISMIC D	DESIGN CATEGORY "D"	
			SEISMIC ANCHORAGE TO FLOORS, ROOFS, ETC.		I SEISMIC SWAY			PROFESSIONALLY SEA SWAY BRACING DETA			COMMENTS	
EQUIPMENT & SYSTEM COMPONEN	TS				CING	ON CONSTRUCTION DOCUMENTS	SUBSEQUENT SUBMITTAL		OTHER	IBC SECTION THAT	DEFEDENCE THAT	
ITEM	IMPORTANCE FACTOR (Ip)	NOT PROVIDED FOR PROJECT	PROVIDED FOR PROJECT	NOT PROVIDED FOR PROJECT	PROVIDED FOR PROJECT	DRAWING NO. OR SPECIFICATION SECTION	SHOP DRAWINGS	SEPARATE PERMITS & PLANS	PROVISIONS (SEE NOTES)	EXEMPTS SEISMIC REQUIRE- MENTS	REFERENCE THAT EXEMPTS SEISMIC REQUIREMENTS	
PAD MOUNTED EQUIPMENT > 400 LBS DOAS-1	1.5		х	х		M-601					1	
ROOF-MOUNTED EQUIPMENT ≤ 400 LBS (EF-1,2,3,4,5,6)	1.5		х	х		M601					2	
FLOOR-WALL-MOUNTED EQUIPMENT ≤ 400 LBS (HUM-1)	1.5		х	х		M601					2	
AIR DEVICES	1.5	Х		Х							1,3	
DUCTWORK < 6 SQ.FT.	1.5	Х		Х							4,5	

- 1. COMPONENTS SHALL BE POSITIVELY ATTACHED WITH MECHANICAL FASTENERS.
- 2. TABLE 4.4, ITEM 1, GENERAL EXEMPTIONS, PART "A" EQUIPMENT MOUNTED 4 FEET OR LESS ABOVE THE FLOOR LEVEL & WEIGHING 400 LBS OR LESS DOES NOT REQUIRE SEISMIC BRACING.
- 3. TABLE 4.4, ITEM 1, GENERAL EXEMPTIONS, PART "B" EQUIPMENT WEIGHING 20 LBS OR LESS DOES NOT REQUIRE SEISMIC BRACING.
- 4. TABLE 4.4, ITEM 3, DUCT EXEMPTIONS, PART "A" DUCT SUSPENDED FROM HANGERS 12 INCHES OR LESS IN LENGTH WHICH ARE DETAILED TO AVOID SIGNIFICANT BENDING OF THE HANGERS & THEIR ATTACHMENT DOES NOT REQUIRE SEISMIC
- 5. TABLE 4.4, ITEM 3, DUCT EXEMPTIONS, PART "B" DUCT HAVING A CROSS-SECTIONAL AREA OF LESS THAN 6 SQUARE FEET DOES NOT REQUIRE SEISMIC BRACING. SEE PLAN DRAWINGS FOR DUCT SIZES.
- 6. TABLE 4.4, ITEM 4, PIPING SYSTEM EXEMPTIONS PIPING IS SUPPORTED BY ROD HANGERS; HANGERS IN THE PIPE RUN ARE 12 INCHES OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE; HANGERS ARE DETAILED TO
- AVOID BENDING OF THE HANGERS AND THEIR ATTACHMENTS; AND PROVISIONS ARE MADE FOR PIPING TO ACCOMMODATE EXPECTED DEFLECTIONS _ PIPING MEETING ALL CRITERIA IS EXEMPT FROM SEISMIC BRACING REQUIREMENTS.
- 7. TABLE 4.4, ITEM 4, PIPING SYSTEM EXEMPTIONS HIGH-DEFORMABILITY PIPING (STEEL & COPPER PIPING AND TUBING JOINED BY WELDING, BRAZING/SOLDERING OR BY BOLTED STEEL FLANGES) IS USED; PROVISIONS ARE MADE TO AVOID IMPACT WITH LARGER PIPING OR MECHANICAL COMPONENTS OR TO PROTECT THE PIPING IN THE EVENT OF SUCH IMPACT; AND THE NOMINAL PIPE SIZE IS LIMITED TO 3" OR LESS FOR Ip=1.0 & 1" OR LESS FOR Ip>1.0
- 8. TABLE 4.4, ITEM 5, GAS PIPING SYSTEM EXEMPTIONS, PART "A" EXTERIOR GAS PIPING INSTALLED ON ROOFS WHICH SUPPLIES NO MORE THAN 2 PSI AND IS PROTECTED BY AN APPROVED SEISMIC SHUT-OFF VALVE WITHIN 5 FEET OF THE
- BEGINNING OF THE RUN OF GAS PIPE ON THE ROOF OR OTHER APPROVED LOCATION. 9. TABLE 4.4, ITEM 5, GAS PIPING SYSTEM EXEMPTIONS, PART "B" - EXTERIOR GAS PIPING INSTALLED ON ROOFS WHICH SUPPLIES NO MORE THAN 2 PSI AND IS PROTECTED BY APPROVED FLEXIBLE PIPING NO LESS THAN 3 FEET IN LENGTH IS INSTALLED WITHIN 5 FEET OF THE BEGINNING OF THE RUN OF GAS PIPE ON THE ROOF AND AT THE CONNECTION TO THE EQUIPMENT SERVED BY THE PIPE AND AT INTERVALS ALONG THE RUN OF NO MORE THAN 42 FEET.
- 10. EXEMPT EXISTING EQUIPMENT/DUCT/PIPE.

					DEDI	ICATED (OUT DO	OR AIR	UNIT														
		SUPPLY FAN SECTION COOLING PERFORMANCE					HOT GAS	S REHEAT	HEATING PERFORMANCE			MANCE	ELECTRICAL DATA										
PLAN MARK	MANUFACTURER AND MODEL NO.			MAX ESP		MOTOR	TOTAL	SENS.	EAT DB	EAT W/E	B LAT DB	I AT W/P					GA	S HEAT					REMARK
PLAN IVIANN	WIANOFACTORER AND WIODEL NO.	SA CFM	OA CFM	IN W.G.	ПВ	VOLTS/PH	COOLING	COOLING	°E	°E	P LAI DB	°E	REF. TYPE	LAT DB °F	LAT DB °F	INIDIT	EAT °E	LAT °F	TURN	VOLTS/PH	MCA	МОР	KEIVIAKK
				iiv vv.g.	ПР	VOLIS/PH	MBH	MBH		F	F	5				INPUT	EAIF	LAIF	DOWN				
DOAS-1	AON-RN-15-3-0-HB09-3FB:M000-U0B-DBC-AF0-0DMAHBF-00-F000000\	/ 1800	1800	1.5	2	480/3	169.6	92.6	95	78	48	48	410	75	58	400	0	80	10:01	480/3	49	50	1 THRU 9
REMARKS:	1. SIDE DISCHARGE CURB	5. 10:1 MODULATING GAS			9.	DISCON	INECT																
	2. VSD		6.	BAS-BACN	IET MS	STP																	
	3. DIGITAL SCOLL COMPRESSOR		7. MERV 8, MERV 11 FILTRATION		N																		
	4. HOT GAS REHEAT		8. SINGLE POINT POWER																				

	EXHAUST FAN SCHEDULE								
PLAN MARK	MANUFACTURER & MODEL NUMBER	SA CFM	SP"	RPM	DRIVE	НР	ELEC. VOLTS/PH	WEIGHT	REMARKS
EF-1	PLASTEC J20XT4P033	350/510	0.25	1725	INDIRECT	0.34	120/1	40	1,2,4,5,6,7,8
EF-2	PLASTEC J30XT4P150	600/1500	0.3	1725.0	INDIRECT	1.47	120/1	46	1,2,4,5,6,7,8
EF-3	JENCO FAN STXDE6	200	0.25	1750.0	DIRECT	0.33	120/1	89	1,2,3
EF-4	JENCO FAN STXDE7	275	0.25	1750.0	DIRECT	0.33	120/1	89	1,2,3
EF-5	PLASTEC J20XT4P033	750	2	2100	DIRECT	0.34	115/1	40	1,2,4,5,6,7,8
EF-6	PLASTEC J20XT4P033	250	0.5	1800	DIRECT	0.34	115/1	40	1,2,4,5,6,7,8
REMARKS: 1.	CURB				5.	NON SPAI	RK FAN		
2.	DISCONNECT				6.	VARIABLE	SPEED DRIV	E 1PH INPU	JT 3PH OUTPUT
3.	BACKDRAFT DAMPER	ER 7. EXPLOSION PROOF							
4.	BIRDSCRREN	8. BACKDRAFT DAMPER							

	HEATER (ELECTRIC) SCHEDULE									
PLAN MARK	MANUFACTURER	MODEL NO.	CFM	кw	STEPS	VOLTS/P H	REMARKS			
UH-1	Q-MARK/MARLEY	MUH0321SB	350	2.2-3.0	N/A	208/1	1,2			
UH-2	Q-MARK/MARLEY	MUH0321SB	350	2.2-3.0	1	208/1	1,2			
REMARKS: 1.	THERMOSTAT									
2.	AIRFLOW SWITCH									
3.	-									
1										

	(ELECTRIC) UNDER FLOOR HEAT SCHEDULE									
PLAN MARK	MANUFACTURER	MAT SKU	MODEL NO.	MAT WIDTH	MAT LENGTH	WATTS	AMPS	VOLTS/P H	REMARKS	
EFH-1	THERMO SLAB	TSLM015W36-120	TS145-120	36"	15	876	7.3	120/1	1,2,3	
EFH-2	THERMO SLAB TSLM015W36-120 TS145-120 36" 15 876 7.3 120/1 1,2,3									
EFH-3	THERMO SLAB TSLM015W36-120 TS145-120 36" 15 876 7.3 120/1 1,2,3									
REMARKS: 1.	: 1. T-STAT TO BE ON EXTERIOR OF C1D1 ROOM									
2.	2. SENSOR IN FLOOR									
3.	3. CONTROL CONTACTOR									

	ISOLATION	DAMPER	SCHEDULE			
PLAN MARK	MANUFACTURER & MODEL NO.	SIZE	ACTUATOR (ELECTRIC / PNEUMATIC)	FAIL POSTION	REMARKS	
OAD-1	RUSKIN CD50	24X12	ELECTRIC	OPEN	1-3	
OAD-2	RUSKIN CD50	24X12	ELECTRIC	OPEN	1-3	
REMARKS: 1. PROVIDE ELECTRIC ACTUATOR WITH SPRING RETURN						
2. DAMPER TO HAVE BLADE SEAL						
3. MATERIAL TO BE NON SPARK ALUMINUM						

NOTE: SEE FLAMMIBLE STORAGE ALARM DETAIL FOR INTERLOCK

	LOUVE	R SCHE	DULE					
PLAN MARK	MANUFACTURER	MODEL	SIZE	NO. OF SECTIONS	REMARKS			
OAL-1	RUSKIN	ELF-365D	24X12	1	D,BS			
OAL-2	RUSKIN ELF-365D 24X12 1 D,							
REMARKS:	S: <u>ACCESSORIES</u>							
	D - DRAINABLE							
MD - MOTORIZED DAMPER (2 POS.)								

BS - BIRD SCREEN

	AIR DEVICE SCHEDULE								
PLAN MARK	MANUFACTURER	MODEL	MODULE SIZE	NECK SIZE	MATERIAL	ACCESSORIES	FINISH	REMARKS	
S-1	TITUS	300FS	14X6	N/A	STL	PC,VC	BWE	1	
T-1	TITUS	300R	24X8	N/A	STL		BWE	2	
T-2	TITUS	300R	36X8	N/A	STL		BWE	2	
EA-1	TITUS	50F	24X24	12X12	STL		BWE	1	
EA-2	TITUS	50F	24X24	14X14	STL		BWE	1	
1. DUCT MOU 2. TRANSFER			ALU - ALUMIN PL - PLASTIC SP - SPECIAL	UM	ACCESSORIES PC - PATTERN VC - VOLUMN RC - REMOVA BS - BIRD SCF ACT - ACTUA SQR - SQUAR ROUND ADA	TONTROL CONTROL CONTROL ABLE CORE REEN TOR RE TO	FINISH STD - STAI PC - PRIM BWE - BAI SP - SPECI	E COAT KED WHITE	

AIR BALANCE SCHEDULE								
PLAN MARK	OUTSIDE AIR (CFM)	RETURN AIR (CFM)	SUPPLY AIR (CFM)	EXHAUST AIR (CFM)	PRESSURE			
DOAS	1800	0	1800		1800			
FLAMMABLE STORAGE EF- 2				600	600			
NUCLEAR WASTE EF-4				275	275			
POISON OXIDIZER EF-3				200	200			
TRANSFER EF-1				350	350			
RAISED SASH HOOD EF-5				Intermitenant	750			
SNORKLE EF-6				Intermitenant	150			
HVAC SYSTEMS SHALL BE TESTED TO THESE SCHEDULES IN ACCORI			CORDING	TOTAL	-600			

AC 2021 VENTILATION F	RATES TABLI	E 403.3			•	_	Zone Air	
	Occupants	CFM Per Pers	Resulting CFM	CFM Per SF	SF	Resulting CFM	Distribution Effectiveness	Total CFM
SHIPPING	2	5	10	0.06	799	48	1	58
FLAMMABLE STORAGE	0	5	0	1.0	714	565	1	565
NUCLEAR WASTE	0	5	0	1.0	308	262	1	262
POISON / OXYDIZER	0	5	0	1.0	126	184	1	184
TRANSFER	2	5	10	1.0	224	162	1	172
					1			1267

	HUMIDIFIER SCHEDULE								
PLAN MARK	MANUFACTURER	MODEL	LBS per HR	KW	VOLTAGE	Amps	REMARKS		
HUM-1	NEPTRONIC	SKE4-N14M	40	15	480V - 3Ph	20	see below		
	REMARKS								
		CONDEN	ISATE PUMP						



MECHANICAL SCHEDULES
MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY ROLLA, MISSOURI DANGEROUS MATERIALS STORAGE FACILITY

12" = 1'-0" | SITE: ROLLA, MISSOURI DRAWING NO. M600

MECHANICAL	SCHEDULES

12" = 1'-0" Copyright © 2023 Dynamic Engineered Systems MISSOURI CERTIFICATE OF AUTHORITY #: E-2011001315

PROFESSIONAL ENGINEER #: MO-25069

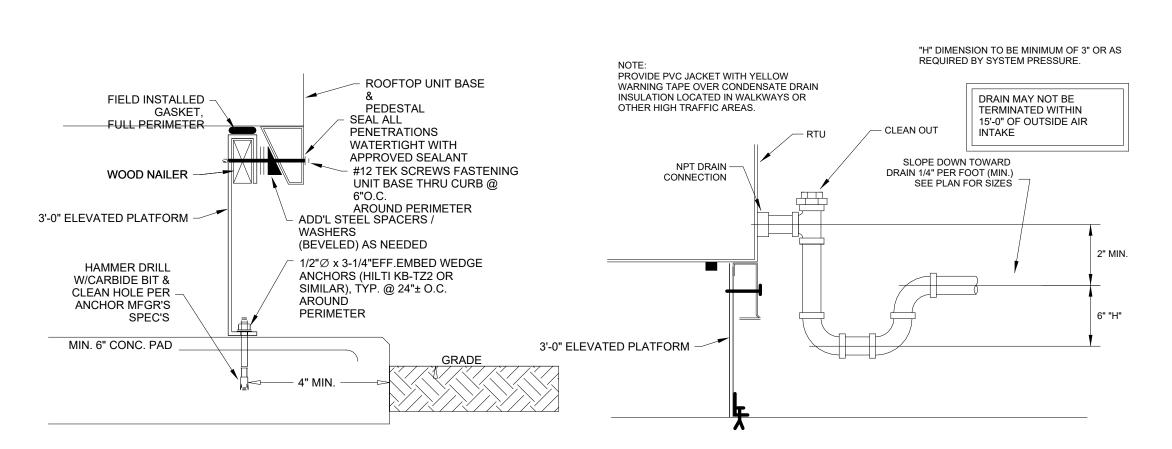
DATE DESCRIPTION DESIGR ENGR PM SCALE 12/07/23 ISSUED FOR BID POB/BM POB POB/BM POB 02/14/24 ADDENDUM 2

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SHEET FULL SIZE 34x22 ANSI D CDG PROJECT PROJ MGR

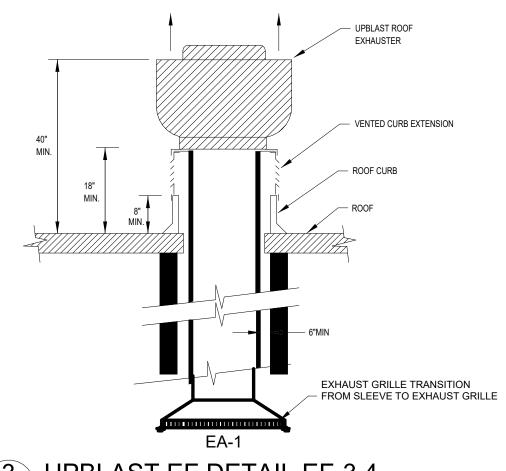
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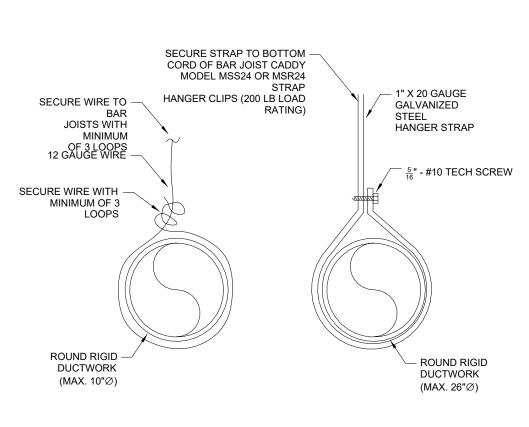
RTU - 1/2" WEDGE ANCHORS M601 / SCALE: NO SCALE

2 CONDENSATE DRAIN DETAIL

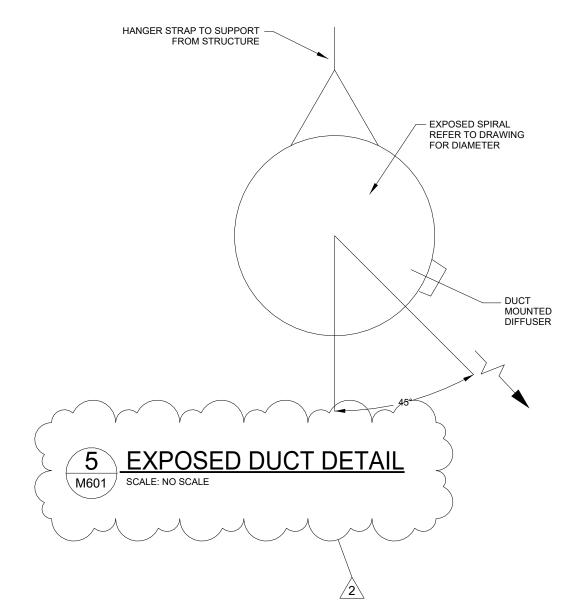
M601 SCALE: NO SCALE Detail NO.: PI001

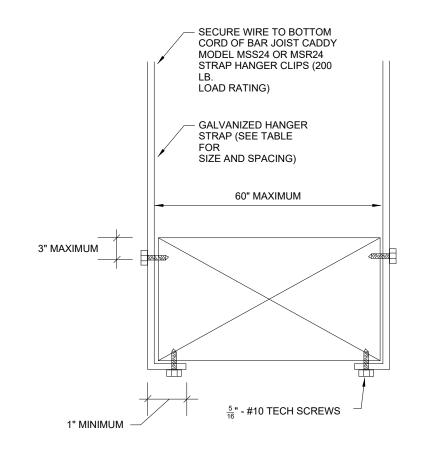


3 UPBLAST EF DETAIL EF-3,4 SCALE: NO SCALE Detail NO.: EQ003C



ROUND DUCT HANGER DETAIL SCALE: NO SCALE Detail NO.: DU015A





6 RECTANGULAR DUCT HANGER DETAIL
SCALE: NO SCALE

RECTANGU	LAR DUCT HAN	GER TABLE
MAXIMUM HALF OF DUCT PERIMETER	PAIR @ 10 FT SPACING	PAIR @ 5 FT SPACING
P/2 = 30"	1" X 22 GA.	1" X 22 GA.
P/2 = 72"	1" X 18 GA.	1" X 22 GA.
P/2 = 96"	1" X 16 GA.	1" X 20 GA.
P/2 = 120"	1" X 16 GA.	1" X 18 GA.
P/2 = 168"	1" X 16 GA.	1" X 16 GA.
P/2 = 192"	NOT GIVEN	1" X 16 GA.

- CAULK WATERTIGHT 3/8" LAG SCREWS 3/8" LAG SCREWS ATTACHING ATTACHING ROOF BRACKET TO ROOFTOP UNIT MEMBRANE TO ROOF PER SIDE) CURB (5 PER SIDE) -MASTIC TAPE 16 GAUGE METAL ROOF WOOD NAILER #10 T-1 TECH -(SEE ATTACHED CALCULATIONS FOR QUANTITIES) LEVELING BLOCK_ 2"X4" WOOD SPACER -BETWEEN METAL DECK AND BARJOISTS 3"x3"x4" ANGLE FRAME BETWEEN BAR JOISTS.
ANGLÉ WELDED TO BAR JOISTS AT EACH END ROOF STRUCTURE-WIT∯' FILLET WELD.

> 7 #10 TECH SCREW ROOF ANCH. M601 SCALE: NO SCALE EQUIPMENT UNDER 1000LBS

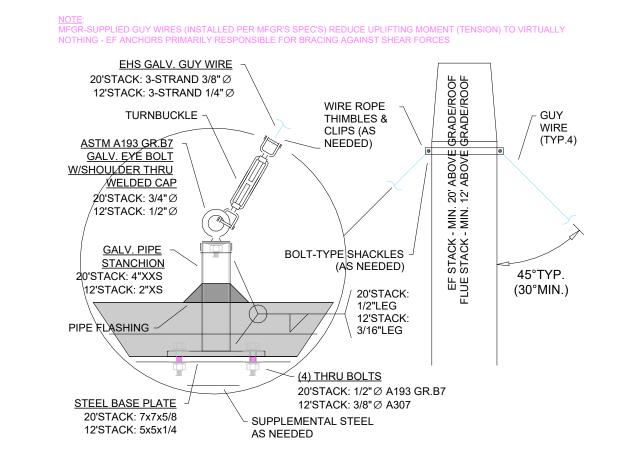
- EXHAUST FAN BASE

ROOF

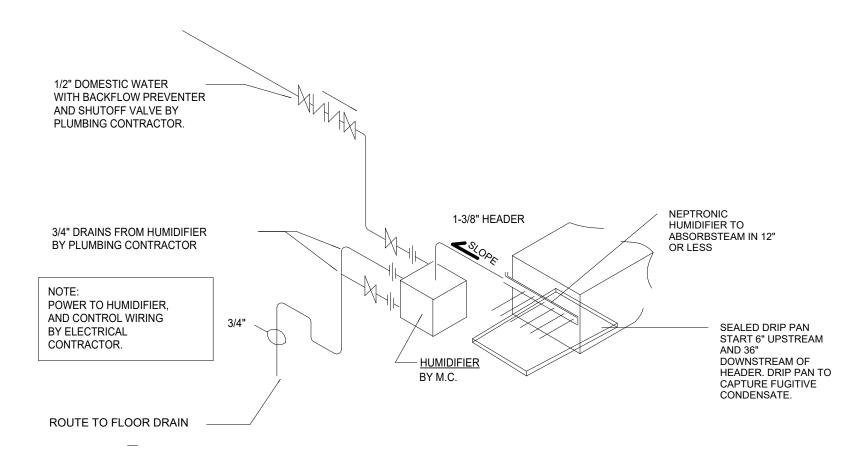
- ROOF

MEMBRAN

INSULATIO



8 GUY WIRES EF-1,2,5,6 M601 SCALE: NO SCALE



HUMIDIFIER DETAIL

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ROLLA, MISSOURI DANGEROUS MATERIALS STORAGE FACILITY 12" = 1'-0" SITE: ROLLA, MISSOURI DRAWING NO. CDG

MECHANICAL DETAILS MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

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SEQUENCE OF CONTROL FOR DOAS (DEDICATED OUTDOOR AIR SYSTEM)

OVERVIEW

• THE UNIT IS PROVIDED WITH PACKAGED CONTROLS WHICH ARE INTEGRATED TO THE BUILDING AUTOMATION SYSTEM (BAS) VIA BACNET. THE BAS SENDS THE DOAS ENABLE SIGNAL, A VENTILATION SETPOINT, AND A DISCHARGE SETPOINT. DOAS IS PROVIDED WITH VARIABLE VOLUME SUPPLY FAN, OUTSIDE AIR DAMPER, DX COOLING, HOT GAS REHEAT, AND FILTER (SEE SCHEDULE). ONE DUCT HUMIDIFIER WILL MODULATE TO MAINTAIN HUMIDITY IN THE SPACE. THIS UNIT WILL RUN 24/7.

DISCHARGE AIR TEMPERATURE CONTROL:

COOLING:

SYSTEM SHALL ENABLE COOLING MODE WHEN OUTSIDE TEMPERATURE IS ABOVE 56 °F. THE SYSTEM SHALL COOL VARYING OUTSIDE AIR TEMPERATURE DOWN TO 55°F AND SHALL MODULATE HOT GAS REHEAT TO MAINTAIN A 70 °F LEAVING AIR TEMPERATURE. PROGRAMMED FOR A 2°F DEADBAND BETWEEN COOLING AND HEATING CHANGE OVER.

HEATING:

• THE SYSTEM SHALL ENABLE HEATING MODE WHEN OUTSIDE TEMPERATURE IS BELOW 54°F. THE SYSTEM SHALL ENERGIZE MODULATING GAS HEAT TO MAINTAIN A 70 °F LEAVING AIR TEMPERATURE. PROGRAMMED FOR A 2°F DEADBAND BETWEEN COOLING AND HEATING CHANGE OVER.

DISCHARGE AIRFLOW CONTROL

OUTSIDE AIRFLOW SET POINT:

• THE MINIMUM OUTSIDE AIRFLOW SETPOINT SHALL MATCH THE DESIGN MINIMUM OUTSIDE AIR REQUIREMENT TO MAINTAIN 1.0 CFM SF VENTILATION RATE. SYSTEM TO BE BALANCED TO CFM INDICATED BY SCHEDULE AND BALANCED BY OWNER CONTRACTOR TO CFM INDICATED. VSD IS BASED ON SPACE PRESSURE AND IS ONLY ADJUSTED TO ACCOUNT FOR RAISED SASH HOOD ON/OFF.

SUPPLY FAN CONTROL

• THE FAN SHALL RUN AND MAINTAIN AIRFLOW SETPOINT 24/7.

ZONE HUMIDIFICATION CONTROL:

HUMIDIFIER H-1 SHALL GENERATE STEAM FROM DOMESTIC WATER. THE DISTRIBUTION TUBES SHALL BE IN THE DUCT. HUMIDIFICATION IS CONTROLLED BY MODULATING THE HUMIDIFIER OUTPUT VIA JCI BAS BACNET INTEGRATION TO MEET DESIRED ZONE RELATIVE HUMIDITY SETPOINT

HUMIDIFICATION SETPOINT:

THE UNIT SHALL MAINTAIN A CONSTANT ZONE SETPOINT OF 30% RELATIVE HUMIDITY.

SUPPLY AIR HUMIDITY CONTROL:

• IF THE SUPPLY AIR HUMIDITY SENSOR DETECTS THAT THE HUMIDITY IS ABOVE 30% RELATIVE HUMIDITY, THE HUMIDIFIER SHALL BE TURNED OFF. HUMIDIFIER TO BE LOCKED OUT IN COOLING MODE.

SPACE HUMIDITY CONTROL:

• IF THE SPACE AIR HUMIDITY SENSOR DETECTS THAT THE HUMIDITY IS BELOW 25% RELATIVE HUMIDITY, THE HUMIDIFIER SHALL BE ENERGIZED. THE HUMIDIFIER SHALL MODULATE ITS OUTPUT TO MAINTAIN THE SPACE HUMIDITY ABOVE 30% RELATIVE HUMIDITY AND PROGRAMMED WITH A DEADBAND TO KEEP FROM SHORT CYCLING.

HUMIDIFIER MODULATION:

THE HUMIDIFIER OUTPUT SHALL BE MODULATED BASED ON THE DIFFERENCE BETWEEN THE SPACE AIR HUMIDITY READING AND THE SETPOINT OF 30% RELATIVE HUMIDITY. THE MODULATION SHALL BE SUCH THAT AS THE SPACE AIR HUMIDITY APPROACHES 30%, THE OUTPUT OF THE HUMIDIFIER IS GRADUALLY REDUCED TO PREVENT OVERSHOOTING THE SETPOINT AND LOCKED OUT DURING COOLING MODE.

ALARMS:

PACKAGED DOAS CONTROLLER FAULT:

• FILTRATION PRESSURE DROP MONITORED AND WILL ALARM BMS IF PRESSURE DIFFERENTIAL IS ACHIEVED. CRITICAL ALARMS FROM THE PACKAGED CONTROLLER SHALL BE MAPPED TO THE BAS FOR PRE FILTER.

PACKAGED HUMIDITY CONTROLLER FAULT:

• ALL ALARMS FROM THE PACKAGED CONTROLLER SHALL BE MAPPED TO THE BAS.

ZONE HUMIDITY:

IF ZONE HUMIDITY DROPS BELOW 25% THE BAS SHALL GENERATE A BAS ALARM.

SEQUENCE OF CONTROL FOR CRITICAL EXHAUST FANS (EF-1-EF-2) AND GAS DETECTION SYSTEM SERVING FLAMMABLE CORROSIVE STORAGE
AREA 100D AND 100D1

OVERVIEW:

• FLAMMABLE AND CORROSIVE STORAGE SPACES SHALL BE SERVED BY A CONTINUOUS OPERATION EXHAUST SYSTEM. THE EXHAUST FANS RUN CONTINUOUSLY AT MINIMUM SPEED AND INCREASES SPEED IN THE EVENT OF A GAS DETECTION ALARM. THIS SPACE SHALL HAVE A REDUNDANT SYSTEM THAT SHALL BE ON EMERGENCY POWER AND SHALL SENSE THE LEL (LOWER EXPLOSIVE LIMIT) OF THE HYDROCARBONS IN THE SPACE.

EXHAUST FANS

EXHAUST FANS EF-1 AND EF-2 OPERATE CONTINUOUSLY AND ARE INTERLOCKED WITH THE DEDICATED OUTDOOR AIR SYSTEM (DOAS). WHEN THE DOAS IS ACTIVATED, THE EXHAUST FANS ARE AUTOMATICALLY TURNED ON. THE STATUS OF THE FANS IS MONITORED BY THE JCI BAS SYSTEM USING A CURRENT SENSING RELAY. ALARM WILL BE TRIGGERED IF BELT BREAKS OR MOTOR FAIL.

STANDALONE BALL IN THE WALL DEVICES SHALL CONFIRM SPACE PRESSURIZATION OF NEGATIVE 0.01" WC FOR HAZARDOUS SPACES (100D)

GAS DETECTION SYSTEM

CONTINUOUS MONITORING:

• LEL SENSORS, TWO IN EACH ROOM FOR REDUNDANCY, WILL CONTINUOUSLY MONITOR THE CONCENTRATION OF COMBUSTIBLE GASES IN THE AREA.

ALARM LEVELS:

• THE SYSTEM IS PROGRAMMED WITH PREDEFINED ALARM LEVELS BASED ON THE PERCENTAGE OF THE LEL (LOWER EXPLOSIVE LIMIT).

• LOW ALARM (ACTIVATED AT 25% OF THE LEL): IF 25% LEL IS ACHIEVED THEN PURGE MODE IS ACTIVATED. THE CORRESPONDING EXHAUST FAN EF1 OR EF2 SHALL INCREASE SPEED TO 100% AND CORRESPONDING OUTSIDE AIR LOUVER OAL1 OR OAL2 SHALL FULLY OPEN UNTIL SPACE IS VENTILATED BELOW 25% LEL CONCENTRATION. JCI BAS WILL SEND EMAIL/TEXT NOTIFICATION TO DESIGNATED PARTY/PERSONNEL.

DAMPER CONTROL:

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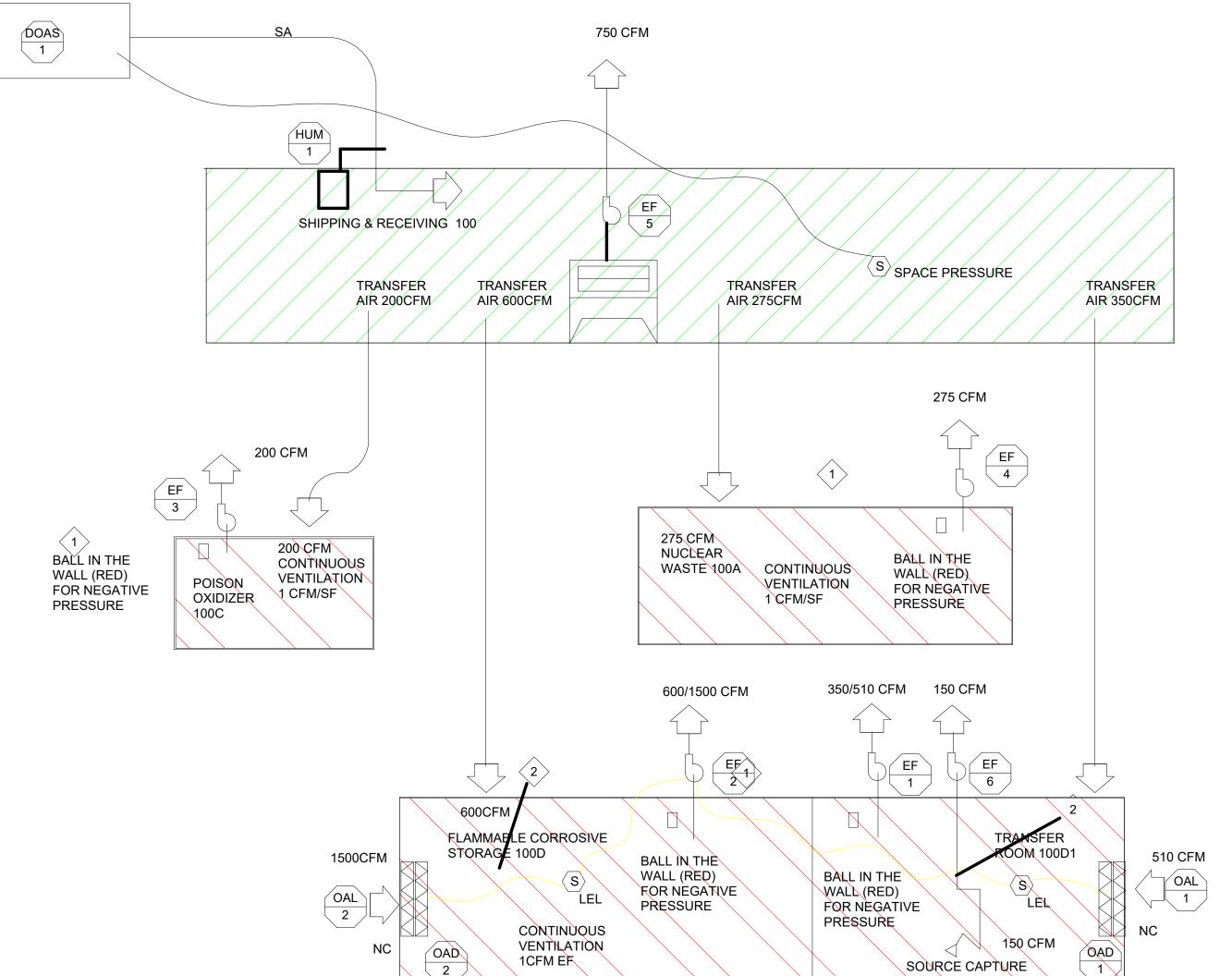
• THE OUTDOOR AIR LOUVERS (OAL1 AND OAL2) ARE INTERLOCKED WITH THE GAS DETECTION SYSTEM. IN THE EVENT OF AN ALARM, THE DAMPERS ARE PROGRAMMED TO AUTOMATICALLY OPEN TO FACILITATE VENTILATION AND DILUTION OF ANY DETECTED GAS. THE JOHNSON CONTROLS BUILDING AUTOMATION SYSTEM (JCI BAS) CONTINUOUSLY MONITORS THE POSITION OF THE DAMPERS VIA END SWITCHES. IF THE DAMPERS FAIL TO REACH THE CORRECT POSITION UPON ACTIVATION, A SECONDARY ALARM WILL BE TRIGGERED IN THE JCI BAS, EITHER ALARM SHALL ALERT THE FACILITY MANAGEMENT TEAM FOR IMMEDIATE ACTION.

SEQUENCE OF CONTROL FOR EXHAUST FANS (EF-3 AND EF-4) SERVING ROOM 100C AND 100A

- EXHAUST FANS EF-3 AND EF-4 OPERATE CONTINUOUSLY AND ARE INTERLOCKED WITH THE DEDICATED OUTDOOR AIR SYSTEM (DOAS). WHEN THE DOAS IS ACTIVATED, THE EXHAUST FANS ARE AUTOMATICALLY TURNED ON. THE STATUS OF THE FANS IS MONITORED BY THE JCI BAS USING A CURRENT SENSING RELAY. ALARM WILL BE TRIGGERED IF BELT BREAKS OR MOTOR FAIL.
- STANDALONE BALL IN THE WALL DEVICES SHALL CONFIRM SPACE PRESSURIZATION OF NEGATIVE 0.01" WC FOR HAZARDOUS SPACES (100C AND 100A)

SEQUENCE OF CONTROL FOR GENERAL EXHAUST FANS (EF-5 AND EF-6) FOR NON-CRITICAL APPLICATION.

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1 HVAC AIR FLOW DIAGRAM 1" = 1'-0"

NEGATIVE

GENERAL NOTES

 HVAC SYSTEMS AIR FLOW DIAGRAM. DO NOT SCALE FOR REFERENCE ONLY.

KEYED NOTES

1 BALL IN WALL STATIC PRESSURE INDICATOR
MFG: AIRFLOW DIRECTION INCORPORATED

MODEL: NEGATIVE BALL IN WALL
SET POINT: 0.01" WC NEGATIVE
WEBSITE: AIRFLOWDIRECTIONS.COM

2 EXPLOSIVE GAS DETECTOR

MFG: CALIBRATED TECHNOLIGIES INCORPORATED MODEL: GG-LEL2

WEBSITE: CTIGAS.COM INTERFACE: JCI CONTROLS

SEE SEQUENCE OF CONTROL FOR OPERATION.



DATE DESCRIPTION DESIGR ENGR PM SCALE 12/07/23 ISSUED FOR BID POB/BM POB SHEET FULL SIZE 34x22 ANSI D Copyright © 2023 Dynamic Engineered Systems POB/BM POB 02/14/24 ADDENDUM 2 CDG PROJECT MISSOURI CERTIFICATE OF AUTHORITY #: E-2011001315 PROJ MGR PROFESSIONAL ENGINEER #: MO-25069

ROLLA, MISSOURI
DANGEROUS MATERIALS STORAGE FACILITY

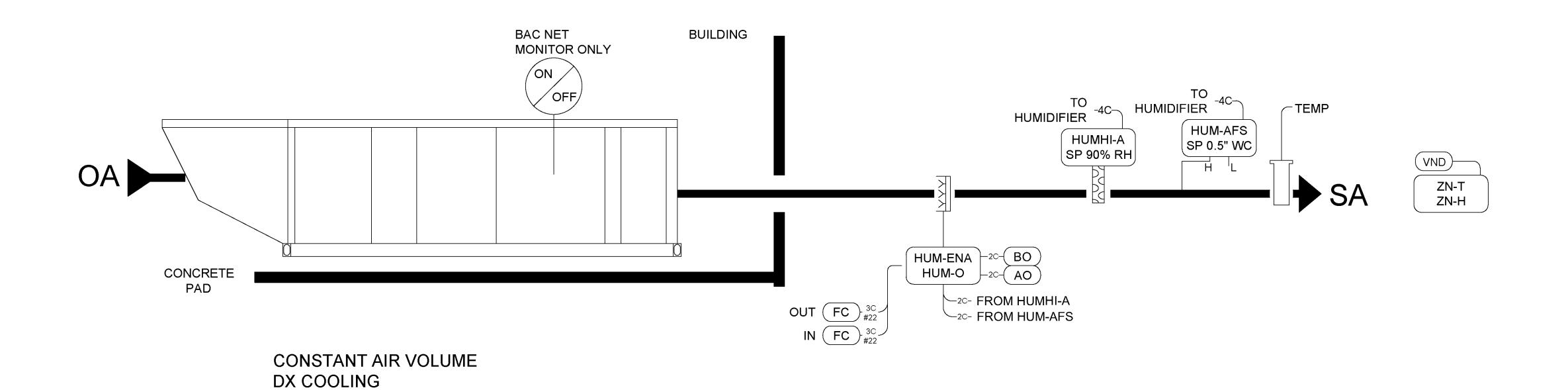
1" = 1'-0" SITE: ROLLA, MISSOURI

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HVAC AIR FLOW DIAGRAM

MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY



NOTES:

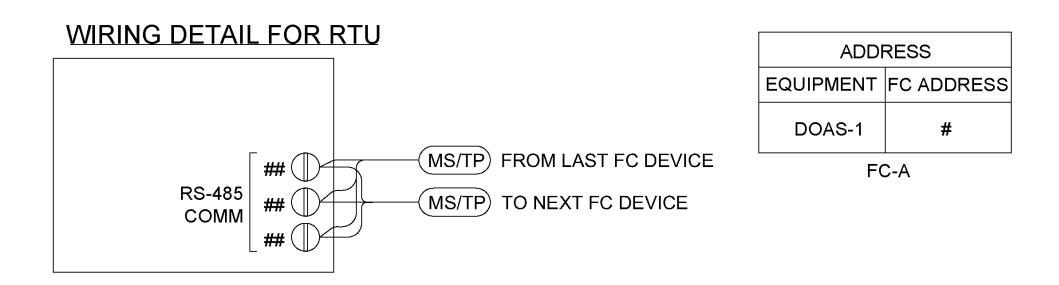
1. RTU-1 IS A PACKAGED UNIT. ALL CONTROL DEVICES ARE PROVIDED BY UNIT MANUFACTURER.

DUCT HUMIDIFIER

HOT GAS REHEAT FOR DEHUMIDIFICATION

1) JCI DOAS CONTROLS 12" = 1'-0"

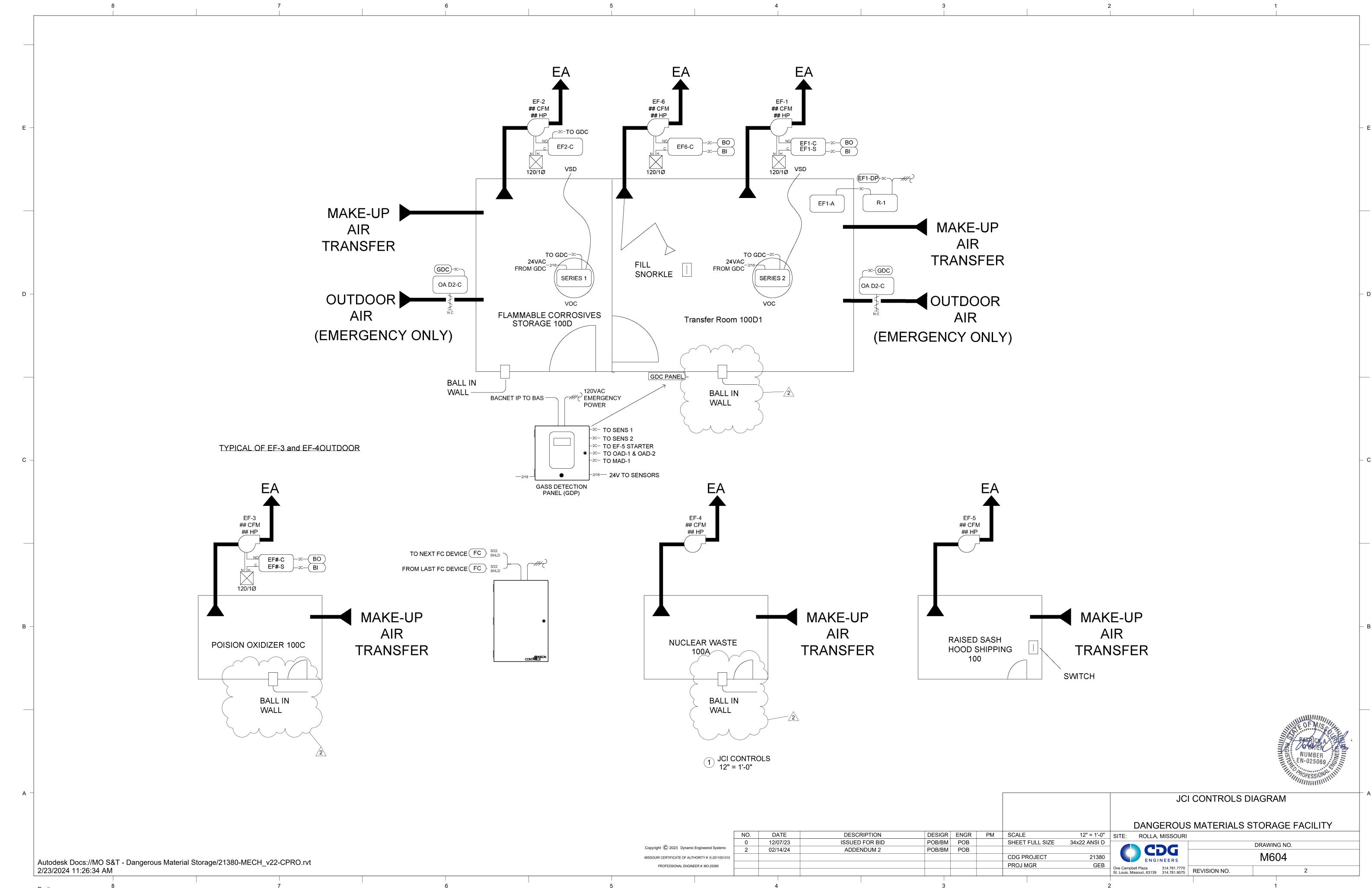
2. JCI WILL INSTALL AND WIRE ZONE TEMPERATURE AND HUMIDITY SENSOR

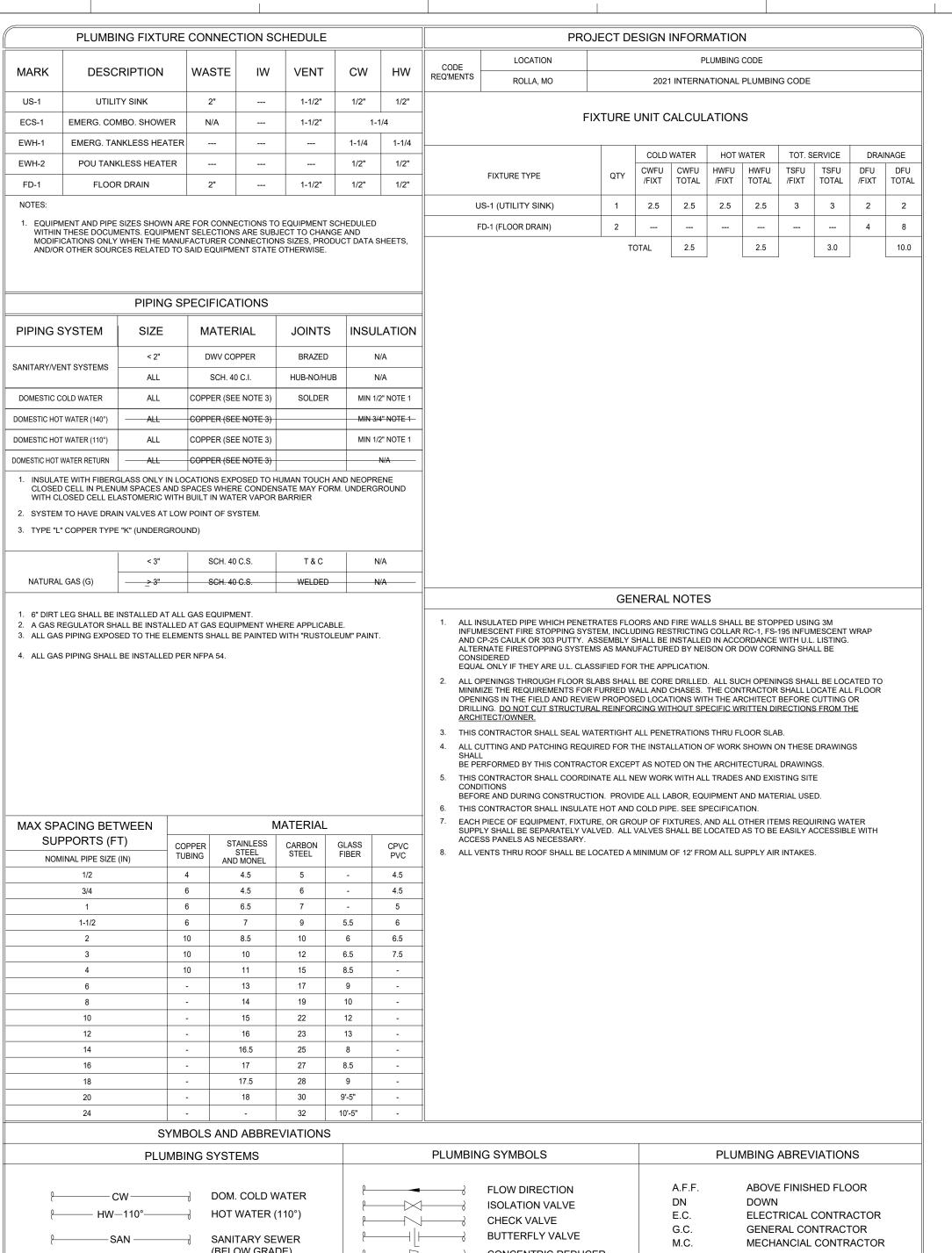




JCI DOAS CONTROLS DIAGRAM DANGEROUS MATERIALS STORAGE FACILITY DATE DESCRIPTION DESIGR ENGR PM SCALE 12" = 1'-0" SITE: ROLLA, MISSOURI ISSUED FOR BID 34x22 ANSI D 12/07/23 POB/BM POB SHEET FULL SIZE DRAWING NO. CDG Copyright © 2023 Dynamic Engineered Systems 02/14/24 ADDENDUM 2 POB/BM POB M603 CDG PROJECT MISSOURI CERTIFICATE OF AUTHORITY #: E-2011001315 PROJ MGR PROFESSIONAL ENGINEER #: MO-25069 One Campbell Plaza 314.781.7770 St. Louis, Missouri, 63139 314.781.9075 REVISION NO.

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SYMBO	OLS AND ABBREVIATIONS					
PLUMBIN	IG SYSTEMS	PLUMB	ING SYMBOLS	PLUMBING ABREVIATIONS		
├────────────────────────────────────			FLOW DIRECTION ISOLATION VALVE CHECK VALVE BUTTERFLY VALVE CONCENTRIC REDUCER ECCENTRIC REDUCER PIPE RISE PIPE DROP UNION PRESSURE GAUGE THERMOMETER STRAINER BACKFLOW PREVENTER SIAMESE CONNECTION FIRE HOSE VALVE FLOOR CLEANOUT FLOOR SINK WALL CLEANOUT TRAP ROOF DRAIN	A.F.F. DN E.C. G.C. M.C. N.T.S. U.T.R. GWH MSB FD WC UR LAV SK TMV RD HB FPHB TW DF EWC IE	ABOVE FINISHED FLOOR DOWN ELECTRICAL CONTRACTOR GENERAL CONTRACTOR MECHANCIAL CONTRACTOR NOT TO SCALE UP THRU ROOF GAS WATER HEATER ELECTRIC WATER HEATER MOP SINK BASIN FLOOR DRAIN FLOOR SINK HUB DRAIN WATER CLOSET URINAL LAVATORY SINK THERMOSTATIC MIXING VALVE ROOF DRAIN HOSE BIBB FROST PROOF HOSE BIBB TEMPERED WATER DRINKING FOUNTAIN ELECTRIC WATER COOLER INVERT ELEVATION	

MARK	EQUIP.	DESCRIPTION/ ACCESSORIES	MANUFACTURER/ MODEL	NOTES
US-1	SINGLE BASIN UTILITY SINK	30 X 22 WALL MOUNT PORCELAIN SINGLE BASIN SINK W/MOUNTKIT P-TRAP AND STRAINER W/FAUCET ON 8" CENTERS ADA & LAV GAURD	KOHLER GILFORD K-12-787 KOHLER TRITON K-820T20 TRUE BRO	1,2
EWH-1	POINT OF USE ELECTRIC WATER HEATER	POINT OF USE TANKLESS WATER HEATER 96kW 22°F RISE AT 20.0GPM 480V/3PH 116 AMPS PER PHASE	EEMAX SAFE ADVANTAGE AP096480 EFD N4X	1,2
EWH-2	POINT OF USE ELECTRIC WATER HEATER	POINT OF USE TANKLESS WATER HEATER 10.1kW 34°F RISE @ 2.0GPM 208V/3PH 49AMPS W/INLINE FLOW REGULATOR IFR1-2	EMAX PRO SERIES PRO13240	1,2
ECS-1	EMERGENCY COMBINATION SHOWER/EYE	FLOOR MOUNTED EMERGENCY DRENCH SHOWER/EYE WASH STATION W/1/4" INLET, PROVIDE THERMOSTATIC MIXING VALVE	BRADLEY S19314LL	1,2
FD-1	FLOOR DRAIN	CAST IRON BODY WITH STANDARD SATIN NICKEL BRONZE ADJUSTABLE STRAINER, INTEGRAL CLAMPING DEVICE, BOTTOM OUTLET	JOSAM 30000-S-50	1,2
TS-1	TRAP SEAL	FLOOR DRAIN WATERLESS TRAP SEAL	JOSAM 88240	1,2

2. COORDINATE ALL FIXTURE SELECTIONS WITH OWNER REPRESENTATIVE PRIOR TO PURCHASING.

PLUMBING NOTES:

HANDICAP SPECIFICATIONS: ADA (AMERICANS WITH DISABILITIES ACT) 2010 STANDARDS AND ANSI A117.1 (REFER TO ARCHITECTURAL DRAWINGS FOR EXACT CLEARANCE DIMENSIONS)

THE WORK COVERED BY THESE SPECIFICATIONS INCLUDES BUT IS NOT LIMITED TO PROVIDING ALL LABOR, MATERIAL, AND EQUIPMENT NECESSARY TO COMPLY WITH REQUIREMENTS OF THIS FACILITY.

PLUMBING FIXTURES

UTILITY SINK - AS IDENTIFIED ON PLANS. WALL MOUNTED STEEL/PORECELAIN WITH 2" DRAIN, VINYL BUMPERGUARD ON 3 SIDES. SERVICE FAUCET 8" CTR. TO CTR. WITH VACUUM BREAKER HOSE AND HOSE BRACKET. PROVIDE 2" VENTED WASTE WITH "P-TRAP"; 1/2 " HOT AND COLD WATER SERVICE. CAULK WITH A SILICONE SEALANT ALONG WALLS.

AT 4'-0" A.F.F. FLOOR DRAIN - AS IDENTIFIED ON PLANS. CAST IRON DRAIN WITH NICKEL-BRONZE ADJUSTABLE STRAINER; INSIDE CAULD. OUTLET AND CLAMPING DEVICE WHERE REQUIRED. PROVIDE WITH TRAP PRIMER TAP AND TRAP PRIMER WHERE INDICATED. NOTE: OWNER'S GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER INSTALLATION OF ALL TOILET ACCESSORIES INCLUDING

SUPPORT BLOCKING INSIDE WALL.

SANITARY SEWER - CAST IRON, PVC, OR COPPER PIPING MAY BE USED EXCEPT THAT ALL PIPING BELOW GRADE SHALL BE CAST IRON. OR PVC. VENTS TWO INCHES (2") IN SIZE AND SMALLER MAY BE EITHER SCHEDULE 40 GALVANIZED STEEL OR COPPER PIPING. DOMESTIC WATER AND HOT WATER PIPING TO BE COPPER TYPE "L" INSULATED WITH ARMAFLEX OR EQUIVALENT INSULATING TO A THICKNESS OF "THRU 1". SEE TABLE SHEET MEP 1.0 GAS PIPING (WHEN REQUIRED) SHALL BE BLACK STEEL SCHEDULE 40 WITH SCREWED FITTINGS

PIPING AND FITTINGS SHALL BE OF THE WEIGHTS AND TYPES SHOWN ON DRAWINGS. SIZES SHOWN ON ON DRAWINGS ARE NOMINAL PIPE SIZES. ALL PIPING SHALL BE INSTALLED PARALLEL TO, OR AT RIGHT ANGLES WITH THE BUILDING WALLS AND PARTITIONS AND SHALL BE INSTALLED WITH THE PROPER PITCH.

ALL PIPING SHALL BE UPENDED AND POUNDED TO REMOVE ANY FOREIGNER PRESENT AND SHALL BE SWABBED IF NECESSARY.

PREPARING PIPE

SCREWED PIPE SHALL BE INSTALLED WITH PIPE COMPOUND APPLIED TO THE MALE THREAD WITH NOT MORE THAN TWO THREADS LEFT EXPOSED. PIPE SHALL BE REAMED AFTER THREADING. BELOW GRADE SANITARY PIPING SHALL BE CAST IRON PIPE AND SHALL BE INSTALLED WITH ONE THIRD OF THE HUB CAULKED WITH FIRST QUALITY OAKUM. AND THE REMAINDER FILLED WITH FIRST QUALITY CAULKING AT ONE POURING AND CAULKED TIGHT. COPPER JOINTS SHALL BE MADE UP WITH 95-5 SOLDER.

HANGERS AND SUPPORTS HORIZONTAL PIPING SHALL BE SUPPORTED AT INTERVALS NOT TO EXCEED 10'-0" WITH SWIVEL SPLIT PIPE HANGERS EQUAL TO CRANE #199F OR GRINNELL #104. VERTICAL PIPING SHALL BE SUPPORTED BY MEANS OF WROUGHT IRON CLAMPS SUSPENDED FROM THE UNDER-SIDE OF STRUCTURE WITH HANGER RODS. REFER TO HANGER SCHEDULE

FOR ALL OTHER PIPE HANGER SIZES AND SUPPORT LENGTHS. ALL VALVES SHALL BE BRASS AND MANUFACTURED BY CRANE, NIBCO,

STOCKHAM, LUNKENHEIMER, NORDSTROM, GRINNELL OR EQUAL.

ROUGH-INS

FOR SECOND LEVEL STORES, THE GENERAL CONTRACTOR SHALL ROUTE ALL LINES REQUIRED FOR PLUMBING ROUGH-INS TIGHT AGAINST THE UNDERSIDE OF THE SECOND FLOOR LEVEL WITH ALLOWANCE FOR SLOPE. SECOND FLOOR SLAB SHALL BE CORE DRILLED AS REQUIRED TO INSTALL THESE ITEMS AT THE LOCATIONS SHOWN ON THE PLANS. COORDINATE WITH LOWER LEVEL TENANTS.

TESTING AND ADJUSTING CONTRACTOR SHALL DEMONSTRATE OPERATION OF PIPING SYSTEM TO FULL SATISFACTION OF TENANT. ALL PIPING SHALL WITHSTAND AIR PRESSURE TESTING PER GOVERNING CODES.

FIRE SPRINKLER NOTES:

ALL NEW SYSTEMS SHALL BE DESIGNED AND COORDINATED WITH CURRENT NFPA STANDARDS AS ADOPTED BY GOVERNING CODES AND FIRE MARSHAL OF MUNICIPALITY. NEW AND EXISTING SYSTEMS SHALL MEET THE REQUIREMENTS OF NFPA AND LOCAL CODES FOR OCCUPANCY AND HAZARD CLASSIFICATION SYSTEMS MAY REQUIRE HYDRAULIC FLOW TESTING BY GOVERNING AUTHORITY TO ESTABLISH FLOW RATES TO SYSTEMS AT PEAK AND OFF PEAK DEMAND TIMES FOR LOCAL WATER DELIVERY SYSTEMS. EXISTING FLOW TEST EXPIRED 01-04-24, NEW FLOW TEST REQUIRED SYSTEMS SHOWN WITHIN THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE, I.E., PIPE SIZE, HEAD LOCATION, AND FINAL PIPE ROUTING SHALL BE PREPARED AND CALCULATED BY FIRE SPRINKLER INSTALLING CONTRACTOR TO BE REVIEWED AND APPROVED BY INSTALLING ENGINEER OF RECORD AND LOCAL AHJ "AUTHORITY HAULING JURISDICTION" PRIOR TO INSTALLATION. SYSTEMS SHALL BE TESTED AND APPROVED BY AHJ. FIRE PROTECTION PIPING TO BE ANCHORED AND SUPPORTED PER

TESTING AND ADJUSTING: CONTRACTOR SHALL DEMONSTRATE PIPE SYSTEMS TO AHJ BE MEANS OF HYDROSTATIC TESTING AND TESTING FORMS AS PER NFPA AND

LOCAL AJH. GUARANTEE

NFPA.

ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF ACCEPTANCE. THE COMLETED PLUMBING SYSTEM SHALL BE FULLY OPERATIONAL AND ACCEPTANCE BY TENANT SHALL BE A CONDIDTION OF THEIS CONTRACT. ALL WORK FOUND TO BE DEFECTIVE SHALL BE REPAIRED OR REPLACED BY THIS SUBCONTRACTOR WITHOUT ADDITIONAL COST TO THE TENANT.

1 PLUMB SYMBOLS/LEGENDS 12" = 1'-0"

DESCRIPTION

ISSUED FOR BID

ADDENDUM 2

DESIGR ENGR PM SCALE 34x22 ANSI D SHEET FULL SIZE

PLUMBING SYMBOLS AND LEGENDS MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY ROLLA, MISSOURI DANGEROUS MATERIALS STORAGE FACILITY

2

12" = 1'-0" | SITE: ROLLA, MISSOURI DRAWING NO. CDG P000 ENGINEERS

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DATE

12/07/23

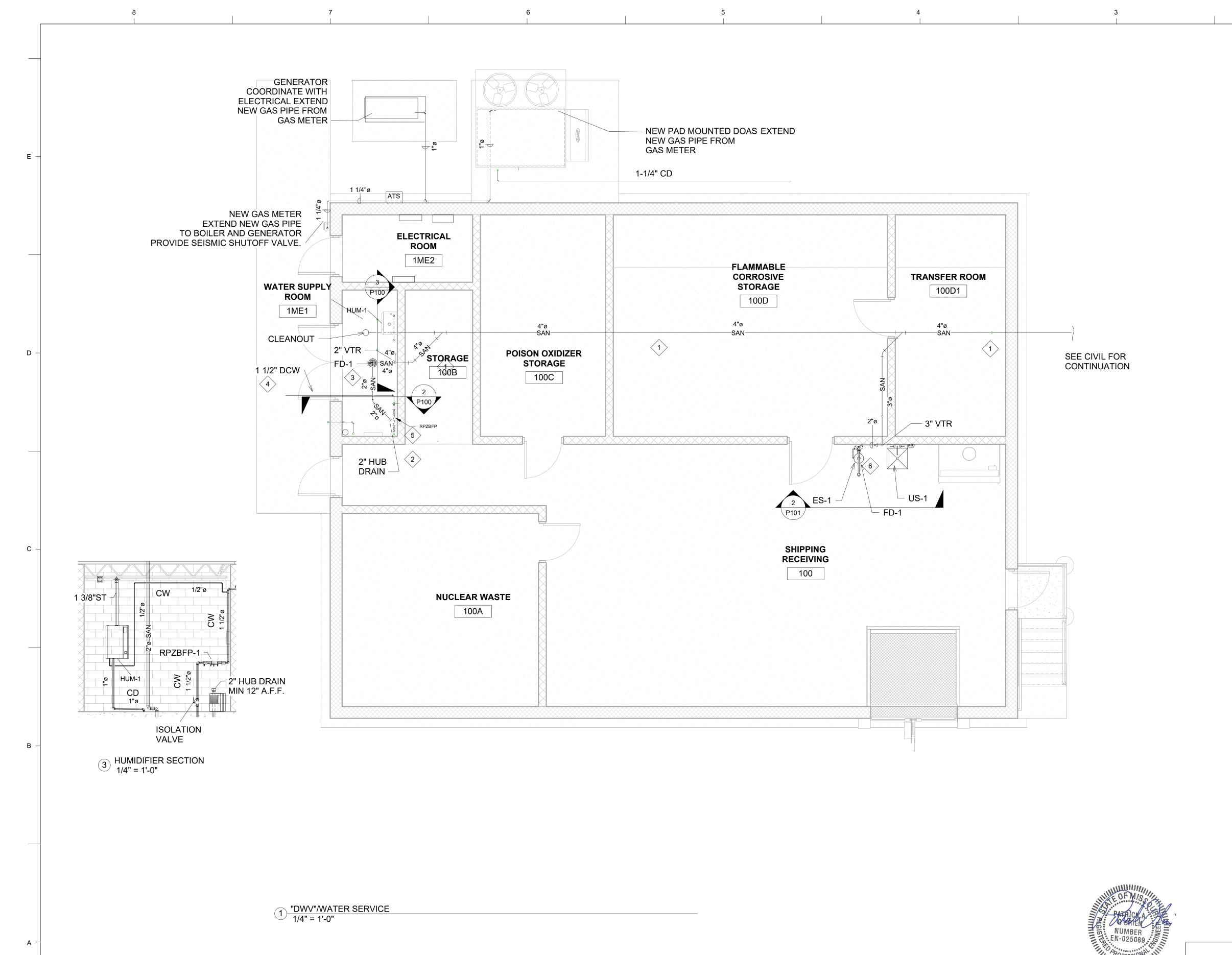
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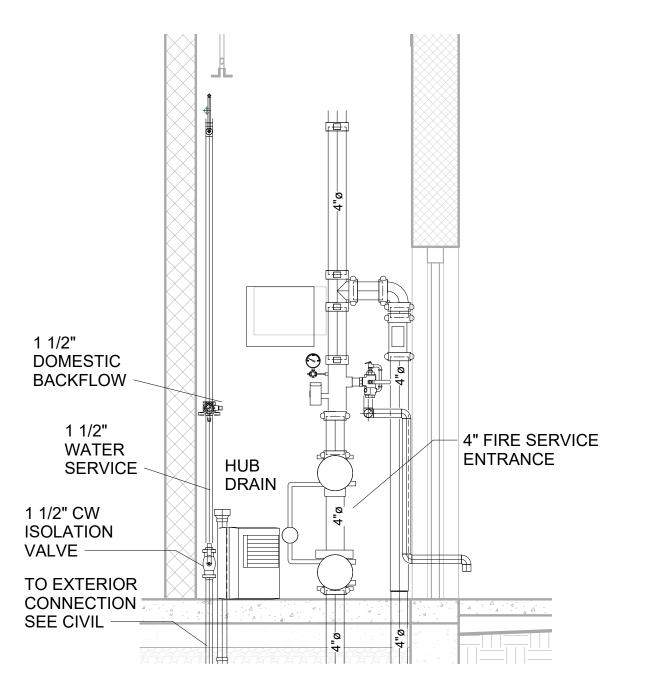


GENERAL NOTES

- 1. UTILITIES SERVICES (I.E. DOMESTIC WATER, SANITARY) ARE APPROXIMATE. CONTRACTOR TO LOCATE PRIOR TO INSTALLING UNDERGROUND PIPING AND COORDINATE WITH NEW BUILDING SANITARY FIXTURES. ALTERNATE CONNECTION POINT MAY BE USED. VERIFY UTILITY LOCATIONS WITH CIVIL DRAWINGS PRIOR TO BIDDING.
- 2. COORDINATE EQUIPMENT AND FIXTURE SPECIFICATIONS FOR ALL ITEMS LISTED ON THESE DRAWINGS WITH EXACT MANUFACTURER SPECIFICATIONS PRIOR TO PIPING AND INSTALLATION.
- 3. COORDINATE WITH UTILITY CONTRACTOR FOR CONNECTIONS TO NEW SANITARY SEWER, DOMESTIC WATER, FIRE SPRINKLER, AND GAS.

KEYED NOTES

- SANITARY PIPING IS BELOW FLOOR. COORDINATE WITH OTHER TRADES FOR ANY CONFLICT WITH AND FOOTINGS/PIERS.
- PROVIDE HUB DRAIN FOR BACKFLOW INSPECTION, TESTING, & DRAIN DOWN, COORDINATE WITH GC AND EQUIPMENT FOR FINAL WALL LOCATION. BACKFLOW INSTALLING CONTRACTOR TO PROVIDE TEST REPORT FOR DOR RECORDS AS REQUIRED.
- (3) FLOOR DRAINS TO HAVE TRAP SEAL, COORDINATE VENT PIPE BELOW GRADE & ROUTE TO VENT THRU ROOF.
- COORDINATE NEW CONNECTION TO NEW WATER SERVICE. VERIFY SIZE AND LOCATION OF SERVICE. LOCATION SHOWN IS APPROXIMATE AND DIAGRAMMATIC IN NATURE. ROUTE NEW TYPE "K" COPPER SERVICE FROM METER (BY OTHERS) BELOW SLAB TO MECHANICAL ROOM AND PROVIDE NEW 1 1/2" ISOLATION VALVE. EXTEND UP TO RFBPZ-1. ALL PIPE ABOVE GRADE TO BE TYPE "L"
- 5 1 1/2" RPZ BACK FLOW PREVENTER. COORDINATE BACKFLOW TEST DRAIN ROUTING TO NEW HUB DRAIN.
- 6 NO CONTAMINATES DOWN SANITARY SEWER FROM ES-1. PROVIDE WING NUT DRAIN COVER WITH SEAL. SEAL TO REMAIN DURING ALL NORMAL OPERATIONS AND REMOVED ONLY DURING TESTING.OF SHOWER SYSTEMS BY MAINTENANCE.



2 DOMESTIC WATER SECTION 1/2" = 1'-0"

PLUMBING "DWV" WATER SERVICE FLOOR PLAN MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY ROLLA, MISSOURI DANGEROUS MATERIALS STORAGE FACILITY

As indicated | SITE: ROLLA, MISSOURI SHEET FULL SIZE 34x22 ANSI D

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12/07/23

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DESCRIPTION

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ADDENDUM 2

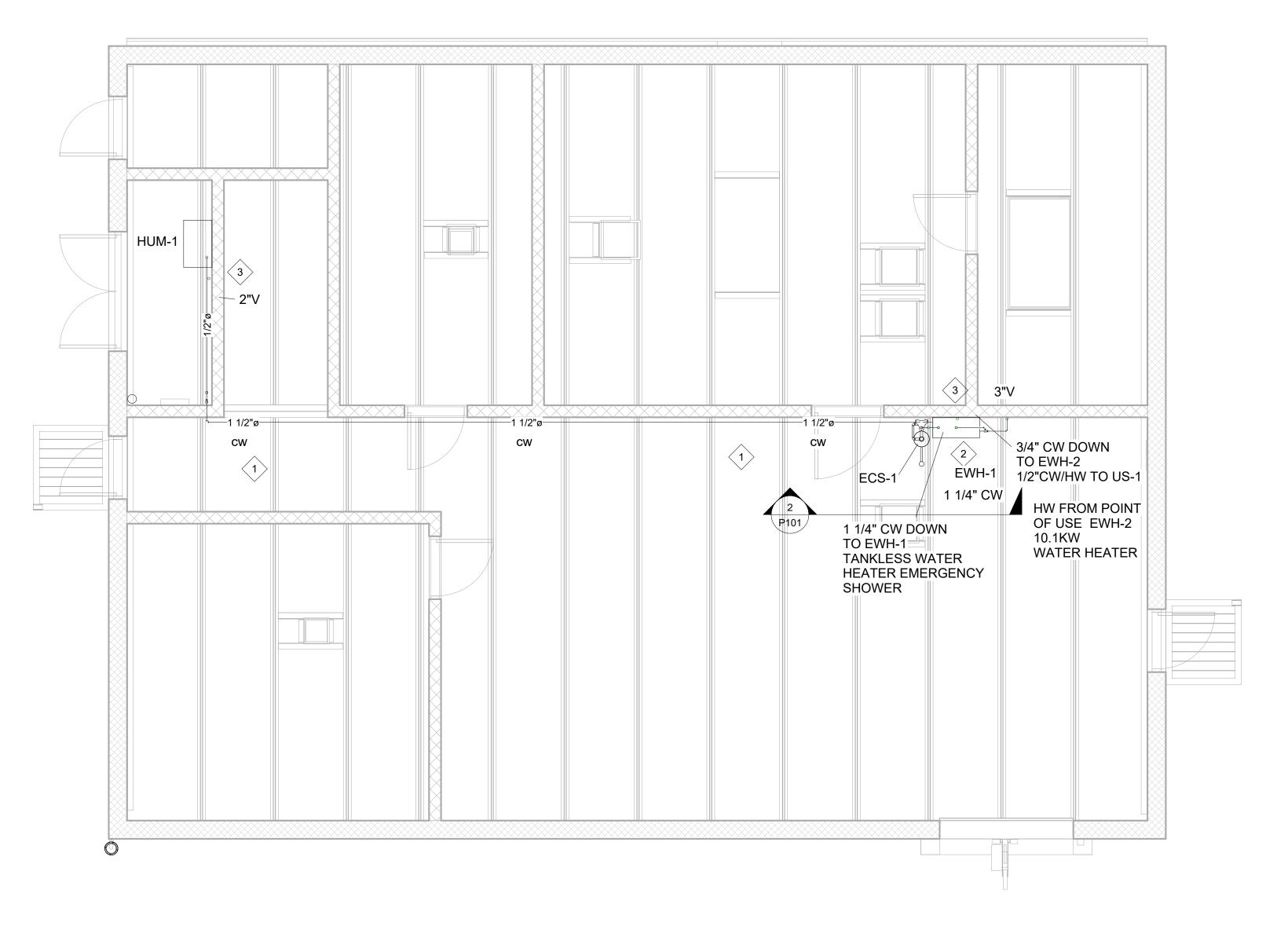
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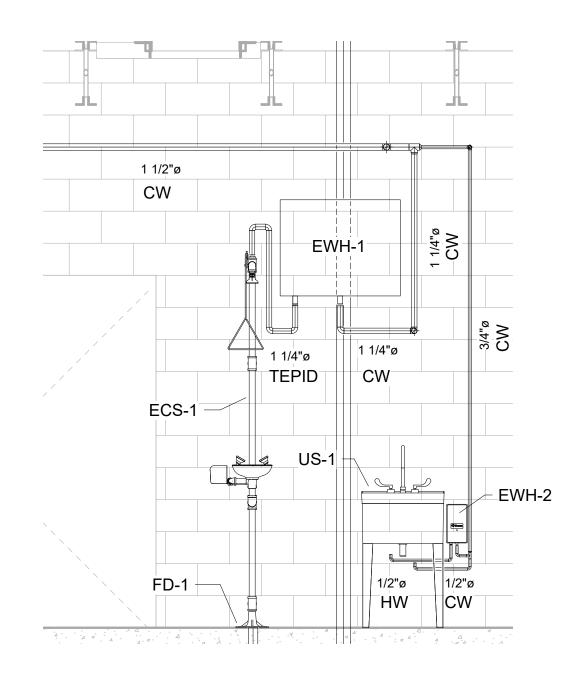
1 ABOVE SLAB PLUMBING PIPING 1/4" = 1'-0"

GENERAL NOTES

- 1. UTILITIES SERVICES (I.E. DOMESTIC WATER, SANITARY) ARE APPROXIMATE. CONTRACTOR TO LOCATE PRIOR TO INSTALLING UNDERGROUND PIPING AND COORDINATE WITH NEW BUILDING SANITARY FIXTURES. ALTERNATE CONNECTION POINT MAY BE USED. VERIFY UTILITY LOCATIONS WITH CIVIL DRAWINGS PRIOR TO BIDDING.
- 2. COORDINATE EQUIPMENT AND FIXTURE SPECIFICATIONS FOR ALL ITEMS LISTED ON THESE DRAWINGS WITH EXACT MANUFACTURER SPECIFICATIONS PRIOR TO PIPING AND INSTALLATION.

KEYED NOTES

- DOMESTIC OVERHEAD WATER, SANITARY, VENT. ALL OVERHEAD WATER PIPE TO BE INSULATED, JACKETED, LABLED & HAVE FLOW ARROWS.
- NEW ELECTRIC TANKLESS WATER HEATER TO PROVIDE TEPID WATER AT ECS-1. PROVIDE THERMOSTATIC VALVE FROM MANUFACTURER.
- 3 COORDINATE VENT RISER AND WALL LOCATIONS FOR FINAL ROUTE TO ROOF. ANCHOR TO WALL.



2 SAFETY SHOWER/UTILITY SINK 1/2" = 1'-0"



ABOVE FLOOR DOMESTIC WATER
MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY
ROLLA, MISSOURI

As indicated SITE: ROLLA, MISSOURI

ROLLA, MISSOURI

ROLLA, MISSOURI

DRAWING NO.

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2" VTR -GENERATOR DOAS UNIT BELOW GRADE SANITARY Isometric Plumbing (FOR REFERENCE
ONLY)



PLUMBING ISOMETRIC
MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY
ROLLA, MISSOURI
DANGEROUS MATERIALS STORAGE FACILITY

SITE: ROLLA, MISSOURI

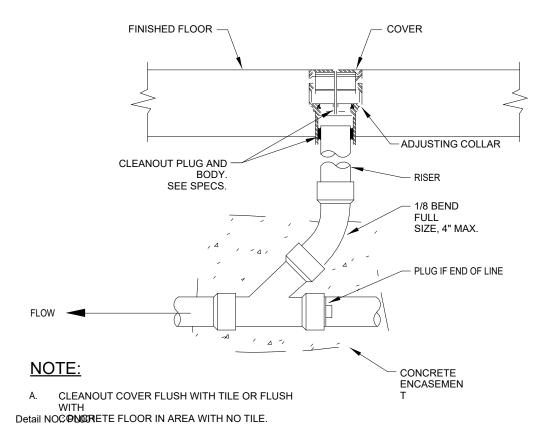
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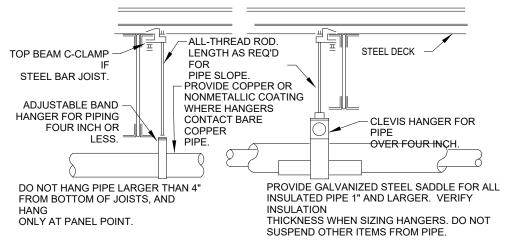
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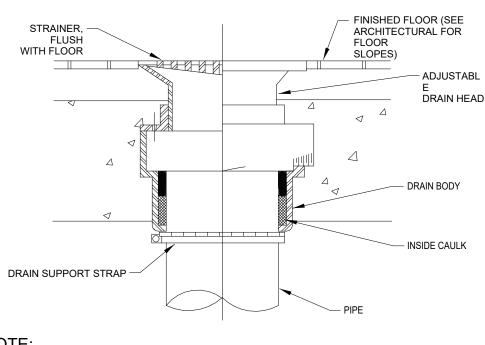




PROVIDE UPPER ATTACHMENT AS REQUIRED FOR CASES NOT SHOWN HERE. DO NOT INSTALL HANGER INSIDE INSULATION OR OTHERWISE PENETRATE VAPOR BARRIER. DO NOT HANG ONE PIPE FROM ANOTHER EXCEPT IN CHASES. TRAPEZE HANGERS MAY BE USED FOR MULTIPLE PARALLEL PIPES. SLOPE ALL WATER PIPING SLIGHTLY TOWARD DRAINABLE LOCATIONS. HANGER SPACING FOR PIPE SIZE: COPPER: 2"=9' 1-1/2"=8' 1-1/4=7' 1"=6' 3/4"=6' 1/2"=5'. CAST IRON: 10' AND ONE NEAR ALL JOINTS. LOCATE HANGERS AS CLOSE AS POSSIBLE TO TURNS AND TEES OF PIPE. PROVIDE SUPPLEMENTARY STEEL STRUTS BETWEEN JOISTS IF REQUIRED. LOCATE HANGERS TO TAKE LOAD OFF OF EQUIPMENT CONNECTIONS. ANCHOR WATER PIPE AGAINST SWAYING DUE TO CHANGES IN WATER VELOCITY. PROVIDE SEISMIC BRACING IF/AS REQUIRED BY LOCAL AUTHORITIES. CHAINS OR PERFORATED STRAP IRON OR STEEL IS NOT ACCEPTABLE. DO NOT SUSPEND PIPE FROM JOIST BRACING MEMBERS. REFER TO CODES AND SPECIFICATIONS FOR FURTHER INFORMATION.



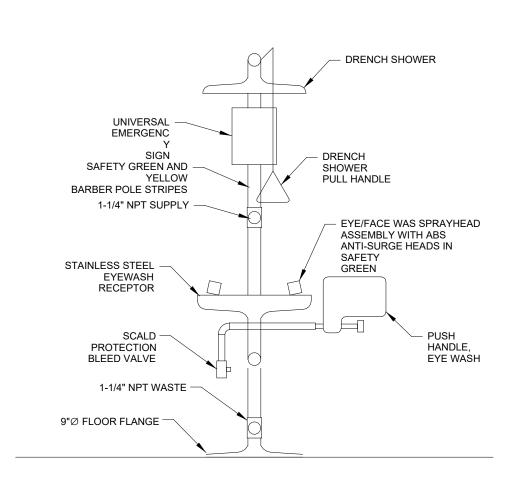
P600 SCALE: NO SCALE



NOTE:

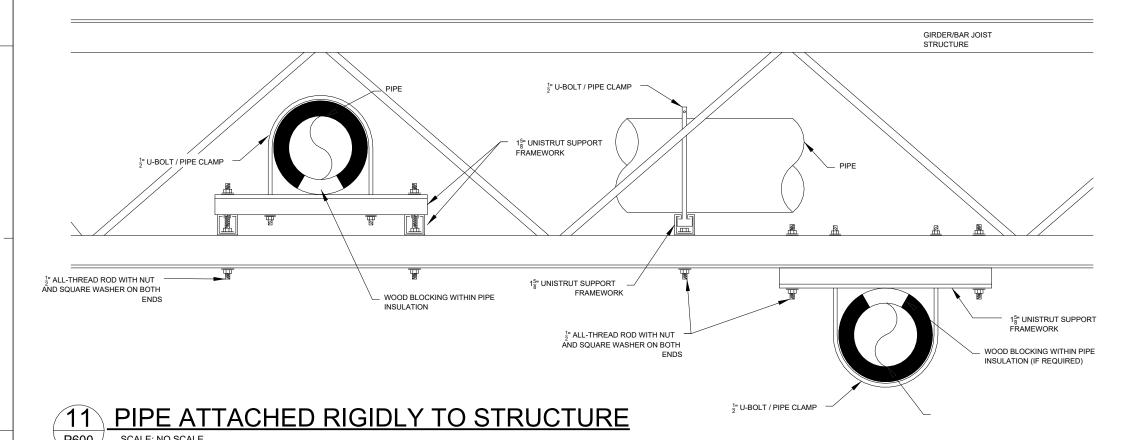
A. FLOOR DRAIN COVER FLUSH WITH TILE OR FLUSH WITH CONCRETE FLOOR IN AREA WITH NO TILE.

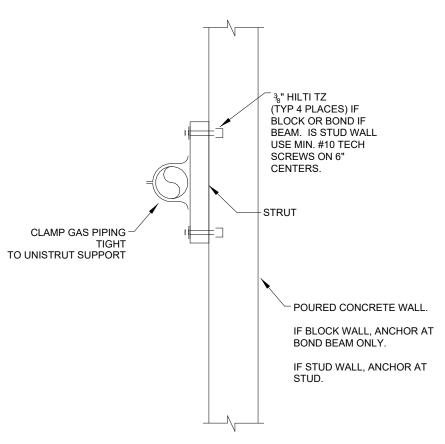
2 FLOOR DRAIN DETAIL



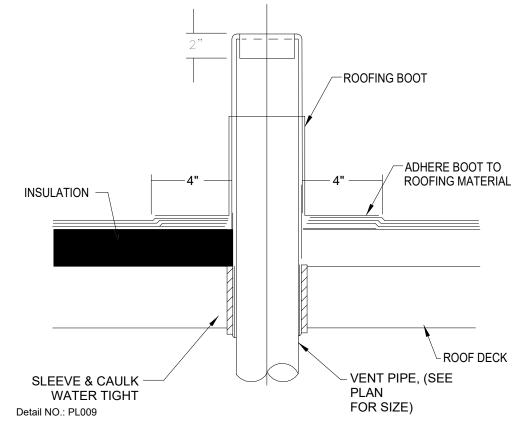
8 EMERGENCY SHOWER DETAIL P600 SCALE: NO SCALE

Detail NO.: PL018

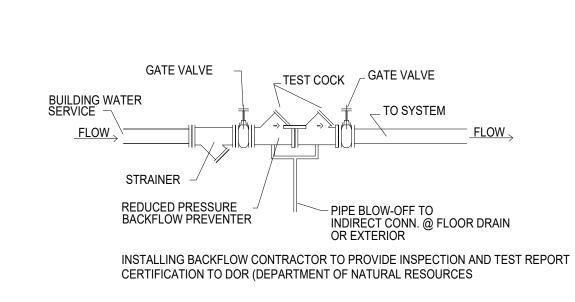




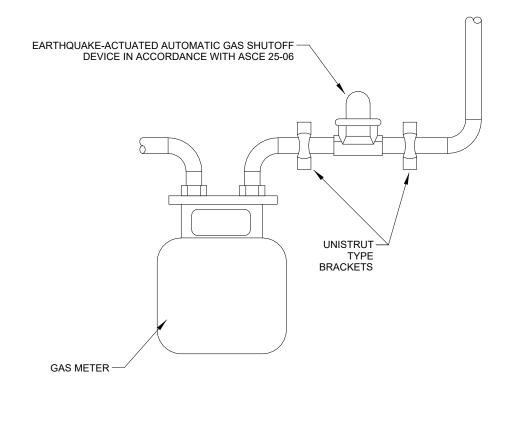
3 WALL ANCHOR DETAIL P600 / SCALE: NTS

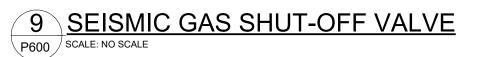


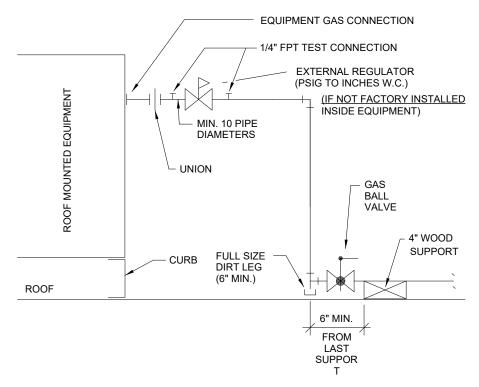
4 VENT THRU ROOF DETAIL P600 / SCALE: NTS



5 BACKFLOW PREVENTER DETAIL







10 GAS CONNECTION DETAIL P600 SCALE: NO SCALE

EQUIPMENT & SYSTEM COMPONENTS		SEISMIC ANCHORAGE TO FLOORS, ROOFS, ETC.		SEISMIC SWAY BRACING		LOCATION OF THE PROFESSIONALLY SEALED ANCHORAGE AND SWAY BRACING DETAILS				COMMENTS	
						ON CONSTRUCTION DOCUMENTS	SUBSEQUENT SUBMITTAL		OTHER	IBC SECTION THAT	ST. LOUIS COUNTY
ITEM	IMPORTANCE FACTOR (Ip)	NOT PROVIDED FOR PROJECT	PROVIDED FOR PROJECT	NOT PROVIDED FOR PROJECT	PROVIDED FOR PROJECT	DRAWING NO. OR SPECIFICATION SECTION	SHOP DRAWINGS	SEPARATE PERMITS & PLANS	PROVISIONS (SEE NOTES)	EXEMPTS SEISMIC REQUIRE- MENTS	REFERENCE THAT EXEMPTS SEISMIC REQUIREMENTS
PIPING ≤ 4" (WASTE, VENT, PD)	1.0	X		х							2A
WASTE PIPING ≥ 4" (UNDERGORUND)	1.0	х		x							
VENT PIPING	1.0	X		х							2A
WATER PIPING < 4" (HOT, COLD, HOT RETURN)	1.0	x		x							2A
GAS PIPING > 1" DIAMETER	1.5		х		х	M-601					4,5,6
GAS PIPING ≤ 1" DIAMETER	1.5		х	X							4,5,6,7
ELECTRIC HOT WATER HEATER < 400LBS	1.0	х		X							2C

- 2. TABLE 4.4, NOTE 2:
- A. THE FOLLOWING SANITARY DRAIN, WASTE, AND VENT PIPESCH 40 IS LESS THAN 6" OR LESS IN DIA., SERVICE WEIGHT AND NO HUB CAST IRON, 2 INCHES OR LESS IN DIA. B. THE FOLLOWING STORM DRAIN PIPE SCHEDULE 40 AND 80 PVC, 3 INCHES OR LESS IN DIA., SERVICE WEIGHT AND NO HUB CAST IRON, NOT APPLICABLE
- C. THE FOLLOWING WATER PIPE: TYPE L, & M COPPER 4" INCHES OR LESS IN DIAMETER SCH 40 AND 80 PVC 4INCHES OR LESS IN DIAMETER
- D. FLEXIBLE CONNECTIONS ARE NOT REQUIRED FOR CONNECTIONS TO APPLIANCES OR PLUMBING FIXTURES THAT ARE MOUNTED TO WALLS OR FLOORS
- 🖰 DUCTILE PIPING STEEL, COPPER PIPING, AND TUBING JOINED BY WELDING, BRAZING, SOLDERING OR FLANGES. REFER TO TABLE 4.4, C
- BENDING OF THE HANGERS AND THEIR ATTACHMENTS; AND PROVISIONS ARE MADE FOR PIPING TO ACCOMMODATE EXPECTED DEFLECTIONS _ PIPING MEETING ALL CRITERIA IS EXEMPT FROM SEISMIC BRACING REQUIREMENTS.
- 5. TABLE 4.4, ITEM 4, PIPING SYSTEM EXEMPTIONS HIGH-DEFORMABILITY PIPING (STEEL & COPPER PIPING AND TUBING JOINED BY WELDING, BRAZING/SOLDERING OR BY BOLTED STEEL FLANGES) IS USED; PROVISIONS ARE MADE TO AVOID IMPACT WITH LARGER PIPING OR MECHANICAL COMPONENTS OR TO PROTECT THE PIPING IN THE EVENT OF SUCH IMPACT; AND THE NOMINAL PIPE SIZE IS LIMITED TO 3" OR LESS FOR Ip=1.0 & 1" OR LESS FOR Ip>1.0
- 6. TABLE 4.4, ITEM 5, GAS PIPING SYSTEM EXEMPTIONS, PART "A" EXTERIOR GAS PIPING INSTALLED ON ROOFS WHICH SUPPLIES NO MORE THAN 2 PSI AND IS PROTECTED BY AN APPROVED SEISMIC SHUT-OFF VALVE WITHIN 5 FEET OF THE BEGINNING OF THE 7. TABLE 4.4, ITEM 5, GAS PIPING SYSTEM EXEMPTIONS, PART "B" - EXTERIOR GAS PIPING INSTALLED ON ROOFS WHICH SUPPLIES NO MORE THAN 2 PSI AND IS PROTECTED BY APPROVED FLEXIBLE PIPING NO LESS THAN 3 FEET IN LENGTH IS INSTALLED WITHIN 5



Detail NO.: PL009

	NO.	DATE	DESCRIPTION	DESIGR	ENGR	PM	SCALE	12" = 1'-0"	S
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	2	02/14/24	ADDENDUM 2	POB/BM	POB				
MISSOURI CERTIFICATE OF AUTHORITY #: E-2011001315							CDG PROJECT	21380	
PROFESSIONAL ENGINEER #: MO-25069							PROJ MGR	GEB	

PLUMBING DETAILS MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY ROLLA, MISSOURI DANGEROUS MATERIALS STORAGE FACILITY SITE: ROLLA, MISSOURI DRAWING NO. P600

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