<u>PIPING</u>

ELBOW DOWN

BOTTOM CONNECTION

(REFER TO SPECIFICATION

FLOW DIRECTION DESIGNATION

☐ LINE CONTINUATION BREAK

EXISTING PIPING TO BE REMOVED

FOR SIDE, TOP OR BOTTOM TEE)

TOP CONNECTION

ELBOW UP

(45° OR 90°)

TOP CONNECT (45° OR 90°)

€ 45° PIPE DROP

PIPING SYSTEM LABELS

CHILLED WATER SUPPLY

DOMESTIC COLD WATER

DRAIN

CONDENSATE PUMP DISCHARGE

HIGH PRESSURE STEAM HEATING HOT WATER RETURN

HEATING HOT WATER SUPPLY

- LOW PRESSURE CONDENSATE

LOW PRESSURE STEAM

CONTROLS

CONTROLS ABBREVIATION MATRIX

CONTROLS ABBREVIATION EXAMPLE

FOR FIRST POSITION, USE FIRST COLUMN.

DEFINITIONS

- FAIL TO LAST POSITION

NORMALLY OPEN

NORMALLY CLOSED

FOR FOLLOWING POSITION(S), USE SECOND COLUMN.

ALLOW AN OPERATION TO START

REQUIRE AN OPERTION TO STOP

COMMAND EQUALS STATUS

REQUIRE AN OPERATION TO START

MAXIMUM COMMAND OR FULL OPEN

MINIMUM COMMAND OR FULL CLOSED

PREVENT AN OPERATION FROM STARTING

DUCT SMOKE DETECTOR

PRESSURE TRANSMITTER

PRESSURE DIFFERENTIAL

TRANSMITTER

F_{SD} DUCT SMOKE DETECTOR

T=TEMPERATURE.

ACTIVATE

DEACTIVATE

DISABLE

PROVE

100%

S=SWITCH, L=LOW, A=ALARM

FAIL OPEN

FAIL CLOSED

MAKE UP WATER

DOUBLE

<u>SINGLE</u>

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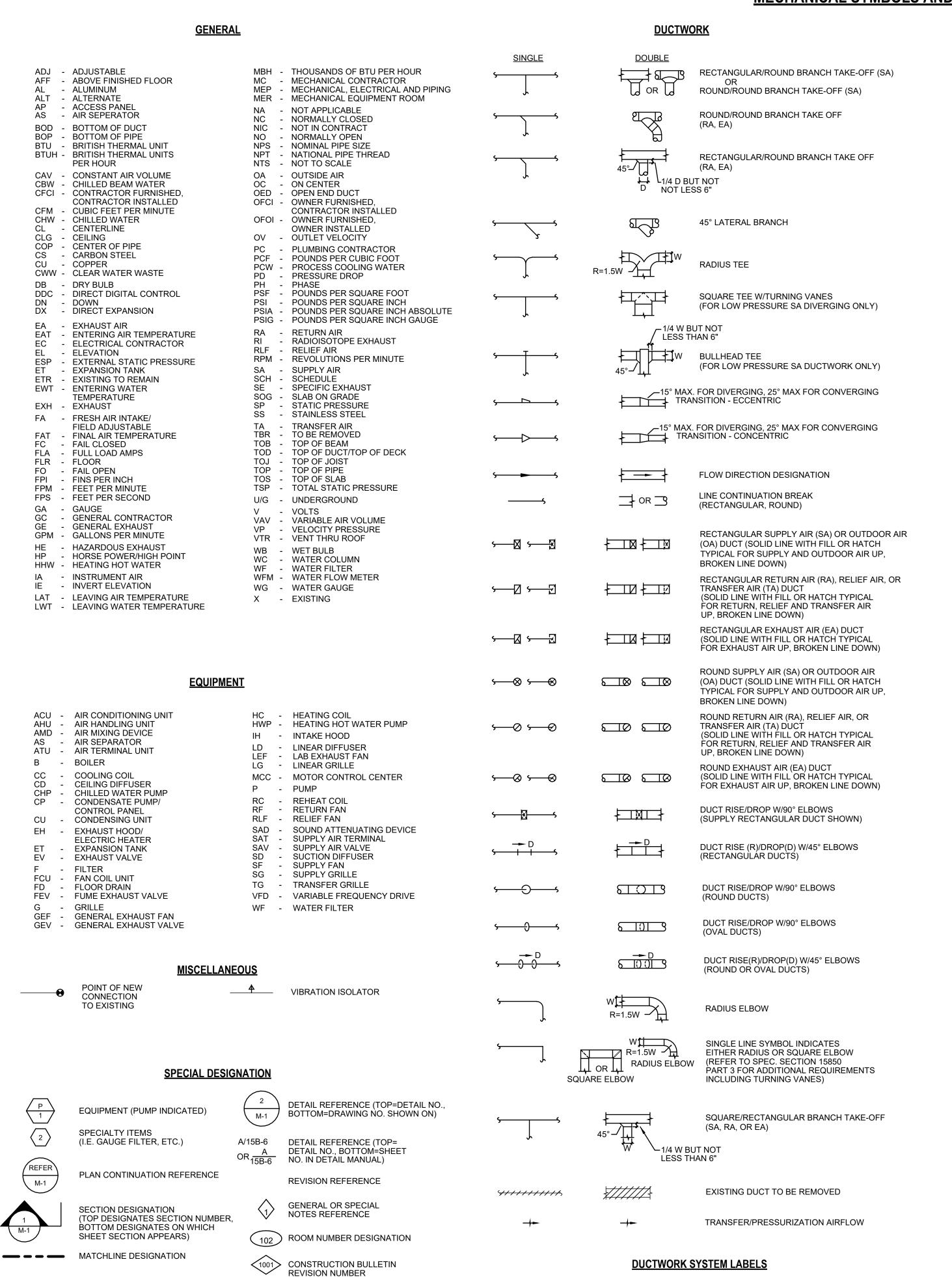
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Architects Lewis + Whitlock 206 West Virginia St. Tallahassee, Florida 32301

850.942.1718 www.think3d.net Description:

Mechanical Symbols and Abbreviations

Sheet No.:



- EXHAUST AIR

- OUTSIDE AIR

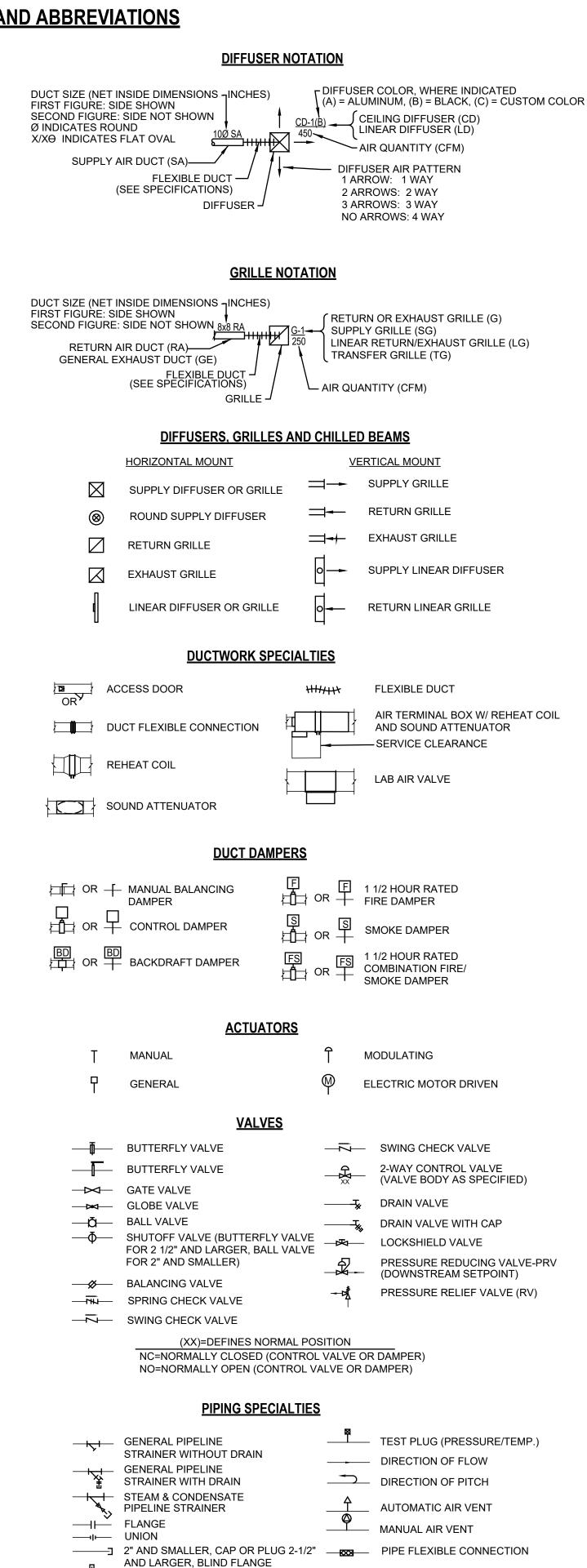
FUME EXHAUST

GENERAL EXHAUST

RETURN AIR

SUPPLY AIRTRANSFER AIR

RLF - RELIEF AIR



THERMOMETER

GAUGE VALVE)

—<u>I</u>H— FLOW SENSOR

—**№**— FLOW METER

PRESSURE GAUGE (WITH

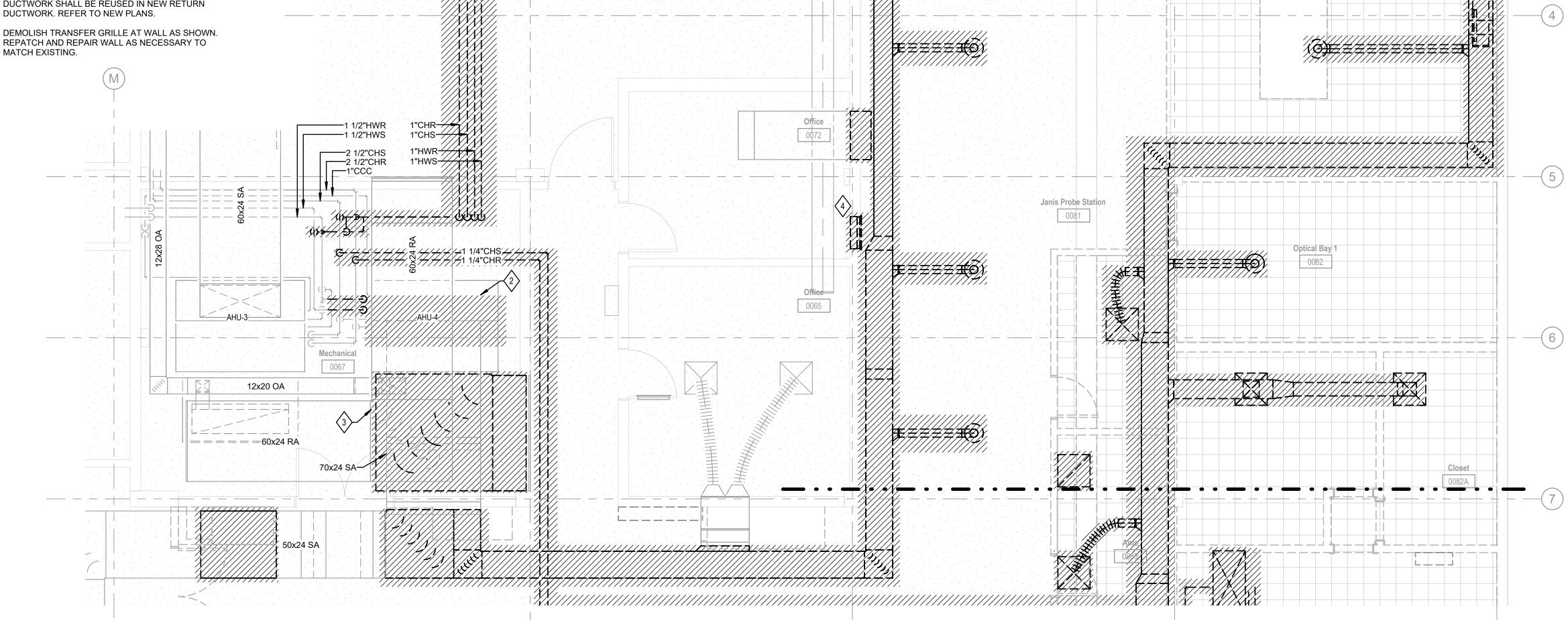
EQUIPMENT NOTATION FAN/BLOWER **CONTROLS SYMBOLS** PROCESS FLOW DIRECTIONAL XXXXX \ \ PROCESS MEDIUM DESCRIPTION CONTROLLER IDENTIFIER (VFD, MS, ETC) — VFD = VARIABLE FREQUENCY DRIVE MS = MOTOR STARTER DEVICE/CONTROLLER SIGNAL PATHWAY SENSING LINE FIELD MOUNTED CONTROLS ── CONCENTRIC OR ECCENTRIC REDUCER THERMOSTAT ——▶— CONCENTRIC OR ECCENTRIC REDUCER COMBINATION TEMPERATURE & — CONCENTRIC REDUCER **HUMIDITY STAT** ECCENTRIC REDUCER COMBINATION TEMPERATURE, ——

☐— INVERTED BUCKET TRAP HUMIDITY, AND CO2 STAT —☐⊗— FLOAT AND THERMOSTATIC TRAP AFM AIR FLOW MONITOR

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- 2. EXISTING BUILDING ELEMENTS AND DISTRIBUTION, INCLUDING BUT NOT LIMITED TO WALLS, CEILINGS, LIGHTS, CONDUIT, DUCTS, PIPING, INSULATION, OR OTHER SYSTEMS THAT ARE DAMAGED OR REMOVED DUE TO CONTRACTOR'S WORK SHALL BE PATCHED, REPAIRED, OR REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER, THE OWNER, AND AUTHORITIES HAVING JURISDICTION.
- 3. CONTRACTOR SHALL COORDINATE WITH OWNER ALL WORK THAT REQUIRES THE SHUTDOWN OF EXISTING AND STARTUP OF NEW UTILITIES PRIOR TO START. WORK MAY BE REQUIRED TO BE PERFORMED AT NIGHT, ON WEEKENDS AND/OR OVER HOLIDAYS.
- 4. FOR CLARITY, NOT ALL DEVICES ARE SHOWN ON FLOOR PLANS. REFER TO FLOW DIAGRAMS, CONTROL DIAGRAMS, DETAILS AND SPECIFICATIONS FOR ADDITIONAL DEVICES.
- 5. WHERE REQUIRED, PROVIDE ADDITIONAL DEMOLITION BEYOND THAT SHOWN TO FACILITATE INSTALLATION OF NEW WORK.
- 6. WORK SHOWN HEREIN IS INTENDED TO SHOW END RESULT AND DOES NOT FULLY IMPLY SEQUENCING OF WORK. CONTRACTOR TO ESTABLISH WORK SEQUENCE VIA COORDINATION WITH OWNER, REVIEW OF EXISTING CONDITIONS AND REVIEW OF PHASING PLANS.

SHEET KEYNOTES

- 1. DEMOLISH FUME EXHAUST LOUVER. REFER TO ARCHITECTURAL DRAWINGS.
- 2. DEMOLISH EXISTING HOT WATER COIL AND COOLING COIL AT UNIT IN PREPARATION OF COOLING COIL REPLACEMENT. REFER TO NEW PLANS. CONTRACTOR SHALL REPAIR AND/OR REPLACE UNIT CASING AS REQUIRED BY UNIT MANUFACTURER PROCEEDING DEMOLITION. HEATING HOT WATER LINES AND ASSOCIATED PIPING ACCESSORIES SHALL SHALL BE DEMO'D BACK TO RISER AND CAPPED. CHILLED WATER PIPING TO COOLING COIL SHALL BE TEMPORARILY DISCONNECTED DURING DEMOLITION AND RECONNECTED UPON INSTALLATION OF NEW
- 3. DEMOLISH RETURN DUCTWORK AT UNIT WITHIN MECHANICAL ROOM. OUTSIDE AIR DUCT TAPPED INTO RETURN DUCTWORK SHALL BE MAINTAINED AND RECONNECTED TO NEW RETURN DUCTWORK. ALL CONTROL DEVICES IN RETURN DUCTWORK SHALL BE REUSED IN NEW RETURN
- 4. DEMOLISH TRANSFER GRILLE AT WALL AS SHOWN. REPATCH AND REPAIR WALL AS NECESSARY TO MATCH EXISTING.



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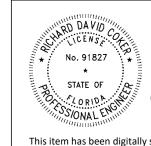
Dilution Fridge Area

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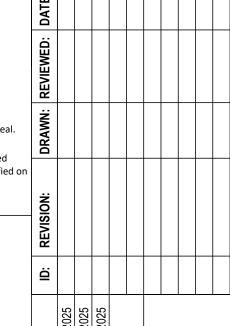
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Description: Basement Mechanical Demolition Plan - A

Sheet No.:

MD1.1

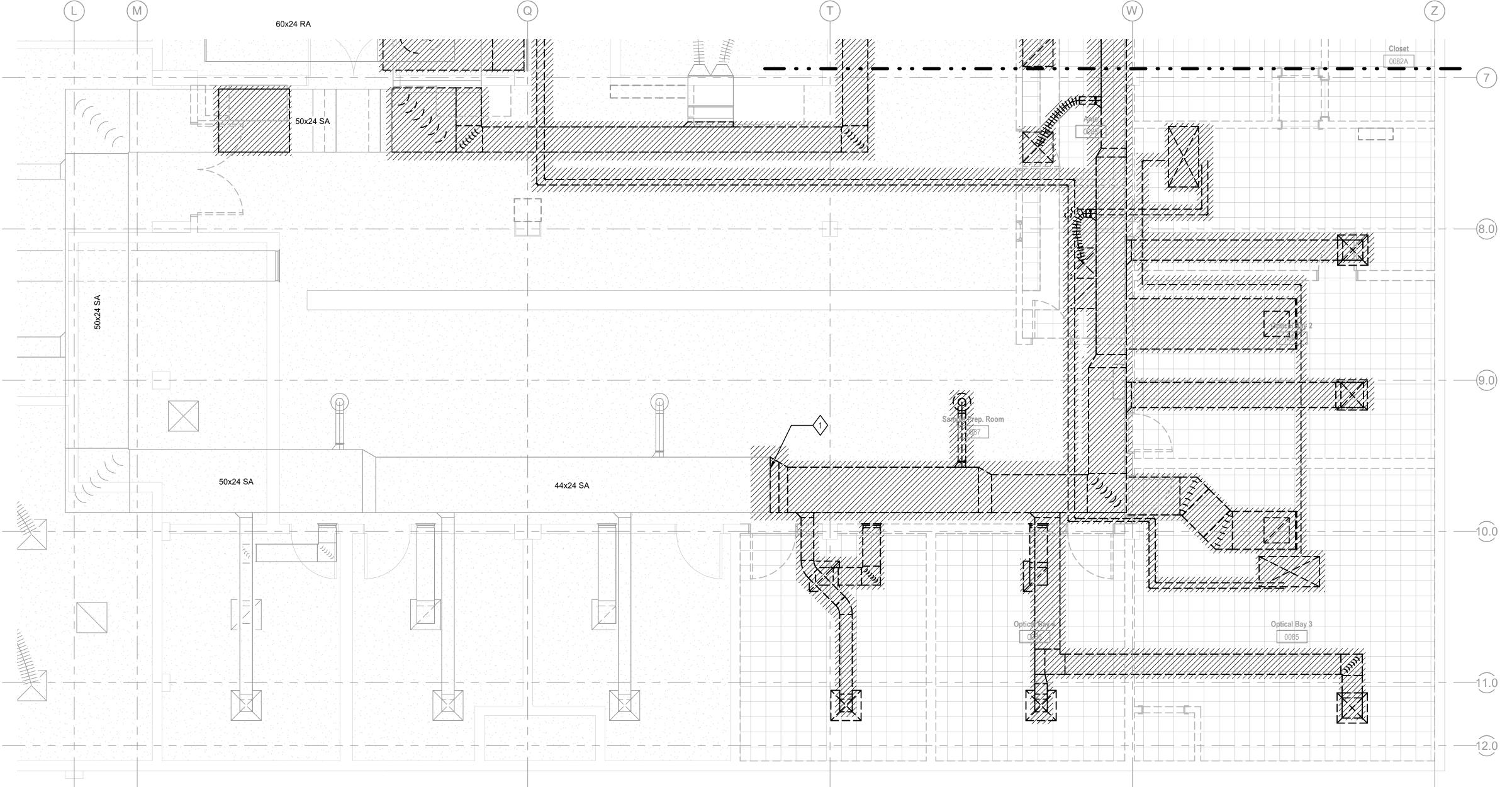
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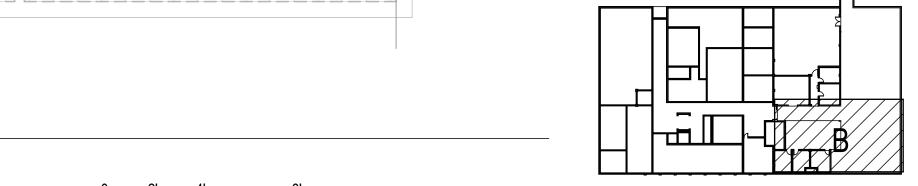
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- 6. WORK SHOWN HEREIN IS INTENDED TO SHOW END RESULT AND DOES NOT FULLY IMPLY SEQUENCING OF WORK. CONTRACTOR TO ESTABLISH WORK SEQUENCE VIA COORDINATION WITH OWNER, REVIEW OF EXISTING CONDITIONS AND REVIEW OF PHASING PLANS.

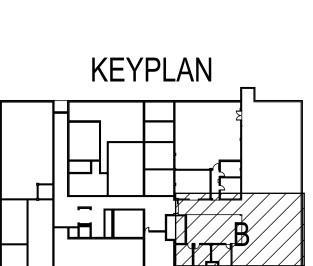
SHEET KEYNOTES

1. DEMOLISH DUCTWORK SERVING AREAS WITHIN PROJECT SCOPE, AS SHOWN. CAP EXISTING TO









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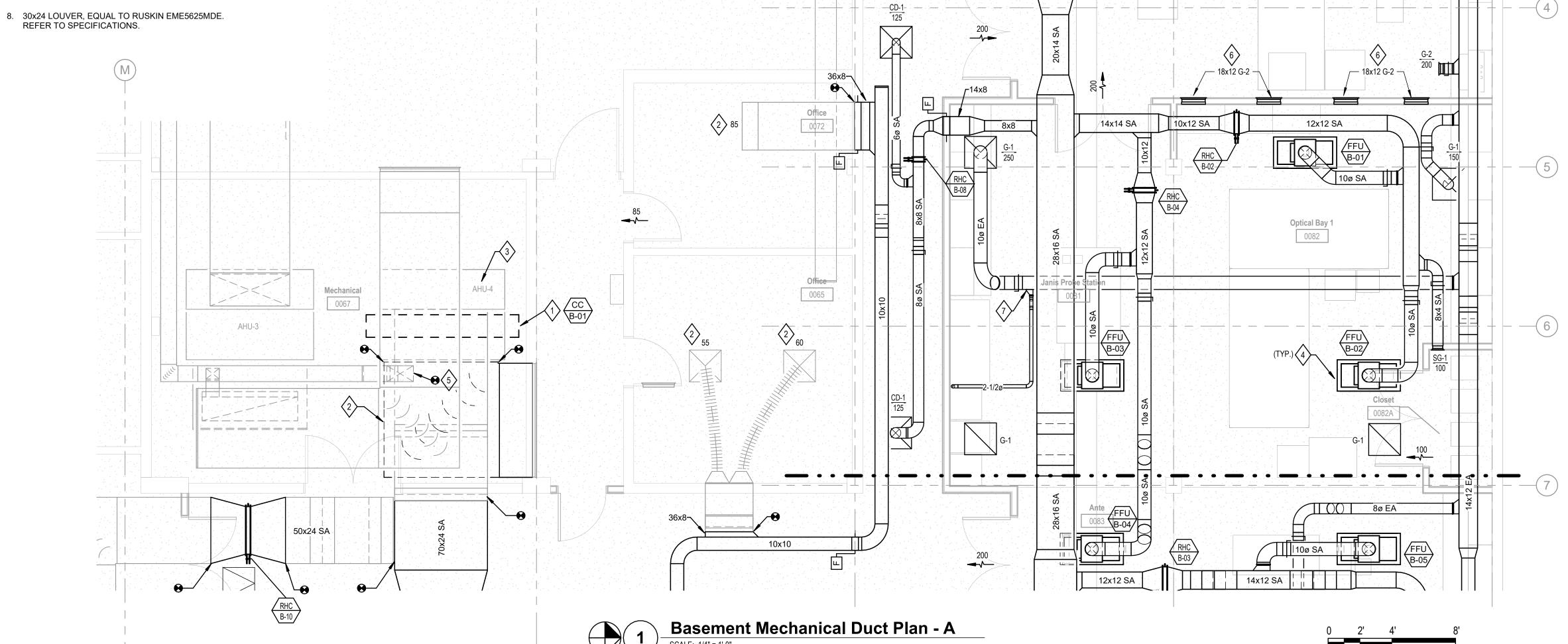
Basement Mechanical Demolition Plan - B

MD1.2

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SHEET KEYNOTES

- 1. NEW COOLING COIL REFER TO COOLING COIL SCHEDULE FOR REQUIRED PERFORMANCE. CONTRACTOR SHALL REPAIR AND/OR REPLACE UNIT CASING AS REQUIRED BY UNIT MANUFACTURER RESULTING FROM DEMOLITION. REFER TO DEMOLTION AND NEW PIPING PLANS FOR FURTHER DETAILS.
- RELOCATE AND REUSE EXISTING CONTROLS SENSORS AND EQUIPMENT, INCLUDING DUCT SMOKE DETECTOR, IN NEW RETURN DUCTWORK NEAR INTAKE OF UNIT. REFER TO CONTROLS DIAGRAM FOR COMPLETE REPRESENTATION OF CONTROL DEVICES TO BE REUSED.
- 3. TAB TO REBALANCE UNIT TO AIRFLOWS LISTED ON COOLING COIL SCHEDULE. REFER TO SCHEDULE.
- 4. REFER TO FFU SCHEDULE FOR AIRFLOW REQUIREMENTS.
- 5. RECONNECT EXISTING OA DUCTWORK TO NEW RETURN DUCTWORK.
- 6. INSTALL TRANSFER GRILLES AND DUCTWORK 10'-0" ABOVE FINISHED FLOOR FROM BOTTOM OF
- 7. PVC EXHAUST DUCTWORK TO LAB EQUIPMENT. SIZE BRANCH AS SHOWN AND CONNECT TO EXHAUST DUCT MAIN WITH PVC TO GALVANIZED TRANSITION. TERMINATE PVC PIPE 12" BELOW CEILING AT EACH DROP SHOWN WITH BUTTERFLY

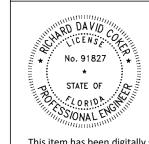


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/ 30x24x24 DEEP GE PLENUM

12x12 G-2

8x4 SA

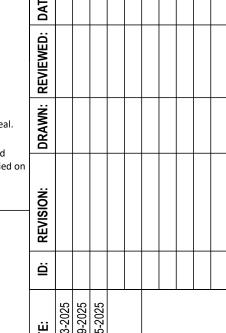
Dilution Fridge Area

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

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KEYPLAN

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Sheet No.:

M1.1

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SHEET KEYNOTES

- 1. REFER TO FFU SCHEDULE FOR AIRFLOW REQUIREMENTS
- 2. TAB CONTRACTOR TO REBALANCE EXISTING

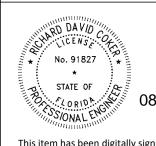
DIFFUSERS TO CFM SHOWN IN BOLD.

- 3. ARCHITECTURAL CEILING ACCESS PANEL TO BE INSTALLED AT THIS LOCATION. REFER TO ARCHITECTURAL PLANS.
- 4. TERMINATE TRANSFER AIR DUCT OPEN ENDED WITH WIRE MESH GRILLE ON BOTH ENDS.
- 5. PVC EXHAUST DUCTWORK TO LAB EQUIPMENT. SIZE BRANCH AS SHOWN AND CONNECT TO EXHAUST DUCT MAIN WITH PVC TO GALVANIZED TRANSITION. TERMINATE PVC PIPE 12" BELOW CEILING AT EACH DROP SHOWN WITH BUTTERFLY
- 6. CONNECT EXHAUST DUCTWORK TO SNORKEL AT LOCATION SHOWN AND BALANCE BRANCH TO 80 CFM. REFER TO ARCHITECTURAL PLANS.



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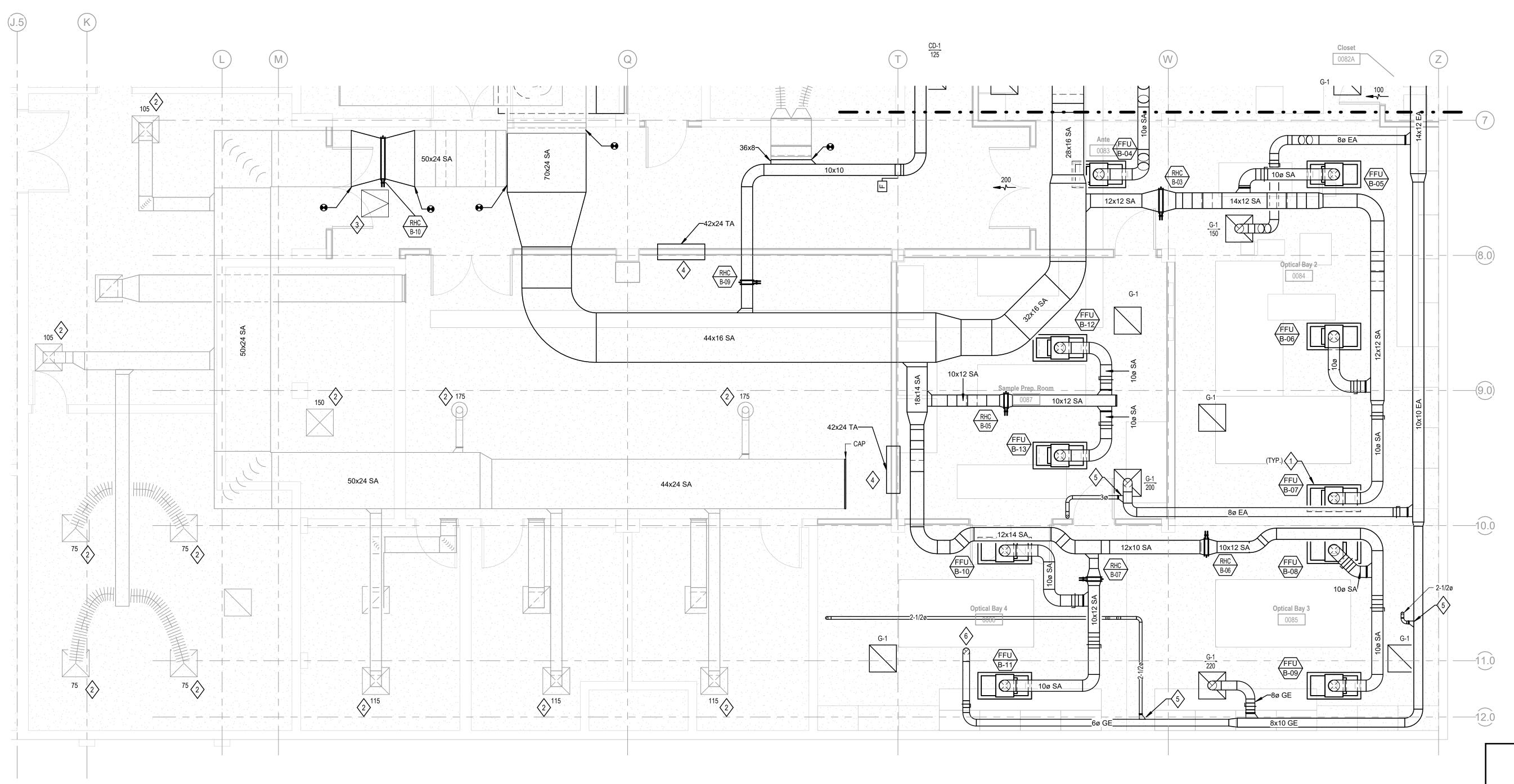
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KEYPLAN

Description: Basement Mechanical Duct Plan - B

Sheet No.:

M1.2

Basement Mechanical Duct Plan - B

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

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

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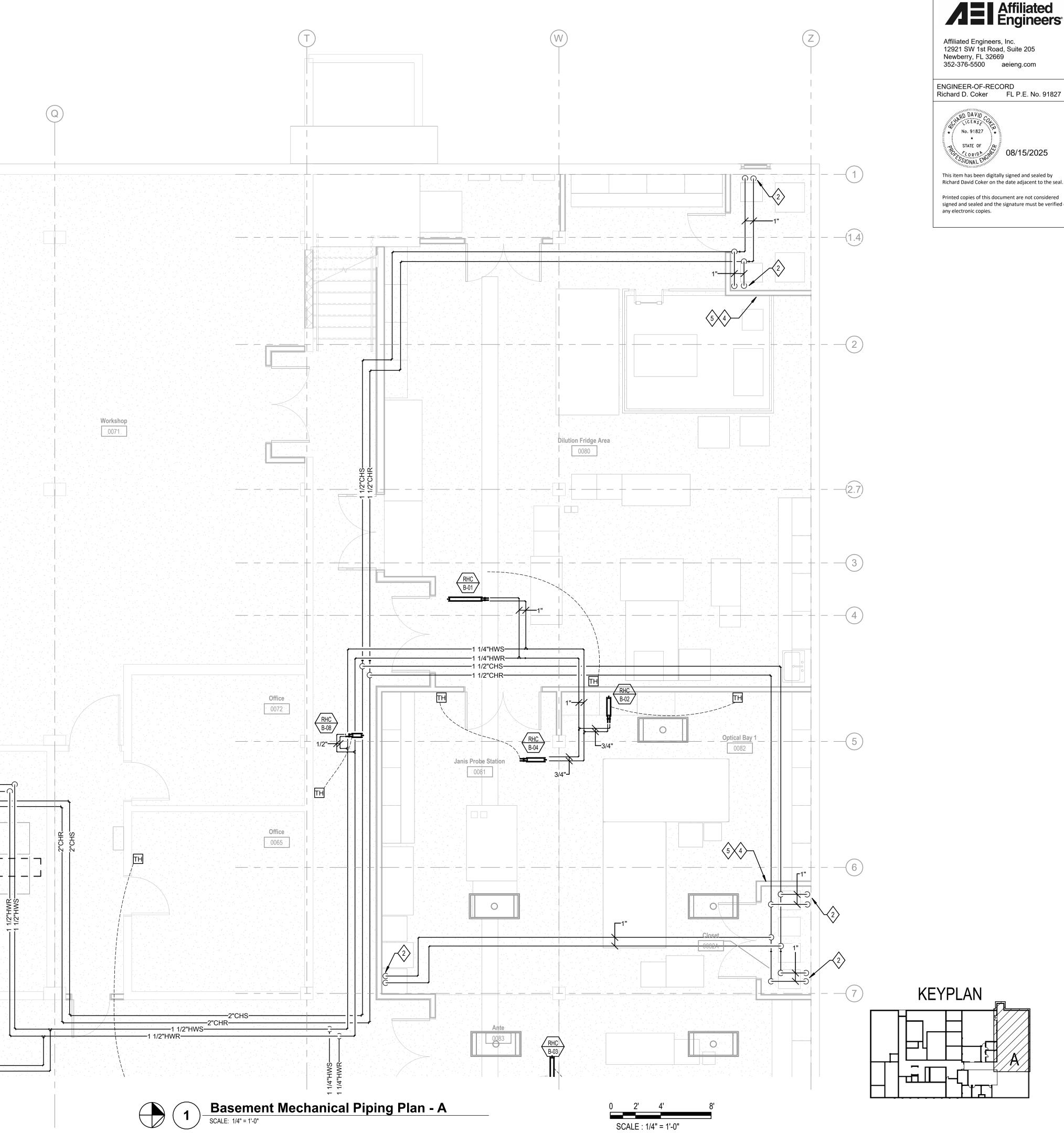
SHEET KEYNOTES

- 1. NEW COOLING COIL REFER TO COOLING COIL SCHEDULE. CONTRACTOR TO RECONNECT EXISTING CHILLED WATER, SUPPLY, RETURN, AND CONDENSATE LINES TO UNIT AFTER INSTALLATION OF NEW COIL. ALL EXISTING PIPING ACCESSORIES, INCLUDING CHILLED WATER CONTROL VALVE, SHALL BE RECONNECTED. PERFORMANCE OF SUCH VALVES AND ACCESSORIES SHALL BE VERIFIED AND REPORTED TO ENGINEER IF INOPERATIVE OR DAMAGED.
- 2. PROVIDE EQUIPMENT SHUT-OFF VALVES AND PRESSURE GAUGES ON CHILLED WATER SUPPLY AND RETURN LINES SERVING HEAT EXCHANGER. ADDITIONALLY, PROVIDE WYE STRAINER ON SUPPLY LINE, DOWNSTREAM OF SHUT-OFF VALVE. TERMINATE PIPING OPEN-ENDED 4'0" AFF.
- 3. PROVIDE SHUT-OFF VALVES FOR NEW HEATING HOT WATER AND CHILLED WATER LINES.
- 4. PROVIDE FIVE (5) 4" WALL SLEEVES 10'0" AFF FOR OWNER-FURNISHED HOSES AND CABLING. COORDINATE FINAL LOCATIONS WITH OWNER. WALL SLEEVES SHALL BE HILTI CS-SL SA. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
- 5. PROVIDE TRAPEZES FROM CLOSET TO EQUIPMENT FOR THE SUPPORT OF OWNER-FURNISHED HOSES AND CABLING. TRAPEZE AND SUPPORTS SHALL BE CONSTRUCTED OF NON-FEFFOUS MEMBERS IN DILUTION FRIDGE AREA AND IN ACCORDANCE WITH SPECIFICATIONS. COORDINATE FINAL ROUTING WITH OWNER.

TH

2 1/2"CHR

Mechanical 0067





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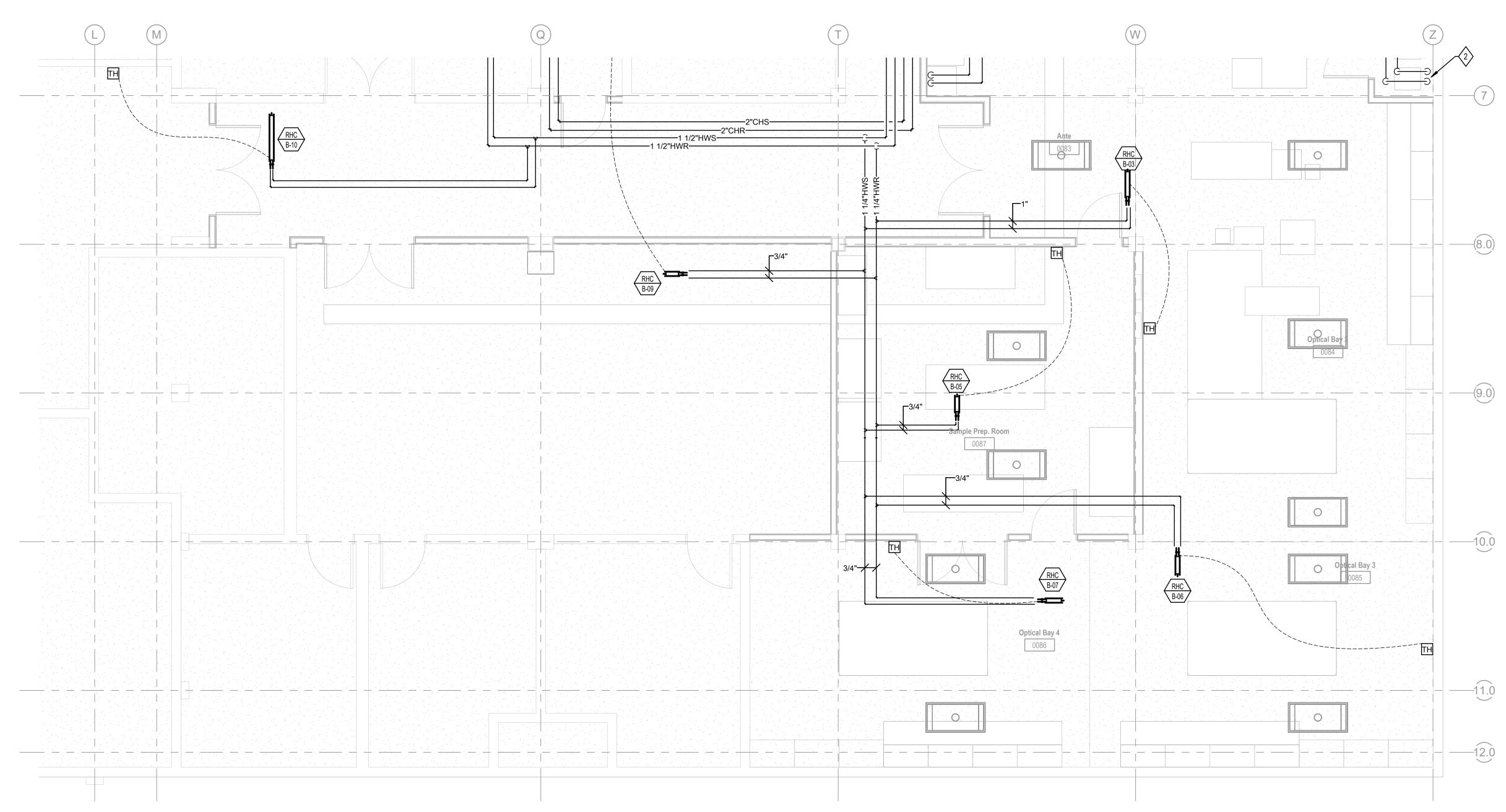
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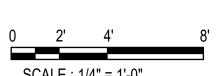
Sheet No.:

Piping Plan - A

M2.1

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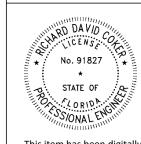






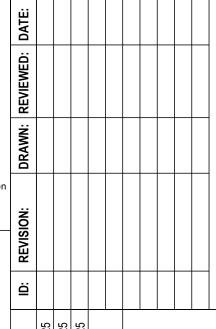
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KEYPLAN

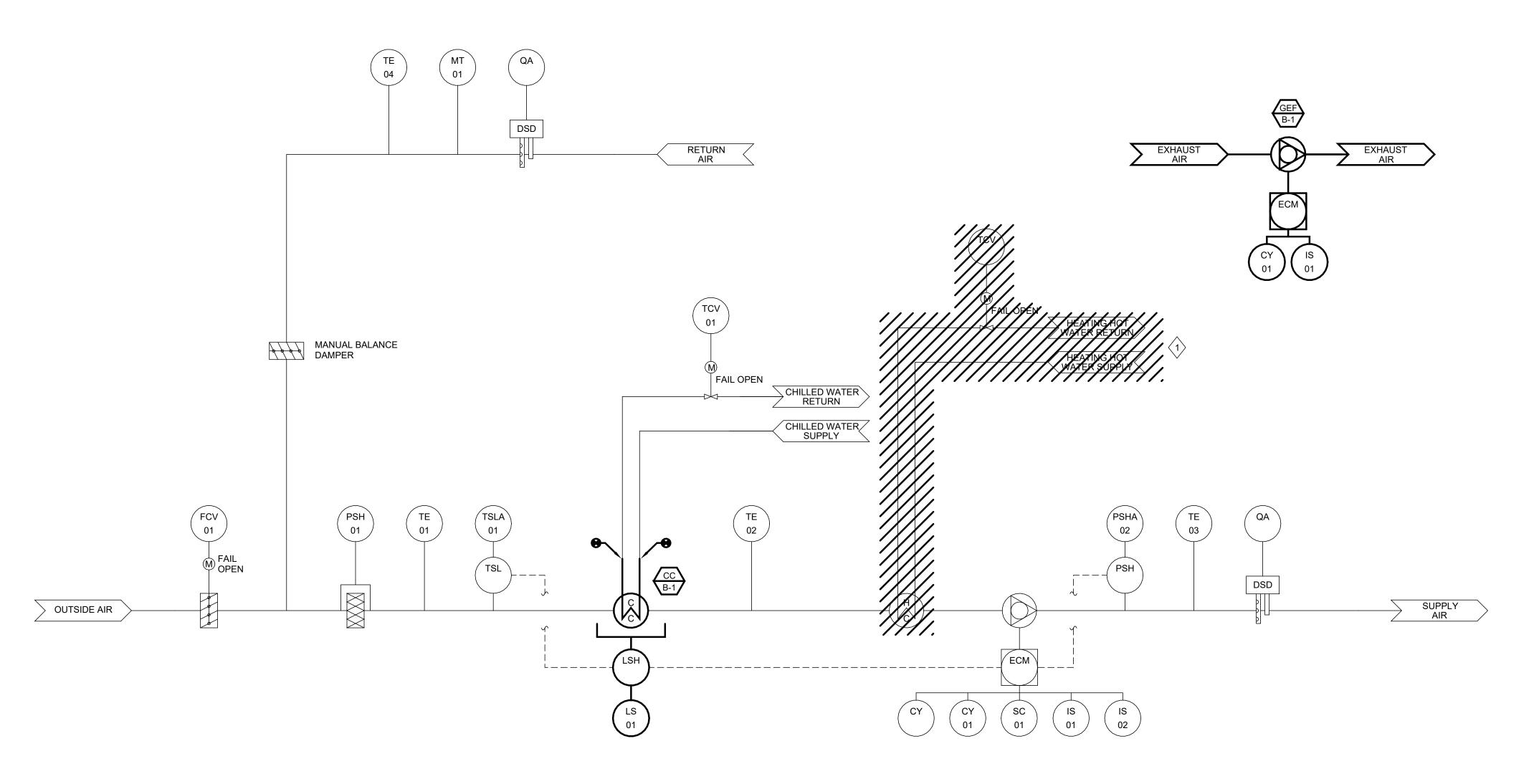
www.think3d.net Description:

Basement Mechanical Piping Plan - B

M2.2

) Basement Mechanical Piping Plan - B

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



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					TYPE		,	VALUE	Ξ	CO	NDITI	ON
TAG	POINT DESCRIPTION	UNITS	POINT NAME	ANALOG	DIGITAL	INTEGRATED	DEFAULT	MAXIMUM	MINIMUM	HIGH LIMIT	TOW LIMIT	ALARM DELAY (MIN)
												<u> </u>
HARDWARE CY 01	SUPPLY FAN RUN COMMAND	START/STOP	KE AHU04.SAF		X							
FCV 01	OUTSIDE AIR DAMPER POSITION	% OPEN	KE AHU04.OAD	X								\vdash
IS 01	SUPPLY FAN 1 STATUS	ON/OFF	KE AHU04.SAF1		X							
IS 02	SUPPLY FAN 2 STATUS	ON/OFF	KE AHU04.SAF2		X							
MT 01	RETURN AIR HUMIDITY	% RH	KE AHU04.RAH	X								
PSH 01	DIRTY FILTER ALARM STATUS	NORMAL/ALARM	KE AHU04.FIL		Х							
PSHA 02	HIGH STATIC ALARM STATUS	NORMAL/ALARM	KE_AHU04.HSP		Х					4.0		
PT 01	SUPPLY AIR STATIC PRESSURE	IN WG	KE_AHU04.SSP	Х								
SC 01	SUPPLY FAN SPEED	%	KE_AHU04.SVD	Х								
TE 01	MIXED AIR TEMP	DEG F	KE_AHU04.MAT	Х								
TE 02	COOLING COIL LEAVING AIR TEMPERATURE	DEG F	KE_AHU04.CCT	Х								
TE 03	SUPPLY AIR TEMPERATURE	DEG F	KE_AHU04.SAT	X								
TE 04	RETURN AIR TEMPERATURE	DEG F	KE_AHU04.RAT	X								
TCV 01	COOLING COIL VALVE POSITION	% OPEN	KE_AHU04.CCV	X								
TSLA 01	LOW TEMPERATURE ALARM STATUS	NORMAL/ALARM	KE_AHU04.LTD		Х						38.0	
SOFTWARE												<u> </u>
SDP	SYSTEM ENABLE	ON/OFF	(1)		Х							
SDP	COOLING COIL LEAVING AIR TEMPERATURE SETPOINT	DEG F	(1)	X	<u> </u>							
SDP	ACTIVE ECM SUPPLY FAN SPEED SETPOINT	% SPEED	(1)	X								

(1) COORDINATE POINT NAME WITH OWNER.

GENERAL NOTES

- DRAWING IS TYPICAL AND MAY REPRESENT MORE THAN ONE SYSTEM.
- 2. COORDINATE THE INSTALLATION AND FINAL LOCATION OF INSTRUMENTS
- WITH OTHER TRADES. VERIFY ALL CABLE REQUIREMENTS
- PRIOR TO TERMINATING.
- PROVIDE FINAL I/O ADDRESS, CABLE TAGS, MEDIUM TYPE, ETC.
- SETPOINTS, TIMERS, DELAYS AND ALARM LIMITS ARE ADJUSTABLE AND SHALL BE COORDINATED WITH TAB ENGINEER, MECHANICAL SCHEDULES, AND CONTROL DIAGRAMS.
- PROVIDE ALL LABOR, MATERIALS, SERVICES, EQUIPMENT, AND DEVICES NECESSARY FOR A COMPLETE, FULLY FUNCTIONAL BUILDING AUTOMATION SYSTEM AS INTENDED IN THE SEQUENCES OF OPERATION, SPECIFICATIONS, AND CONTROL DRAWINGS.

SHEET KEYNOTES

HEATING HOT WATER COIL SHALL BE DEMOLISHED AT UNIT. REFER TO FLOORPLANS. ALL ASSOCIATED CONTROL POINTS AND SEQUENCES SHALL BE DELETED ACCORDINGLY.

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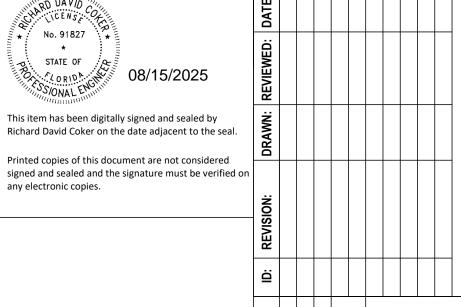
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Sheet No.:

AIR HANDLING UNIT CONTROL SEQUENCE

GENERAL:

- A. THIS CONTROLS DIAGRAM CAPTURES MODIFICATIONS TO THE EXISTING AIR HANDLING UNIT SEQUENCE. SEQUENCES BELOW REPRESENT THE FINAL INTENDED PERFORMANCE OF THE UNIT. CONTRACTOR TO REMOVE OR REVISE EXISTING SEQUENCES NOT CAPTURED IN THIS DIAGRAM TO ELICIT THE INTENDED PERFORMANCE AS NECESSARY.
- B. AIR HANDLING UNIT SYSTEM IS A SINGLE DUCT, CONSTANT VOLUME WITH TERMINAL REHEAT SYSTEM AND INTERLOCKED EXHAUST FAN.
- C. INTERLOCKED EXHAUST FAN IS A CONSTANT VOLUME EXHAUST FAN. EXHAUST FAN HAS LOCAL MOUNTED SPEED CONTROL FOR TEST AND BALANCE (TAB). D. AIR HANDLING UNIT SYSTEM SHALL OPERATE CONTINUOUSLY (24 HOURS PER DAY, 365 DAYS PER YEAR).
- E. TAB AND OWNER SHALL ESTABLISH ACTIVE ECM SPEED SETPOINT FOR THE AIR HANDLING UNIT AND MANUAL SPEED SETTING OF EXHAUST FAN TO ACHIEVE DESIGN AIR FLOW RATES AS SCHEDULED.

2. <u>UNIT OPERATION</u>:

- A. AIR HANDLING UNIT AND INTERLOCKED EXHAUST FAN SHALL BE STARTED AND STOPPED AUTOMATICALLY THROUGH THE BUILDING AUTOMATION SYSTEM. PROOF
- OF FAN OPERATION IS PROVIDED BY THE MOTOR CURRENT SWITCH. B. IF AIR HANDLING UNIT IS SIGNALED TO START AND DOES NOT START WITHIN 20 SECONDS (ADJ.) OF THE START COMMAND OR IF THE OPERATING FAN FAILS AS DETECTED BY THE MOTOR CURRENT SWITCH, THE AIR HANDLING UNIT AND INTERLOCKED EXHAUST FAN SHALL BE COMMANDED TO SHUTDOWN PER THE
- SEQUENCE BELOW AND AN ALARM SHALL BE GENERATED. C. IF INTERLOCKED EXHAUST FAN IS SIGNALED TO START AND DOES NOT START WITHIN 60 SECONDS (ADJ) OF THE START COMMAND, THE FAN SHALL BE DE-ENERGIZED AND AN ALARM SHALL BE GENERATED. AIR HANDLING UNIT SHALL CONTINUE TO RUN AND OPERATE NORMALLY.

3. <u>UNIT START UP</u>:

- A. UPON START COMMAND FROM THE BAS, UNIT SHALL START UP ACCORDING TO THE FOLLOWING ORDER:
- COOLING COIL TEMPERATURE CONTROL SEQUENCE ACTIVATES.
- SUPPLY FANS START AT THEIR MINIMUM SPEED OF 20 HZ (ADJ) AND ARE PROVEN. • INTERLOCKED GENERAL EXHAUST FAN (GEF B-1) IS COMMANDED ON AND PROVEN.
- 4. <u>COOLING COIL LEAVING AIR TEMPERATURE CONTROL:</u>
- A. THE COOLING COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN A CONSTANT COOLING COIL LEAVING AIR TEMPERATURE AS MEASURED BY THE COOLING COIL LEAVING AIR TEMPERATURE SENSOR LOCATED DOWNSTREAM OF THE COOLING COIL. COOLING COIL LEAVING AIR TEMPERATURE SETPOINT IS INDICATED IN
- B. UPON RISE IN COOLING COIL LEAVING AIR TEMPERATURE ABOVE SETPOINT, CHILLED WATER CONTROL VALVE SHALL MODULATE OPEN. C. UPON DROP IN COOLING COIL LEAVING AIR TEMPERATURE BELOW SETPOINT, CHILLED WATER CONTROL VALVE SHALL MODULATE CLOSED.

5. <u>UNIT FAN SPEED:</u>

A. THE SUPPLY FAN SHALL MAINTAIN A CONSTANT AIRFLOW AS SET BY TEST AND BALANCE.

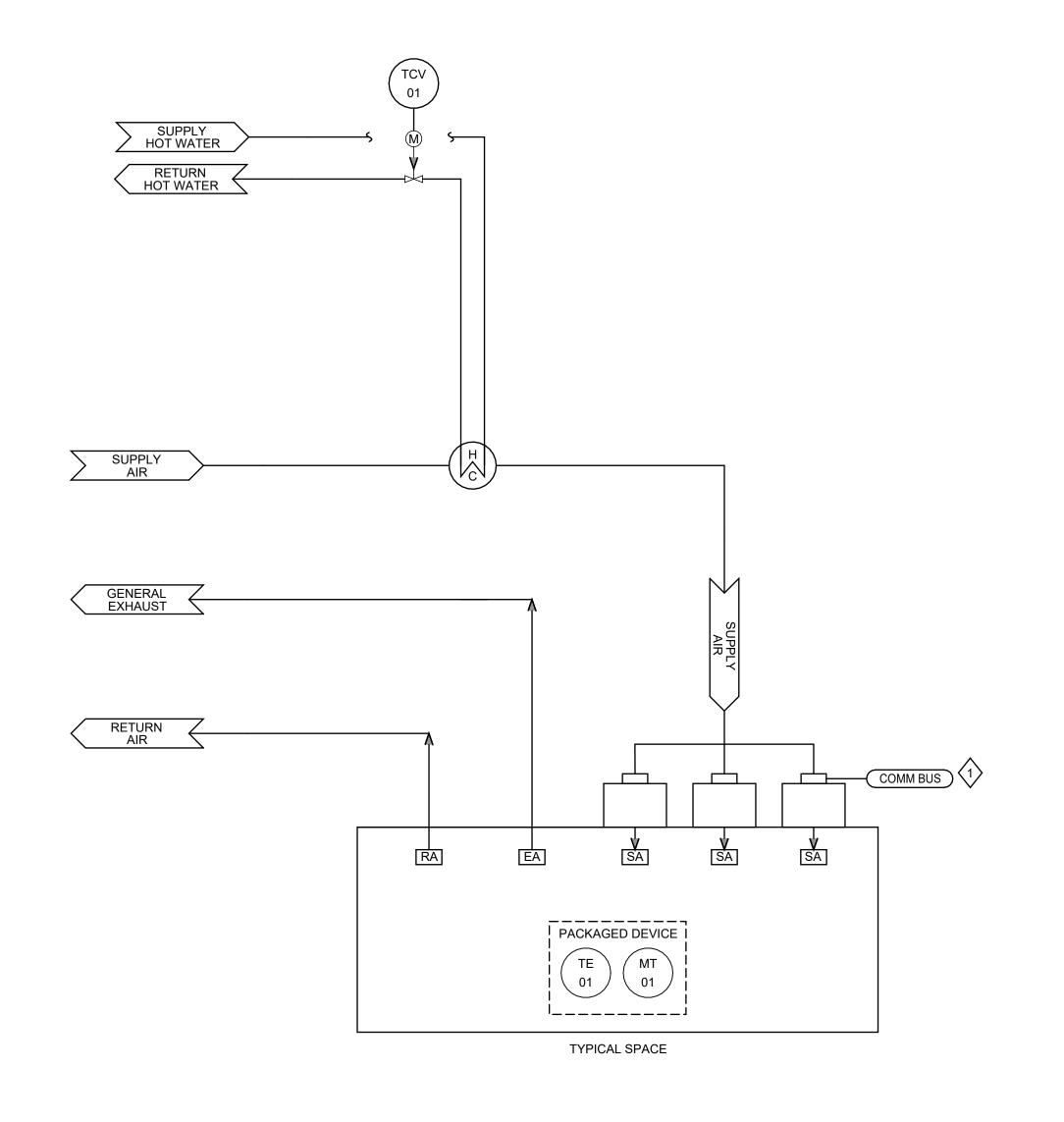
6. <u>EXHAUST FAN SPEED:</u>

A. THE EXHAUST FAN SHALL MAINTAIN A CONSTANT AIRFLOW AS SET BY TEST AND BALANCE.

- A. UPON DETECTION OF WATER IN THE PRIMARY DRAIN PAN, THE AIR HANDLING UNIT AND INTERLOCKED EXHAUST FAN SHALL BE COMMANDED TO SHUTDOWN PER
- THE SEQUENCE BELOW AND AN ALARM SHALL BE GENERATED. B. IF THE LOW TEMPERATURE ALARM (FREEZESTAT) IS TRIPPED, INITIATE SHUTDOWN SEQUENCE AS DESCRIBED BELOW BUT IN LIEU OF CLOSING CHILLED WATER CONTROL VALVE, VALVE SHALL BE COMMANDED TO FULL OPEN. THE LOW TEMPERATURE ALARM MUST BE MANUALLY RESET. ONCE MANUALLY RESET, THE AHU SYSTEM SHALL RESTART AUTOMATICALLY.
- C. UPON ACTIVATION OF FIRE/SMOKE ALARM AT THE UNIT OR INTERLOCKED FANS, ALL FANS SHALL BE COMMANDED TO STOP AND AN ALARM SHALL BE GENERATED THROUGH THE BUILDING AUTOMATION SYSTEM.

8. <u>SHUTDOWN SEQUENCE:</u>

- A. UPON SHUTDOWN COMMAND, THE FOLLOWING SHALL OCCUR:
- SUPPLY FAN SHALL BE SIGNALED TO STOP AND SHALL SLOWLY RAMP DOWN AND BE PROVEN BY ITS CURRENT SENSING DEVICES.
- INTERLOCKED EXHAUST FAN SHALL BE SIGNALED TO STOP AND BE PROVEN BY ITS CURRENT SENSING DEVICES.
- ONCE ABOVE NOTED STATUSES HAVE BEEN PROVEN, THE CHILLED WATER CONTROL VALVE SERVING THE AIR HANDLING UNIT SHALL CLOSE.
- THE SYSTEM SHALL NOT GENERATE NEW ALARMS WHEN THE SYSTEM IS SHUTDOWN.



						U	ISER II					
					POINT	Γ	SE	TPOI	NT	P	ALARM	Л
					TYPE		'	VALUE	Ξ	CO	NDITI	ON
TAG	POINT DESCRIPTION	UNITS	POINT NAME	ANALOG	DIGITAL	INTEGRATED	DEFAULT	MAXIMUM	MINIMUM	нібн LIМІТ	LOW LIMIT	AI ARM DEI AY (MIN)
HARDWARE												
MT 01	SPACE RELATIVE HUMIDITY	% RH	(1)	Х								
TCV 01	HEATING HOT WATER CONTROL VALVE	% OPEN	(1)	Х								
TE 01	SPACE TEMPERATURE	DEG F	(1)	X								lacksquare
SOFTWARE												
SDP	ZONE TEMPERATURE SETPOINT	DEG F	(1)	Х			72.0					
INTEGRATED												
SDP	UNIT STATUS	NORMAL/ALARM	(1)		Х							
SDP	FILTER DIFFERENTIAL PRESSURE	IN W.G.	(1)	Х								
SDP	FILTER LOADING	%	(1)	Х								
SDP	FILTER RUNTIME	HOURS	(1)	Х								
SDP	MOTOR RUNTIME	HOURS	(1)	Х								
SDP	CURRENT AIRFLOW	CFM	(1)	Х								
SDP	FAN SPEED	%	(1)	X								

(1) COORDINATE POINT NAME WITH OWNER.

TYPICAL ROOM CONTROL SEQUENCE

1. GENERAL:

- A. CONSTANT VOLUME AIR SUPPLY AND EXHAUST SYSTEM WITH SPACE REHEAT FOR TEMPERATURE
- B. DUCTED, SINGLE-PASS AIR HEPA FAN FILTER UNITS ARE PROVIDED FOR LOCAL AIR FILTRATION FOR SELECT ROOMS. REFER TO FLOORPLANS.
- 2. REHEAT COILS: A. SUPPLY AIR REHEAT COIL CONTROL VALVES SHALL MODULATE TO MAINTAIN THE ROOM TEMPERATURE SETPOINT AS SENSED BY THE SPACE TEMPERATURE SENSOR.

3. FAN FILTER UNITS:

- A. THE FAN FILTER UNITS (FFU) ARE TO OPERATE 24 HOURS PER DAY, 365 DAYS PER YEAR. B. THE SPEED OF THE FFU SHALL MAINTAIN A CONSTANT SPEED AS ORIGINALLY SET BY TAB. SPEED SHALL BE MONITORED AT THE BAS THROUGH A BACNET COMMUNICATION LINK TO EACH UNIT. C. TAB TO CONFIRM AND SET THE SUPPLY CFM FOR EACH FFU PER DUCT PLANS AND FFU SCHEDULE.

EMERGENCY POWER:
 A. ALL FAN FILTER UNITS WILL OPERATE ONLY ON NORMAL POWER.

GENERAL NOTES

- DRAWING IS TYPICAL AND MAY REPRESENT MORE THAN ONE SYSTEM.
- 2. COORDINATE THE INSTALLATION AND FINAL LOCATION OF INSTRUMENTS WITH OTHER TRADES.
- 3. VERIFY ALL CABLE REQUIREMENTS PRIOR TO TERMINATING.
- PROVIDE FINAL I/O ADDRESS, CABLE TAGS, MEDIUM TYPE, ETC.
- SETPOINTS, TIMERS, DELAYS AND ALARM LIMITS ARE ADJUSTABLE AND SHALL BE COORDINATED WITH TAB ENGINEER, MECHANICAL SCHEDULES, AND CONTROL DIAGRAMS.
- PROVIDE ALL LABOR, MATERIALS, SERVICES, EQUIPMENT, AND DEVICES NECESSARY FOR A COMPLETE, FULLY FUNCTIONAL BUILDING AUTOMATION SYSTEM AS INTENDED IN THE SEQUENCES OF OPERATION, SPECIFICATIONS, AND CONTROL DRAWINGS.

SHEET KEYNOTES

1 APPLIES ONLY TO ROOMS WITH FAN FILTER UNIT(S), AS SHOWN ON FLOORPLANS. ROOMS MAY HAVE MORE THAN ONE FFU SERVING THE SPACE. CONTROL POINTS LISTED ARE TYPICAL FOR EACH FFU.

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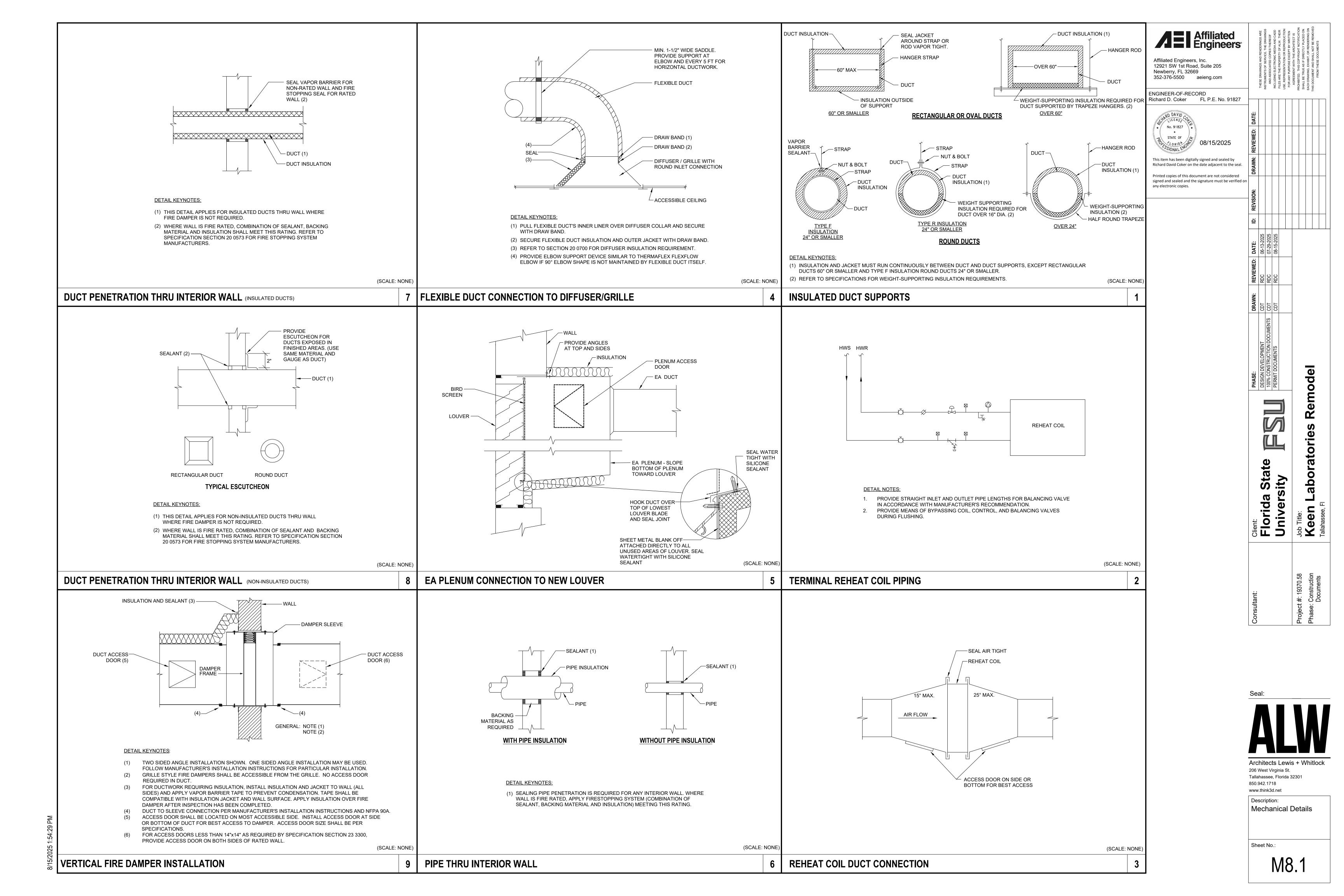
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Description: Mechanical Controls

Sheet No.:

1 TYPICAL ROOM CONTROL DIAGRAM
SCALE: NONE



COOLING COILS	Affiliated Engineers
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DUCT-MOUNTED REHEAT COILS

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																								GENE	RAL E	XHAUST FANS
MARK GEF	ROOM NUMBER	LOCATION ROOM NAME	SERVICE	EXHAUST CFM	TSP ("WG)	TYPE	DRIVE	WHEEL TYPE	MIN. DIA. (IN)	MAXIMUM FRPM	MIN. FAN CLASS	FAN ARR.	FAN MOTOR LOCATION	FAN ROTATION AND DISCHARGE	DAMPER	INTERLOCK	HP	MOTOR VOLTS	PH	VFD 63 Hz	125		 000 2	VER LEVE	0 8000	REMARKS
B-01	0080A	CLOSET	BASEMENT GENERAL EXHAUST	1,250	1.0	INLINE CENTRI	DIRECT	BI	12	1665	N/A	4	N/A	INLINE	BACKDRAFT	AHU-4	1/2	208	1	ECM 74	72	73		63 59		(1)

(°F) (°F) LIGHT DESIGN:

DAIKIN

LOCATION

ROOM

NUMBER

0067

(3) REPLACEMENT COOLING COIL BASIS OF DESIGN: DAIKIN 5WS1008B

ROOM

NAME

MECHANICAL

CC -

B-01

(1) BASIS OF DESIGN: GREENHECK SQ-120-VG. PROVIDE FAN WITH SPEED CONTROLLER. REFER TO SPECIFICATION SECTION 23 05 13 FOR MORE REQUIREMENTS.

AHU-4

(2) REPLACEMENT COOLING COIL SECTION SHALL FIT WITHIN THE EXISTING UNIT CABINET WHILE MEETING SCHEDULED PERFORMANCE.

CFM

(1)

(1) UNIT SHALL BE REBALANCED TO AIRFLOW LISTED. CONTRACTOR TO ADJUST FAN SPEED AND RETURN MANUAL BALANCING DAMPER AS REQUIRED TO ACHIEVE SCHEDULED AIRFLOWS.

CFM

(1)

AIR DISTRIBUTION DEVICES

COOLING COIL (2)

(FPM) ("WG) PD (FT)

10,000 | 1,350 | 75.2 | 63.0 | 49.4 | 49.2 | 450 | 1.0 | 10.0 | 388.7 | 50.0 | 42.0 | 57.0 | NO | (3)

DB WB DB WB FACE VEL. AIR PD WATER (MBH)

EAT (°F) LAT (°F) MAXIMUM MAX. MAX. CAP. GPM EWT LWT U.V. BASIS OF

MARK	TYPE	CFM	NOMINAL DUCT CONNECTION SIZE	REMARKS
	CUDDLY AID	0-120	6Ø	SUPPLY DIFFUSERS SHALL BE EQUAL TO PRICE ASPD MAX. NECK VELOCITY 700 FPM
	SUPPLY AIR DIFFUSER 24x24 MODULE SIZE	125-240	8Ø	MAX. NC = 30 MAX. PRESSURE DROP 0.10"
CD-1	Z4XZ4 MODOLL GIZL	245-380	10Ø	CEILING LAY-IN OR SURFACE MOUNT
		380-550	12Ø	
		555-750	14Ø	
		0-100	6Ø	RETURN/EXHAUST GRILLES SHALL BE EQUAL TO PRICE 630. MAX. NECK VELOCITY 700 FPM
	RETURN/EXHAUST AIR	101-225	8Ø	MAX. NC = 30 MAX. PRESSURE DROP 0.10"
	GRILLE 24 X 24 MODULE SIZE	226-325	10Ø	CEILING LAY-IN
G-1		326-475	12Ø	
	RETURN EXHAUST	476-700	14Ø	
		701-1,400	16Ø	
		1,401-2,000	18Ø	
	SUPPLY AIR GRILLE VARIABLE SIZE	0-125	6x6 or 8x4	SUPPLY GRILLES/REGISTERS SHALL BE EQUAL TO PRICE 620 L (BLADES PARALLEL TO LONG DIM.)
	SIDEWALL—	130-240	8x8 or 12x6	MAX. NECK VELOCITY 700 FPM MAX. NC = 40 MAX. PRESSURE DROP 0.10"
SG-1	OR —	245-420	12x8	DUCT OR CEILING/WALL SURFACE MOUNT ALTERNATE SIZES WITH EQUIVALENT CORE AREA ARE
		425-750	18x10	ACCEPTABLE
	CEILING/DUCT —	755-1260	24x12	
	RETURN/EXHAUST AIR GRILLE	0-110	6x6	RETURN/EXHAUST GRILLES SHALL BE EQUAL TO PRICE 630 MAX. NECK VELOCITY 700 FPM
G-2	VARIABLE SIZE ☐ SIDEWALL—	115-235	8x8	MAX. NC = 40 MAX. PRESSURE DROP 0.10"
U-2	OR —	240-350	12x8 or 10x10	DUCT OR CEILING/WALL SURFACE MOUNT ALTERNATE SIZES WITH EQUIVALENT CORE AREA ARE ACCEPTABLE
		355-520	12x12	
	CEILING/DUCT	525-800	18x12	

NOTES:

- 1. PROVIDE DUCT TRANSITIONS AS REQUIRED TO MATCH AIR DISTRIBUTION DEVICE CONNECTION SIZE AS SCHEDULED.
- 2. UNLESS OTHERWISE INDICATED, PROVIDE WHITE FINISH FOR LAYIN/SURFACE MOUNTED, ALUMINUM FOR EXPOSED AIR DISTRIBUTION DEVICES.
- 3. UNLESS OTHERWISE INDICATED, CONFIRM AFF HEIGHT FOR ALL WALL MOUNTED AIR DISTRIBUTION DEVICES WITH ARCHITECT. 4. SCHEDULE APPLIES TO ALL AIR DISTRIBUTION DEVICES EXCEPT WHERE DEVICE SIZES ARE CALLED OUT SPECIFICALLY ON PLANS.

HVAC DESIGN CONDITIONS

LOCATION	PROCESS	DESIGN DATA					REMARKS
		T DB	T WB	RH	T DP	HR]
		(DEG. F)	(DEG. F)	(PERCENT)	(DEG. F)	(GR PER LB)	
OUTDOOR	COOLING	96.2	76.1	N/A	N/A	N/A	(1) (2) (4)
OUTDOOR	DEHUMIDIFICATION	82.8	N/A	N/A	77.4	N/A	(1) (2) (5)
OUTDOOR	HEATING	26.2	N/A	N/A	N/A	N/A	(1) (3)
TYPICAL CONDITIONED SPACE	COOLING	75.0	N/A	50	N/A	N/A	-
TYPICAL CONDITIONED SPACE	HEATING	70.0	N/A	N/A	N/A	N/A	-
LABORATORY SPACE	COOLING	72.0	N/A	45	N/A	N/A	-
LABORATORY SPACE	HEATING	70.0	N/A	N/A	N/A	N/A	-

- (1) 2021 ASHRAE HANDBOOK FUNDAMENTALS, CLIMATIC DESIGN INFORMATION (4) MCWB DATA
- (2) 0.4% ANNUAL CUMULATIVE FREQUENCY OF OCCURRENCE (3) 99.6% ANNUAL CUMULATIVE FREQUENCY OF OCCURRENCE

ABBREVIATIONS:

T DB (TEMPERATURE, DRY BULB) T WB (TEMPERATURE, WET BULB) RH (RELATIVE HUMIDITY) T DP (TEMPERATURE, DEW POINT)

HR (HUMIDITY RATIO) MCDB (MEAN COINCIDENT WET BULB) MCWB (MEAN COINCIDENT DRY BULB)

(5) MCDB DATA

SPACE SERVED REHEAT COIL REMARKS AIR HANDLING ROOM ROOM WATER SIDE AIR SIDE SYSTEM NUMBER(S) NAME(S) AIRFLOW | MIN. CAP. | EAT LAT MAX. PD GPM EWT MAX. PD (CFM) (MBH) (°F) (°F) ("WG) (°F) (FT) DILUTION FRIDGE AREA / CLOSET 180 2.5 B-01 0080 / 0080A AHU-4 2,425 86.8 0.25 8.7 OPTICAL BAY 1 / B-02 0082 / 0082A AHU-4 900 32.2 52 0.25 3.2 180 2.5 B-03 0084 OPTICAL BAY 2 AHU-4 1,080 38.7 52 0.25 3.9 180 2.5 ANTE / JANIS PROBE B-04 0083 / 0081 AHU-4 860 30.8 52 0.25 3.1 180 2.5 B-05 0087 SAMPLE PREP. ROOM AHU-4 680 24.3 0.25 2.4 180 2.5 B-06 0085 OPTICAL BAY 3 AHU-4 710 25.4 52 0.25 2.5 180 2.5 B-07 OPTICAL BAY 4 645 23.1 0.25 2.3 180 2.5 0086 AHU-4 0.9 B-08 0052 CORRIDOR AHU-4 250 9.0 0.25 180 2.5 B-09 0065 / 0075 OFFICES 0.25 0.7 180 2.5 AHU-4 200 7.2 52 B-10 **EXISTING OFFICES** AHU-4 1,190 42.6 52 0.25 4.3 180 2.5 85

FAN FILTER UNITS (HEPA)

MARK		LOCATION	UNIT SIZE		SUPP	LY FAN		REMARKS
	ROOM	ROOM		CFM		MOTOR		
FFU -	NUMBER	NAME			HP	VOLT	PHASE	
B-01	0082	OPTICAL BAY 1	24" x 48"	400	1/3	208	1	-
B-02	0082	OPTICAL BAY 1	24" x 48"	400	1/3	208	1	-
B-03	0086	JANIS PROBE STATION	24" x 48"	560	1/3	208	1	-
B-04	0085	ANTE ROOM	24" x 48"	300	1/3	208	1	-
B-05	0084	OPTICAL BAY 2	24" x 48"	360	1/3	208	1	-
B-06	0084	OPTICAL BAY 2	24" x 48"	360	1/3	208	1	-
B-07	0084	OPTICAL BAY 2	24" x 48"	360	1/3	208	1	-
B-08	0088	OPTICAL BAY 3	24" x 48"	355	1/3	208	1	-
B-09	0088	OPTICAL BAY 3	24" x 48"	355	1/3	208	1	-
B-10	0089	OPTICAL BAY 4	24" x 48"	320	1/3	208	1	-
B-11	0089	OPTICAL BAY 4	24" x 48"	325	1/3	208	1	-
B-12	0087	SAMPLE PREP RM	24" x 48"	340	1/3	208	1	-
B-13	0087	SAMPLE PREP RM	24" x 48"	340	1/3	208	1	-

DUCT PRESSURE CLASS, MATERIAL & LEAKAGE

SYSTEM	SERVICE	SECTION	DUCTWORK		SEAL	LEAKAGE TESTING							
			PRESSURE CLASS	MATERIAL OF CONSTRUCTION	CLASS	TEST PORTION (% OF LENGTH)	TEST PRESSURE (IN WG)	LEAKAG	E CLASS	LEAKAG (CFM/10	E FACTOR 0 SF)		
			(IN WG)					RECT.	ROUND	RECT.	ROUND		
SUPPLY AIR	SA	EXISTING MAIN TO DIFFUSER/GRILLE	+4	GALVANIZED STEEL	А	100	4	4	2	9.8	4.9	-	
GENERAL EXHAUST	GE	GRILLE TO FAN INLET	-2	GALVANIZED STEEL	А	25	-2	4	2	6.3	3.1	-	
GENERAL EXHAUST	GE	FAN DISCHARGE TO LOUVER	+2	GALVANIZED STEEL	А	25	2	4	2	6.3	3.1	-	

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