VA/COR BEFORE PROCEEDING WITH THE INSTALLATION OF THEIR WORK.

12. THE SEQUENCE FOR THE INSTALLATION OF ALL WORK SHALL BE COORDINATED BETWEEN ALL CONTRACTORS ON THE PROJECT AND IN STRICT ACCORDANCE WITH VA STIPULATIONS AS DIRECTED BY SAME.

13. CONTRACTOR SHALL BE RESPONSIBLE AND PAY FOR ALL CORING, CUTTING, PATCHING, REPAIRING, REFINISHING AND REMOVAL/REPLACEMENT OF NEW OR EXISTING BUILDING CONSTRUCTION REQUIRED TO ACCOMMODATE THE INSTALLATION OR REMOVAL OF THEIR WORK. CONTRACTOR SHALL XRAY ALI SLABS PRIOR TO CORING. ALL PATCHING, REPAIRING AND REFINISHING WORK SHALL BE PERFORMED BY THOSE REGULARLY INVOLVED IN THAT TRADE AND SHALL MATCH THE ADJACENT CONSTRUCTION AS CLOSELY AS POSSIBLE. CARE SHALL BE TAKEN SO AS NOT TO DAMAGE ANY EXISTING BUILDING CONSTRUCTION OR ITEMS THAT ARE TO REMAIN. ANY EXISTING FINISHES THAT ARE DAMAGED DURING THE INSTALLATION OF NEW WORK OR REMOVAL OF EXISTING WORK SHALL BE REPAIRED, REPLACED AND PAID FOR BY THE INSTALLING CONTRACTOR, TO THE SATISFACTION OF THE VA/COR. REFER TO ARCHITECTURAL DRAWINGS FOR EXISTING BUILDING CONSTRUCTION THAT IS TO REMAIN AND, THEREFORE, SUBJECT TO PATCHING, REPAIRING, REFINISHING, AND REMOVAL/REPLACEMENT. WHERE THERE IS EVIDENCE THAT WORK OF ONE TRADE WILL INTERFERE WITH WORK OF OTHER TRADES, ALL TRADES SHALL MEET ON JOB SITE TO WORK OUT SPACE CONDITIONS AND MAKE SATISFACTORY ADJUSTMENTS TO INSTALLATION OF THE NEW WORK. CONTRACTORS SHALL VERIFY EXACT LOCATIONS OF ALL DEVICES AND EQUIPMENT WITH FIELD CONDITIONS, SHOP DRAWINGS, AND WORK OF OTHER TRADES PRIOR TO ROUGH-IN. EACH CONTRACTOR SHALL BE RESPONSIBLE, AT THEIR OWN EXPENSE, FOR THE REMOVAL AND REINSTALLATION OF ANY PART OF THEIR WORK IF SAME WAS INSTALLED WITHOUT CONSULTING WITH OTHER TRADES BEFORE INSTALLING THEIR WORK.

MECHANICAL EQUIPMENT NOTES:

14. CONTRACTOR SHALL STORE ALL MATERIALS AND EQUIPMENT SHIPPED TO THE SITE IN A PROTECTED AREA. IF MATERIAL IS STORED OUTSIDE OF THE BUILDING, IT MUST BE STORED OFF THE GROUND A MINIMUM OF SIX INCHES (6") SET ON 6 X 6 PLANKS AND/OR WOOD PALLETS. ALL MATERIAL AND EQUIPMENT MUST BE COMPLETELY COVERED WITH WATERPROOF TARPS OR VISQUIN. ALL PIPING AND DUCTWORK WILL HAVE THE ENDS CLOSED TO KEEP OUT DIRT AND OTHER DEBRIS. NO EQUIPMENT WILL BE ALLOWED TO BE

15. THIS CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED IN THE SPECIFICATIONS PRIOR TO THE START OF INSTALLATION FOR VA/COR APPROVAL AND THE SUCCESSFUL REVIEW BY THE ARCHITECT/ENGINEER.

STORED OUTSIDE THE BUILDING ON THE SITE UNLESS IT IS SUPPORTED OFF

THE GROUND AND COMPLETELY PROTECTED WITH WEATHERPROOF COVERS.

FINAL PAYMENT WILL BE ISSUED. THE AS-BUILT DRAWINGS SHALL BE SUBMITTED IN ELECTRONIC REPRODUCIBLE FORM.

17. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE STARTUP AND TESTING OF ALL EQUIPMENT.

18. THIS CONTRACTOR SHALL PROVIDE A COMPETENT OPERATING TECHNICIAN TO INSTRUCT THE VA IN THE OPERATION AND MAINTENANCE OF THE EQUIPMENT.

19. UPON COMPLETION OF THE WORK. THIS CONTRACTOR SHALL REVIEW AND CHECK THE ENTIRE PORTION OF WORK, CLEAN EQUIPMENT AND DEVICES. REMOVE SURPLUS MATERIALS AND RUBBISH FROM THE PROPERTY AND LEAVE THE WORK IN NEAT AND CLEAN ORDER AND IN COMPLETE WORKING CONDITION EACH RESPECTIVE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ANY CARTONS, DEBRIS, EQUIPMENT, ETC., INSTALLED BY THIS CONTRACTOR INCLUDING EQUIPMENT FURNISHED BY OTHERS AND UNPACKED OR REMOVED FROM CARTONS BY THIS CONTRACTOR.

20. ALL ITEMS THAT REQUIRE ACCESS, SUCH AS FOR OPERATING, CLEANING, SERVICING, MAINTENANCE, AND CALIBRATION, SHALL BE EASILY AND SAFELY ACCESSIBLE BY PERSONS STANDING AT FLOOR LEVEL, OR STANDING ON PERMANENT PLATFORMS, WITHOUT THE USE OF PORTABLE LADDERS. EXAMPLES OF THESE ITEMS INCLUDE, BUT ARE NOT LIMITED TO: ALL TYPES OF VALVES, FILTERS AND STRAINERS, TRANSMITTERS, CONTROL DEVICES. PRIOR TO COMMENCING INSTALLATION WORK. REFER CONFLICTS BETWEEN THIS REQUIREMENT AND CONTRACT DRAWINGS TO THE VA/COR FOR RESOLUTION. FAILURE OF THE CONTRACTOR TO RESOLVE, OR POINT OUT ANY ISSUES WILL RESULT IN THE CONTRACTOR CORRECTING AT NO ADDITIONAL COST TO THE

21. UNLESS INDICATED OTHERWISE, THE ARCHITECT/ENGINEER MAKES NO REPRESENTATION AS TO WHETHER OR NOT ANY HAZARDOUS OR CONTAMINATED MATERIALS (INCLUDING BUT NOT LIMITED TO ASBESTOS, PCB'S, LEAD, CONTAMINATED SOILS, ETC.) ARE PRESENT WITHIN THE EXISTING BUILDING OR ON THE SITE. WORK SHOWN ON THE DRAWINGS AND/OR INDICATED IN THE SPECIFICATIONS SHALL NOT BE CONSTRUED TO CALL FOR CONTACT WITH ANY OF THESE MATERIALS. IF THESE MATERIALS ARE ENCOUNTERED OR SUSPECTED, THE CONTRACTOR SHALL NOT DISTURB THEM AND SHALL CONTACT THE VA/COR IMMEDIATELY.

22. IT IS MANDATORY THAT THE COMPLETE EXISTING BUILDING REMAIN IN CONTINUOUS AND NON-INTERRUPTED OPERATION DURING REMODELING/ALTERING OF SAID EXISTING BUILDING. THE SPECIFIC AREA(S) BEING REMODELED/ALTERED AT ANY SCHEDULED TIME ARE OBVIOUSLY EXCLUSIVE OF THIS STATEMENT. SERVICES TO EXISTING BUILDING SHALL BE KEPT IN CONTINUOUS OPERATION INCLUDING POWER, SIGNAL SYSTEMS, LIGHTING, TELEPHONE, HEATING, COOLING, VENTILATING, TEMPERATURE CONTROL, SEWERS AND HOT AND COLD WATER. ANY ABSOLUTELY NECESSARY INTERRUPTION OF THESE SERVICES TO ACCOMPLISH CONTRACT WORK SHALL BE ARRANGED WITH THE VA/COR A MINIMUM OF TEN (10) WORKING DAYS IN ADVANCE. SUCH INTERRUPTIONS SHALL BE KEPT TO AN ABSOLUTE MINIMUM AS FAR AS TIME INTERVAL IS INVOLVED AND TEMPORARY SERVICES SHALL BE FURNISHED AND INSTALLED UNDER THIS CONTRACT WHERE NECESSARY TO ACCOMPLISH THIS PURPOSE TEMPORARIES SHALL BE REMOVED BY THE CONTRACTOR ONLY AFTER NEW PERMANENT SERVICES ARE INSTALLED AND FULLY OPERATIONAL.

23. IN CASE OF CONFLICTS OR DISCREPANCIES WITHIN OR AMONG THE CONTRACT DRAWINGS, THE BETTER QUALITY, MORE STRINGENT REQUIREMENTS, OR GREATER QUANTITY OF WORK, AS DETERMINED BY THE GOVERNMENT/CONTRACTING OFFICER, SHALL BE PROVIDED.

CONSULTANT

ALL EQUIPMENT/DEVICES SHALL BE AND OF FIRST RATE QUALITY (UNLESS OTHERWISE SPECIFIED) AND IS TO BEAR THE APPROPRIATE AGA, CSA OR UL APPROVED LABELS, LISTINGS, AND CERTIFICATIONS FOR THE SPECIFIC DESIGN

2. ALL EQUIPMENT SOUND LEVELS SHALL NOT EXCEED 50 DB AT PROPERTY LINE.

3. ALL INTERCONNECTING WIRING AT UNIT SHALL BE FACTORY PRE—WIRED AND REQUIRE ONLY ONE (1) POWER CONNECTION TO THE UNIT BY THE ELECTRICAL CONTRACTOR. DISCONNECT SWITCH SHALL BE BY THE ELECTRICAL CONTRACTOR.

4. SUBMIT THE REQUIRED NUMBER OF COPIES OF EACH CATALOG CUT, FOR THE EQUIPMENT SPECIFIED, TO THE VA/COR FOR APPROVAL AND TO THE ARCHITECT /ENGINEER FOR HIS/HER SUCCESSFUL REVIEW PRIOR TO THE BEGINNING OF CONSTRUCTION. THIS CONTRACTOR SHALL ALSO ASSEMBLE PRINTED INSTRUCTIONS FOR THE OPERATION AND MAINTENANCE OF EACH ITEM INSTALLED AND BIND TOGETHER WITH EQUIPMENT CUTS AND CONTROL WIRING DIAGRAMS. SUBMIT THE REQUIRED NUMBER OF COPIES TO THE VA/COR FOR HIS/HER SUCCESSFUL RFVIFW.

5. THE DRAWINGS, SCHEDULES AND SPECIFICATIONS HAVE BEEN PREPARED USING ONE MANUFACTURER FOR EACH PIECE OF EQUIPMENT AS THE BASIS OF DESIGN INCLUDING ALL DIMENSIONAL DESIGN. IF THE CONTRACTOR PURCHASES EQUIPMENT FROM A SPECIFIED ACCEPTABLE MANUFACTURER, BUT NOT THE SCHEDULED MANUFACTURER USED FOR THE BASE DESIGN, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING ALL THE DIMENSIONS OF THE EQUIPMENT TO VERIFY THAT IT WILL FIT IN THE SPACE SHOWN ON THE DRAWINGS. MINOR DEVIATIONS IN DIMENSIONS WILL BE PERMITTED, PROVIDED THE RATINGS MEET THOSE SHOWN ON THE DRAWINGS AND EQUIPMENT WILL PHYSICALLY FIT INTO THE SPACE ALLOCATED WITH SUITABLE ACCESS AROUND EQUIPMENT FOR OPERATION AND MAINTENANCE OF THE EQUIPMENT. WHEN EQUIPMENT SUBMITTED FOR REVIEW DOES NOT MEET THE PHYSICAL SIZE OR ARRANGEMENT OF THAT SCHEDULED AND SPECIFIED, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ALTERATIONS REQUIRED TO ACCOMMODATE SUCH EQUIPMENT AT NO ADDITIONAL COST TO THE VA. CONTRACTOR WILL ALSO PAY ALL COSTS FOR ADDITIONAL WORK REQUIRED BY OTHER CONTRACTORS AND THE VA TO MAKE CHANGES WHICH WOULD ALLOW THE EQUIPMENT TO FIT IN THE SPACE AND TO FUNCTION AS INTENDED.

CONTRACTOR AND/OR MANUFACTURER SHALL VERIFY THAT THE CHARACTERISTICS OF THE EQUIPMENT HE SUBMITS FOR REVIEW MEET THE CAPACITY AND DUTY SPECIFIED. WHEN EQUIPMENT SUBMITTED FOR REVIEW REQUIRES MODIFICATIONS TO THE WORK OF OTHER CONTRACTORS, SUBMITTING CONTRACTOR SHALL PAY FOR ALL COSTS FOR ADDITIONAL WORK REQUIRED BY OTHER CONTRACTORS, VA. ARCHITECT OR ENGINEER TO MAKE CHANGES WHICH WOULD ALLOW THE EQUIPMENT FUNCTION SAFELY AND PROPERLY.

CONTRACTOR MUST FIELD VERIFY SIZES, CAPACITIES, WEIGHTS, HORSE POWERS, ETC. ON ALL EQUIPMENT. NOTIFY THE VA/COR IF ANY DISCREPANCIES EXIST BETWEEN THE ACTUAL FIELD CONDITIONS AND THE DRAWINGS.

ENGINEERING DISCIPLINE REFERENCE NOTES

SEE ALL PROJECT GENERAL NOTES AND OTHER REQUIREMENTS INCLUDING THE LIFE SAFETY AND INFECTION CONTROL WORK LOCATED WITHIN THE GENERAL DRAWINGS SECTION. COMPLY WITH ALL REQUIREMENTS AS THEY ARE A DIRECT PART OF THIS SECTION AS IF THEY WERE DIRECTLY INCLUDED AND PROVIDED HEREIN.

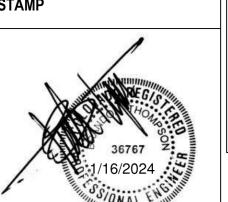
EQUIVALENCY SUBSTITUTIONS: THE "BASIS OF DESIGN" (BOD) COMPLIANCE PROTOCOLS" ARE TO BE FOLLOWED FOR ALL MATERIALS, EQUIPMENT, ASSEMBLIES AND SYSTEMS SPECIFIED AND DETAILED THROUGHOUT ALL DRAWINGS AND SPECIFICATION SECTIONS, WHETHER THE BOD DESIGNATE IS SPECIFICALLY REFERENCED THEREIN OR NOT. SEE THE GENERAL DRAWINGS SECTION FOR THE SPECIFIC BOD COMPLIANCE REQUIREMENTS AND PROTOCOLS TO BE FOLLOWED.

HVAC SYMBOLS AND ABBREVIATIONS BUTTERFLY VALVE ACCESS DOOR FLEXIBLE DUCT CONNECTION GLOBE VALVE ABOVE FINISHED FLOOR GATE VALVE MANUAL SINGLE BLADE OR OPPOSED BLADE DAMPER BUILDING AUTOMATION SYSTEM CHECK VALVE BALL VALVE (2" & SMALLER) BRAKE HORSEPOWER BUTTERFLY VALVE (2 1/2" & LARGER) BOTTOM OF PIPE MOTOR OPERATED DAMPER 3 WAY CONTROL VALVE BRITISH THERMAL UNIT 2 WAY CONTROL VALVE BRITISH THERMAL UNIT PER HOUR VERTICAL FIRE DAMPER WITH ACCESS DOOR CIRCUIT BALANCING VALVE W/BALANCING PORTS (8" AND UNDER CIRCUIT FLOW INDICATOR W/BALANCING PORTS AND MEMORY STOP BUTTERFLY VALVE FOR BALANCING (10" AND ABOVE) CUBIC FEET PER MINUTE SOLENOID VALVE HORIZONTAL FIRE DAMPER CHWR CHILLED WATER RETURN PRESSURE REDUCING VALVE CHWS CHILLED WATER SUPPLY PLUG VALVE (GAS COCK) AIR FLOW DRAIN LINE PRESSURE RELIEF VALVE (PIPE TO FLOOR DRAIN) DRAIN VALVE WITH HOSE THREADED OUTLET 12x24 DUCT SIZE FREE AREA (1ST FIGURE, SIDE OF DUCT SHOWN) AUTOMATIC BALL OR BUTTERFLY VALVE PIPE UNION (OR FLANGES IF 2 1/2" OR LARGER PIPE) CROSS-SECTION OF SUPPLY OR OUTSIDE AIR INTAKE DUCT EXHAUST AIR CONCENTRIC PIPE REDUCER OR INCREASER ENTERING AIR TEMPERATURE STEAM TRAP ASSEMBLY CROSS-SECTION OF RETURN DUCT EXHAUST FAN PRESSURE SWITCH (WITH THREAD OR WELD-O-LET) EXTERNAL STATIC PRESSURE PRESSURE GAUGE AND NEEDLE VALVE CROSS-SECTION OF EXHAUST DUCT ENTERING WATER TEMPERATURE FLOW SWITCH (WITH THREAD OR WELD-O-LET) THERMOMETER (WITH PIPE WELL) INCLINED RISE (R) OR DROP (D) FINS PER FOOT THERMOMETER WELL FEET PER MINUTE TEMPERATURE WELL WITH DDC SENSOR 90° ELBOW WITH TURNING VANES FACE VELOCITY PRESSURE WELL WITH DDC SENSOR GENERAL CONTRACTOR PRESSURE/TEMPERATURE PLUG WITH CAP 90° BRANCH TAKE-OFF W/45 DEGREE ENTRY GALLONS PER MINUTE HORSEPOWER STRAINER WITH BLOWDOWN VALVE ROUND FLEXIBLE DUCT HOT WATER COIL REFRIGERANT EXPANSION VALVE HIGH TEMPERATURE HOT WATER SUPPLY DIRECTION OF FLOW SQUARE OR RECTANGLE DUCT TRANSITION HIGH TEMPERATURE HOT WATER RETURN PITCH OF PIPE (DOWN) HOT WATER RETURN SQUARE OR RECTANGLE TO ROUND DUCT TRANSITION PIPE ELBOW (TURNED UP) HOT WATER SUPPLY PIPE ELBOW (TURNED DOWN) LEAVING AIR TEMPERATURE PIPE TEE DOWN (DROP) DUCT UP TO ROOF MOUNTED EXHAUST FAN OR VENTILATOR LEAVING WATER TEMPERATURE MINIMUM CIRCUIT AMPS PIPE TEE UP OR ANGLE XXX-1 EQUIPMENT TAG MAXIMUM OVERCURRENT PROTECTION PIPE TEE DOWN OR ANGLE WALL THERMOSTAT OR TEMPERATURE SENSOR MTHWS MEDIUM TEMPERATURE HOT WATER SUPPLY NEW CONNECTION WALL THERMOSTAT OR TEMPERATURE SENSOR WITH GUARD MTHWR MEDIUM TEMPERATURE HOT WATER RETURN PIPING, DUCTWORK, OR EQUIPMENT TO BE REMOVED WALL HUMIDISTAT LOW TEMPERATURE (HEATING) HOT WATER SUPPLY (UP TO 120°F) NOT TO SCALE LOW TEMPERATURE (HEATING) HOT WATER RETURN (UP TO 120°F) NEW CONNECTION POINT PUMPED CONDENSATE RETURN HIGH TEMPERATURE (HEATING) HOT WATER SUPPLY DUCT SMOKE DETECTOR PRESSURE DROP HIGH TEMPERATURE (HEATING) HOT WATER RETURN <u>DIFFUSER TAG</u> S-SUPPLY- DIFFUSER/GRILLE HIGH PRESSURE STEAM SUPPLY IDENTIFICATION R-RETURN E-EXHAUST (XX) PREHEAT COIL HIGH PRESSURE CONDENSATE RETURN --- → DIFFUSER/GRILLE SIZE DIFFUSER/GRILLE —— __CFM POUNDS PER SQUARE INCH MEDIUM TEMPERATURE (HEATING) HOT WATER SUPPLY (140-220°F) AIRFLOW RATE REVOLUTIONS PER MINUTE MEDIUM TEMPERATURE (HEATING) HOT WATER RETURN (140-220°F) RADIANT PANEL (CHILLED WATER/HOT WATER) RETURN ——— LPS ——— LOW PRESSURE STEAM (UP TO 15 PSIG) LOW PRESSURE CONDENSATE (UP TO 15 PSIG) RADIANT PANEL (CHILLED WATER/HOT WATER) SUPPLY ——— LPR ——— SUPPLY AIR MAKE-UP WATER PUMPED CONDENSATE RETURN STATIC PRESSURE VACUUM CONDENSATE THESE LISTS OF SYMBOLS AND ABBREVIATIONS ARE GENERAL. NOT ALL SYMBOLS AND ABBREVIATIONS MAY BE APPLICABLE TO THIS TEMPERATURE CONTROL TOTAL STATIC PRESSURE CHILLED WATER SUPPLY ——— CHWS ——— CHILLED WATER RETURN CONDENSER WATER SUPPLY VARIABLE FREQUENCY DRIVE — CWR — CONDENSER WATER RETURN RADIANT PANEL (CHILLED WATER/HOT WATER) RETURN WATER COLUMN RADIANT PANEL (CHILLED WATER/HOT WATER) SUPPLY WATER GAUGE REFRIGERANT SUCTION OR REFRIGERANT LIQUID ISSUE FOR BID - 01/16/2024 **Project Title Project Number Drawing Title**

ISSUE FOR BID 01-16-24 Revisions:

BANCROFT ARCHITECTS + ENGINEERS

ARCHITECT/ENGINEER OF RECORD | STAMP 3300 Dundee RD. Northbrook, IL 60062 T: 847.952.9362 www. bancroft-ae.com Bancroft Project No: 22-113



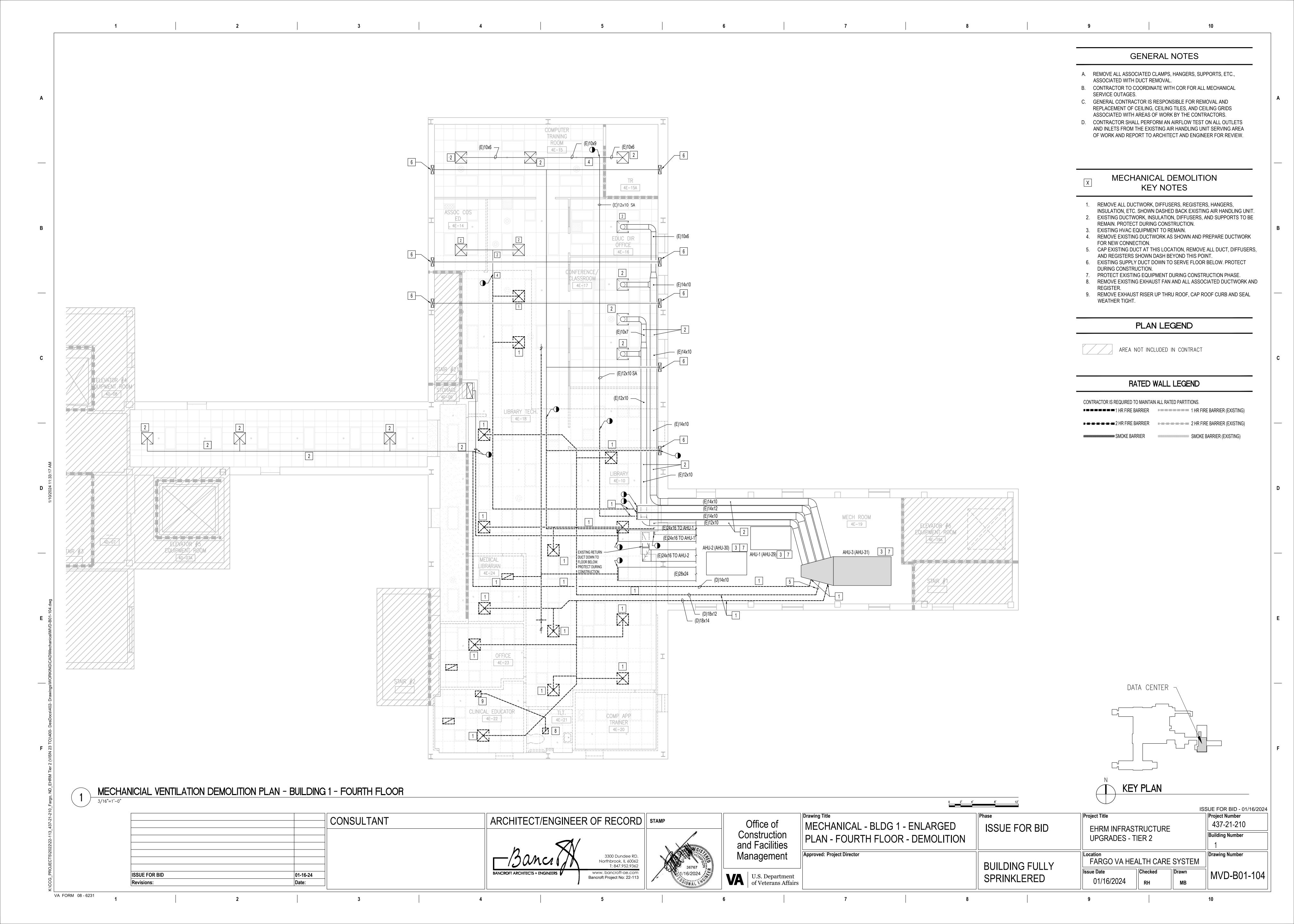
Construction and Facilities Management U.S. Department of Veterans Affairs

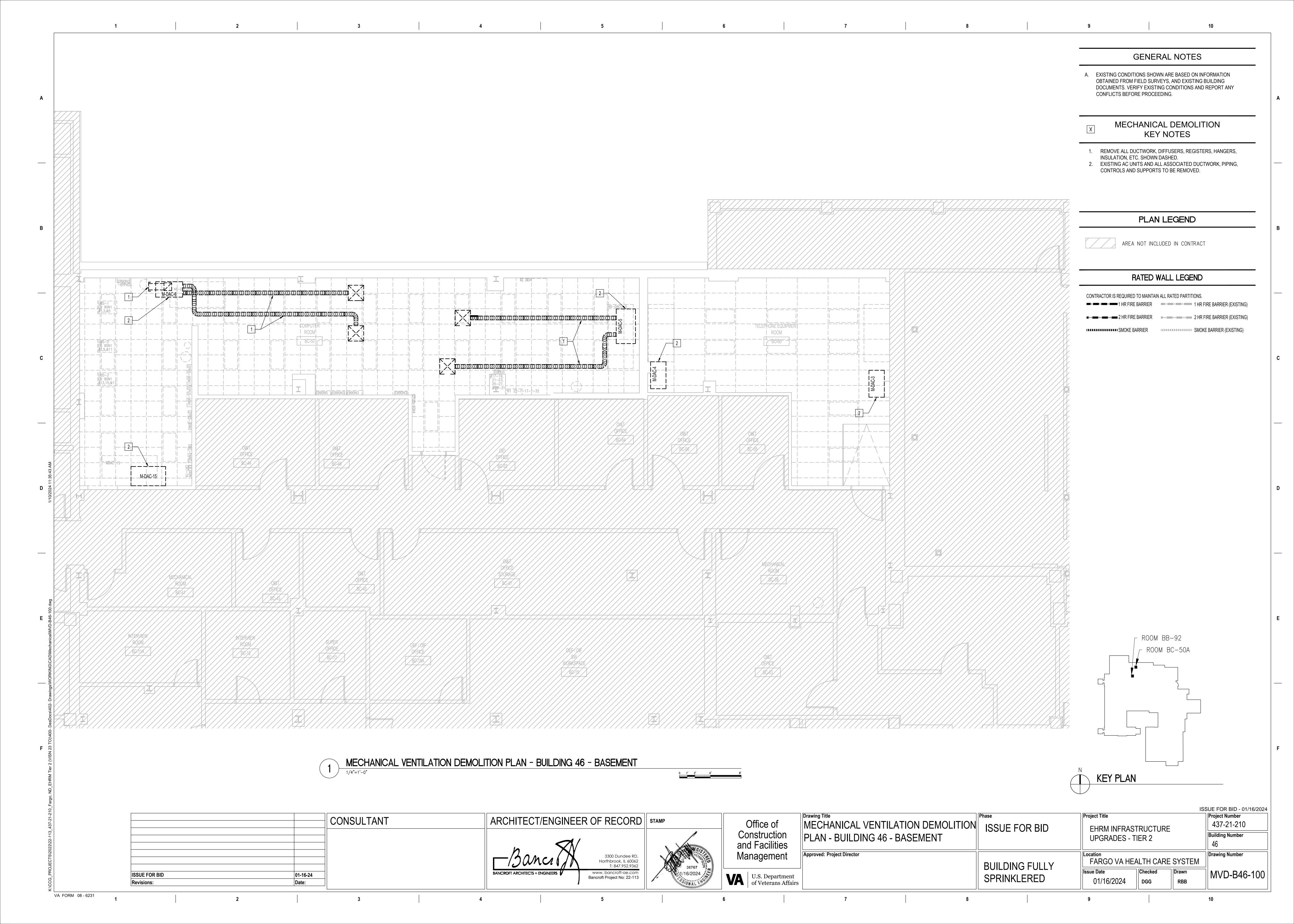
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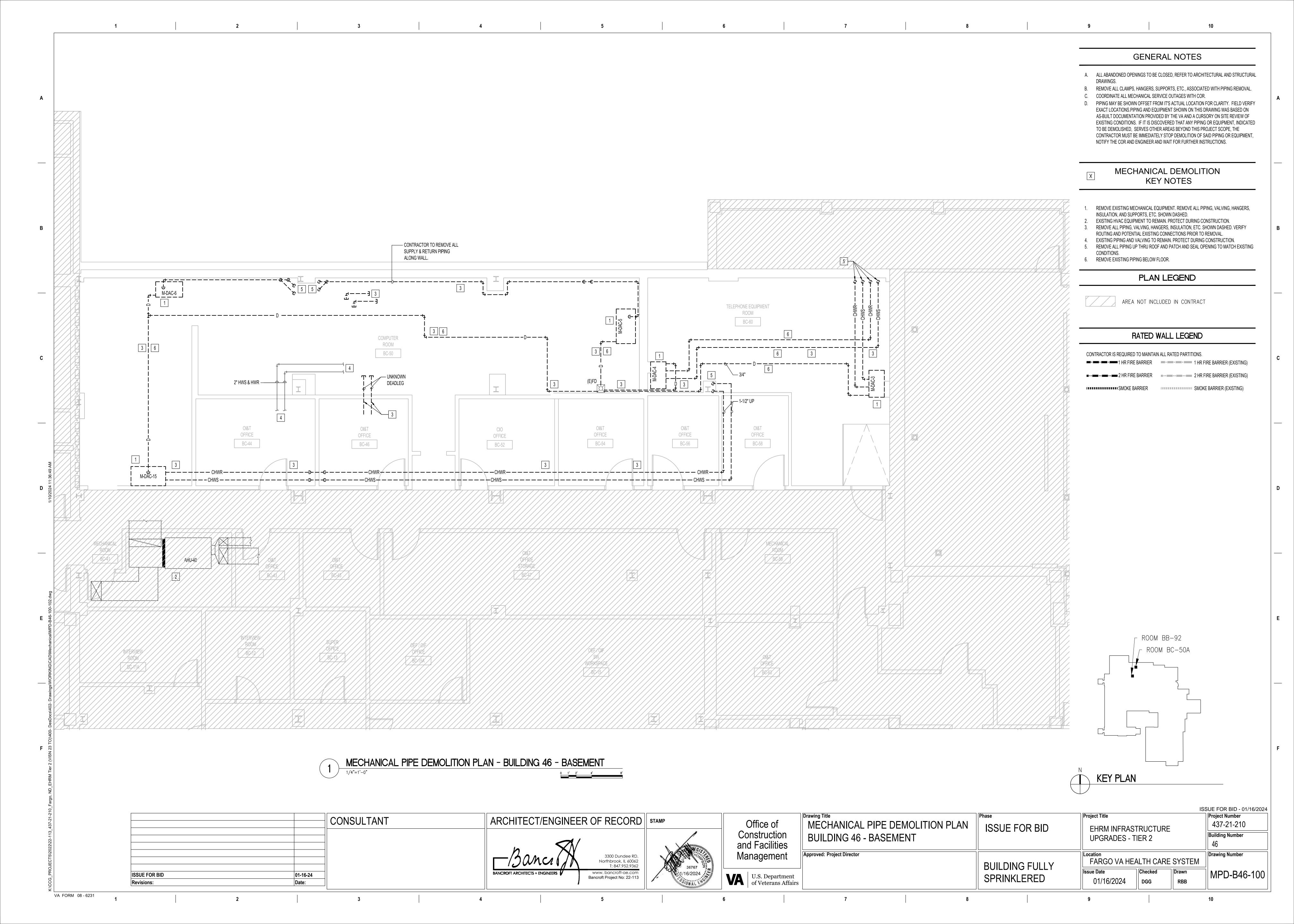
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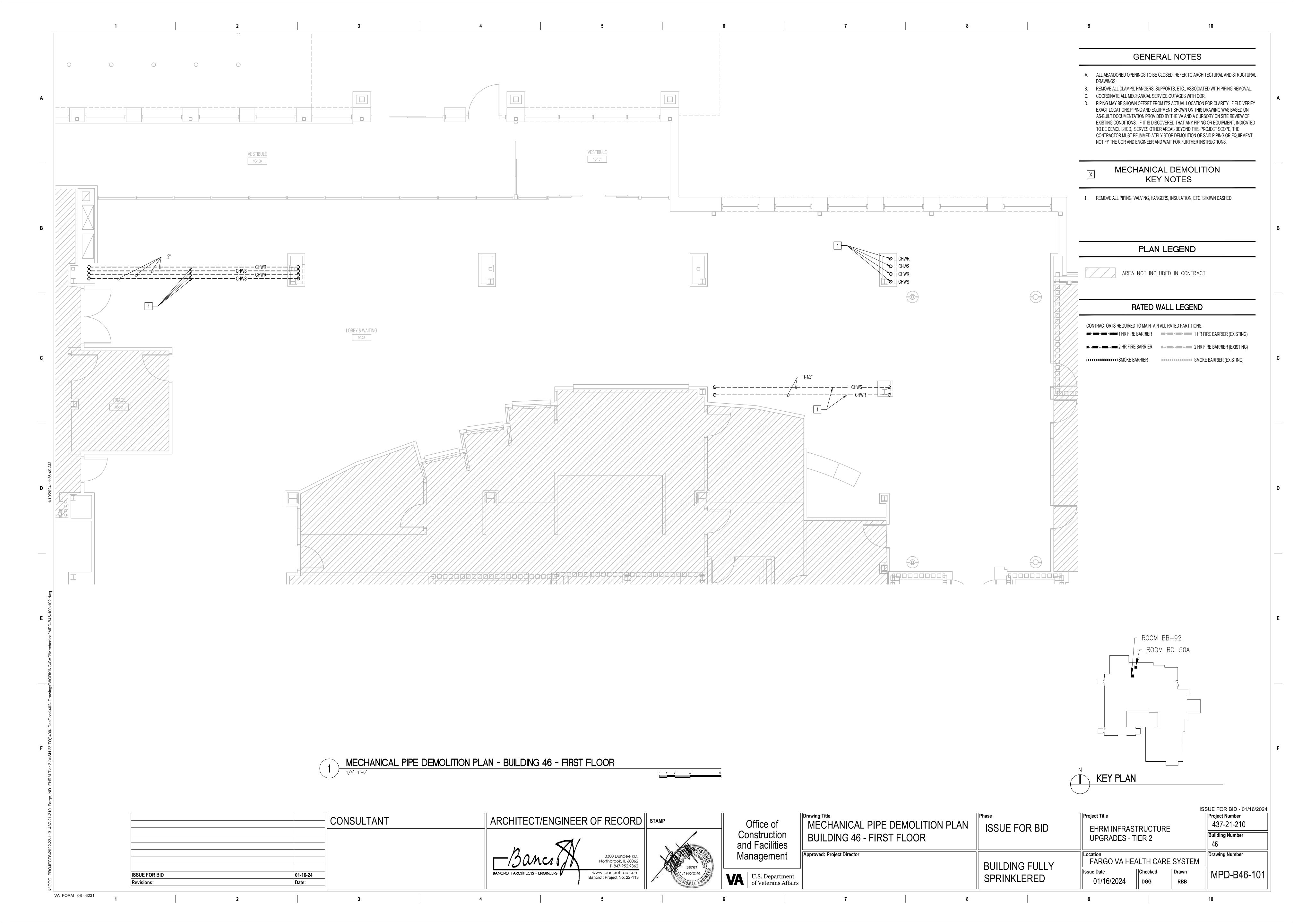
437-21-210 MECHANICAL - GENERAL NOTES, ISSUE FOR BID EHRM INFRASTRUCTURE **Building Number** SYMBOLS AND ABBREVIATIONS UPGRADES - TIER 2 1-9-46 **Drawing Number** FARGO VA HEALTH CARE SYSTEM **BUILDING FULLY** Checked M-001 **SPRINKLERED** 01/16/2024 RH MB

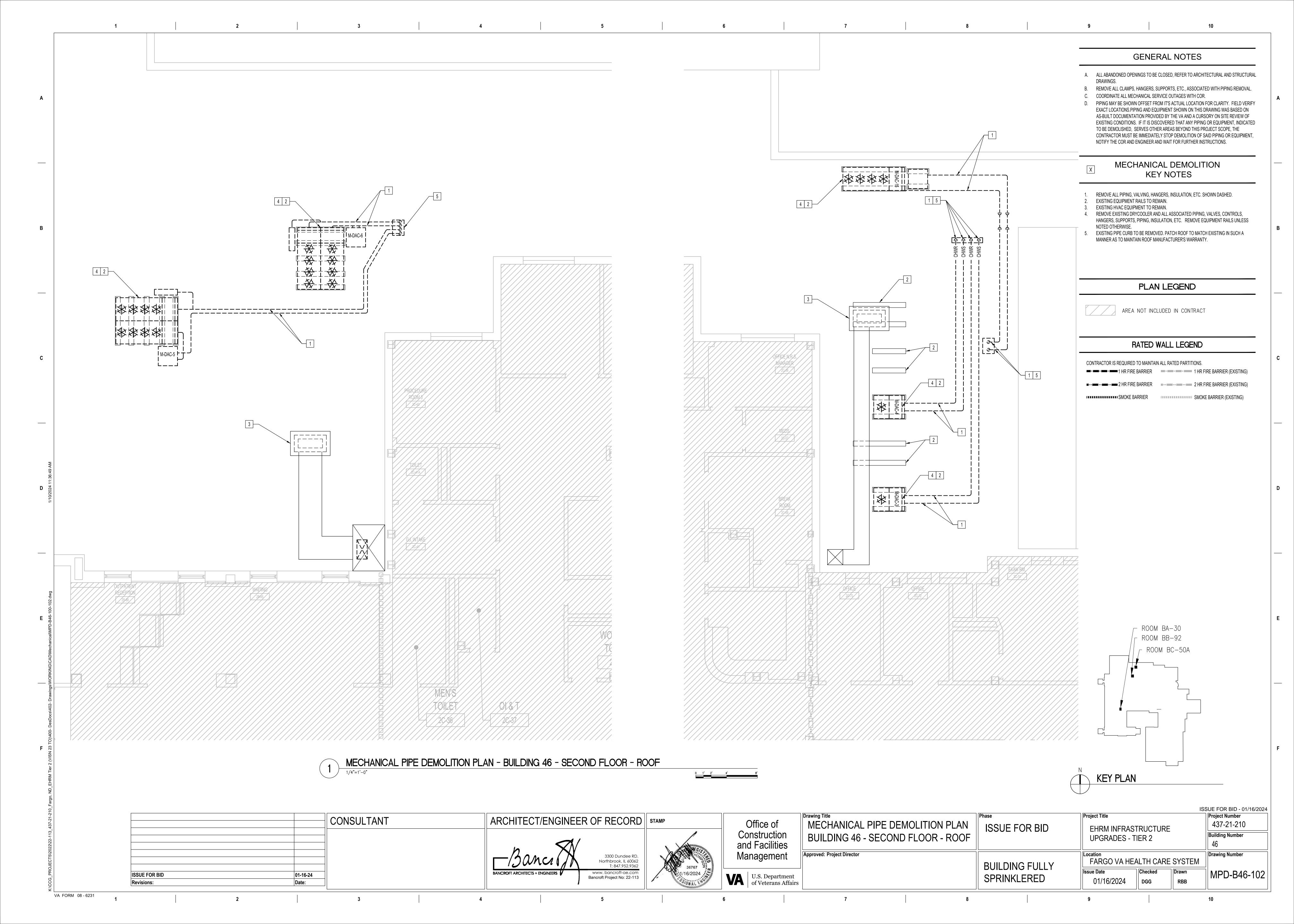
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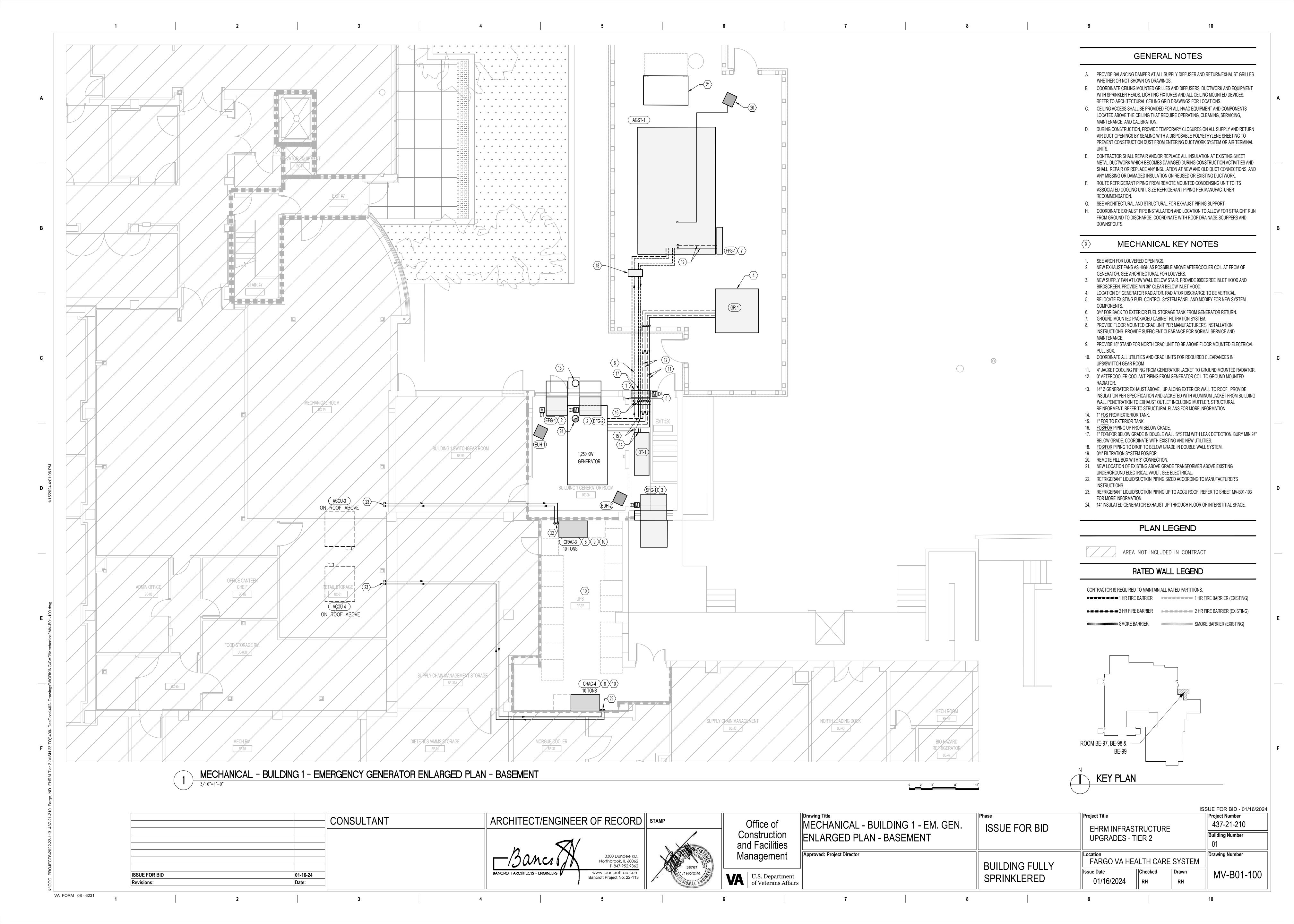


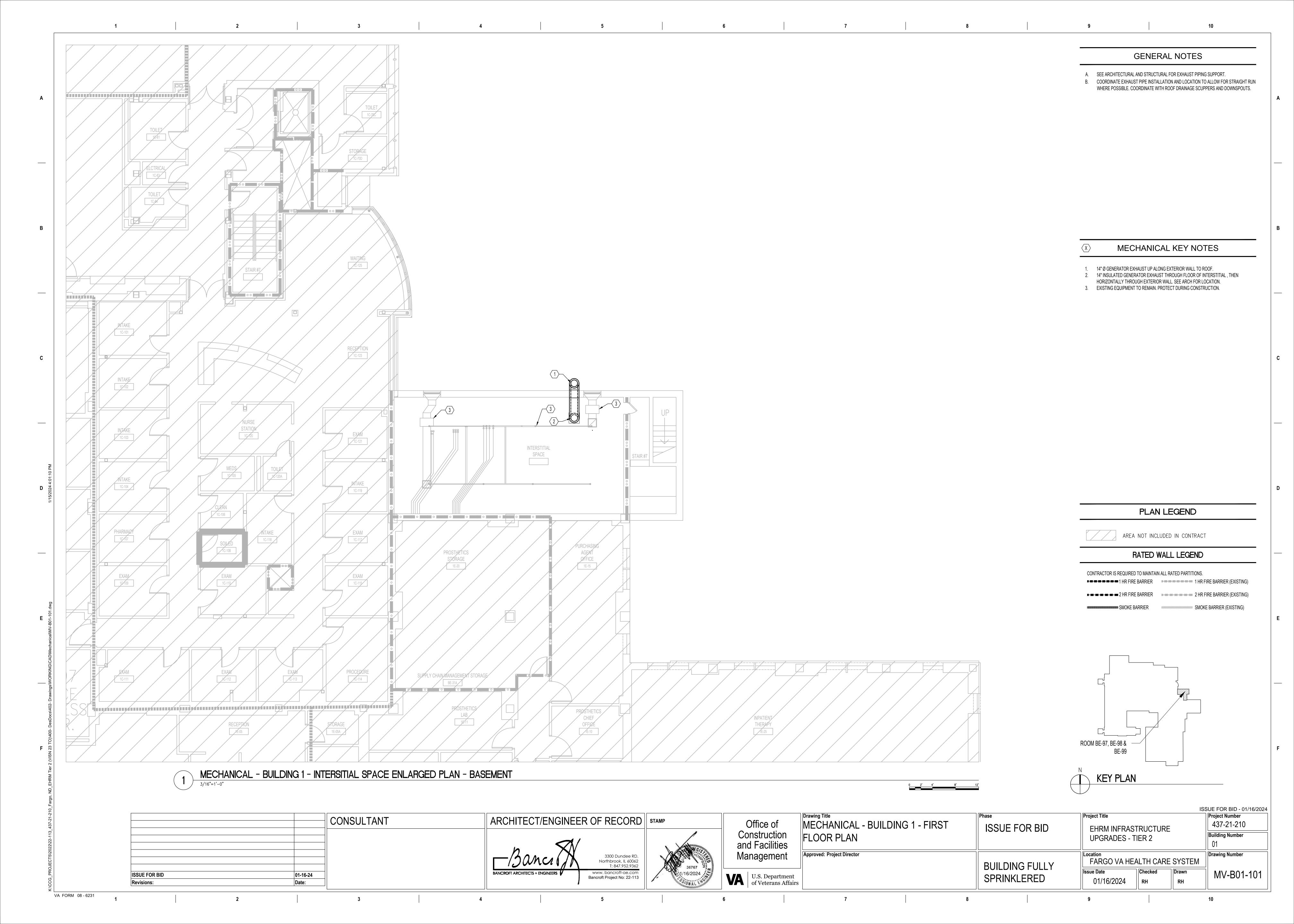


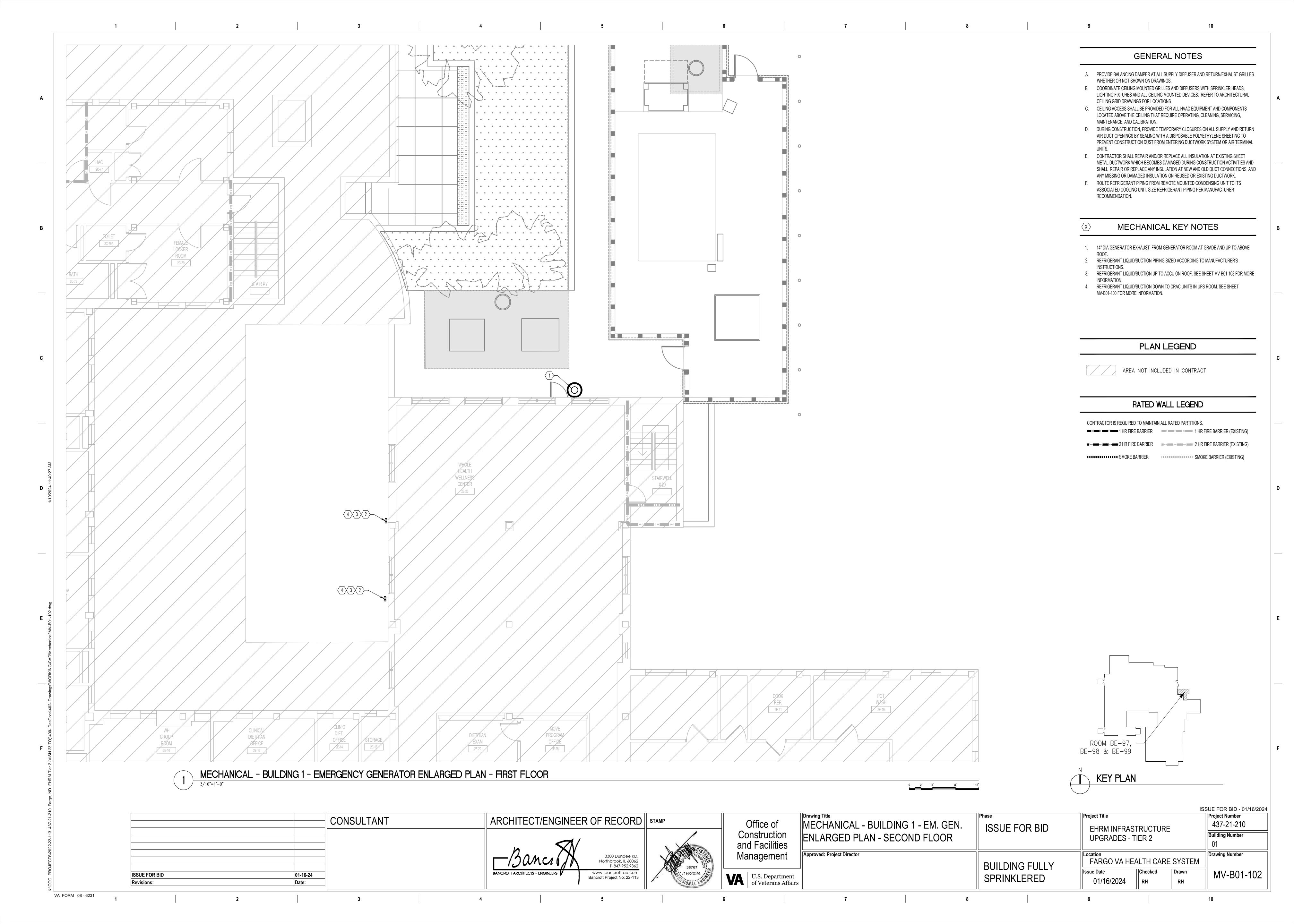


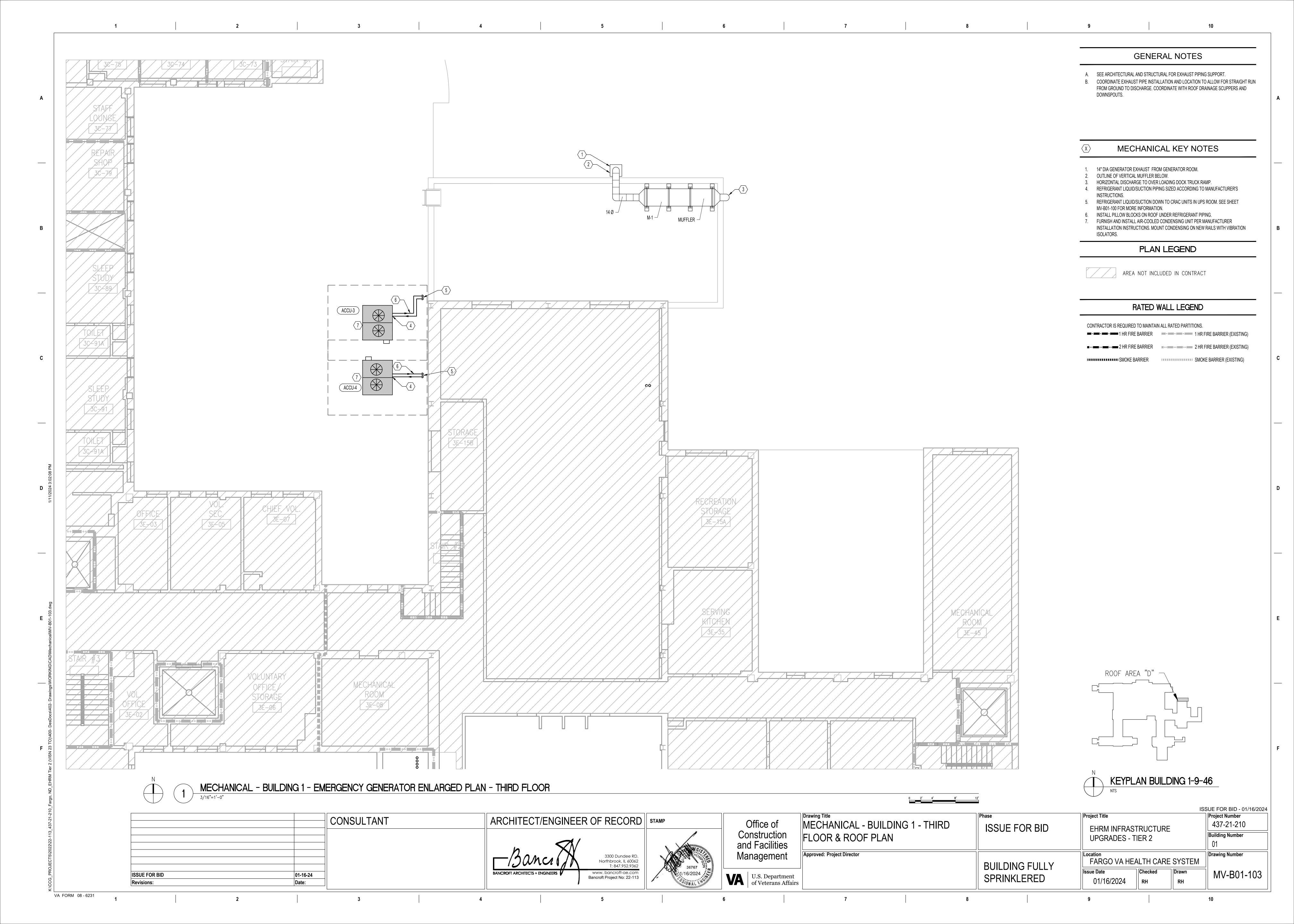


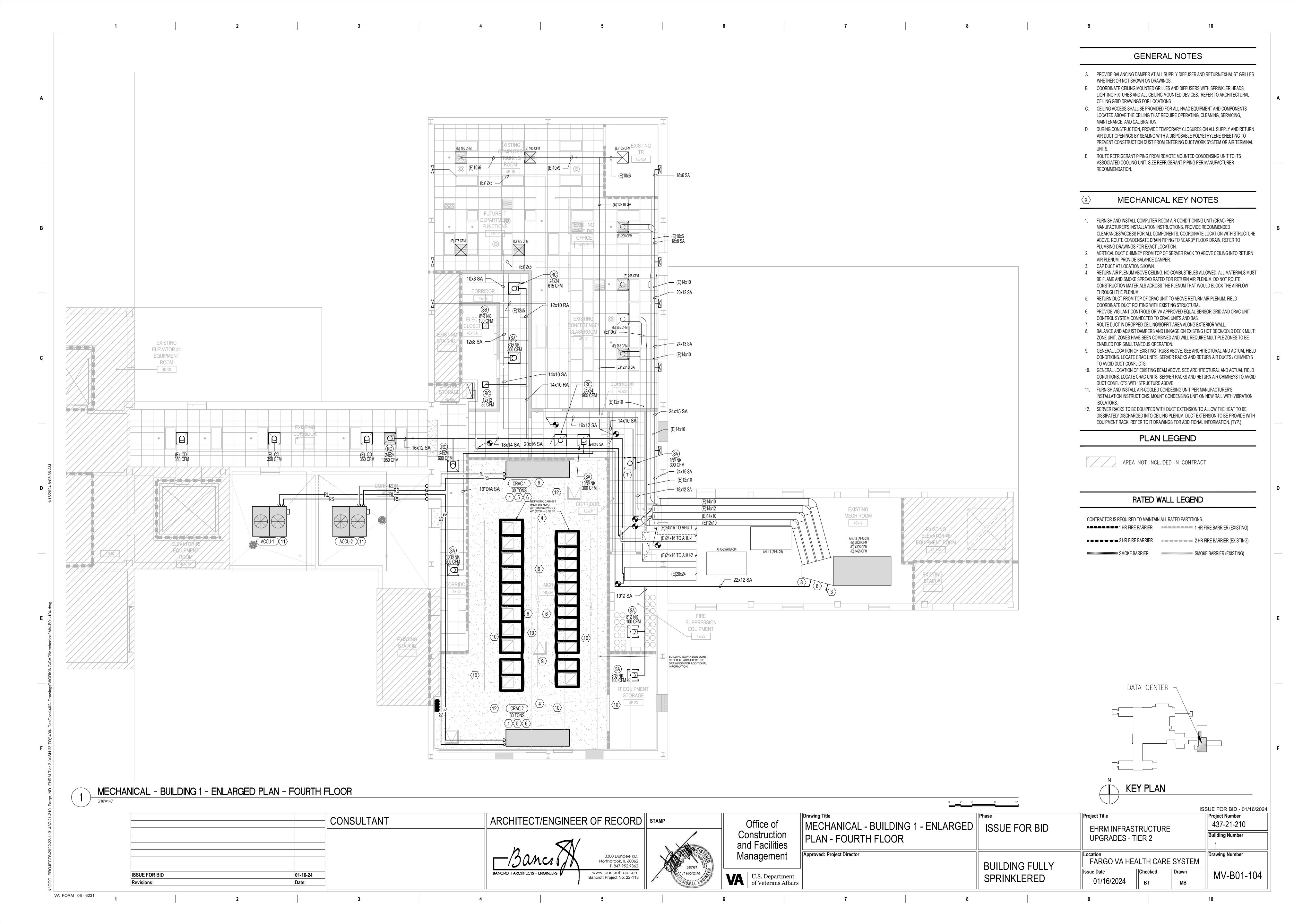


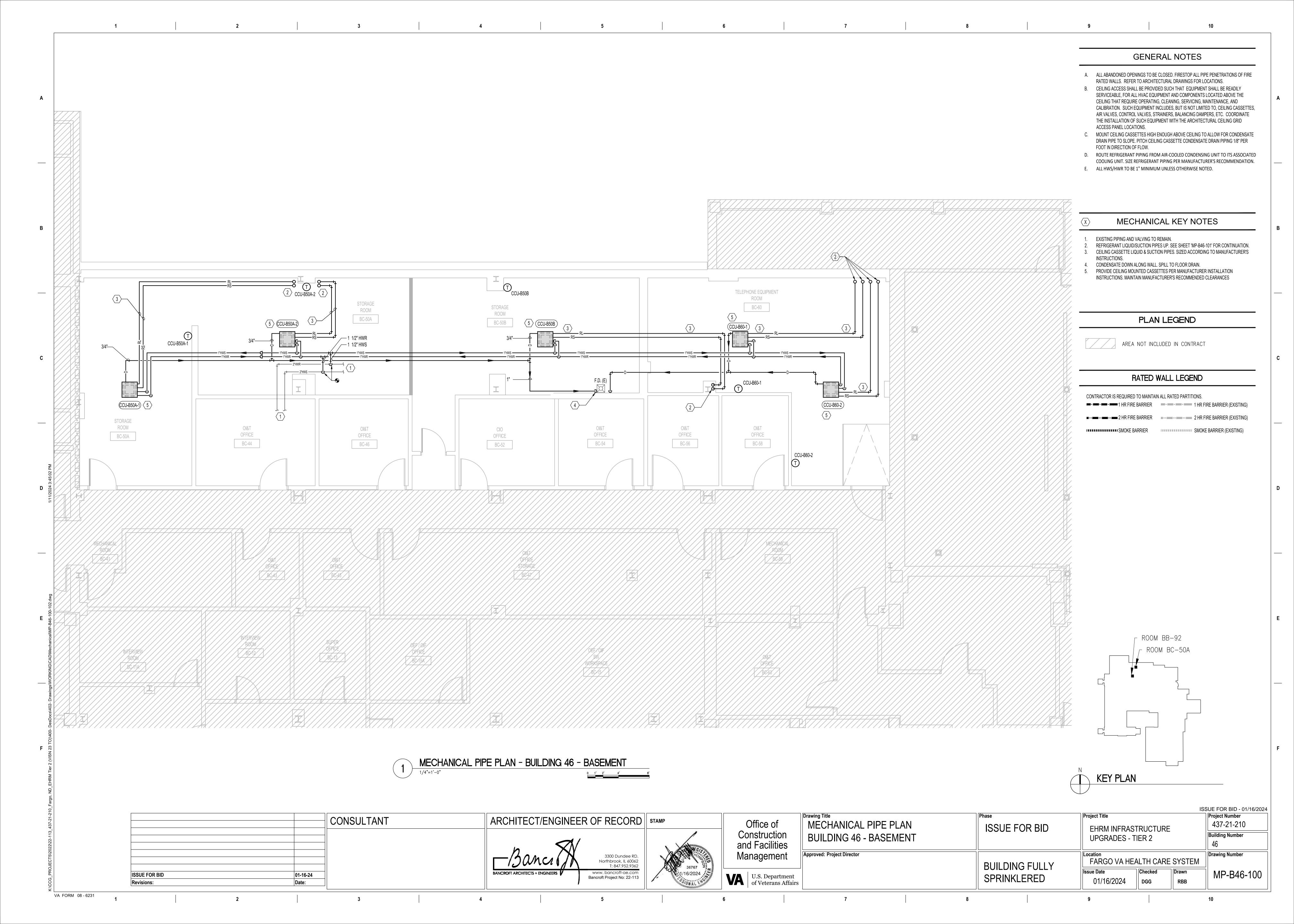


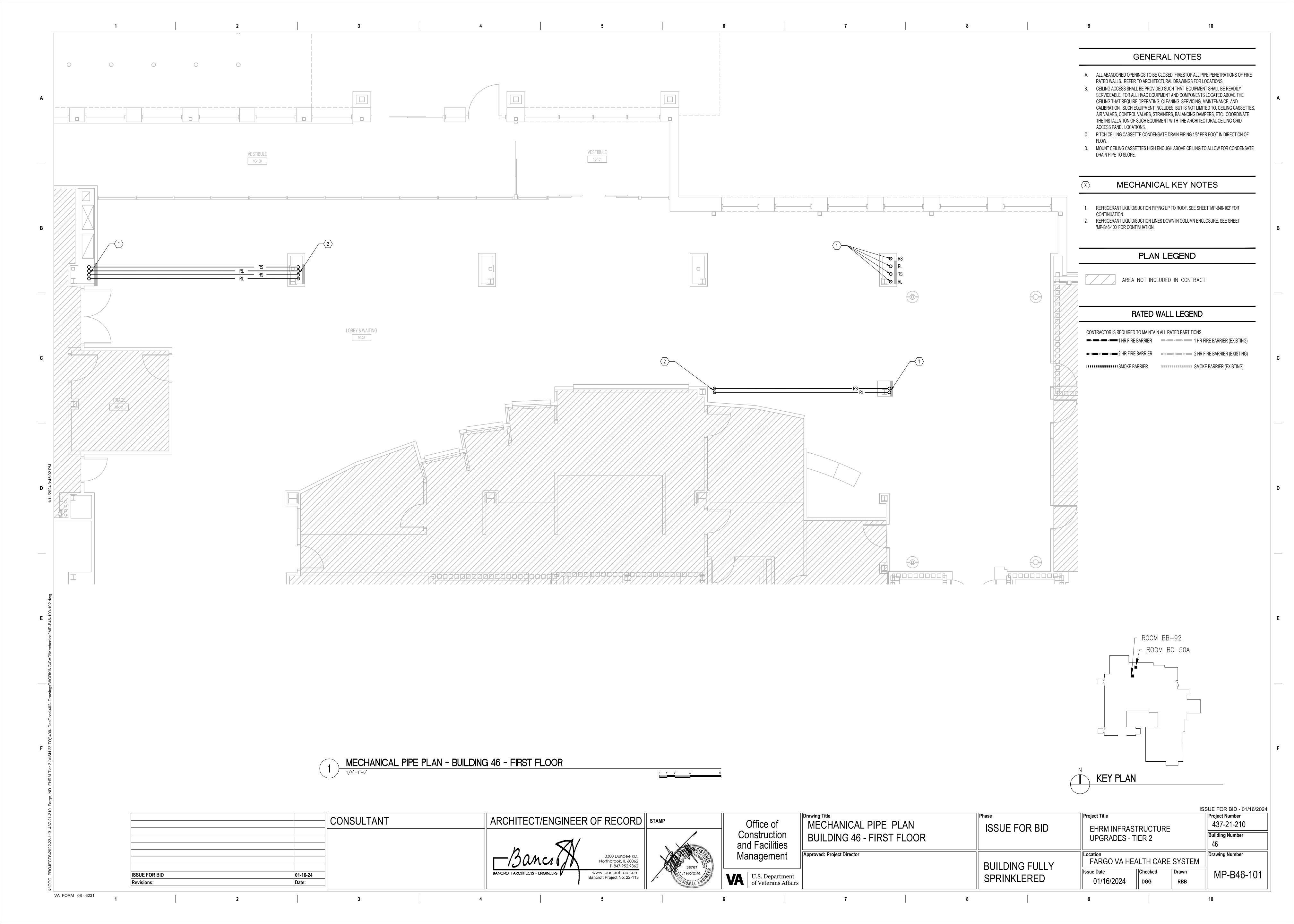


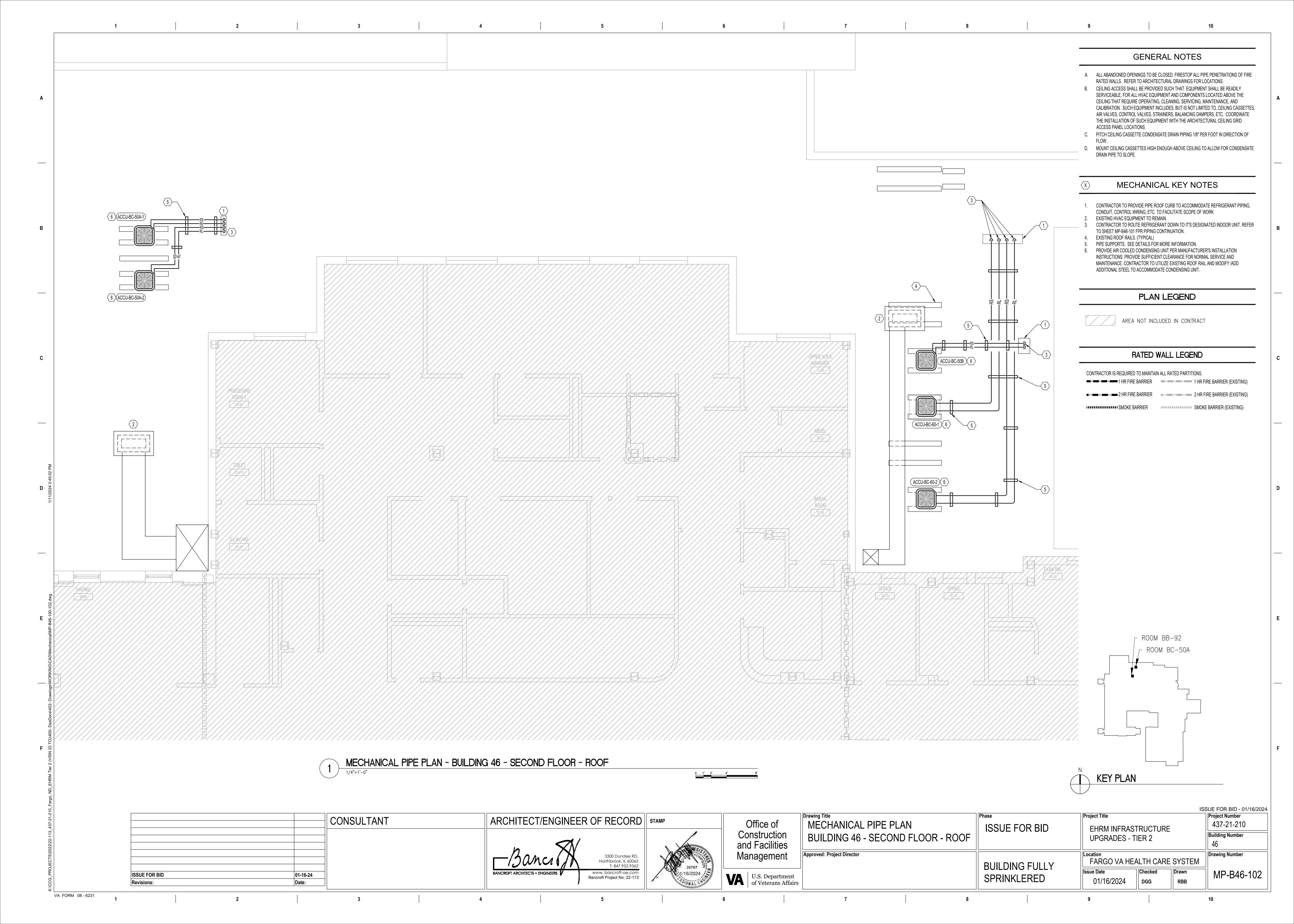


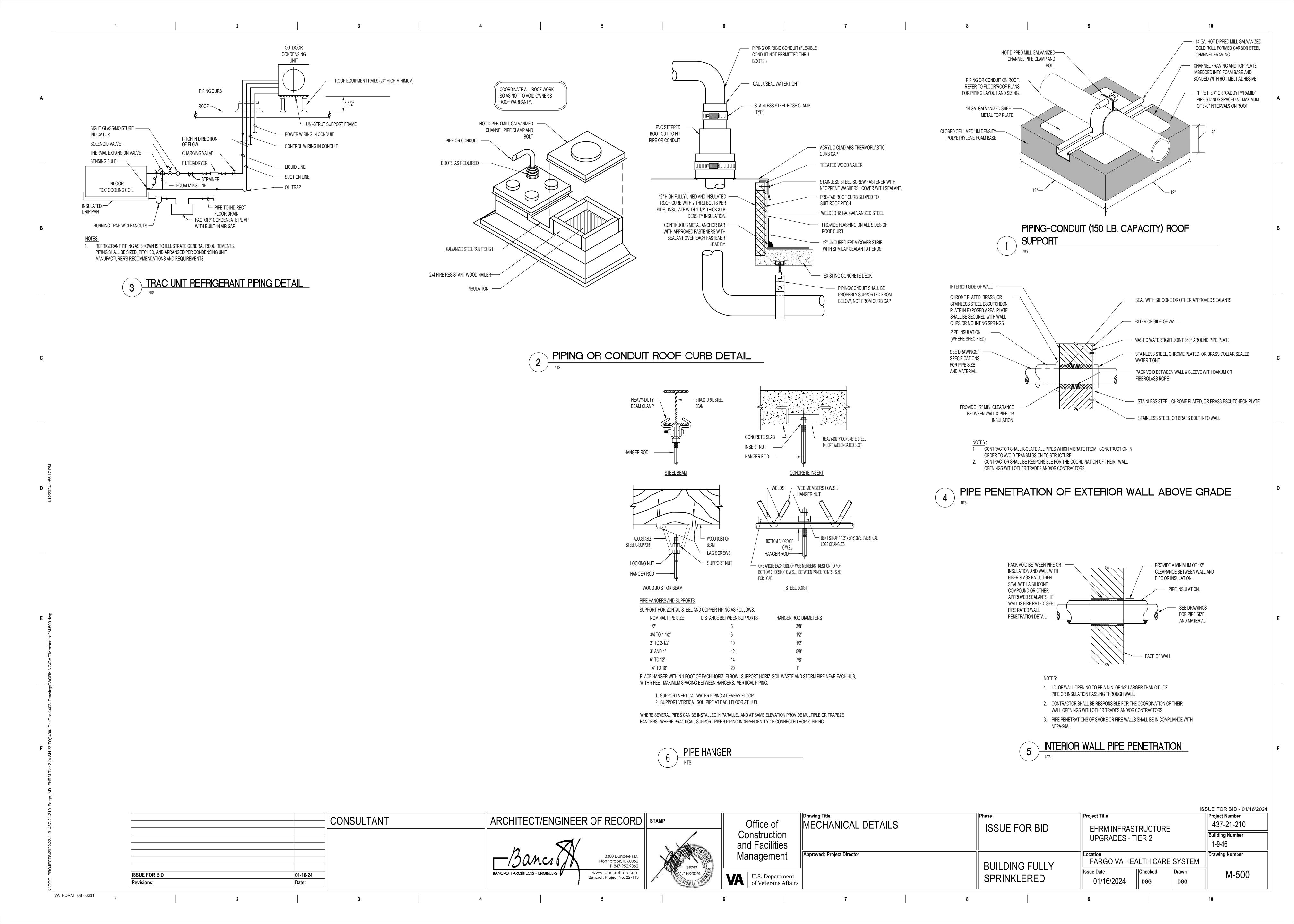


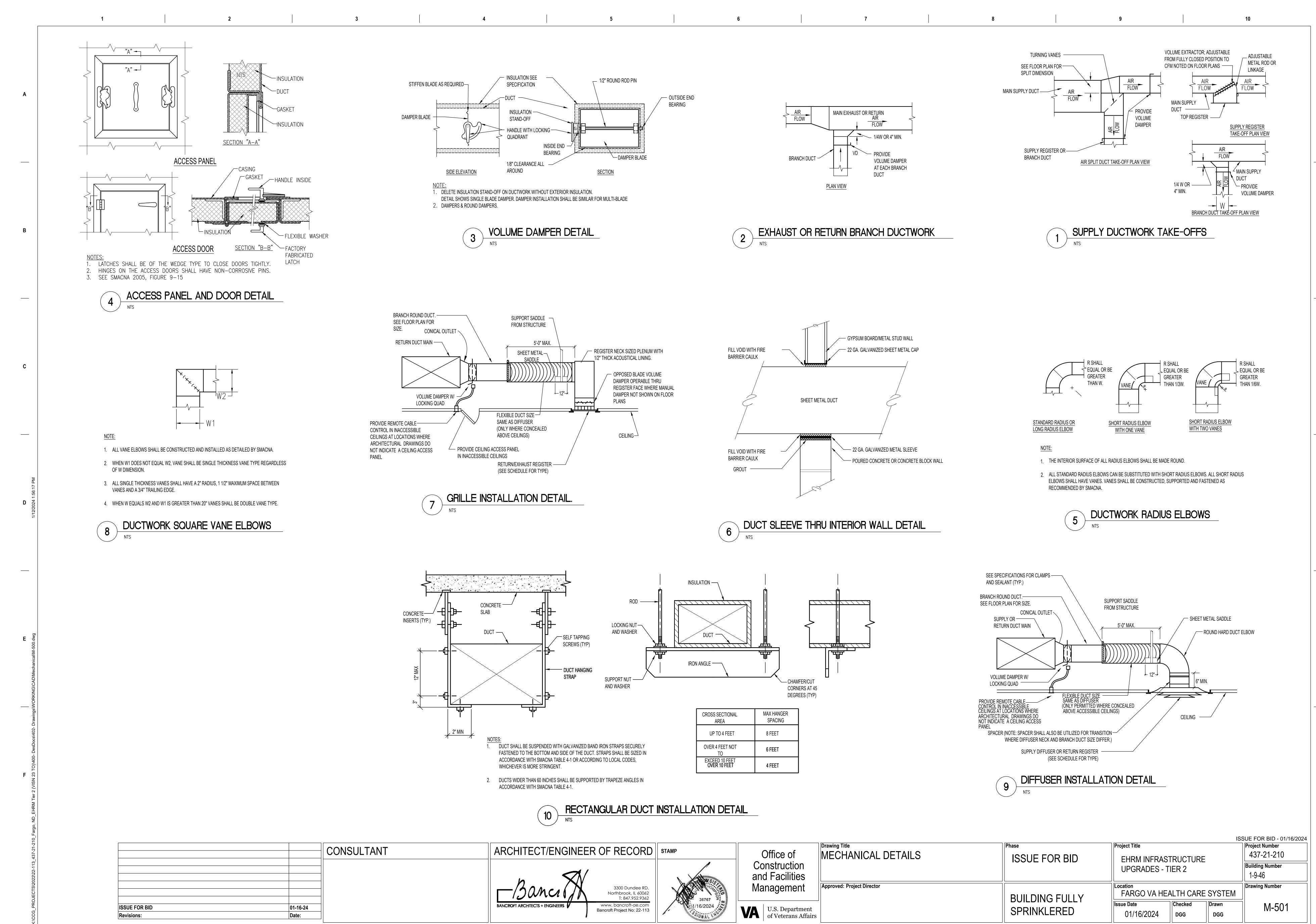




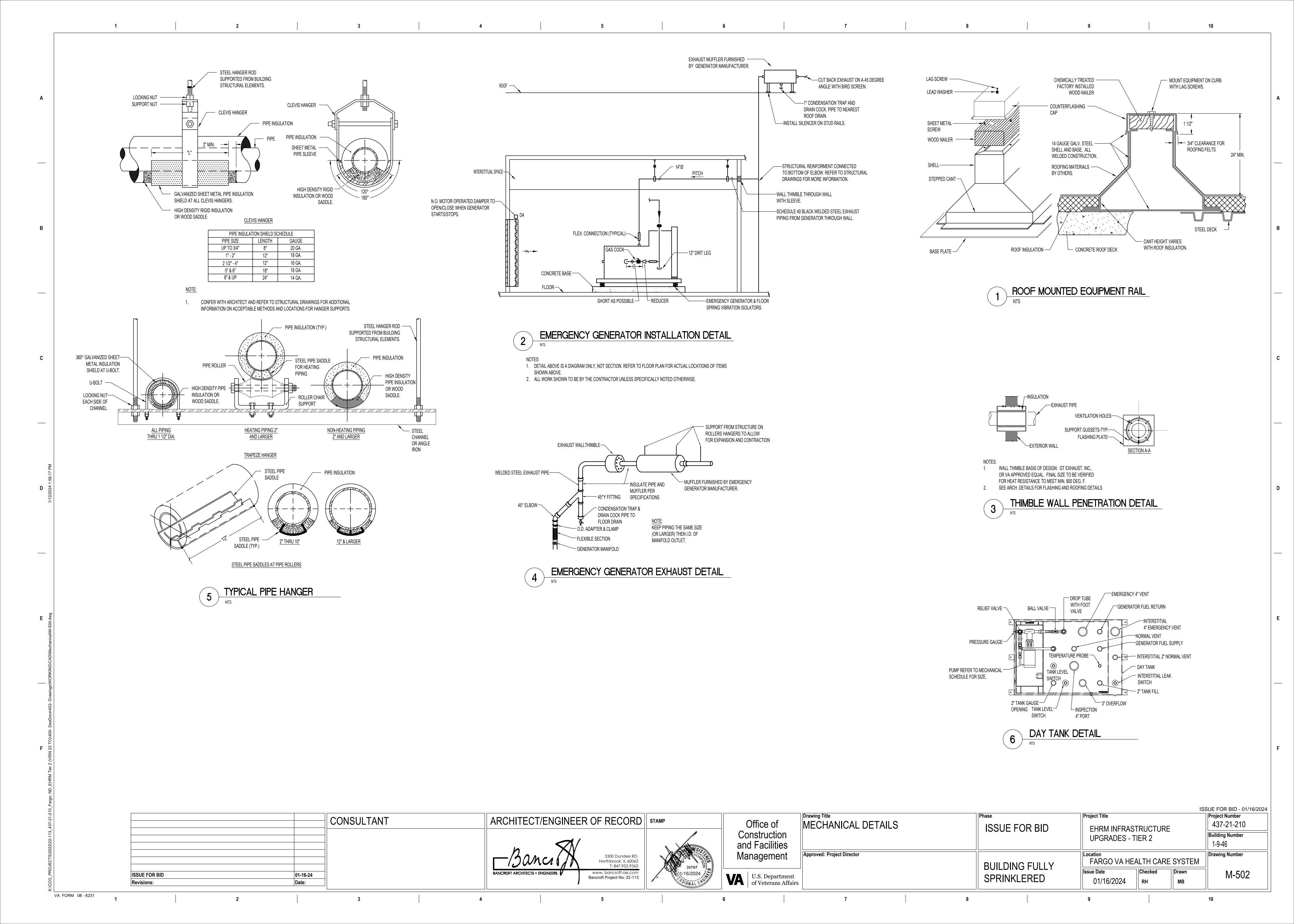


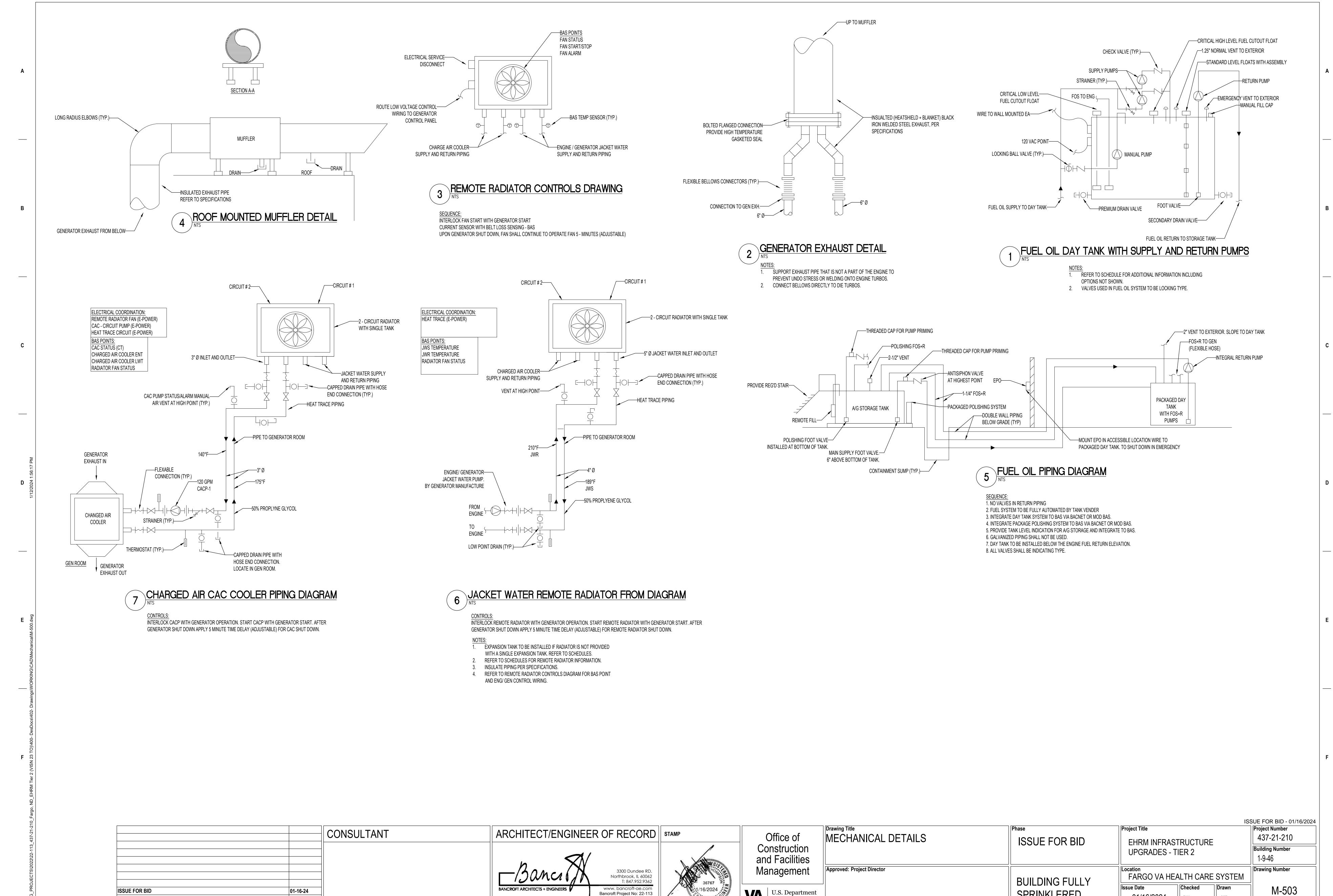






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Revisions:

Date:

U.S. Department of Veterans Affairs

M-503 SPRINKLERED MB

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			GENERAL			-					FANS	}		_					REHEAT SECTION		HUMIDIFIE	R SECTION	FILTERS		ELE	CTRICAL DA	ιTA		1
EQUIPMENT TAG	LOCATION	AREA SERVED	MANUFACTURER	TYPE	MODEL	-	PHYSICAL COMMENSIONS W	HARACTERI (IN.) H	WEIGHT (LBS.)	CFM		MOTOR KW (EACH)	CAPACITY STEPS	REFRIG. TYPE	NET TOTAL CAPACITY (MBH)	NET SENSIBLE CAPACITY (MBH)	EAT (DB°F/WB°F)	TYPE	STAGES	CAPACITY (kW)	TYPE	STEAM CAPACITY (LBS/HR)	TYPE	FLA	MCA	MOCP	PHASE	VOLT	NOTES
CRAC-1	MAIN COMPUTER ROOM 4E-24	MCR 4E-24	ABOVE AIRE	DOWNFRONT FLOW	MCH-105D-3-HGHERH-EC-00-DFF-2E	33	107	85	3,420	15,000	3	3.10	VARIABLE	R-410a	378.3	312.1	75/62.5	ELECTRIC	SCR	30	STEAM CANISTER	30.0	MERV 8	132.6	158.7	175	3	208	1, 2, 3, 4, 5, 6, 9
CRAC-2	MAIN COMPUTER ROOM 4E-24	MCR 4E-24	ABOVE AIRE	DOWNFRONT FLOW	MCH-105D-3-HGHERH-EC-00-DFF-2E	33	107	85	3,420	15,000	3	3.10	VARIABLE	R-410a	378.3	312.1	75/62.5	ELECTRIC	SCR	30	STEAM CANISTER	30.0	MERV 8	132.6	158.7	175	3	208	1, 2, 3, 4, 5, 6, 9
CRAC-3	UPS ROOM BE-97	UPS BE-97	ABOVE AIRE	UPFRONT FLOW	MCH-035D-3-HGER0-EC-00-UF1-2A	34	59	95	1,695	4,400	1	3.10	VARIABLE	R-410a	89.3	89.3	75/62.5	ELECTRIC	SCR	15	N/A	N/A	MERV 8	48.6	60.8	70	3	208	1, 2, 3, 4, 5, 6, 7, 8, 9
CRAC-4	UPS ROOM BE-97	UPS BE-97	ABOVE AIRE	UPFRONT FLOW	MCH-035D-3-HGER0-EC-00-UF1-2A	34	59	95	1,695	4,400	1	3.10	VARIABLE	R-410a	89.3	89.3	75/62.5	ELECTRIC	SCR	15	N/A	N/A	MERV 8	48.6	60.8	70	3	208	1, 2, 3, 4, 5, 6, 7, 8, 9

1. OTHER ACCEPTABLE MANUFACTURERS: VA APPROVED EQUALS.

3. PROVIDE SUPPLY AIR SENSOR WITH MULTIPLE RETURN SENSORS FIELD VERIFY EXACT LOCATION.

2. PROVIDE LOCKING DISCONNECT, STARTER, AND CONTROLLER WITH BACnet COMPATIBLE BY MANUFACTURER.

4. PROVIDE SMOKE SENSOR WITH UNIT ALARM AND SHUTDOWN INCLUDE SUPERVISION CONTACTS 5. PROVIDE DUAL REFRIGERATION CIRCUITS WITH HOT GAS BYPASS AND MUFFLERS, DIGITAL SCROLL COMPRESSOR, AND COMPRESSORS TO INLCUDE CRANKCASE HEATER.

6. BMS CARD COMPATIBLE WITH CURRENT BUILDING CONTROL SYSTEM

7. EACH CRAC SHALL HAVE A LOCAL MONITORING PANEL AFFIXED TO THE UNIT ACCESSING THE FOLLOWING INFORMATION: 8. 24" FLOOR STAND SYSTEM AUTOMATIC RESTART WITH PROGRAMMABLE DELAY, SEQUENTIAL LOAD ACTIVATION, SENSOR CALIBRATION, 9. LOW AMBIENT OPERATION TO -20

CURRENT TEMPERATURE SET POINT AND LOCATION OF THAT SET POINT, CURRENT SUPPLY AND RETURN TEMPERATURE AND HUMIDITY, UNIT DIAGNOSTICS (FAN, VALVE, ALARM), ALARM LOG HISTORY, RUNTIME LOG, AUDIBLE AND VISUAL ALARM

												UCT FR	EE SPLIT S'	YSTEM SC	HEDULE																
										_			INDOOR UN	T										OUTD	OOR UNIT						
EQUIPMENT	BUILDING NO.	LOCATION	BASIS OF	COOLING CAPACITY	HEATING CAPACITY	HEATING FLOW RATE	ENTERING WATER TEMPERATURE			WEIGHT	DIMENSIO	NS (IN.)		AIRFLOW		FILTERS		ELECT	RICAL DATA		EQUIPMENT			WEIGHT	C	OMPRESSOR		ELF	ECTRICAL DATA	1	NOTES
TAG			DESIGN	(MBH)	(MBH)	(GPM)	(°F)	MODEL	TYPE	(LBS)	H W	D	TOTAL CFM	EAT. D.B. (°F)	EAT. W.B. (°F)	TYPE	MCA	MOCP	PHASE	VOLTS	TAG	MODEL	LOCATION	(LBS)	SIZE (TONS)	REF. TYPE	EAT (°F)	ICA MOC	P PHASE	VOLTS	
CCU-BC50A-1	46	STORAGE ROOM BC-50A	MODINE	19.2	40.4	4.0	180	CSD18BACBBNDM	CEILING CASSETTE	84	32.4 32.4	12	590	80	67	CLEANABLE	0.7	15	1	208	ACCU-BC-50A-1	YC2E18	ROOF	150	1.5	R-410A	90	11.8 20	1	208	1, 2, 3, 4, 5, 6, 7, 8
CCU-BC50A-2	46	STORAGE ROOM BC-50A	MODINE	19.2	40.4	4.0	180	CSD18BACBBNDM	CEILING CASSETTE	84	32.4 32.4	12	590	80	67	CLEANABLE	0.7	15	1	208	ACCU-BC-50A-2	YC2E18	ROOF	150	1.5	R-410A	90	11.8 20	1	208	1, 2, 3, 4, 5, 6, 7, 8
CCU-BC-50B	46	SPLICE ENCLOSURE ROOM BC-50B	MODINE	19.2	40.4	4.0	180	CSD18BACBBNDM	CEILING CASSETTE	84	32.4 32.4	12	590	80	67	CLEANABLE	0.7	15	1	208	ACCU-BC-50B	YC2E18	ROOF	150	1.5	R-410A	90	11.8 20	1	208	1, 2, 3, 4, 5, 6, 7, 8
CCU-BC-60-1	46	TELEPHONE EQUIPMENT ROOM BC-50B	MODINE	19.2	40.4	4.0	180	CSD18BACBBNDM	CEILING CASSETTE	84	32.4 32.4	12	590	80	67	CLEANABLE	0.7	15	1	208	ACCU-BC-60-1	YC2E18	R00F	150	1.5	R-410A	90	11.8 20		208	1, 2, 3, 4, 5, 6, 7, 8
CCU-BC-60-2	46	TELEPHONE EQUIPMENT ROOM BC-50B	MODINE	19.2	40.4	4.0	180	CSD18BACBBNDM	CEILING CASSETTE	84	32.4 32.4	12	590	80	67	CLEANABLE	0.7	15	1	208	ACCU-BC-60-2	YC2E18	ROOF	150	1.5	R-410A	90	11.8 20	1	208	1, 2, 3, 4, 5, 6, 7, 8

1. ACCEPTABLE MANUFACTURERS: VA APPROVED EQUALS

2. INDOOR UNIT SHALL BE INTERLOCKED TO OUTDOOR UNIT FOR POWER AND CONTROL WIRING.

3. FACTORY SHROUD FOR EXPOSED CEILING APPLICATION.

4. PROVIDE DIGITAL WALL STAT, NON-FUSED DISCONNECT, AND CONDENSATE PUMP.

5. PROVIDE THE FOLLOWING FACTORY INSTALLED ACCESSORIES FOR THE OUTDOOR UNIT:

LOW AMBIENT KIT

6. MERV 10 FILTER AND SPARE

7. BACNET CARD

8. INDOOR UNITS PROVIDED WITH HEATING WATER COILS

			ELECTR	IC SUSPENDE	D HEATEI	R SCHE	DULE						
		GENERAL				HEATER		F <i>F</i>	AN DATA	ELE	CTRICAL DATA	4	NOTES
EQUIPMENT TAG	LOCATION	TYPE	MANUFACTURER	MODEL	KW	PHASE	VOLT	TYPE	CFM	AMPS	PHASE	VOLT	NOTES
EUH-1	BUILDING 1 GENERATOR ROOM BE-98	SUSPENDED HORIZONTAL	MODINE	HER200	20	3	208	PROP.	1300	55.6	3	208	1,2,3,4
EUH-2	BUILDING 1 GENERATOR ROOM BE-98	SUSPENDED HORIZONTAL	MODINE	HER200	20	3	208	PROP.	1300	55.6	3	208	1,2,3,4

1. OTHER ACCEPTABLE MANUFACTURERS: VA APPROVED EQUAL

2. DISCONNECT SWITCH.

3. MOUNTING KIT TO MATCH MOUNTING REQUIREMENTS. 4. FAN DELAY SWITCH.

					EXHAUST / SUPPL	Y FAN SC	HEDUL	E										
EQUIPMENT TAG	LOCATION	AREA SERVED	MANUFACTURER	MODEL	TYPE	DRIVE	CFM	ESP (IN.)	MAXIMUM SONES	FAN RPM	BHP	HP	RPM	OTOR PHASE	VOLT	WEIGHT	CONTROL TYPE	NOTES
EFG-1	GENERATOR ROOM	GENERATOR ROOM	GREENHECK	SBCE-3H36	WALL MOUNTED PROPELLER	BELT	17500	0.25	46.0	1200	4.6	5	-	3	208	250	BAS	1, 3, 4, 5, 7
EFG-2	GENERATOR ROOM	GENERATOR ROOM	GREENHECK	SBE-3H36	WALL MOUNTED PROPELLER	BELT	17500	0.25	46.0	1200	4.6	5	-	3	208	250	BAS	1, 3, 4, 5, 7
SFG-1	GENERATOR ROOM	GENERATOR ROOM	GREENHECK	SBS-3H48	WALL MOUNTED PROPELLER	BELT	25000	0.375	40.0	688	5.1	7 1/2	-	3	208	400	BAS	1, 3, 4, 5, 6

1. OTHER ACCEPTABLE MANUFACTURERS: SEE SPECIFICATIONS.

2. PROVIDE THE FOLLOWING OPTIONS: GRAVITY BACKDRAFT DAMPER AND DISCONNECT SWITCH.

3. PROVIDE GALVANIZED BIRDSCREEN, , WALL HOUSING, MOTORIZED DAMPER. 4. PROVIDE VFD AND ROOM SPACE TEMPERATURE SENSOR ON BAS.

5. PROVIDE THE FOLLOWING OPTIONS AND ACCESSORIES: ELECTRICAL DISCONNECT SWITCH, NEOPRENE

VIBRATION ISOLATORS.

6. 90 DEGREE INLET HOOD 7. 45 DEGREE OUTLET HOOD

ISSUE FOR BID - 01/16/2024 Project Title Project Number CONSULTANT ARCHITECT/ENGINEER OF RECORD | STAMP Office of MECHANICAL SCHEDULES 437-21-210 ISSUE FOR BID EHRM INFRASTRUCTURE Construction **Building Number UPGRADES - TIER 2** and Facilities 1-9-46 Approved: Project Director Drawing Number Management 3300 Dundee RD. Northbrook, IL 60062 T: 847.952.9362 FARGO VA HEALTH CARE SYSTEM **BUILDING FULLY** Checked Drawn www. bancroft-ae.com Bancroft Project No: 22-113 M-600 BANCROFT ARCHITECTS + ENGINEERS U.S. Department of Veterans Affairs **ISSUE FOR BID** 01-16-24 SPRINKLERED MB Date: Revisions:

VA FORM 08 - 6231

		DIF	FUSER, GRILLE, AND REGISTE	R SCHEDULE			
EQUIPMENT TAG	MANUFACTURER	MODEL	TYPE	NOMINAL FACE SIZE	MATERIAL	MAX. N.C.	NOTES
A	TITUS	OMNI	SQUARE PANEL FACE	VARIES	STEEL	30	1, 2
В	TITUS	300R	DOUBLE DEFLECTION REGISTER	VARIES	STEEL	30	1, 2, 3
С	TITUS	350R	35 DEG. DEFLECTION REGISTER	VARIES	STEEL	30	1, 2, 3

OTHER ACCEPTABLE MANUFACTURERS: SEE SPECIFICATIONS.

. FINISH AS SELECTED BY ARCHITECT. PROVIDE DAMPER AT NECK.

					А	IR COOLED (CONDENSING	UNIT SCHEDU	LE										
						HEAT			WEIGHT		FAN	IS			ELE	CTRICAL D	ATA		
EQUIPMENT TAG	BUILDING NO.	LOCATION	UNIT SERVED	MANUFACTURER	MODEL	REJECTION (MBH)	REFRIGERANT (TYPE)	AMBIENT TEMPERATURE	(LBS) (ESTIMATED)	EAT (°F)	QUAN.	KW (HP)	RPM	FLA	MCA	MOCP	PHASE	VOLT	NOTES
ACCU-1	1	ROOF	CRAC-1	ABOVE AIRE	XPU-105D-3-EA-VF-1	498.1	R410a	-20	1850 (verify)	100	2	1.6	-	120.8	134.8	175	3	208	1, 2, 3, 4, 5
ACCU-2	1	ROOF	CRAC-2	ABOVE AIRE	XPU-105D-3-EA-VF-1	498.1	R410a	-20	1850 (verify)	100	2	1.6	-	120.8	134.8	175	3	208	1, 2, 3, 4, 5
ACCU-3	1	ROOF	CRAC-3	ABOVE AIRE	XPU-035D-3-EA-VF-1	150.5	R410a	-20	750 (verify)	100	2	2	-	43.9	48.1	60	3	208	1, 2, 3, 4, 5
ACCU-4	1	ROOF	CRAC-4	ABOVE AIRE	XPU-035D-3-EA-VF-1	152.4	R410a	-20	750 (verify)	100	2	2	ı	43.9	48.1	60	3	208	1, 2, 3, 4, 5
WOTE O																			

1. OTHER ACCEPTABLE MANUFACTURS: VA APPROVED EQUALS.

2. PROVIDE FUSIBLE PLUG KIT AND SURGE PROTECTION DEVICE KIT FOR FIELD INSTALLATION.

3. PROVIDE FACTORY WIRED AND MOUNTED NEMA 3R ELECTRICAL PANEL AND UNIT MOUNTED DISCONNECT. 4. PROVIDE DUAL REFRIGERATION CIRCUITS WITH HOT GAS BYPASS AND HOT GAS MUFFLERS, TANDEM DIGITAL SCROLL COMPRESSOR PER

CIRCUIT, AND COMPRESSORS TO INCLUDE CRANKCASE HEATER, LOW AMBIENT KIT AND CONTROL.

5. SPRING VIBRATION ISOLATORS, SEISMIC LEGS

		AB	OVE GROUND STO	RAGE TANK SCHI	EDULE		
EQUIPMENT TAG	MANUFACTURER	MODEL	SERVICE	DIMENSIONS (INCHES) L x W	EMPTY WEIGHT (LBS)	TANK CAPACITY (GALLONS)	NOTES
AGST-1	NORTHLAND FUELS	NF-1000-2085	GENERATOR	CUSTOM	50,000	10,000	1,2,3,4

1. OTHER ACCEPTABLE MANUFACTURER'S: VA APPROVED EQUAL.

2. TANK SHALL COME WITH THE FOLLOWING OPTIONS:

TANK LEVEL GAUGE, TANK LEVEL SWITCH, TANK FILL, EMERGENCY VENT,

INTERSTITIAL LEAK SWITCH, INTERSTITIAL EMERGENCY VENT

3. TANK SHALL COME STANDARD WITH THE FOLLOWING FEATURES: INNER TANK DRAIN CONNECTION WITH PLUG, INTERSTITIAL DRAIN CONNECTION WITH PLUG

(4) INLET/OUTLET DROP TUBES.

4. 5 GALLON SPILL/FILL BOX, RETURN FITTING, 18" WIDE OSHA APPROVED LADDER 5. INTEGRAL STEEL DIKE FOR 110% PRIMARY TANK CONTANMENT, RAIN COVERS TO DIVERT PRECIPITAITON FROM CONTAINMENT, HINGED ACCESS TO ALL SIDES OF CONTAINMENT THROUGH RAIN COVERS

							DA'	y tank s	CHEDULE							
EQUIPMENT	MANUFACTURER	MODEL	SERVICE	MAX. DIMENSIONS (INCHES)	EMPTY WEIGHT	TANK CAPACITY	2014	RETURN		NUMBER OF BUILDS	DDM	FUEL PUMPS	0.4.0.1777 (0.0.17)	NUMBER OF LEVEL	VOLT/PHASE	NOTES
TAG				LxW		(GALLONS)	RPM	HP	CAPACITY (GPH)	NUMBER OF PUMPS	RPM	HP	CAPACITY (GPH)	INDICATORS		
DT-1	SIMPLEX	STS-300	GENERATOR 1	79.5"X30"X80"H (at control and pump panel)	900 LBS	300	1800	1	1020	2	1800	3/4	510	6	120 V / 1 PH	1,2,3,4,5,6,7,8

1. OTHER ACCEPTABLE MANUFACTURER'S: VA APPROVED EQUAL.

2. TANK SHALL COME WITH THE FOLLOWING OPTIONS:

TANK LEVEL GAUGE, TANK LEVEL SWITCH, TANK FILL, EMERGENCY VENT, INTERSTITIAL LEAK SWITCH, INTERSTITIAL EMERGENCY VENT AND CONTROL PANEL.

3. TANK SHALL COME STANDARD WITH THE FOLLOWING FEATURES:

INNER TANK DRAIN CONNECTION WITH PLUG, INTERSTITIAL DRAIN CONNECTION

WITH PLUG, (4) INLET/OUTLET DROP TUBES.

RPM	HP	CAPACITY (GPH)	NUMBER OF PUMPS	RPM	HP	CAPACITY (GPH)	INDICATORS	VOLINITIAGE	NOTES
1800	1	1020	2	1800	3/4	510	6	120 V / 1 PH	1,2,3,4,5,6,7,8

4. TEFC PUMP MOTOR

5. DOUBLE WALL, UL 142, 10 GAGE CARBON STEEL

6. INTERSTITIAL SPACE OF TANK SHALL PROVIDE 110% CONTAINMENT

OF THE DAY TANK CAPACITY. 7. TANK SHALL NOT BE MORE THAN 19" WIDE AND 6'-0" TALL.

8. PROVIDE (2) FUEL PUMPS AND (1) RETURN PUMP.

									PULP SCH	EDULE										
		M000ELM0.		LOCATION	76					TO THE REAL PROPERTY OF THE PERTY OF THE PER							Y/M/E	ELEMENT PORTS	Pap Common	
CACP-1	B&G	SERIES e-80SC	CHARGE AIR COOLER	GEN. ROOM	INLINE	120	16	80	NA	125	7	3	3	N	0.75	1150	208/3	YES	CONSTAN	1, 2

1. OTHER ACCEPTABLE MANUFACTURER'S: VA APPROVED EQUAL.

2. PUMPS SHALL BE UL LISTED FOR USE WITH FUEL OIL

			ROOF MOUNTED		NTOR RAD	MTCR 8	HEDLE			
				EL 014/	TOTAL		ELECTRIC	CAL		
EQUIPMENT TAG	MANUFACTURER	MODEL	SERVICE	FLOW RATE (GPH)	PUMP HEAD (PSI)	MOTOR HP	VOLTS	PHASE	DRY WEIGHT	NOTES
GR-1	IEA	HC046B	GENERATOR JACKET AND AFTER COOLER	250 / 250	50	40	208	3	4700 LBS	1, 2, 3, 4, 5

1. OTHER ACCEPTABLE MANUFACTURER'S: VA APPROVED EQUAL.

2. DAUL CIRCUIT FOR JACKET COOLING AND AFTER COOLER COOLING

3. 52.5 GALLON SURGE TANK SPLIT 70/30 FOR DUAL CICUITS

4. VIBRATION SWITCH

5. PROVIDE VFD WITH MANUAL BYPASS TO COMPLETELY BYPASS VFD

	(GENERATO	R MUFI	FLER SC	HEDULE	=		
TAG	MANUFACTURER	MODEL	FACE DI	MENSION	INLET	MATERIAL	WEIGHT	NOTES
			DIA (N.)	L (IN.)	(IN.)		(LBS)	
M-1	NETT TECHNOLOGIES	NTSH-C14	36"	174"	14"	CARBON STEEL	500	1,2,3,4

1. OTHER ACCEPTABLE MANUFACTURER'S: ANY VA APPROVED EQUAL

2. VERTICAL MOUNTING BRACKETS

3. FLANGED INLET AND OUTLET 4. 50 db NOISE REDUCTION.

	FUEL OIL PURIFICATION SYSTEM SCHEDULE											
				FLOW RATE (GPH)	TOTAL PUMP HEAD (PSI)		ELECTRIC/					
EQUIPMENT TAG	MANUFACTURER	MODEL	SERVICE			MOTOR HP	VOLTS	PHASE	NOTES			
FPS-1	SIMPLEX	SFG-5C	10,000 GALLON ABOVE GROUND STORAGE TANK	300	50	0.75	120	1	1, 2, 3, 4, 5			
NOTES:												

1. OTHER ACCEPTABLE MANUFACTURER'S: VA APPROVED EQUAL.

2. PUMPS TO BE U.L. LISTED FOR USE WITH FUEL OIL

3. PUMP AND PANEL SHALL HAVE A DEDICATED ELECTRICAL FEED, STARTER, AND DISCONNECT CONTAINED IN NEMA #4 CABINET.

4. PROVIDE WITH THE FOLLOWING OPTIONS:

MICROPROCESSOR-BASED CONTROLS WITH COLOR TOUCH SCREEN AND BAS CONNECTION, TEFC MOTOR

PUMP "HAND-OFF-AUTO" SWITCH, CONTROL POWER "ON-OFF" SWITCH, LEAK DETECTOR SWITCH SIMPLEX STRAINER, PRIMARY FILTER, SECONDARY FILTER PRIMARY/SECOND FILTER DP SWITCH/GAUGE

5. CABINET FOR EXTERIOR INSTALLATION.

		CONSULTANT	ARCHITECT/ENGINEER OF RECORD STAMP	11	Drawing Title MECHANICAL SCHEDULES	ISSUE FOR BID	Project Title	Project Number 437-21-210
				Construction and Facilities		ISSUE FUR BID	EHRM INFRASTRUCTURE UPGRADES - TIER 2	Building Number 1-9-46
			3300 Dundee RD. Northbrook, IL 60062 T: 847.952.9362	Management	Approved: Project Director	BUILDING FULLY	Location FARGO VA HEALTH CARE SYSTEM	Drawing Number
SSUE FOR BID Revisions:	01-16-24 Date:		BANCROFT ARCHITECTS + ENGINEERS Www. bancroft-ae.com Bancroft Project No: 22-113	U.S. Department of Veterans Affair	rs	SPRINKLERED		M-601

AI - ZONE SETPOINT ADJUST AI - DISCHARGE AIR TEMP BI - DISCHARGE AIR HUMIDITY AI - ROOM HUMIDITY

1. MULTIPLE TEMPERATURE SENSOR USED TO CONTROL CRAC UNITS. REFER TO MECHANICAL SCHEDULE FOR EXACT QUANTITIES.

COMPUTER ROOM AIR CONDITIONING UNIT - CONTROL DIAGRAM

GENERAL (CONTROLS PROVIDED WITH UNIT BY MANUFACTURERS) THERE ARE FOUR COMPUTER ROOM AIR CONDITIONING UNIT (CRAC) PROVIDED IN THE SYSTEM EACH SIZED FOR 50% LOAD. THE CRACS ARE CONTROLLED BY A FACTORY MOUNTED CONTROL SYSTEM AND CONNECT TO THE BAS FOR MONITORING PURPOSES. THE CRACS ARE EQUIPPED WITH VFD OR EC WITH ALL FANS OPERATING.

THE UNIT SHALL MAINTAIN

A 68°F (ADJ.) COOLING SETPOINT AND 40% RELATIVE HUMIDITY (ADJ.)

THE MANUFACTURER CONTROLLER SHALL PROVIDE OPERATION OF UNIT COMPONENTS SUCH AS COMPRESSOR CYCLING FOR DISCHARGE AIR TEMPERATURES, AUTOMATICALLY HEAT, COOL, REHEAT, HUMIDIFY. AND DEHUMIDIFY AS REQUIRED TO MAINTAIN SPACE TEMPERATURE AND HUMIDIFY SETPOINTS.

THE CONTROL CONTRACTOR TO UTILIZE A VIGILENT MONITORING SYSTEM, OR EQUAL ALLOWED BY VA, TO CONTROL AND MONITOR CRAC UNITS IN THE MCR TO SEND CALLS FOR AIRFLOW, TEMPERATURE SETPOINTS, HUMIDITY SETPOINTS FOR A FULLY OPTIMIZED CONTROL SYSTEM.

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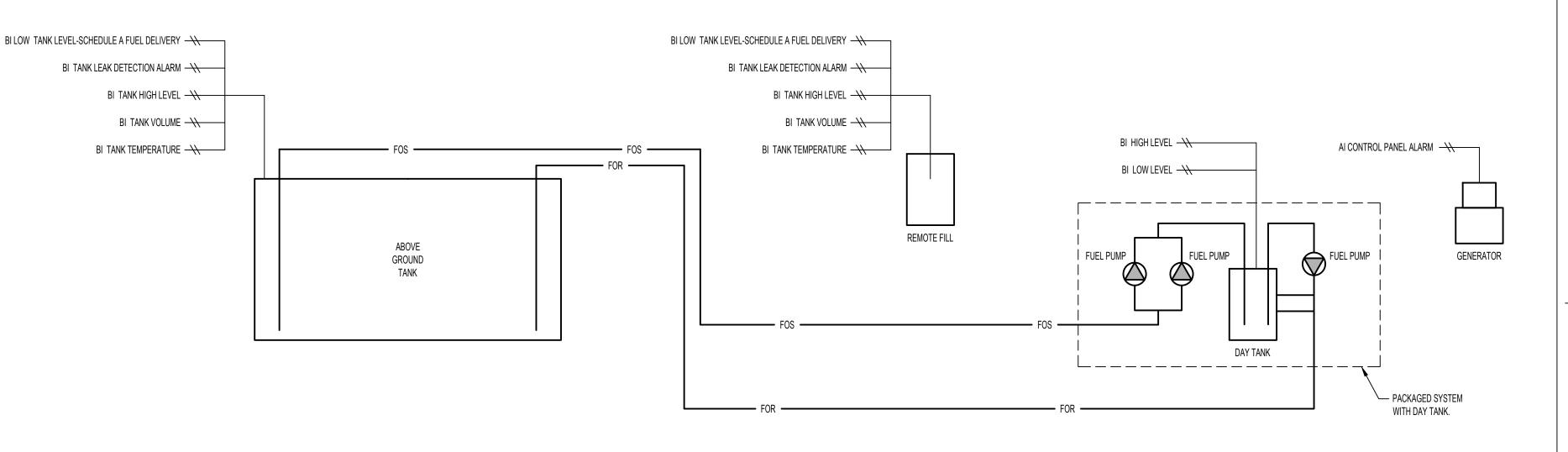
- PROVIDE AN AUDIBLE ALARM FOR THE FOLLOWING CONDITIONS:
- HIGH TEMPERATURE LOW TEMPERATURE
- HIGH HUMIDITY LOW HUMIDITY

BAS SEQUENCE OF OPERATION (PROVIDED BY TCC)

THE BAS SHALL BE ABLE TO MONITOR THE OPERATING PARAMETERS (THRU VIGILENT SYSTEM), AND ALARM CONDITIONS INDICATED BY CRAC. BAS SHALL BE CAPABLE OF ENABLING/DISABLING CRAC AND ASSOCIATED CONDENSING UNIT.

THE TEMPERATURE AT ALL IT EQUIPMENT INLETS (SUPPLY SIDE SENSORS) MUST BE BETWEEN 72°F AND 80.6°F. THE EXHAUST TEMPERATURE FROM EACH CABINET SHOULD BE 20°F HIGHER THAN THIS, ON A KW-LOADING AVERAGE BASIS, TO MEET THE DESIGN CONDITION. THE CONTROL SYSTEM MUST BE ABLE TO DETERMINE THE OPERATIONAL ΔT, MONITOR THE SUPPLY TEMPERATURES AT THE ENCLOSURES (NOT JUST AT THE CRAC OUTPUT), AND REGULATE EACH INDIVIDUAL CRACS' FAN SPEED AND REFRIGERANT FLOW. IN A CONTINGENCY CONDITION WHERE ONE CRAC UNIT IS OFFLINE, THE REMAINING CRAC UNIT(S) MUST RECOGNIZE THIS AND ASSUME AN INCREASED COOLING POSTURE; IDEALLY, THE REMAINING CRACS WILL AGAIN SPLIT THE CFM LOADING TO MINIMIZE FAN ENERGY. THE VIGELENT OR VA APPROVED SYSTEM SENSOR NETWORK MUST PROVIDE FEEDBACK ON WHETHER ONE OR MORE UNITS MUST INCREASE FAN SPEED OR DECREASE THE SUPPLY AIR TEMPERATURE

	HAR	DWAF	RE PO	INTS			SOFTWAR	E POINTS		SHOW ON
POINT NAME	Al	AO	BI	во	AV	BV	SCHED	TREND	ALARM	GRAPHIC
ZONE TEMPERATURE SETPOINT (CRAC-1)	Х							Х		Х
ZONE TEMPERATURE SETPOINT (CRAC-2)	Х							Х		Х
DISCHARGE AIR TEMPERATURE (CRAC-1)	Х							Х		Х
DISCHARGE AIR TEMPERATURE (CRAC-2)	Х							Х		Х
ZONE SETPOINT ADJUST (CRAC-1)	Х							Х		Х
ZONE SETPOINT ADJUST (CRAC-2)	Х							Х		Х
RETURN AIR TEMPERATURE (CRAC-1)	Х							Х		Х
RETURN AIR TEMPERATURE (CRAC-2)	Х							Х		Х
RETURN AIR HUMIDITY (CRAC-1)	Х							Х		Х
RETURN AIR HUMIDITY (CRAC-2)	Х							Χ		Х
CRAC START/STOP (CRAC-1)		Х						Χ		Х
CRAC START/STOP (CRAC-2)		Х						Χ		Х
CRAC STATUS (CRAC-1)			Х					Χ		Х
CRAC STATUS (CRAC-2)			Х					Х		Х
CRAC ALARM (CRAC-1)			Х					Х	Х	Х
CRAC ALARM (CRAC-2)			Х					Х	Х	Х
COOLING STAGE (CRAC-1)				Х				Х		Х
COOLING STAGE (CRAC-2)				Х				Х		Х
HIGH TEMPERATURE									Х	
LOW TEMPERATURE									Х	
HIGH HUMIDITY									Х	
LOW HUMIDITY									Х	



DIESEL FUEL SYSTEM - CONTROL DIAGRAM

SEQUENCE OF OPERATION: LEVEL & LEAK DETECTION

LEVEL AND LEAK DETECTION OF THE DIESEL FUEL SYSTEM SHALL BE CONTROLLED AND MONITORED BY A MICROPROCESSOR BASED LEVEL / LEAK DETECTION CONTROLLER. THE LEVEL / LEAK DETECTION CONTROLLER SHALL PROVIDE THE FOLLOWING:

- CONTINUOUS TANK FUEL INVENTORY MONITORING.
- LEAK SENSOR MONITORING.
- REMOTE FILL AUDIBLE / VISUAL ALARM ANNUNCIATOR.
- REMOTE TANK DISPLAY PANEL. PUMP CONTROLLER INTERFACE.
- BUILDING CONTROL SYSTEM INTERFACE.

STORAGE TANKS REMOTE FILL:

THE DIESEL STORAGE TANKS SHALL BE PUMPED FILLED THROUGH DEDICATED REMOTE FILL BOX, LOCATED NEAR THE TANK

THE DEDICATED PEDESTAL MOUNTED DIESEL TANK REMOTE FILL BOX SHALL CONTAIN A DRY CONNECT 100Ø FUEL TRUCK HOSE CONNECTION AND MANUAL RETURN PUMP. A REMOTE AUDIBLE / VISUAL ALARM ANNUNCIATOR FOR TANK OVERFILL PROTECTION SHALL BE LOCATED NEARBY. ALARM SHALL SOUND AT 90% FULL AND 95% WILL TANK FILL STOP CONTROL AT 90%

ABOVE GROUND PIPING SHALL CONNECT FILL BOX TO IABOVE GROUND STORAGE TANK FILL TUBE. EACH FUEL STORAGE TANK FILL TUBE SHALL BE EQUIPPED WITH A REMOTE FILL KIT AND AN AUTO LIMITER AUTOMATIC SHUT-OFF VALVE. A FUEL LEVEL PROBE SHALL BE INSTALLED IN EACH TANK TO MONITOR FUEL LEVEL IN EACH TANK AND CONTINUOUSLY REPORT EACH STORAGE TANK FUEL LEVEL TO THE LEVEL / LEAK DETECTION CONTROLLER.

THE LEVEL / LEAK DETECTION CONTROLLER SHALL CONTINUOUSLY MONITOR THE FUEL LEVEL IN EACH FUEL STORAGE TANK. WHEN THE FUEL LEVEL PROBE INDICATES THE TANK IS 95% (ADJ) FULL, THE LEVEL / LEAK DETECTION CONTROLLER SHALL SEND A SIGNAL TO THE REMOTE AUDIBLE / VISUAL ALARM ANNUNCIATOR IN THE FILL BOX ALERTING PERSONNEL TO TERMINATE THE TANK FILLING PROCESS.

THE LEVEL / LEAK DETECTION CONTROLLER SHALL CONTINUOUSLY TRANSMIT THE FUEL TANK LEVELS AND LEAK STATUS TO THE REMOTE MOUNTED ALARM CONSOLE(S). THE REMOTE CONSOLE(E) SHALL BE CAPABLE OF DISPLAYING THE FUEL LEVEL OF ALL CONNECTED TANKS.

STORAGE TANKS LEVEL CONTROL:

THE LEVEL / LEAK DETECTION CONTROLLER SHALL DISPLAY THE FOLLOWING TANK FUEL LEVEL ALARMS AND RELAY THESE ALARMS (SHOULD THEY OCCUR) TO THE BUILDING CONTROL SYSTEM:

- LOW-LOW LEVEL (LLL) CRITICAL ALARM, LOW FUEL SUPPLY. IMMEDIATE FUEL DELIVERY IS REQUIRED.
- LOW LEVEL (LL) LOW LEVEL ALARM. INDICATES FUEL DELIVERY SHOULD BE SCHEDULED. HIGH-HIGH LEVEL (HHL) - CRITICAL ALARM. TANK IS BEING OVERFILLED.
- NOTE: FUEL STORAGE TANK LEVEL SHOULD BE MAINTAINED NEAR 95% FULL.

FUEL SYSTEM LEAK DETECTION:

LEAK SENSORS ARE PROVIDED IN THE INTERSTITIAL SPACE BETWEEN DOUBLE WALLS STORAGE TANKS, IN STEEL CONTAINMENT TANK, PIPE TRANSITION SUMPS, BELOW GRADE PIPING, AND DAY TANK OVERFLOW / RUPTURE BASINS. EACH LEAK SENSOR SHALL PROVIDE AN INDEPENDENT ALARM SIGNAL TO THE LEVEL / LEAK DETECTION CONTROLLER TO INDICATE THE LOCATION IN THE FUEL SYSTEM WHERE THE LEAK HAS OCCURRED. THE LEVEL / LEAK DETECTION CONTROLLER SHALL SEND AN ALARM SIGNAL TO THE EMCS IDENTIFYING THE SOURCE OF THE LEAK.

NOTE: DOUBLE WALL PIPING INTERSTITIAL SPACE LEAKAGE SENSING IS PROVIDED BY SLOPING ALL PIPING BACK TO AN ENCLOSURE OR A PIPING SUMP WHERE THE FLUID LEVEL IS MONITORED WITH A DISCRIMINATING SENSOR.

STORAGE TANK SHELL LEAK DETECTION:

THE DOUBLE WALL STORAGE TANKS SHALL BE PROVIDED WITH A LIQUID FILLED RESERVOIR AND INTERSTITIAL SPACE. A RESERVOIR SENSOR SHALL DETECT BREACHES IN THE INNER AND OUTER TANK WALLS AND SHALL DISTINGUISH BETWEEN A BREACH IN THE INNER AND OUTER TANK WALLS WHEN REPORTING AN ALARM TO THE LEVEL / LEAK DETECTION PANEL. THE LEVEL / LEAK DETECTION CONTROLLER SHALL FORWARD ALL ALARM SIGNALS TO THE EMCS.

DIESEL FUEL SYSTEM PUMP CONTROL

IF THE FUEL LEVEL SHOULD FALL BELOW THE LOW-LOW (LLL) LEVEL , THE PUMP CONTROLLER SHALL TERMINATE PUMPIING AND SEND AN ALARM SIGNAL TO THE OPERATORS WORKSTATION. IF WHEN THE FUEL LEVEL IN FUEL OIL STORAGE TANK HAS RISEN ABOVE THE LOW-LOW LEVEL, THE SYSTEM SHALL SWITCH BACK ON.

THE PUMP CONTROLLER SHALL AUTOMATICALLY SELECT THE LEAD OR LAG PUMP ON THE DAY TANK S BASED ON A RUN TIME LOG TO ALLOW EQUAL RUN TIME FOR EACH PUMP.

UPON A CALL FOR FUEL, THE LEAD PUMP SHALL BE ENERGIZED. IF A LEAD PUMP FAILURE OCCURS, SEND A FAILURE ALARM TO THE BUILDING CONTROL SYSTEM (THROUGH THE LEVEL / LEAAK DETECTION CONTROLLER) AND ENERGIZE THE LAG PUMP. WHEN THE DEMAND FOR FUEL FROM THE DAY TANKS IS SATISFIED, DE-ENERGIZE THE FUEL PUMP. REPORT THE STATUS CONDITION FOR EACH PUMP TO THE BUILDING CONTROL SYSTEM. (THROUGH THE LEVEL / LEAK DETECTION CENTRAL CONTROLLER).

- 1. PUMP AUTO (MONITORING OF THE H-O-A SWITCH; PUMP IS AVAILABLE FOR OPERATION)
- PUMP RUNNING (PUMP IS IN OPERATION)
- 3. PUMP FAILURE (PUMP HAS BEEN COMMANDED ON BUT IS NOT RUNNING)

BELLY DAY TANK FILL:

SOLENOID FILL VALVE SHALL BE NORMALLY CLOSED BUT SHALL BE ELECTRICALLY HELD OPEN UNLESS THE HHL SETTING HAS BEEN REACHED. WHEN THE DIESEL FUEL LEVEL IN THE DAY TANK FALLS BELOW A PREDETERMINED FILL SETPOINT LEVEL (LL-75% OF FULL CAPACITY, ADJUSTABLE) AS INDICATED BY THE DAY TANK LEVEL SENSOR, START THE LEAD FUEL PUMP AND OPEN SOLENOID VALVE #1 (NORMALLY CLOSED VALVE) ON THE DAY TANK. WHEN THE DAY TANK REACHES 85% FULL, CLOSE SOLENOID VALVE #1 AND TERMINATE THE TANK FUEL PUMP START SIGNAL. THE FOLLOWING CONDITIONS FOR THE DAY TANK SHALL BE RELAYED TO THE BUILDING CONTROL

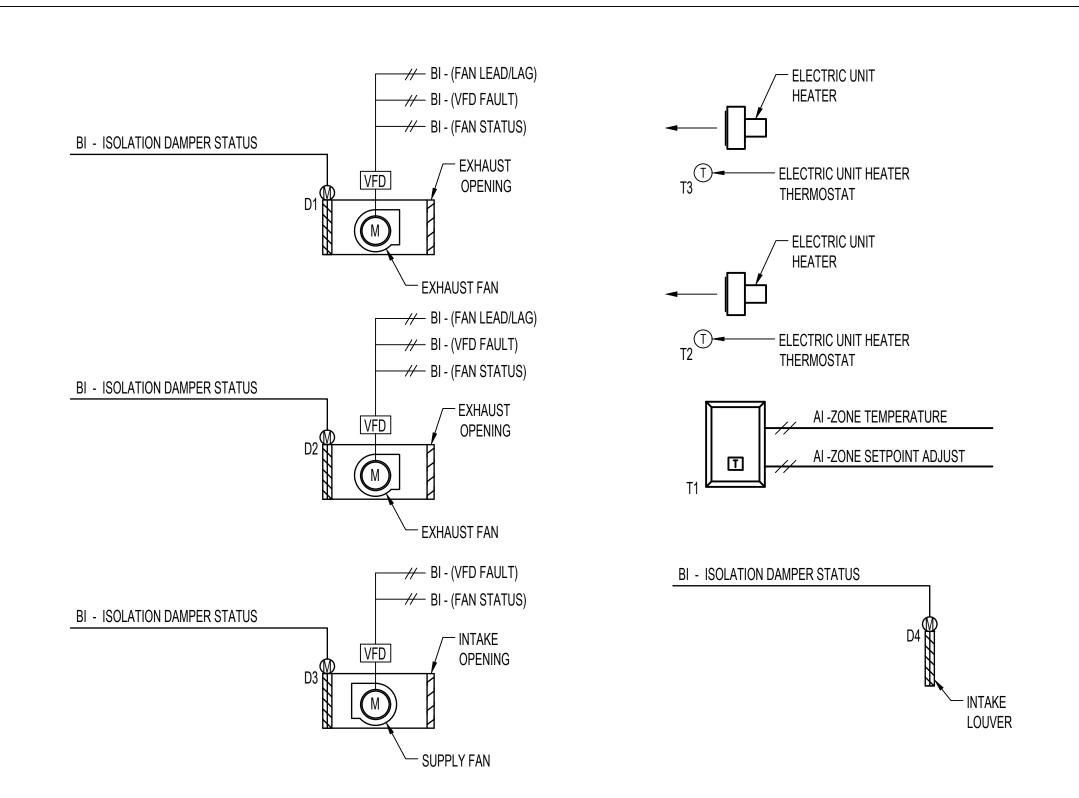
- 1. LOW-LOW LEVEL (LLL) SEND CRITICAL ALARM, TANK IS ALMOST EMPTY.
- LOW LEVEL (LL) NO ALARM, TANK FILL IS REQUIRED.
- HIGH-HIGH LEVEL (HL) SEND CRITICAL ALARM, TANKS IS OVERFULL 90% HIGH LEVEL
- 85% FILL STOP LEVEL
- 75% FILL START LEVEL 50% LOW LEVEL

15% CRITICAL LOW LEVEL.

IF DURING THE DAY TANK(S) FILL SEQUENCE A HIGH-HIGH SIGNAL (HL - SET AT APPROXIMATELY 90% FULL) OCCURS AT ANY DAY TANK, START DAY TANK RETURN PUMP TO MAINTAIN NORMAL FUEL LEVEL. IF RETURN PUMP IS INOPERABLE OR FURTHER OVERFILLING, CLOSE SOLENOID VALVE #1 AND SEND ALARM TO THE BUILDING CONTROL SYSTEM (THROUGH THE LEVEL / LEAK DETECTION CONTROLLER) IDENTIFYING THE DAY TANK WITH THE HIGH-HIGH LEVEL ALARM.

IF THE DAY TANK SECONDARY CONTAINMENT LEAK DETECTION SENSOR (LDS) SHOULD DETECT THE PRESENCE OF FUEL, SEND AN ALARM TO THE BUILDING CONTROL SYSTEM.

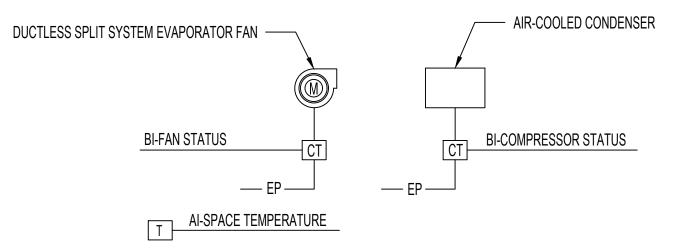
ISSUE FOR BID - 01/16/2024 Project Title Project Number **Drawing Title** CONSULTANT ARCHITECT/ENGINEER OF RECORD | STAMP Office of MECHANICAL CONTROLS 437-21-210 ISSUE FOR BID EHRM INFRASTRUCTURE Construction **Building Number** UPGRADES - TIER 2 1-9-46 and Facilities Approved: Project Director Management **Drawing Number** 3300 Dundee RD. FARGO VA HEALTH CARE SYSTEM Northbrook, IL 60062 **BUILDING FULLY** T: 847.952.9362 Checked Drawn M-701 www.bancroft-ae.com BANCROFT ARCHITECTS + ENGINEERS U.S. Department of Veterans Affairs **ISSUE FOR BID** 01-16-24 **SPRINKLERED** Bancroft Project No: 22-113 DGG DGG Date: Revisions:



EMERGENCY GENERATOR ROOM FAN CONTROLS

1. EMERGENCY GENERATOR SHALL BE INTERLOCKED WITH INTAKE LOUVER D4. WHEN EMERGENCY GENERATOR IS DE-ENERGIZED INTAKE LOUVER D4 SHALL CLOSE.

- EXHAUST LOUVER/FAN (D1 & D2)/(EFG-1 AND EFG-2) AND INTAKE LOUVER/FAN D3/SFG-1 TO BE ACTIVATED TO MAINTAIN ROOM TEMPERATURE SENSED BY T1. WHEN ROOM THERMOSTAT RISES ABOVE 85°F ROOM EXHAUST FAN (EFG-1 AND EFG-2) SHALL RUN & INTAKE LOUVER D3 SHALL OPEN. WHEN ROOM THERMOSTAT DROPS BELOW 75°F ROOM EXHAUST FAN SHALL STOP & INTAKE LOUVER D3 SHALL CLOSE.
 - THE EXHAUST FANS SHALL OPERATE IN A LEAD/LAG FASHION. THE LEAD EXHAUST SHALL MODULATE OUTPUT OF THE VFD AS REQUIRED TO MAINTAIN
 - TEMPERATURE SETPOINT FROM REMOTE WALL MOUNTED THERMOSTAT. WHEN LEAD PUMP ACHIEVE 80% OF THE VFD THE LAG FAN MODULATE TO MAINTAIN TEMPERATURE SETPOINT.
- 3. ELECTRIC UNIT HEATER SHALL BE INTERLOCKED WITH ROOM THERMOSTAT T2 SET AT 45°F. ON A DROP IN ROOM TEMPERATURE BELOW 43°F ELECTRIC UNIT HEATER SHALL BE ENERGIZED & ON A RISE IN ROOM TEMPERATURE ABOVE 47°F.

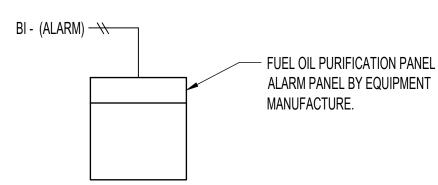


DUCTLESS SPLIT SYSTEM CONTROL DIAGRAM

DUCTLESS SPLIT SYSTEMS

DUCTLESS SPLIT SYSTEMS SHALL HAVE SYSTEM MANUFACTURER'S STANDARD WALL-MOUNTED PROGRAMMABLE CONTROLLER. SYSTEM SHALL OPERATE UNDER ITS BUILT-IN, FACTORY INSTALLED CONTROL SYSTEM TO MAINTAIN ROOM TEMPERATURE SET POINT (72F). AN INDEPENDENT, WALL-MOUNTED TEMPERATURE SENSOR SHALL MONITOR ROOM TEMPERATURE AND SEND AN ALARM TO THE BMS PANEL IF ROOM TEMPERATURE RISES ABOVE 85F (ADJUSTABLE). HIGH TEMPERATURE ALARM SHALL REQUIRE MANUAL RESET. THE BMS SHALL MONITOR COMPRESSOR STATUS.

DUCTLESS SPLIT SYSTEM POINTS LIST										
	HA	HARDWARE POINTS SOFTWARE POINTS								
POINT NAME	AI	AO	ВІ	во	AV	BV	SCHED	TREND	ALARM	SHOW ON GRAPHIC
FAN STATUS			X					X		X
SPACE TEMPERATURE	Х							Х	Х	Х
COMPRESSOR STATUS			Х					Х	Х	Х



FUEL OIL PURIFICATION SYSTEM

CONTROL SEQUENCE - MONITORING CONTROL: BUILDING AUTOMATION SYSTEM (BAS) SHALL MONITOR THE FUEL OIL PURIFICATION ALARM CONTACT PROVIDED WITH THE PANEL. THE EQUIPMENT ALARM CONTROL PANEL SHALL ALSO BE SHOWN ON THE BAS THROUGH A BACNET CONNECTION TO FET ALL THE INFORMATION FROM THE EQUIPMENT

CONTROL CONTRACTOR TO DISPLAY ALL AVAILABLE INFORMATION FROM THE EQUIPMENT ALARM

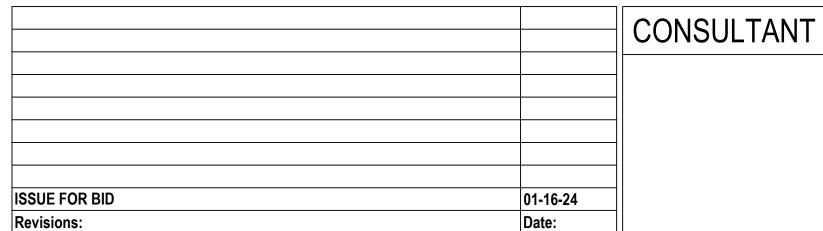
DISPLAY THE FOLLOWING ON BAS

- LOW WATER IN TRAP VACUUM AT PRIMARY FILTER (FILTER CHANGE INSTRUCTIONS)
- PRESSURE AT FINAL FILTER (FILTER CHANGE INSTRUCTIONS)
- HIGH WATER IN TRAP SYSTEM ON

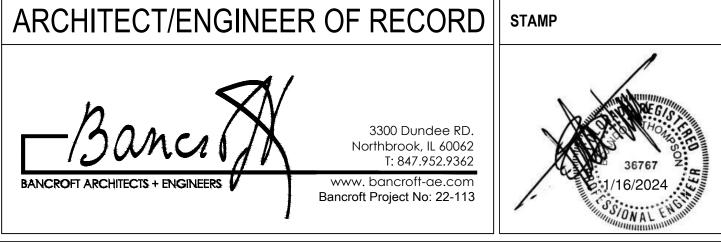
ALARMS:

ALARM PANEL.

- HIGH WATER IN TRAP
- HIGH VACUUM (SERVICE PRIMARY FILTERS) HIGH PRESSURE (SERVICE FINAL FILTERS)
- NO FLUID FLOW



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MECHANICAL CONTROLS	ISSUE FOR BID	Project Title EHRM INFRASTRUCTURE UPGRADES - TIER 2			
Approved: Project Director	BUILDING FULLY SPRINKLERED	Location FARGO VA HEA Issue Date 01/16/2024	LTH CARE Checked DGG	SYST Drawn DGG	

ISSUE FOR BID - 01/16/2024

Project Number

Building Number

Drawing Number

M-702

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U.S. Department of Veterans Affairs