

REMARKS:

1. ACCEPTABLE MANUFACTURERS : TRANE, DAKIN, TEMTROL, VYS.
2. PROVIDE WITH FACTORY START-UP UTILIZING MANUFACTURERS STANDARD FORMS AND THE FORMS INCLUDED IN THE SPECIFICATIONS.
3. ENTIRE UNIT SHALL BE DOUBLE WALL CONSTRUCTION WITH 6" BASE RAIL.
4. SUPPLY STAINLESS STEEL W/NO CONDENSATE PAN. ENTIRE DRAIN SHALL BE PITCHED TO OUTLET. WATER CARRY OVER IS NOT ALLOWED. SELECT CHILLED WATER COILS ACCORDINGLY. PROVIDE STAINLESS STEEL INTERMEDIATE DRAIN PANS FOR STACKED CHILLED WATER COILS ALL PRE-PIPED TO MAIN DRAIN PAN.
5. CHILLED WATER COILS SHALL BE A MAXIMUM OF 8 ROWS AND 10 FPI.
6. PROVIDE STAINLESS STEEL CHILLED WATER COIL CASING.
7. REFER TO DRAWINGS FOR FULL UNIT CONFIGURATION.
8. PROVIDE FACTORY MOUNTED OUTSIDE, RETURN, AND RELIEF AIR DAMPERS. THE ACTUATOR SHALL BE PROVIDED AND MOUNTED BY THE TEMPERATURE CONTROLS CONTRACTOR.
9. THE TOTAL STATIC PRESSURE FOR THE FANS SHALL INCLUDE THE FOLLOWING. (A) LISTED IS. (B) DESIGN FLOW ALLOWANCE. (C) PRESSURE DROPS THROUGH UNIT CONFIGURATION INCLUDING (COILS, DAMPERS, FILTERS, ETC).
10. PROVIDE HIGH EFFICIENCY INVERTER DUTY MOTORS.
11. UNIT DESIGN FAN HORSEPOWER, DIMENSIONS AND WEIGHT ARE LISTED IN THE SCHEDULE IT IS THE CONTRACTOR'S AND ALTERNATE MANUFACTURER'S RESPONSIBILITY TO ENSURE THAT THE HORSEPOWER, FIT AND ALL CLEARANCES ARE MAINTAINED SHOULD EQUIPMENT OTHER THAN SPECIFIED BE FURNISHED.
12. COORDINATE SHIPPING SPLITS AS REQUIRED FOR INSTALLATION.
13. PROVIDE UNIT MOUNTED VFD FOR EACH FAN SECTION.
14. THE MAXIMUM MOTOR SIZE SHALL BE 15 HP. PROVIDE DUAL PLENUM FANS WHERE REQUIRED TO MEET THIS REQUIREMENT. BACK DRAFT DAMPERS SHALL BE PROVIDED ON WHERE DUAL FANS ARE REQUIRED.
15. PROVIDE UNIT WITH PERMANENT AIR FILTER FRAMES FOR 2" THROW AWAY MERV 8 MEDIA.
16. UNIT SHALL BE PROVIDED WITH FOUR (4) COMPLETE MEDIA CHANGES.
17. PROVIDE RELIEF FAN WITH INTEGRAL PIZZO RING AND TRANSDUCER FOR AIRFLOW MEASUREMENT FOR ALL AHUS WITH RELIEF FAN.

REMARKS:

1. ACCEPTABLE MANUFACTURERS: DAKIN, SAMSUNG, MITSUBISHI, LG.
2. INTERLOCK WITH THE TEMPERATURE SENSOR IN THE ROOM.
3. PROVIDE SINGLE POINT CONNECTION FOR THE INDOOR UNIT.
4. INDOOR UNITS POWERED BY THE OUTDOOR UNIT.
5. PROVIDE "SEA-FOAST" PROTECTION ON OUTDOOR UNITS.
6. PROVIDE WITH 1 COMPLETE SET OF FILTERS.
7. UNIT SHALL BE UL LISTED.
8. PROVIDE WITH SIGHT GLASS, EXPANSION DEVICE, LINE DRIER, SIZE LINES AND PROVIDE INTERMEDIATE TRAPS PER MANUFACTURER'S INSTRUCTIONS. SUBMIT DETAILED PIPING SCHEMATIC WITH SHOP DRAWINGS.
9. PROVIDE WITH LOW AMBIENT CONTROL. INCLUDE A CRANKCASE HEATER AND WIND BAFFLE TO ALLOW FOR OPERATION TO 0°F AMBIENT TEMPERATURE (FACTORY MOUNTED OR INSTALLED BY A FACTORY CERTIFIED TECHNICIAN).
10. PROVIDE WITH CONDENSATE PUMP.

REMARKS:

1. ALL TERMINAL UNITS SHALL BE SINGLE WALL WITH 1/2" FOIL FACED INSULATION.
2. ALL HEATING COILS SHALL BE 2-ROWS.
3. PROVIDE EACH TERMINAL UNIT WITH INDEPENDENT CONTROLLER. NO UNIT SHALL BE OPERATED BY ANOTHER CONTROLLER LOCATED ON ANOTHER TERMINAL UNIT.
4. PROVIDE BOTTOM ACCESS PANEL.
5. TERMINAL UNIT LABEL WITH "X" SHALL BE COILING ONLY. NO HEATING COIL.
6. ZONE NUMBER DESCRIPTION: VAV-XY-Z. X = LEVEL, Y = AREA, Z = VAV#.
7. PROVIDE WITH SPST DISCONNECT (NO XFMR) FROM FACTORY.
8. PROVIDE WITH 2-WAY CONTROL VALVE.
9. PROVIDE WITH 3-WAY CONTROL VALVE.

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[illegible]

08 MAY 2025 - ISSUE FOR BIL

THE LINE BELOW INDICATES THE EXACTLY ONE FOOTER PER SHEET POSITION AND SIZE

E

D

C

B

A

5/6/2025 1:03:41 PM

1

2

3

4

5

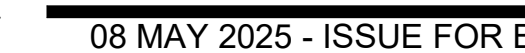
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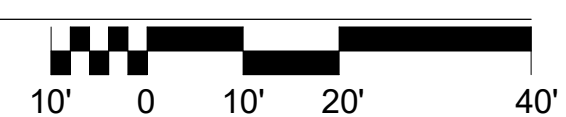
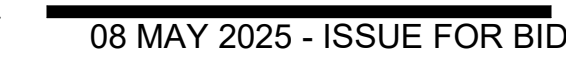
AHU-1 - VENTILATION AIR CALCULATIONS

Room Name	Occ Category	Area Az	People per 1000sf	Max. Zone Pop	Actual Zone Pop Pz	Normal Zone Pop Ps	cfm per person Rp	People Ventilation RpPz	cfm/sf A Rate Ra	Area Ventilation RaAz	Total Outside Air Vbz	Zone Efficiency Voz	Primary Airflow Vpz	Primary ou fraction Zp	Actual OA Provided Zp		
100 - VESTIBULE	Corridors	236	0	0	0	0	0	0	0.06	14	14	14	500	0.03	90		
101 - LOBBY	Lobbies/prefunction	624	30	19	0	0	7.5	0	0.06	37	37	37	250	0.15	45		
102 - SECURITY & RECEPTION	Office spaces	78	5	1	1	1	5	5	0.06	5	10	10	170	0.06	30		
104 - STUDENT LOUNGE	Conference rooms	682	50	35	4	2	5	20	0.06	41	61	61	935	0.07	165		
105 - AIRPLANE ETIQUETTE	Classrooms (ages 9 plus)	179	35	7	10	6	7.5	75	0	0	75	75	565	0.13	100		
106 - LOUNGE	Conference rooms	524	50	27	4	0	5	20	0.06	31	51	51	325	0.16	60		
107 - CORRIDOR	Corridors	1088	0	0	0	0	0	0	0.06	65	65	65	200	0.33	40		
109 - SEATING/ STUDYING	Corridors	784	0	0	0	0	0	0	0.06	47	47	47	1550	0.03	275		
110 - VENDING	Corridors	50	0	0	0	0	0	0	0.06	3	3	3	255	0.01	45		
112 - OPEN CORRIDOR	Corridors	1386	0	0	0	0	0	0	0.06	83	83	83	400	0.21	75		
114 - CLASSROOM	Classrooms (ages 9 plus)	1095	35	39	50	50	7.5	375	0	0	375	375	1380	0.27	245		
115 - CLASSROOM	Classrooms (ages 9 plus)	1100	35	39	50	50	7.5	375	0	0	375	375	1365	0.27	240		
116 - CLASSROOM	Classrooms (ages 9 plus)	1092	35	39	50	50	7.5	375	0	0	375	375	1320	0.28	235		
118 - LOUNGE	Conference rooms	304	50	16	4	2	5	20	0.06	18	38	38	225	0.17	40		
119 - CUSTODIAN	None	62	0	0	0	0	0	0	0	0	0	0	0	0.00	0		
120 - RESTROOM (M)	Toilet rooms - public	225	0	0	0	0	0	0	0	0	0	0	75	0.00	15		
121 - RESTROOM (W)	Toilet rooms - public	233	0	0	0	0	0	0	0	0	0	0	75	0.00	15		
122 - LARGE STORAGE	Storage rooms	572	0	0	0	0	0	0	0.12	69	69	69	655	0.10	115		
200 - OPEN CORRIDOR	Corridors	3431	0	0	0	0	0	0	0.06	206	206	206	1275	0.16	225		
201 - ATC LAB	Computer Lab	1952	25	49	80	50	10	800	0.12	234	1034	1034	4000	0.26	705		
201A - STORAGE	Storage rooms	40	0	0	0	0	0	0	0.12	5	5	5	0	0.00	0		
202 - WELLNESS	Office spaces	73	5	1	1	1	5	5	0.06	4	9	9	140	0.07	25		
203 - CORRIDOR	Corridors	502	0	0	0	0	0	0	0.06	30	30	30	125	0.24	25		
204 - STORAGE	Storage rooms	58	0	0	0	0	0	0	0.12	7	7	7	50	0.14	10		
205 - CONFERENCE ROOM	Conference rooms	257	50	13	8	0	5	40	0.06	15	55	55	980	0.06	175		
206 - OFFICE	Office spaces	120	5	1	2	1	5	10	0.06	7	17	17	85	0.20	15		
207 - BREAK ROOM	Conference rooms	193	50	10	4	0	5	20	0.06	12	32	32	500	0.06	90		
208 - OFFICE	Office spaces	120	5	1	2	1	5	10	0.06	7	17	17	80	0.22	15		
209 - OFFICE	Office spaces	145	5	1	2	1	5	10	0.06	9	19	19	525	0.04	95		
210 - OFFICE	Office spaces	120	5	1	2	1	5	10	0.06	7	17	17	80	0.22	15		
211 - OFFICE	Office spaces	145	5	1	2	1	5	10	0.06	9	19	19	525	0.04	95		
212 - OFFICE	Office spaces	120	5	1	2	1	5	10	0.06	7	17	17	80	0.22	15		
213 - OFFICE	Office spaces	145	5	1	2	1	5	10	0.06	9	19	19	250	0.07	45		
214 - OFFICE	Office spaces	120	5	1	2	1	5	10	0.06	7	17	17	80	0.22	15		
215 - COMPUTER LAB	Computer (without printing)	1099	35	39	50	50	7.5	375	0	0	375	375	1350	0.28	240		
216 - HIGH-TECH CLASSROOM	Classrooms (ages 9 plus)	1096	35	39	50	50	7.5	375	0	0	375	375	1435	0.26	255		
219 - CUSTODIAN	None	62	0	0	0	0	0	0	0	0	0	0	0	0.00	0		
220 - RESTROOM (M)	Toilet rooms - public	226	0	0	0	0	0	0	0	0	0	0	75	0.00	15		
221 - RESTROOM (W)	Toilet rooms - public	234	0	0	0	0	0	0	0	0	0	0	75	0.00	15		
222 - ADMIN. OFFICE	Office spaces	5	2	2	1	5	10	0.06	21	31	31	290	0.13	45			
223 - DEP. CHAIR OFFICE	Office spaces	181	5	1	2	1	5	10	0.06	11	21	21	320	0.07	60		
224 - DEP. CHAIR OFFICE	Office spaces	170	5	1	2	1	5	10	0.06	10	20	20	325	0.06	60		
300 - LOBBY	Lobbies/prefunction	430	30	13	4	2	7.5	30	0.06	26	56	56	280	0.20	50		
301 - CONFERENCE CENTER	Conference rooms	2120	50	106	50	50	5	250	0.06	127	377	377	4050	0.09	715		
302 - STORAGE	Storage rooms	49	0	0	0	0	0	0	0.12	5	6	6	0	0.00	0		
303 - CUSTODIAN	None	62	0	0	0	0	0	0	0	0	0	0	0	0.00	0		
304 - RESTROOM (M)	Toilet rooms - public	226	0	0	0	0	0	0	0	0	0	0	75	0.00	15		
305 - RESTROOM (W)	Toilet rooms - public	234	0	0	0	0	0	0	0	0	0	0	75	0.00	15		
306 - CORRIDOR	Corridors	328	0	0	0	0	0	0	0.06	20	20	20	500	0.04	90		
307 - LARGE STORAGE	Storage rooms	262	0	0	0	0	0	0	0.12	31	31	31	200	0.16	40		
310 - BREAK ROOM	Conference rooms	278	50	14	4	2	5	20	0.06	17	37	37	400	0.09	75		
											Total Vbz:	4548	4548	Maz (Zp):	0.33	5085	OA Total
											Ez			Ev:	0.8	Vou	Vot
											Ceiling or floor supply of cool air						
											Total Outside Air Required:						
											AHU-1 Total Outside Air Provided:						

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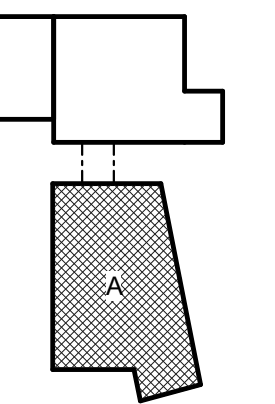
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AVIATION BUILDING**

THE UNIVERSITY OF CHICAGO PRESS

LS3P PROJECT: 9202-230350B

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KEY PLAN:



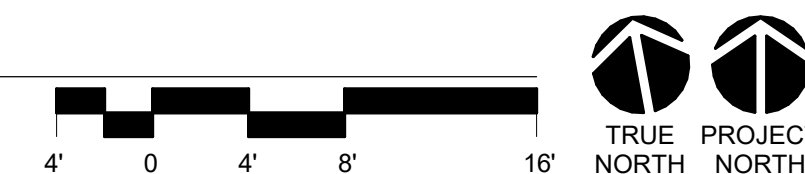
SHEET NAME:
DUCTWORK PLAN -
LEVEL 1 - AREA A

ORIGINAL SUBMISSION: 05/08/25

HEET: **M-101A**

3 MAY 2025 - ISSUE FOR BI

1 DUCTWORK PLAN - LEVEL 1 - AREA A
M-101A 1/8" = 1'-0"



WALL RATING LEGEND:

	NON-RATED PARTITION
	1 HOUR FIRE BARRIER
	2 HOUR FIRE BARRIER

**ECSU SCHOOL OF
AVIATION BUILDING**

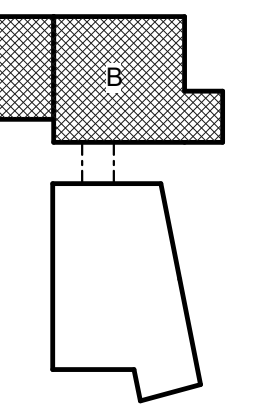
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SCO PROJCT: 22-25479-02B

LS3P PROJECT: 9202-230350B

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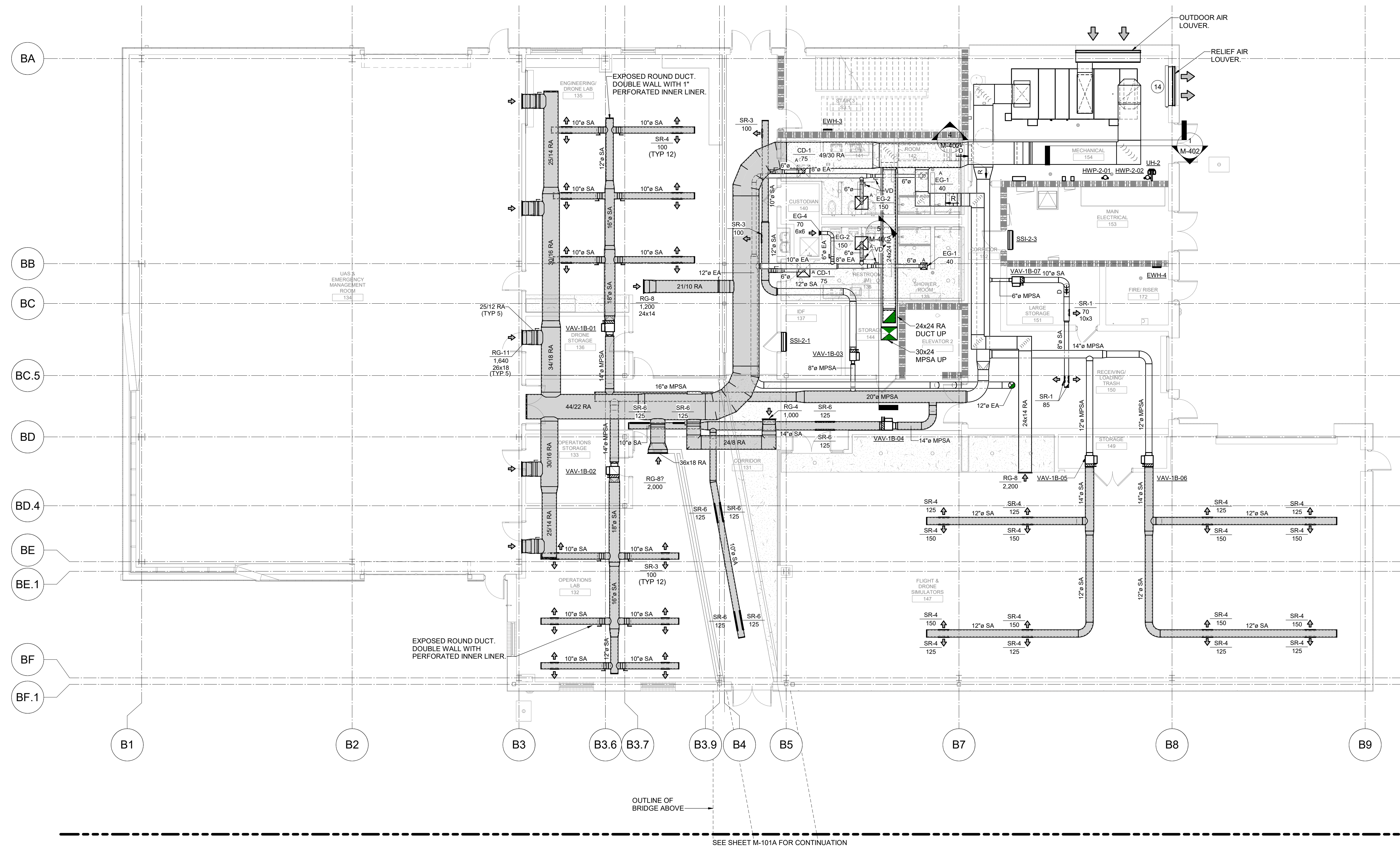


SHEET NAME:
DUCTWORK PLAN -
LEVEL 1 - AREA B

ORIGINAL SUBMISSION: 05/08/25

HEET: **M-101B**

3 MAY 2025 - ISSUE FOR BID



1 DUCTWORK PLAN - LEVEL 1 - AREA B
M-101B 1/8" = 1'-0"

SEE SHEET M-101A FOR CONTINUATION



WALL RATING LEGEND:

 NON-RATED PARTITION
 1 HOUR FIRE BARRIER
 2 HOUR FIRE BARRIER

**ECSU SCHOOL OF
AVIATION BUILDING**

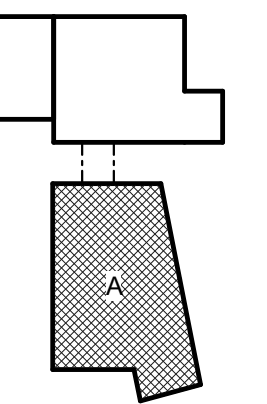
1704 Weeksville Rd., Elizabeth City, NC 27909

SCO PROJECT: 22-254/9-02B

LS3P PROJECT: 9202-230350B

[illegible]

KEY PLAN:



SHEET NAME:
DUCTWORK PLAN -
LEVEL 2 - AREA A

ORIGINAL SUBMISSION: 05/08/25

HEET: **M-102A**

3 MAY 2025 - ISSUE FOR BID

THE LINE SHOWN ABOVE IS EXACTLY
ONE INCH LONG AT THIS SHEETS

E

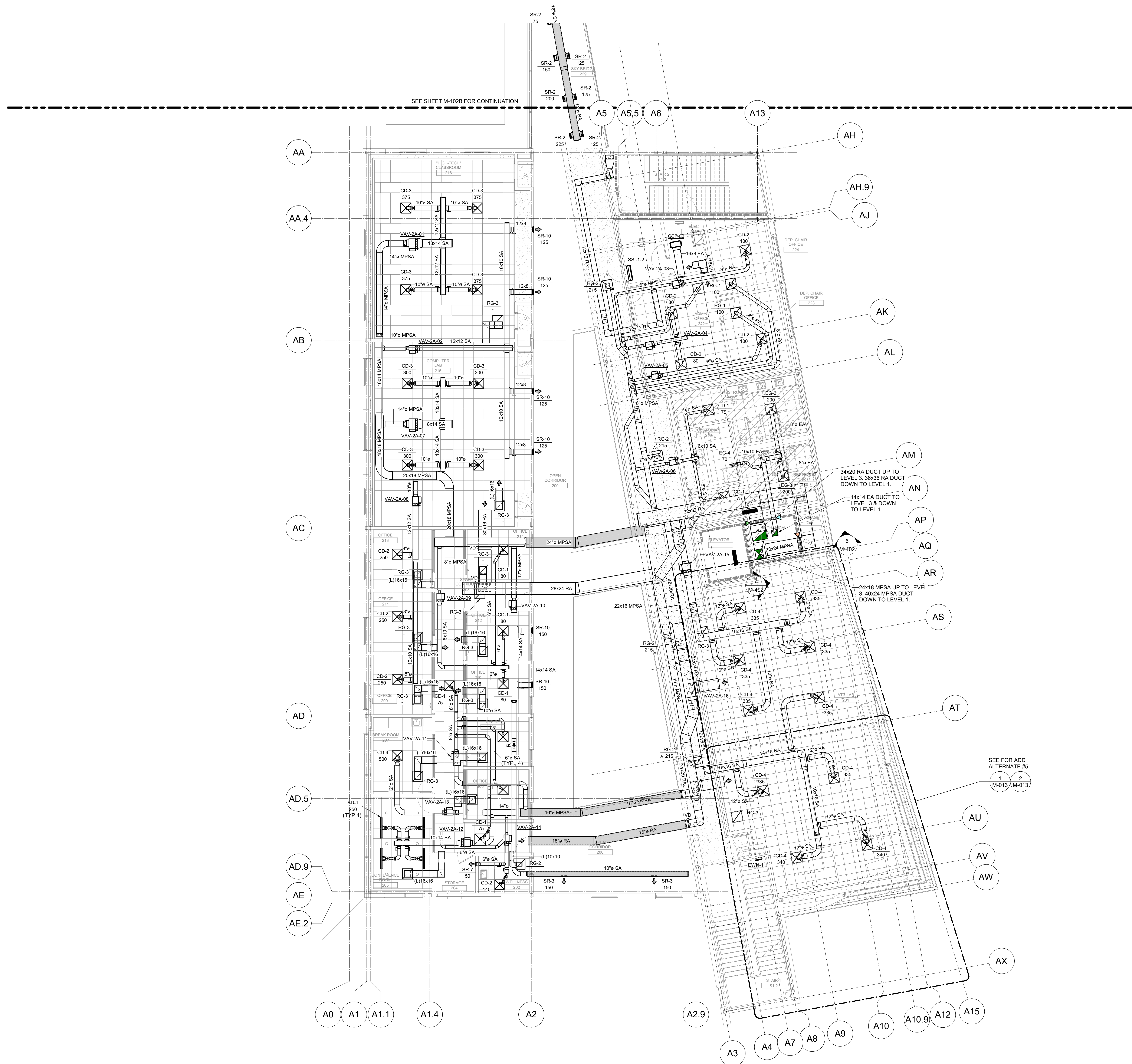
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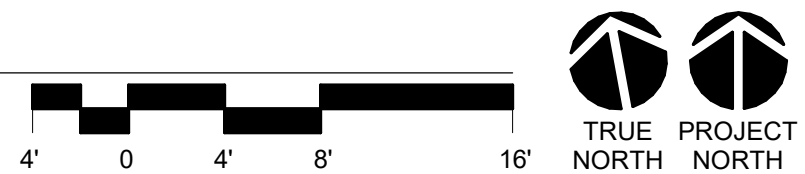
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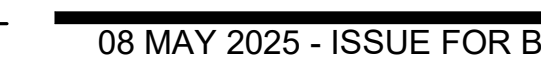


1 DUCTWORK PLAN - LEVEL 2 - AREA A
M-102A 1/8" = 1'-0"



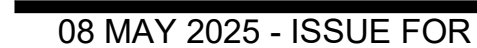
WALL RATING LEGEND:

	NON-RATED PARTITION
	1 HOUR FIRE BARRIER
	2 HOUR FIRE BARRIER



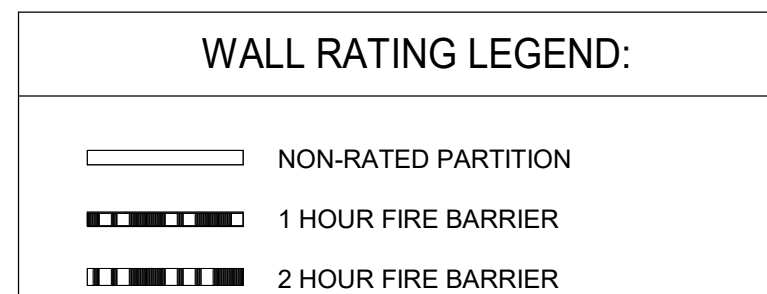
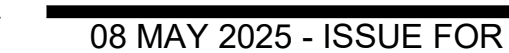
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PROJECT FRODO BAGGINS

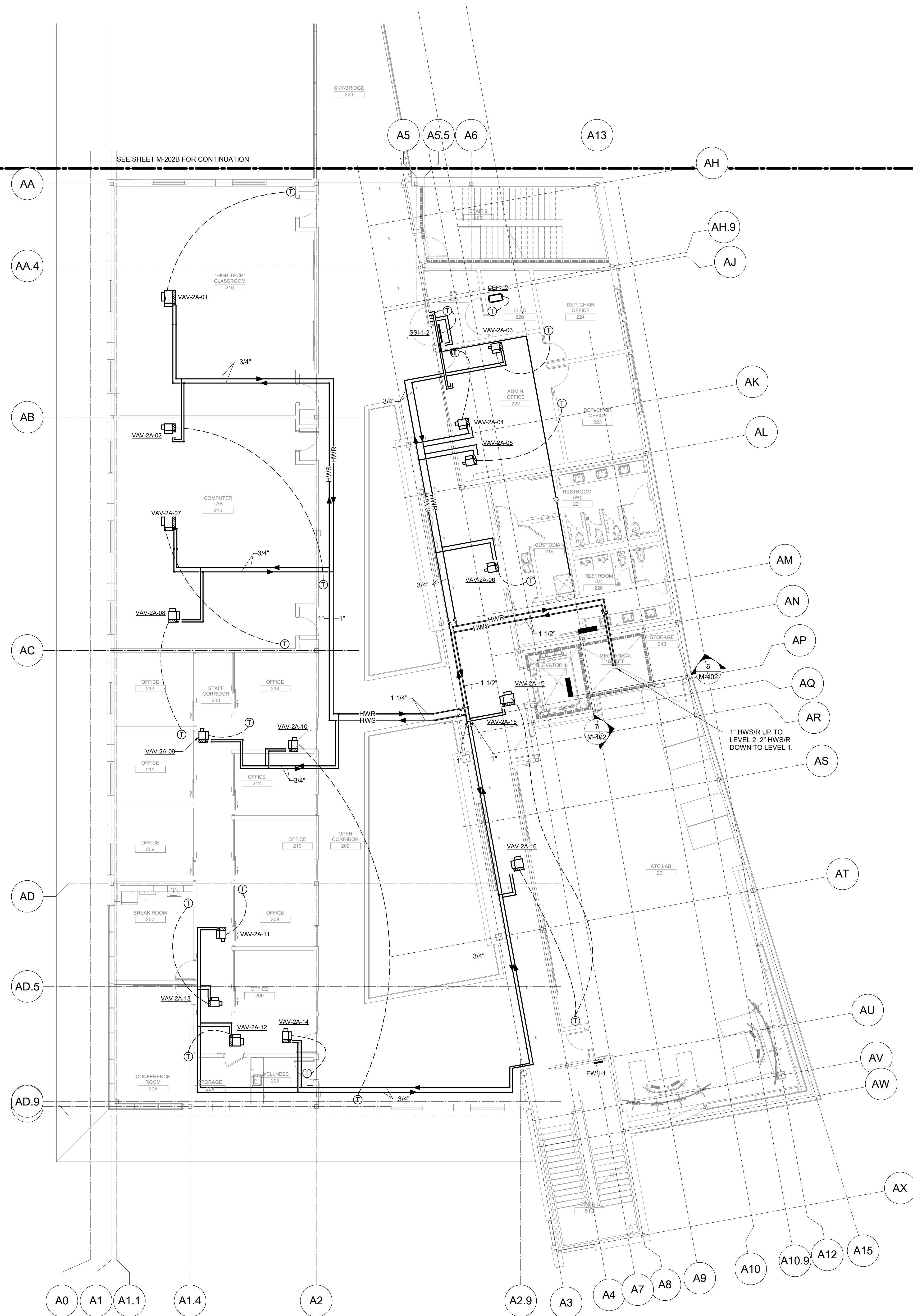
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SCO PROJECT: 22-254/9-02B
LS3P PROJECT: 9202-230350B

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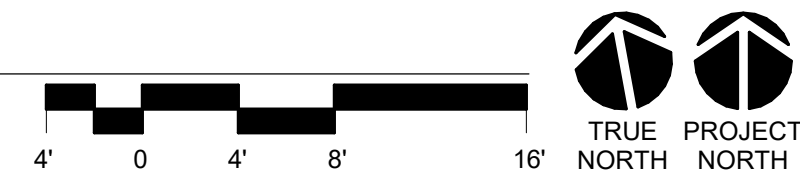
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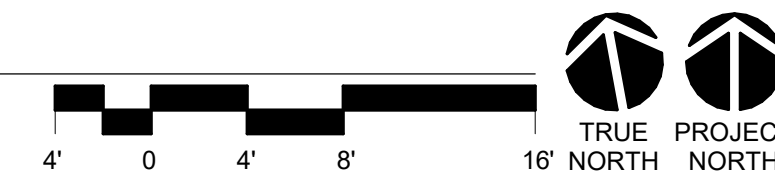


1 PIPING PLAN - LEVEL 2 - AREA A
M-202A 1/8" = 1'-0"

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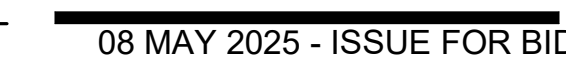
-  NON-RATED PARTITION
 1 HOUR FIRE BARRIER
 2 HOUR FIRE BARRIER



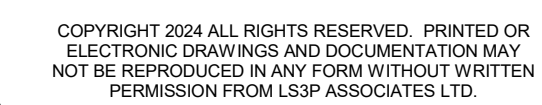
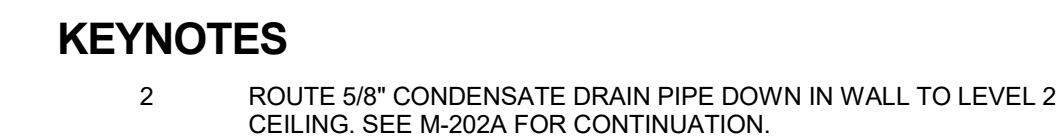


WALL RATING LEGEND:

	NON-RATED PARTITION
	1 HOUR FIRE BARRIER
	2 HOUR FIRE BARRIER



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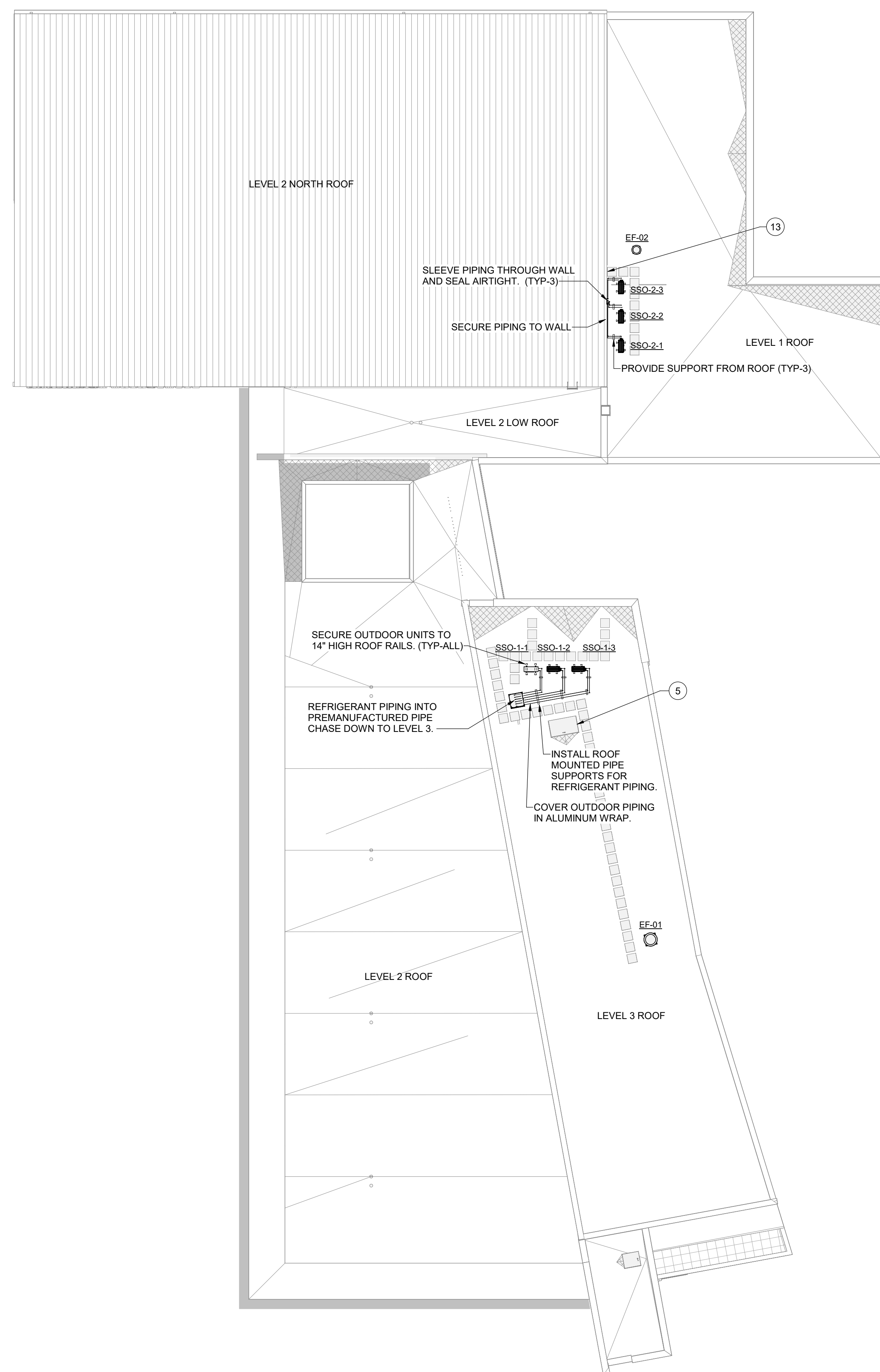
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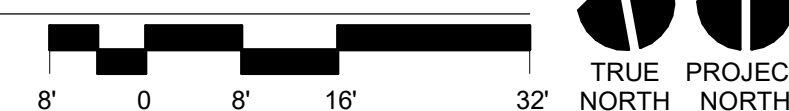
WALL RATING LEGEND:

	NON-RATED PARTITION
	1 HOUR FIRE BARRIER
	2 HOUR FIRE BARRIER

5/6/2025 1:06:09 PM



1 MECHANICAL ROOF PLAN
M-300 1/16" = 1'-0"



KEYNOTES

- 5 3'-0"x5'-6" ROOF HATCH DOWN TO 307 LARGE STORAGE WITH SHIP'S
LADDER ON LEVEL 3. SEE SHEETS M-103A AND M-203A FOR
CONTINUATION.
- 13 ACCESS TO LOW ROOF FROM DOOR AT EXTERIOR OF 230 CORRIDOR.



Elizabeth City
State University

LS3P

227 WEST TRADE STREET, SUITE 700
CHARLOTTE, NORTH CAROLINA 28201
TEL. 704.333.6686 FAX. 704.333.2922
WWW.LS3P.COM



223.040.01 5/8/2025

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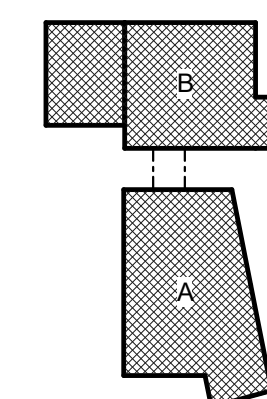
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SCO PROJECT: 22-25479-02B

LS3P PROJECT: 9202-230350B

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KEY PLAN:

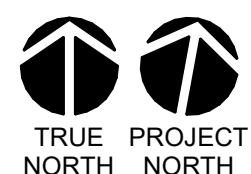


SHEET NAME:
MECHANICAL ROOF
PLAN

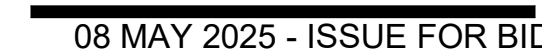
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SUBMISSION:

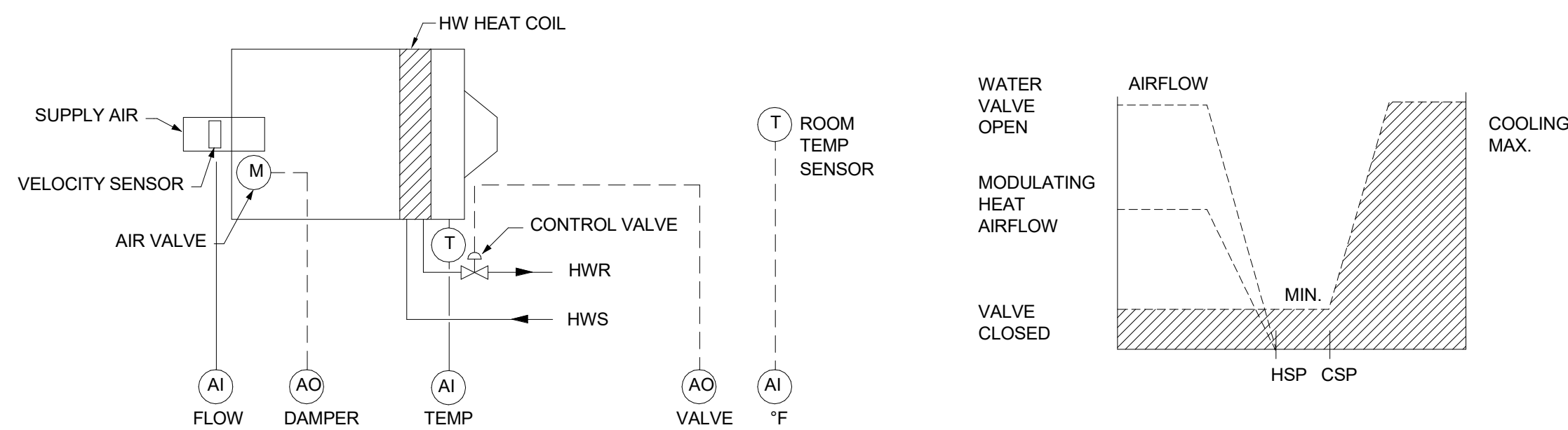
SHEET: **M-300**

08 MAY 2025 - ISSUE FOR BID



 NON-RATED PARTITION
 1 HOUR FIRE BARRIER
 2 HOUR FIRE BARRIER





VAV TERMINALS

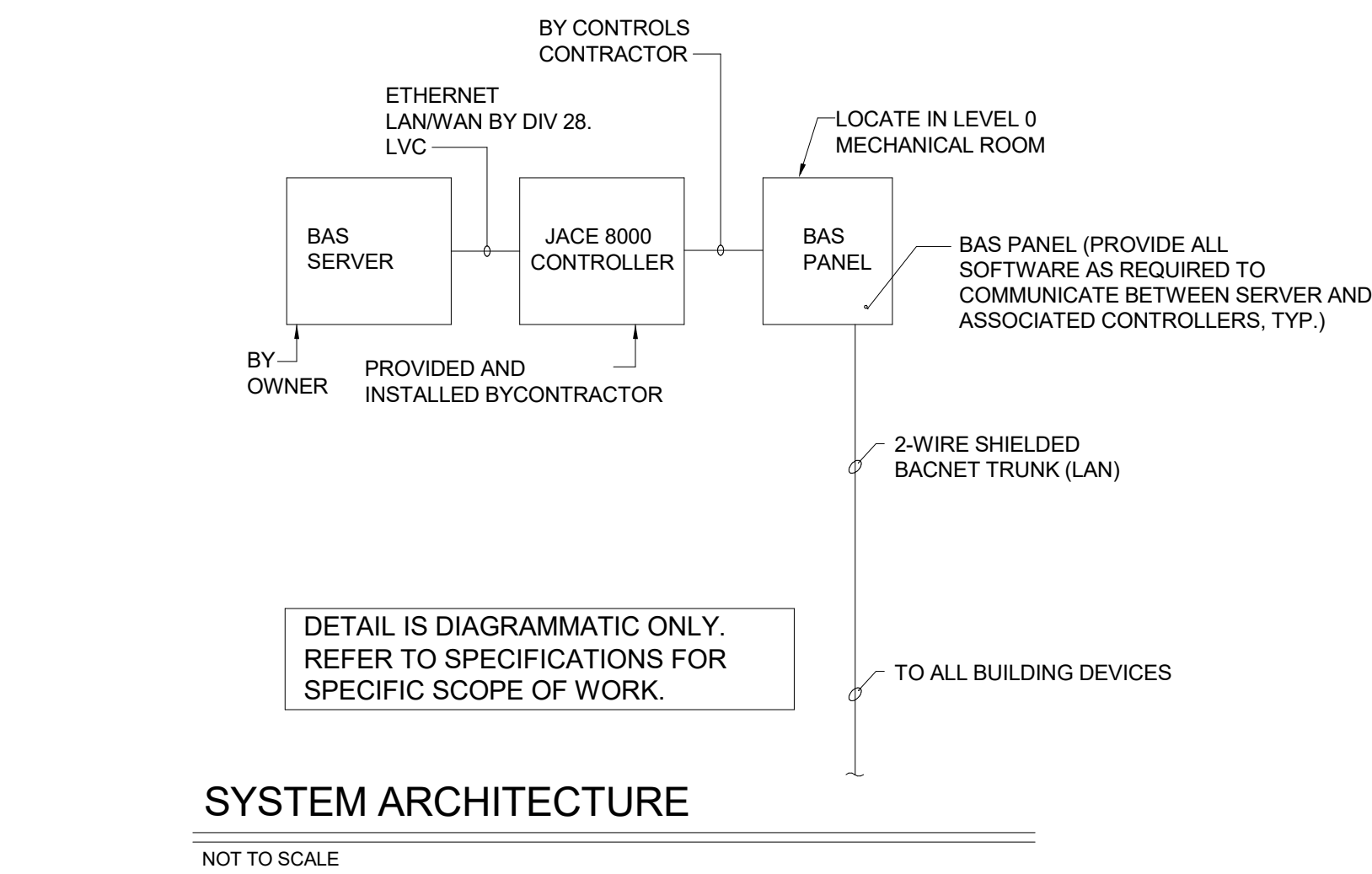
NOT TO SCALE

VAV TERMINALS (VAV REHEAT WITH A DUAL MAXIMUM AND SINGLE MINIMUM)

EACH TERMINAL SHALL BE INTERLOCKED TO BE ENERGIZED WHEN ITS ASSOCIATED AIR HANDLER IS ENERGIZED. SUPPLY AIR FROM THE AIR HANDLER SHALL BE DELIVERED TO THE CONDITIONED SPACE THROUGH THE TERMINAL BY A PRESSURE INDEPENDENT VELOCITY CONTROLLER. THE VELOCITY SENSOR SHALL BE LOCATED IN THE TERMINAL SUPPLY AIR INLET AND SHALL SENSE AVERAGE AIR VELOCITY IN THE INLET. THE CONDITIONED SPACE TEMPERATURE SHALL RESET THE VELOCITY CONTROLLER SETPOINT UPWARD ON RISE IN SPACE TEMPERATURE, AND DOWNWARD ON A FALL IN SPACE TEMPERATURE. THE VELOCITY CONTROLLER SHALL HAVE ADJUSTABLE DUAL MAXIMUM AND SINGLE MINIMUM AIR VELOCITY SETPOINTS. AS THE ROOM TEMPERATURE FALLS, THE VELOCITY SHALL BE RESET DOWNWARD TO A MINIMUM COOLING CFM. ON A CONTINUED FALL IN ROOM TEMPERATURE, THE VELOCITY SHALL BE MODULATED OPEN TO THE COIL, AND THE AIR VELOCITY SHALL GRADUALLY INCREASE TO THE HEATING MAXIMUM (ADJUSTABLE) TO SATISFY THE ROOM TEMPERATURE REQUIREMENT. UPON RISE IN SPACE TEMPERATURE ABOVE SETPOINT, THE REVERSE SHALL OCCUR.

THE TERMINAL UNIT CONTROLS SHALL BE ELECTRICALLY OPERATED DDC AND SHALL BE PROVIDED BY THE CONTROL SYSTEM MANUFACTURER. THE CONTROLS MANUFACTURER SHALL SHIP THE UNIT CONTROLS TO THE TERMINAL UNIT MANUFACTURER FOR MOUNTING AT THE FACTORY. ALL COSTS INCLUDING THE COST OF MOUNTING THESE CONTROLS SHALL BE BORNE BY THE MECHANICAL CONTRACTOR. THE TERMINAL UNIT HOT WATER VALVE SHALL BE FURNISHED BY THE CONTROLS MANUFACTURER AND MOUNTED IN THE PIPING BY THE MECHANICAL CONTRACTOR.

POINT LIST																					
		HARDWARE										SOFTWARE									
		OUTPUT					INPUT					ALARMS		BAS FUNCTIONS							
		DIGITAL		ANALOG			DIGITAL		ANALOG			DIGITAL	ANALOG								
SYSTEM:	CONTROL RELAY	SOLAR	CONTRACTOR	PNEUMATIC TRANSDUCER	ELECTRICAL TRANSDUCER	ELECTRIC MOTOR	PRESSURE SWITCH	TEMPERATURE SENSORS	CONTROL VALVE	ANALOG CONTACT	RV	TEMPERATURE	RELATIVE HUMIDITY	PSIG, PSI, P4	FLOW	AMPERAGE	BRIGHT STATUS	MAINTENANCE			
VAV BOXES																					
POINT DESCRIPTION																					
ROOM SENSOR																					
PRIMARY AIR VALVE																					
HOT WATER VALVE																					
DISCHARGE TEMP.																					



CONTROL NOTES

- THE CONTROLS CONTRACTOR SHALL COORDINATE COMPATIBILITY OF THIS BUILDING CONTROLS WITH ECSU. TRANE CONTROLS IN THE SYSTEM USED ON CAMPUS.
- SYSTEM GRAPHICS SCREENS SHALL INCLUDE THE FOLLOWING:
 - CURRENT SYSTEM STATUS (I.E. ON/OFF, OCCUPIED/UNOCCUPIED, ETC.), LAST START/STOP TIME AND DATE, INDICATION OF CURRENT EQUIPMENT STATUS (FANS, COMPRESSORS, PUMPS, BOILERS, CHILLERS, ELECTRIC DUCT HEATERS, RETURN AIR TEMPERATURE, DAMPER POSITION IN % OPEN OR CLOSED, DEHUMIDIFICATION SET POINT RETURN AIR TEMPERATURE, OUTSIDE AIR TEMPERATURE, ETC.).
 - THE WEB-BASED INTERFACE SHALL PROVIDE THE FOLLOWING SCREENS (OR VIEWS) AND THE INDICATED FUNCTIONALITY FOR EACH:
LOGON SCREEN--ALLOWS THE USER TO ENTER HIS OR HER USER NAME AND PASSWORD FOR LOGGING INTO THE SYSTEM. SYSTEM VIEW--PROVIDES THE FOLLOWING THREE PANELS: BROWSER--THE USER CAN BROWSE THE AVAILABLE SERVER(S) AND VIEW THE RANGES OF INFORMATION (EMS DATA POINTS) ASSOCIATED WITHIN EACH. ITEMS--THE PANEL DISPLAYS THE ITEMS (EMS DATA POINTS) ASSOCIATED WITH THE SERVER SELECTED IN THE BROWSER PANEL. OPERATION--DISPLAYS THE OPERATION AND ITS VALUE ASSOCIATED WITH THE ITEM SELECTED IN THE ITEMS PANEL, AND ALLOWS AUTHORIZED USERS TO MODIFY THE ITEM OR TO ADD THE ITEM TO A SUMMARY
- WIRE MANUAL RESET FREEZESTAT TO SHUT-DOWN FAN WITH ONE CONTACT AND ALERT THE BAS WITH A SECOND CONTACT.
- MOUNT STATIC PRESSURE SENSORS 2/3 DOWN THE LONGEST DUCT RUN. (1 PER FLOOR). CONTROLS SHALL CONTROL TO TAB CRITICAL ZONE.
- THE HIGH PRESSURE CUT-OUT SERVES AS A HIGH LIMIT DEVICE. HARD-WIRE THIS TO STOP THE SUPPLY FAN WITH ONE SET OF CONTACTS, AND ALERT THE BAS WITH THE OTHER CONTACT.
- DIFFERENTIAL DUCT STATIC PRESSURE SENSOR. THE LOW PRESSURE TAP SHALL BE IN THE OCCUPIED SPACE AND THE HIGH PRESSURE TAP SHALL IN THE SUPPLY DUCT. THIS VALUE SHALL BE SAMPLED EVERY SECOND. THE AVERAGE OF LAST 30 SAMPLES SHALL BE USED FOR CONTROL.
- HARD-WIRE SMOKE DETECTOR TO SHUT DOWN THE FAN WITH ONE CONTACT AND ALERT THE BAS WITH THE OTHER.
- ELECTRIC WIRING
 - THE BAS CONTRACTOR SHALL FURNISH AND INSTALL ALL ELECTRICAL CONTROL AND INTERLOCK WIRING REQUIRED FOR THE DDC SYSTEM.
 - THE WIRING FOR THE DDC SYSTEM SHALL BE PLENUM RATED CABLE EXCEPT IN MECHANICAL ROOMS, WALLS AND EXPOSED AREAS WHERE WIRING IS PROVIDED IN CONDUIT. POWER LINE CARRIER DEVICES OR RF SIGNALING DEVICES MAY NOT BE USED. ALL SYSTEM COMPONENTS AND SENSORS SHALL BE HARD WIRED.
- GENERAL: INDIVIDUAL AIR HANDLING UNITS, VAV UNITS, FANS, ETC. SHALL OPERATE AS DESCRIBED IN THE CONTROL SEQUENCE. THE POINTS LIST IS SHOWN AS A REFERENCE FOR MINIMUM REQUIREMENTS AND SHALL NOT BE CONSTRUED TO BE AN ALL EXCLUSIVE LIST OF POINTS TO BE MONITORED AND CONTROLLED.
- AIR FLOW MONITORING STATION
A 4-20 MA TRANSMITTER SHALL BE LOCATED AT THE AIR FLOW MONITORING STATION. THIS TRANSMITTER'S OUTPUT SHALL BE PROPORTIONAL TO VELOCITY. THIS VELOCITY SHALL BE USED ALONG WITH THE DUCT AREA TO CALCULATE CFM.
- ALL TERMINAL UNITS SHALL BE DDC, I.E.: BOX DAMPER CONTROLS, REHEAT COIL VALVES AND DIGITAL ROOM TEMPERATURE SENSORS. ALL AIR HANDLING UNITS SHALL HAVE DDC CONTROL DEVICES, I.E.: CHILLED WATER VALVES, RETURN AIR, OUTSIDE AIR AND RELIEF/EXHAUST AIR DAMPERS WIRED BACK TO A COMMON TERMINAL STRIP USING SPECIFIED SENSORS AND WIRING.
- THE CONTRACTOR SHALL CONNECT THE FACILITY INTEGRATOR INTO THE PROVIDED TERMINAL STRIPS TO MONITOR AND PROVIDE LOOP CONTROL FOR EACH LOCAL LOOP. I.E.: COIL DECK CONTROL, MIXED AIR CONTROL. THE BAS CONTRACTOR SHALL WRITE AND IMPLEMENT ALL PROGRAMMING STRATEGIES.
- AIR HANDLING UNITS SHALL DE-ENERGIZE WHEN FACP DETECTS SMOKE AT EITHER CEILING MOUNTED SMOKE DETECTORS OR BY DUCT MOUNTED SMOKE DETECTORS.
- THE CONTROL SYSTEM COMPONENTS SHALL BE BACNET COMPATIBLE.
- WIRING BETWEEN INDOOR MINI SPLIT & OUTDOOR UNIT SHALL BE PROVIDED BY M.C. INCLUDING CONTROL WIRING. ALL ROOMS SERVED BY SPLIT SYSTEMS SHALL HAVE A SECOND THERMOSTAT TO MONITOR ROOM TEMPERATURE. AN ALARM SHALL BE SENT TO THE BAS UPON A TEMPERATURE OF 85 DEG F (ADJ) OR HIGHER.
- TEMPERATURE SENSORS USED FOR TEMPERATURE CONTROL SHALL BE WALL MOUNTED, TAMPER PROOF STAINLESS STEEL FLAT PLATE SENSORS WITH TAMPER PROOF SCREWS SEALED IN AIRTIGHT BOXES.

CONTROL LEGEND

DP	DIFFERENTIAL PRESSURE TRANSMITTER		DIFFERENTIAL PRESSURE CONTROLLER/SENSOR
PT	PRESSURE TRANSMITTER		VARIABLE FREQUENCY DRIVE
H	HUMIDITY		PSIA POUNDS PER SQUARE INCH - ABSOLUTE
T	TEMPERATURE		PSIG POUNDS PER SQUARE INCH - GAUGE
P	PRESSURE		PSID POUNDS PER SQUARE INCH - DIFFERENTIAL
D	DIFFERENTIAL		AUX MOTOR AUXILIARY CONTACTS
S	STATIC		POT PORTABLE OPERATORS TERMINAL (BY OWNER)
A	ANALOG		F/O FIBEROPTIC CABLE
I	INPUT		(A) HUMIDITY TRANSMITTER CONNECTED TO AN ANALOG INPUT
O	OUTPUT		(A) TEMPERATURE TRANSMITTER CONNECTED TO AN ANALOG INPUT
°F	DEGREE FAHRENHEIT	(A)	DAMPER OPERATOR CONNECTED TO AN ANALOG INPUT
N. W.C.	INCHES WATER COLUMN	(A)	DAMPER OPERATOR CONNECTED TO A DISCRETE OUTPUT
%RH	PERCENT RELATIVE HUMIDITY	(A)	DIFFERENTIAL PRESSURE SWITCH CONNECTED TO A DISCRETE INPUT
N.O.	NORMALLY OPEN	(A)	HIGH PRESSURE TAP
N.C.	NORMALLY CLOSED	(A)	LO PRESSURE TAP
FZ	FREEZESTAT	(A)	TEMPERATURE SENSOR W/ AVERAGING ELEMENT CONNECTED TO AN ANALOG INPUT
SDC	STANDALONE DIGITAL CONTROLLER	(A)	MOTOR AMPS FROM A CT/TRANSDUCER TO AN ANALOG INPUT
	TEMPERATURE SENSOR W/ AVERAGING ELEMENT	(A)	ASC APPLICATION SPECIFIC CONTROLLER
	CONTROL DAMPER	(A)	OWS OPERATORS WORK STATION
	2-WAY CONTROL VALVE	(A)	3-WAY CONTROL VALVE
	BAS INPUT	(A)	2-WAY CONTROL VALVE
	BAS OUTPUT	(A)	
	SMOKE DETECTOR	(A)	
	AMPS	(A)	
	NCU NETWORK CONTROL UNIT	(A)	
	VMA VARIABLE AIR VOLUME UNIT CONTROLLER	(A)	
	POT PORTABLE OPERATORS TERMINAL	(A)	

POINT LIST																					
		HARDWARE										SOFTWARE									
		OUTPUT					INPUT					ALARMS		BAS FUNCTIONS							
		DIGITAL	ANALOG	DIGITAL	ANALOG	DIGITAL	ANALOG	DIGITAL	ANALOG												
SYSTEM: MISCELLANEOUS	CONTROL RELAY																				
	SOLenoid																				
	CONTACTOR																				
	BUILDING TO BAS INTERFACE																				
	ELECTRICAL TRANSducer																				

DOMESTIC WATER HEATERS

A TEMPERATURE SENSOR IN THE MAIN SUPPLY PIPE SHALL MONITOR AND DISPLAY THE DOMESTIC HOT WATER TEMPERATURE. TYPICAL FOR EACH HOT WATER LOOPS.

MINI-SPLIT DEDICATED COOLING UNITS (SSI/SSO)

THE MANUFACTURER PROVIDED THERMOSTAT SHALL CONTROL THE SETPOINT AND OPERATION OF THE SPLIT SYSTEM. A SECOND THERMOSTAT SHALL BE INSTALLED IN EACH SPACE SERVED BY A SPLIT SYSTEM TO MONITOR TEMPERATURE. AN ALARM SHALL BE SENT TO THE BAS UPON A TEMPERATURE MEASURED AT 85 DEF F (ADJ) OR HIGHER.

HOT WATER UNITS

EACH UNIT SHALL OPERATE FROM A WALL MOUNTED THERMOSTAT/SENSOR. TWO-WAY HOT WATER CONTROL VALVES SHALL MODULATE TO MAINTAIN THERMOSTAT/SENSOR SETPOINT. UNIT HEATER SHALL ENERGIZE UPON A TEMPERATURE OF 80 DEG F OR LESS. THE HOT WATER VALVE AND FAN SHALL OPERATE TO MAINTAIN 65 DEG F IN THE SPACE. THE BAS PANEL TO MONITOR STATUS AND ALLOW SETPOINT ADJUSTMENT. AN ALARM SHALL BE SENT IF THE ROOM TEMPERATURE DROPS BELOW 55 DEG F.

ELECTRIC WALL MOUNTED UNIT HEATERS

ON SETPOINT SHALL BE 65 DEG F. A SEPARATE THERMOSTAT SHALL BE INSTALLED IN THE FIRE RISER ROOM TO MEASURE ROOM TEMPERATURE AND ALARM AT THE BAS UPON DETECTION OF A TEMPERATURE OF 50 DEF F OR LESS.

EXHAUST FANS SERVING ELECTRICAL ROOMS

FANS SHALL BE CONTROLLED BY A WALL MOUNTED THERMOSTAT. FAN SHALL ENERGIZE WHEN THERMOSTAT.

EXHAUST FANS SERVING TOILET ROOMS

FAN SHALL BE ENERGIZED FROM BAS SYSTEM AND OPERATE DURING OCCUPIED MODES. PROOF OF OPERATION SHALL BE PROVIDED.

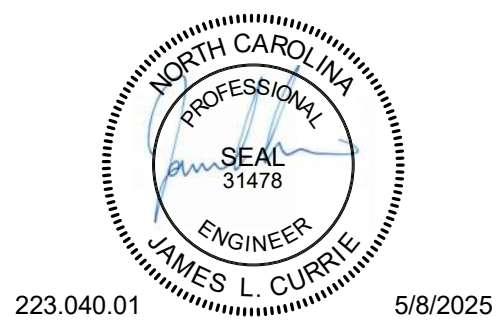
REQUIREMENTS FOR MONITORING CONTROL OF DIVISION 22, 26 AND 28 EQUIPMENT VIA BAS			
ITEM	DESCRIPTION	REFER TO SECTION	REMARKS
LIGHTING CONTROL SYSTEM	ALLOW FOR MONITORING AND REMOTE CONTROL VIA LON WORKS OR BACNET OVER ETHERNET INTERFACE	260937	COORDINATE CONNECTION AND POINT TYPE WITH DIVISION 26 CONTRACTOR.
ATS	MODBUS 485 INTERFACE: STATUS: -SWITCH IN NORMAL POSITION -SWITCH TRANSFERRED TO EMERGENCY POSITION ALARMS: -LOSS OF NORMAL POWER	263200 (AUTOMATIC TRANSFER SWITCHES)	ACCOMPLISH VIA AUXILIARY CONTACTS FURNISHED WITH ATS
ELECTRICAL SYSTEMS	EMERGENCY GENERATOR STATUS FAULT		COORDINATE CONNECTION AND POINT TYPE WITH DIVISION 26 CONTRACTOR.
PLUMBING SYSTEMS	a. SUMP PUMP FOR EACH ELEVATOR PIT · PUMP OPERATION STATUS b. HOT WATER RETURN PUMPS · PUMP ON/OFF. SCHEDULE BY OWNER c. STORM WATER DRAINAGE PUMPS · PUMP OPERATION STATUS · ALARM WHEN COMMANDED RUN TO AND PUMP FAILS TO ENERGIZE. d. DOMESTIC WATER BACKFLOW PREVENTERS · ALARM UPON WATER DETECTION IN DISCHARGE OF SAFETY RELIEF VALVE. INTERLOCK WITH CONTROL SYSTEM PROVIDED BY BACKFLOW MANUFACTURER.		COORDINATE CONNECTION AND POINT TYPE WITH DIVISION 22 CONTRACTOR. REFER TO PLUMBING FOR MORE INFORMATION.



Elizabeth City State University



227 WEST TRADE STREET, SUITE 700
CHARLOTTE, NORTH CAROLINA 28202
TEL. 704.333.6686 FAX. 704.333.2926
WWW.LS3P.COM



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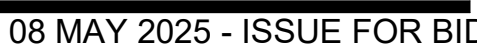
ECSU SCHOOL OF AVIATION BUILDING
1704 Weeksville Rd., Elizabeth City, NC 27909
SCO PROJECT: 22-25479-02B
LS3P PROJECT: 9202-230350B

SHEET NAME:
TEMPERATURE CONTROL DIAGRAMS AND SEQUENCES
ORIG SUBMISSION: 05/08/25

SHEET:
M-501
08 MAY 2025 - ISSUE FOR BID

CONTROLS ABBREVIATIONS	
AFMS	AIR FLOW MEASURING STATION
AI	ANALOG IN
AO	ANALOG OUT
BR	BACNET READ
BW	BACNET WRITE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CO2	CARBON DIOXIDE SENSOR
DI	DIGITAL IN
DO	DIGITAL OUT
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
EA	EXHAUST AIR
ECM	ELECTRONICALLY COMMUTATED MOTOR
EF	EXHAUST FAN
F	FLOW MEASUREMENT
FZ	FREEZE STAT
H	HUMIDITY SENSOR
HPS	HIGH PRESSURE SWITCH
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LPS	LOW PRESSURE SWITCH
M	MOTOR OPERATED ACTUATOR
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
OA	OUTDOOR AIR
RA	RETURN AIR
RF	RETURN FAN
SA	SUPPLY AIR
SD	DUCT SMOKE DETECTOR
SF	SUPPLY FAN
T	TEMPERATURE SENSOR
VFD	VARIABLE FREQUENCY DRIVE

- FILTER MAINTENANCE CHECK - WHEN SUPPLY FAN RUN TIME REACHES 1000 HOURS.



4 TOILET EXHAUST FAN DETAIL
M-601 NOT TO SCALE

PIPE SUPPORT DETAIL

CLEVIS HANGER DETAIL

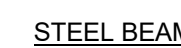


TRAPEZE HANGER DETAIL

CONCRETE INSERT



PIPE STAND SUPPORT



PIPE HANGER ATTACHMENT - VARIOUS STRUCTURES

VERTICAL PIPE SUPPORT FROM FLOOR



