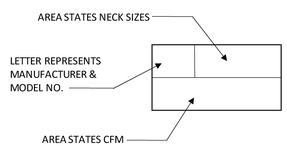
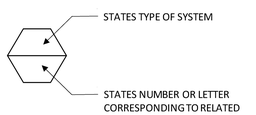
MECHANICAL SYMBOL LIST

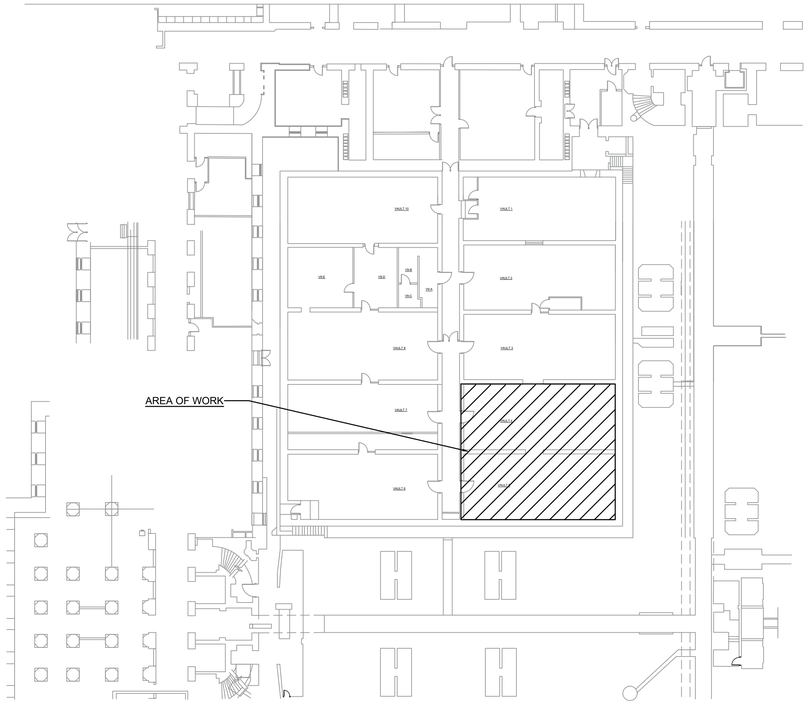
SYMBOL	DESCRIPTION
D	DUCT DROP
R	DUCT RISE
M	MOTOR OPERATED DAMPER
	SUPPLY AIR DEVICE. ARROWS INDICATE DIRECTION OF AIRFLOW
	MANUAL VOLUME DAMPER - M.V.D.
	CONICAL TEE
	BRANCH DUCT WITH 45 CLINCH COLLAR CONNECTION TO MAIN TRUNK DUCT
	RECTANGULAR TURN W/ TURNING VANES
T	THERMOSTAT
SA	SUPPLY AIR
CRAC	COMPUTER ROOM AIR CONDITIONING UNIT
CFM	CUBIC FEET PER MINUTE
RA	RETURN AIR
AFF	ABOVE FINISHED FLOOR
CHS	CHILLED WATER SUPPLY
CHR	CHILLED WATER RETURN
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
CD	CLEARWATER DRAIN
M1	PLAN NOTE REFERENCE SYMBOL
	REMOVE FROM EXISTING
	CONNECT TO EXISITNG
	CHECK VALVE
	BALANCING VALVE
	UNION
T	THERMOMETER
P	PRESSURE GUAGE WITH SNUBBER
	SHUTOFF VALVE
	STRAINER
	PIPING FLOW DIRECTION
	PIPE UP
	PIPE DOWN
	PIPE CAP
	BOTTOM CONNECTION
	LINE BREAK



AIR DEVICE DESIGNATION



MECHANICAL EQUIPMENT DESIGNATION



KEYPLAN
NO SCALE

MECHANICAL DRAWING LIST

No.	Sheet No.	Sheet Title
1	M001	MECHANICAL COVER SHEET
2	M101	VAULT 4 AND 5 DEMO WORK MECHANICAL
3	M102	VAULT 4 AND 5 NEW WORK MECHANICAL
4	M201	MECHANICAL SCHEDULES AND DETAILS
5		
6		
7		
8		
9		
10		

PRICING SET 6/26/2026
SRBR No: 25111-45

ENGINEER :
SRBR
MEP Consulting Engineers since 1959
757 Frederick Road Suite 300 - Catonsville, Maryland 21228
Phone: 410.869.7282 Fax: 410.869-7362
Web: www.SRBRengineers.com

CLIENT :
US TREASURY
PENNSYLVANIA AVE
WASHINGTON, DC

PROJECT :
US TREASURY
VAULTS #4 & 5 AC UNIT REPLACEMENT

"Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the state of Washington DC *License No.* PE905594 *Expiration Date:* 8-31-2026 *."*

SHEET TITLE :
MECHANICAL COVER SHEET

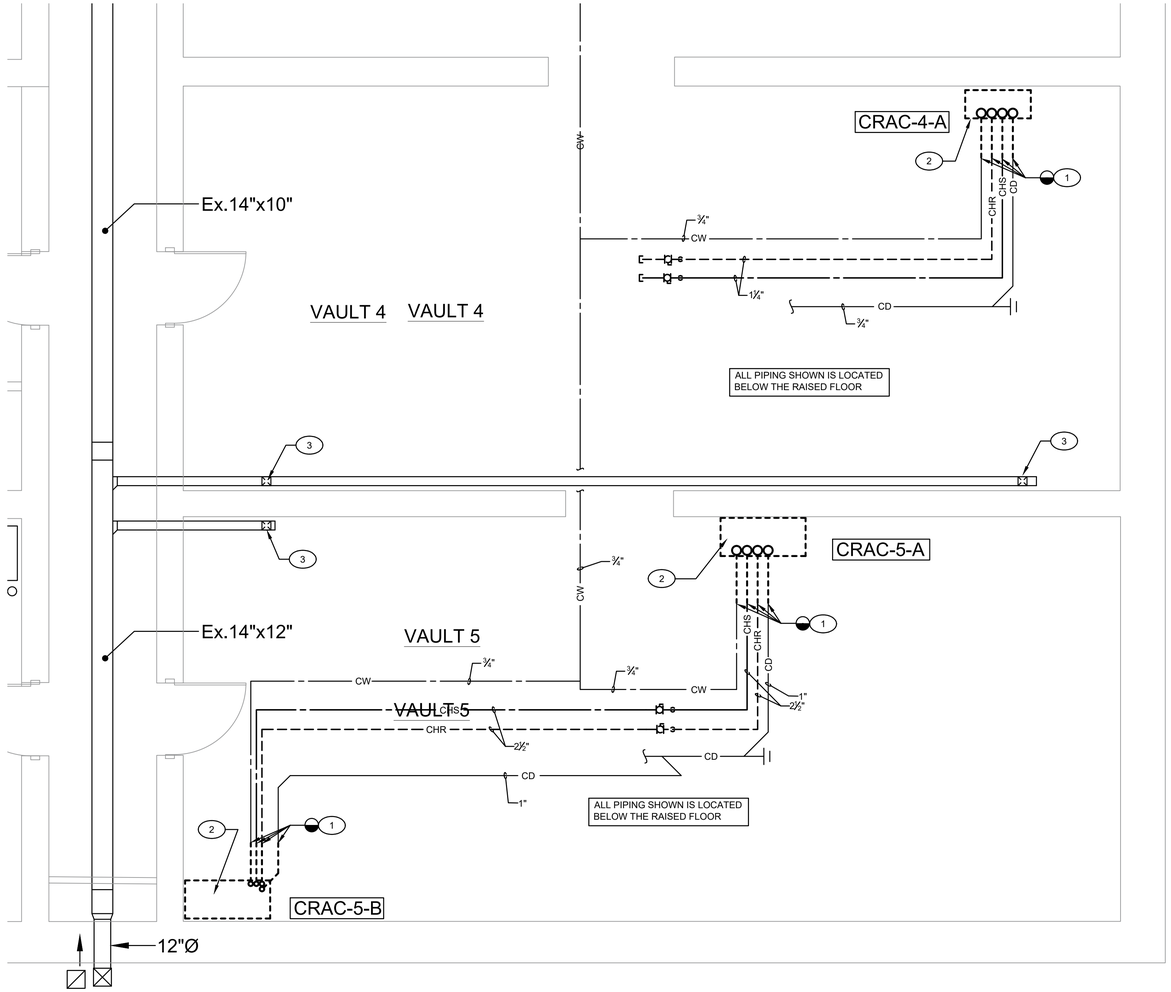
REVISION :
DATE : 6-26-2026
SRBR NO. : 25111-45
DRAWING NO. :
M001

DEMOLITION PLAN NOTES

1. CUT EXISTING PIPES AT POINT INDICATED AND REMOVE BACK TO UNIT. PREPARE PIPES FOR CONNECTION OF NEW PIPING
2. REMOVE EXISTING CRAC UNIT ENTIRELY INCLUDING ALL LOCAL PIPING, CONTROLS, SUPPORTS, POWER, ETC. PREPARE AREAS FOR NEW UNIT
3. EXISTING AIR DEVICE TO REMAIN. CLEAN THE AIR DEVICE.

GENERAL NOTES

1. CONTRACTOR TO PERFORM A PRE-BALANCE TEST OF BOTH CHILLED WATER AND SUPPLY AIRFLOW FOR THE ROOM AND EACH EXISTING CRAC UNIT. DOCUMENT THE READINGS IN A REPORT AND SUBMIT TO THE ENGINEER FOR REVIEW
2. WORK SHALL BE SCHEDULED WITH THE OCCUPANTS OF THE ROOM 1 WEEK IN ADVANCE.
3. CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS, PIPE ARRANGEMENTS, SIZES, LOCATION, ETC. BEFORE BIDDING THE WORK



VAULTS 4 AND 5 PLAN - MECHANICAL DEMOLITION

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

0 1' 2' 4' 8'

PRICING SET 6/26/2026

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MEP Consulting Engineers since 1959

757 Frederick Road Suite 300 - Catonsville, Maryland 21228
Phone: 410.869.7262 Fax: 410.869-7362
Web: www.SRBRengineers.com

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SHEET TITLE :

VAULTS 4 & 5 NEW WORK MECHANICAL

REVISION :

DATE : 6-26-2026

SRBR NO. : 25111-45

DRAWING NO. :

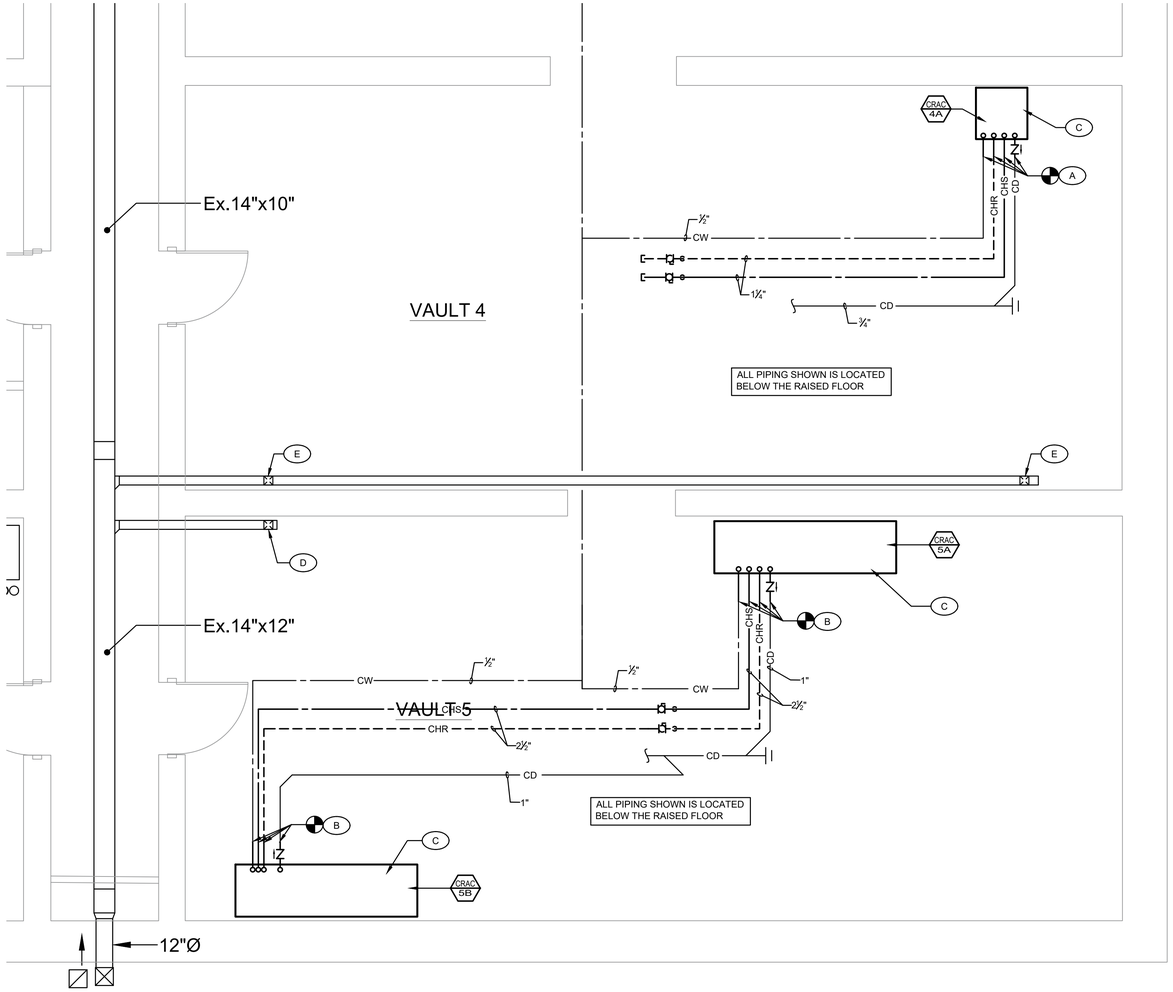
M101

NEW WORK PLAN NOTES

- (A) CONNECT NEW 1⅛" CHS, 1⅛" CHR, ½" CW AND ¾" CD TO EXISTING PIPE, EXTEND OVER TO NEW UNIT AND CONNECT. SEE DETAIL FOR PIPE AND VALVE ARRANGEMENT OF PIPE CONNECTIONS
- (B) CONNECT NEW 2½" CHS, 2½" CHR, ½" CW AND 1" CD TO EXISTING PIPE, EXTEND OVER TO NEW UNIT AND CONNECT. SEE DETAIL FOR PIPE AND VALVE ARRANGEMENT OF PIPE CONNECTIONS
- (C) SET NEW UNIT ON FLOOR IN PLACE OF EXISTING. SET UNIT ON FLOOR NEW FLOOR STAND SET TO THE EXISTING FLOOR HEIGHT. REPAIR/REPLACE SURROUNDING FLOOR TILES AS NEEDED FOR A COMPLETE AND CONTIGUOUS FLOOR SYSTEM AROUND THE UNIT. REMOVE TILES OR MODIFY TILES AS NEEDED.
- (D) BALANCE EXISTING AIR DEVICE TO 75 CFM
- (E) BALANCE EXISTING AIR DEVICE TO 65 CFM

GENERAL NOTES

1. CONTRACTOR TO PERFORM A PRE-BALANCE TEST OF BOTH CHILLED WATER AND SUPPLY AIRFLOW FOR THE ROOM AND EACH EXISTING CRAC UNIT. DOCUMENT THE READINGS IN A REPORT AND SUBMIT TO THE ENGINEER FOR REVIEW
2. WORK SHALL BE SCHEDULED WITH THE OCCUPANTS OF THE ROOM 1 WEEK IN ADVANCE.
3. UNIT CONTROLS SHALL BE INTEGRATED INTO EXISTING BUILDING MANAGEMENT SYSTEM (BMS). UNIT SHALL BE SET UP TO MAINTAIN A SPACE TEMPERATURE OF 72 DEGREES AND 50% RELATIVE HUMIDITY. BMS SHALL MONITOR, AT MINIMUM, OPERATING STATUS OF THE UNIT, CHILLED WATER POSITION, SPACE TEMPERATURE, SPACE RH AND ALL ALARMS.
4. CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS, PIPE ARRANGEMENTS, SIZES, LOCATION, ETC. BEFORE BIDDING THE WORK
5. ADD PERFORATED FLOOR TILES AS NEEDED IN VAULT 4 TO ASSURE ADEQUATE AIRFLOW PASSES FROM UNDER THE FLOOR TO ABOVE THE FLOOR. THE AGGREGATE AREA OF OPENING IN THE FLOOR TILES SHALL NOT BE LESS THAN 480 SQUARE INCHES.
6. CONTRACTOR SHALL INCLUDE IN HIS/HER SCOPE TO PATCH OPENINGS IN WALLS BELOW FLOOR SEPARATING ONE ROOM FROM ADJACENT ROOMS. WALLS SHALL BE PATCHED USING 20 GAGE METAL STUDS 16" ON CENTER AND ⅝" GYPSUM BOARD ON BOTH SIDE OF THE WALL WITH ALL JOINTS TAPED AND SPACKLED.



VAULTS 4 AND 5 PLAN - MECHANICAL NEW WORK

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

0 1' 2' 4' 8'

PRICING SET 6/26/2026

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MEP Consulting Engineers since 1959
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Web: www.SRBRengineers.com

ENGINEER :

CLIENT : US TREASURY
PENNSYLVANIA AVE
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VAULTS #4 & 5 AC UNIT
REPLACEMENT

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SHEET TITLE :
VAULTS 4 & 5
NEW WORK
MECHANICAL

REVISION :

DATE : 6-26-2026

SRBR NO. : 25111-45

DRAWING NO. :

M102

CRAC UNIT SCHEDULE

Tag	Manufacturer and Model Number	Serves	Voltage	MCA	Max. Fuse Amps	FLA	Motor bHP	CFM	ESP	Elec. Heater (KW)	Cooling Coil									Unit Weight (lbs.)	Remarks
											EAT DB °F	EAT WB °F	EWT °F	LWT °F	GPM	Water PD	Gross Total BTU/h	Gross Sensible BTU/h	LDB °F		
CRAC-4A	Liebert PW029DC1A209NW	Vault 4	460-3-60	31.8	35	25.4	4.0	4,800	0.2"	12.0	72	60.1	42	56	11.5	5.2	70,600	66,800	59.1	600	Provide 7.7 lb/hr infrared steam humidifer with controls and control valve, two-way modualting chilled water control valve, floor stand, electric heater, (1) EC fan motors, variable speed. Unit shall have dehumidifcation control sequence and be setupto integrae with BMS
CRAC-5A	Liebert CW106D	Vault 5	460-3-60	79.9	80	63.9	10.9	5,850	0.20	30.0	72	60.1	42	56	47	8.2	298,000	275,000	57	1785	Provide 22.1 lb/hr infrared steam humidifer with controls and control valve, two-way modualting chilled water control valve, floor stand, electric heater, (3) EC fan motors, variable speed. Unit shall have dehumidifcation control sequence and be setupto integrae with BMS
CRAC-5B	Liebert CW106D	Vault 5 Backup	460-3-60	79.9	80	63.9	10.9	5850	0.2	30	72	60.1	42	56	47	8.2	298000	275000	57	1785	Provide 22.1 lb/hr infrared steam humidifer with controls and control valve, two-way modualting chilled water control valve, floor stand, electric heater, (3) EC fan motors, variable speed. Unit shall have dehumidifcation control sequence and be setupto integrae with BMS

MECHANICAL SPECIFICATIONS

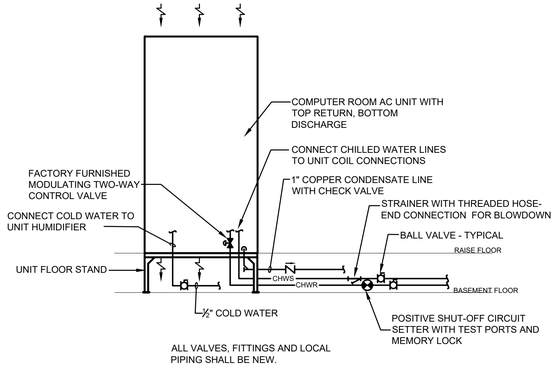
1. Furnish and install a complete and operational system in accordance with drawings and these specifications. Provide all materials whether specified or not for a complete and operational system that complies with all required codes and standards. All materials and equipment shall be installed in accordance with the manufacturer's instructions and all applicable codes and standards. Equipment shall be installed complete including power, controls, supports, etc. Equipment and associated controls shall be functionally tested in all operating modes. All equipment and materials shall be new unless otherwise indicated.
2. The contractor shall be responsible for visiting the site prior to bid and becoming familiar with all existing conditions that may affect his work. The contractor shall include in his bid any required labor and materials necessary to modify, remove or relocate existing work to allow for the new work to be installed. If the contactor believes the new work cannot be installed as shown in the drawings, he shall inform the project construction manager immediately. There shall be no additional compensation for failure to include coordination with existing conditions in the scope and cost.
3. All work shall be done in accordance with applicable building, mechanical, plumbing, electrical and energy codes and standards. These include, but are not limited to the latest International Building Code (IBC), International Mechanical Code (IMC), International Plumbing Code (IPC), International Fuel Gas Code (IFGC), National Fire Protection Association (NFPA), American Society of Refrigeration and Air Conditioning Engineers (ASHRAE), Sheet Metal and Air Conditioning Contractors National Association (SMACNA), National Electrical Code ASME CSD-1.
4. The contractor shall maintain a competent superintendent on site at all times who will oversee all work and ensure the construction is done in a safe, clean and professional manner. He shall ensure the work is done in accordance with the project specifications, all layout is correct and accurate and the quality of the workmanship meets or exceed industry standards. He shall also verify all manufacturer instructions are being followed for installation and setup.
5. The contractor shall submit equipment shop drawings for all major equipment and materials including, but not limited to Computer Room AC units, pipe, valves and insulation. Shop drawings shall indicate materials, dimensions, weights, performance data and warranty information. Equipment shall be as scheduled on the drawings. Alternate manufacturers may be considered provided they meet or exceed the scheduled performance data and are of equal or better quality. Alternate equipment must fit within the allotted space.
6. The contractor shall maintain a set of as-built documents on site at all times. The drawings shall maintain red-line markup of all deviations from the deign documents and include pertinent information such as critical dimensions and elevations.
7. All new equipment and materials shall be reviewed by the contractor before ordering to ensure the equipment will fit in the given space, is suitable for the location, arrangement of duct, piping, etc, and can be serviced once installed. All required service access space shall be maintained and room shall be provided to remove filters and manipulate valves and dampers. Verify equipment electrical characteristics meet the existing available power.
8. The new unit shall be labeled with a phenolic engraved plate that lists the unit ID number, Airflow, Quantity of motors, Motor HP, Motor Amperage, Voltage/Phase, quantity of filters and sizes, chilled water flow in gpm.
9. Computer Room AC units shall be started and tested by a certified representative of the manufacturer. All other equipment shall be started and tested by the installing contractor. The equipment shall be tested in all modes of operation. All operating set points shall be programmed in coordination with the building operating staff. Verify all peripheral components including, but not limited to, control valves, sensors, interlocks, etc operate as intended and specified. The contractor shall provide a one year parts and labor warranty starting from the date the project is accepted and considered substantially complete by the engineer. At the time the equipment is turned over to the owner, all units shall have clean filters.
10. All new air and hydronic systems shall be balanced by a third-party firm certified by AABC or NEBB. Test and balance all fans and the computer room AC unit. All airflows and water flows shall be set to within 10% of that prescribed on the drawings. Submit to the engineer of record a Test and Balance report at the completion of the project indicating information about each piece of equipment and each system. Provide equipment operating data, and individual supply outlet measurement.
11. Chilled water pipe and cold water pipe shall be type L copper with soldered fittings and joints. Pro-Press joints and fittings are also acceptable. Ball valves shall be of bronze construction and full port with extended handles and a drain port placed on the unit side. Balance valves shall be brass construction and include test ports and memory stops. They shall be equal to “Xylem Circuit Setters”. Chilled water pipe and cold water pipe shall be insulated with closed cell elastomeric preformed pipe insulation equal to “Armacell”, ½” thick. All joints and plain ends shall be sealed with an appropriate sealant.
12. Condensate drain pipe shall be DWV or type L copper, insulated with closed cell elastomeric preformed pipe insulation equal to “Armacell”, ½” thick. Install check valve in the new or existing condensate line
13. The CRAC unit floor stand shall be provided with the unit, by the manufacturer. The stand shall be constructed out of steel with reinforced, adjustable legs to the set the height needed. the stand shall support eh unit along the entire perimeter and shall have legs at each corner and evenly spaced along the long dimension. The legs shall have enlarged feet to spread the load.
14. The CRAC unit shall be as scheduled, Basis of design is Liebert, 460V-3 phase, down-flow, chilled water units. units shall be provided with a modulating 2-way control valve, floor stand, ECM fan motor, MERV 8 filters, infrared humidifier, electric resistance reheat, alarm contacts, remote shut-down contact, smoke sensor and high temperature sensor, LT410 point leak detection sensor (1 per unit), locking disconnect and complete packaged controls. The controls shall be capable of being integrated into the existing Siemens Building Management System (BMS). The BMS shall provide room operating set points, start/stop signals, and shall monitor various operating parameters such as space temperature, space RH (%), unit control valve position, unit operating status and alarms.

Table 1: Summary Calculation Used to Determine Outdoor Air Ventilation Rates - Mechanically Ventilated

Reference - 2024 IMC

US TREASURY - VAULT 4 & 5

Zone Identification				2018 International Mechanical Code Compliance											
Room No.	Room Name	Occupancy Category	Area (sf)	People Outdoor Air Rate (cfm/ person)	Area Outdoor Air Rate (cfm/sf)	Occupant Load rate per Table 403.3 (#/1000sf)	Number of Occupants (#)	Breathing Zone Outdoor Air Flow Vbz (CFM)	*Table 403.3.1.2* Zone Air Distribution Effectiveness Ez	Zone Outdoor Air Flow Voz (CFM)	Zone Primary Air Flow Vpz (CFM)	Primary Outdoor Air Fraction Zp=Voz/ Vpz	Actual Primary Outdoor Air Fraction	Actual Zone Outdoor Air Flow Rate (CFM)	Meets Standard?
	Vaul-4	Office	1,185	5.00	0.06	5.00	11	126	1	126	130	0.97	1.00	130	Y
	Vault 5	Office	1,186	5.00	0.06	5.00	0	71	1	71	75	0.95	1.00	75	Y



COMPUTER ROOM AC UNIT PIPING DETAIL

NO SCALE

PRICING SET 6/26/2026

SRBR No: 25111-45

ENGINEER :

SRBR

MEP Consulting Engineers since 1959

757 Frederick Road Suite 300 - Catonsville, Maryland 21228

Phone: 410.869.7262 Fax: 410.869.7362

Web: www.SRBRengineers.com

CLIENT :

US TREASURY

PENNSYLVANIA AVE

WASHINGTON, DC

PROJECT :

US TREASURY VAULTS #4 & 5 AC UNIT REPLACEMENT

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SHEET TITLE :

VAULTS 4 & 5 MECHANICAL SCHEDULES & DETAILS

REVISION :

DATE : 6-26-2026

SRBR NO. : 25111-45

DRAWING NO. :

M201