

U N I V E R S I T Y O F  
SOUTH CAROLINA

**UNIVERSITY OF SOUTH CAROLINA  
BUILDING #1 CLASSROOM B1  
AHU REPLACEMENT**

COLUMBIA, SC

**H27-6111**

A/E Project #15007.01  
MARCH 30, 2015  
ISSUED FOR CONSTRUCTION

Prepared by:

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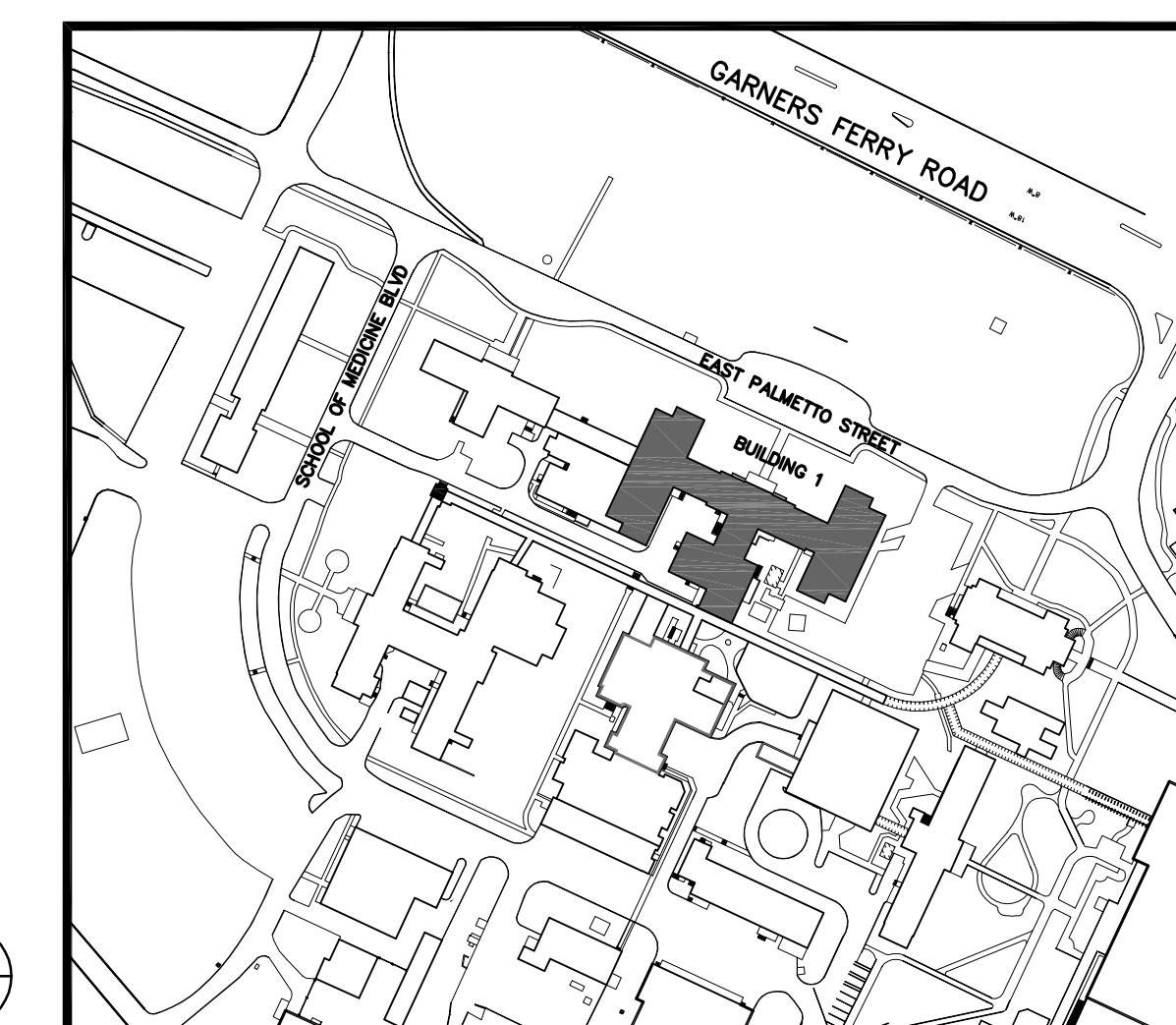
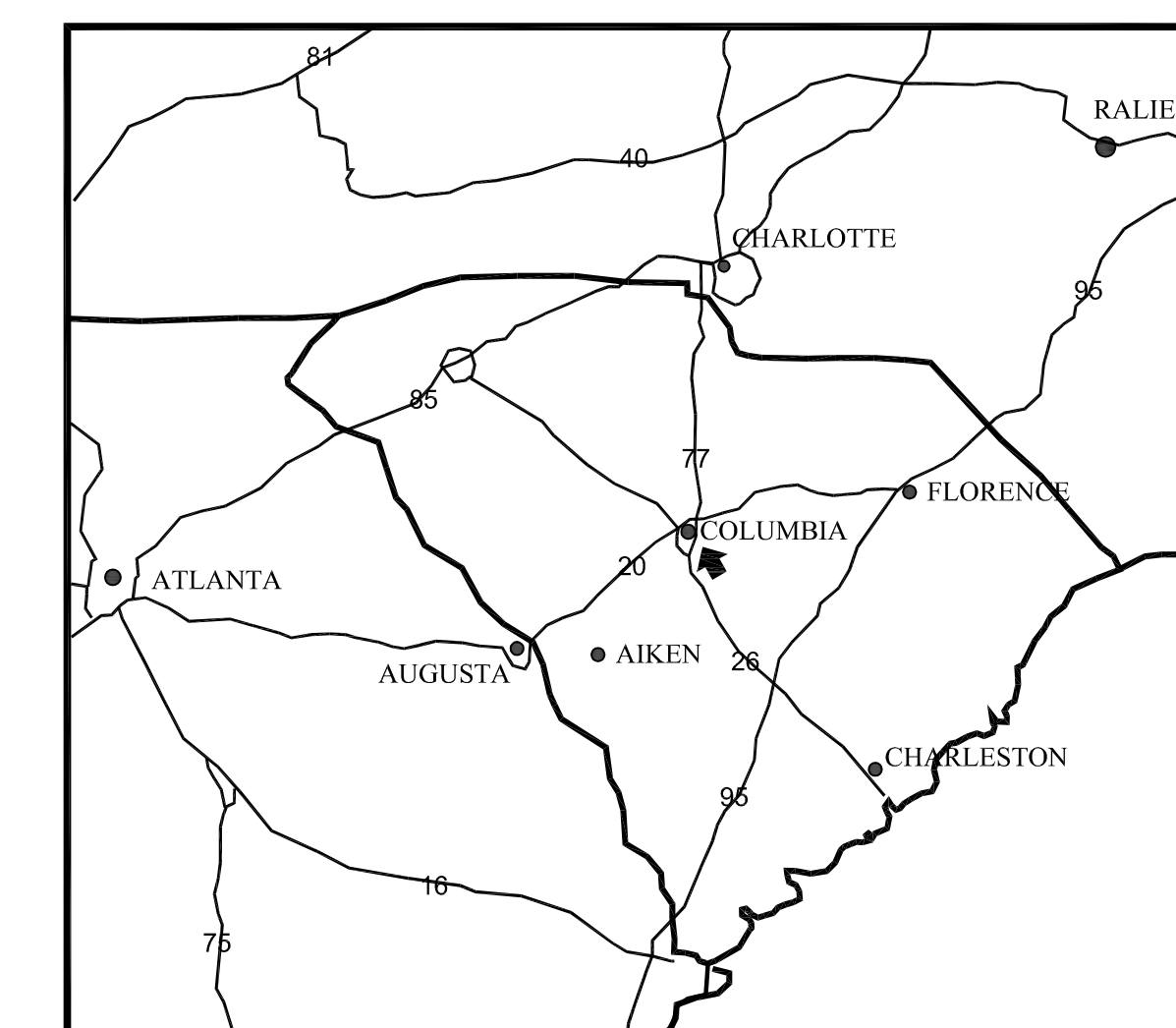
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**SET NO.**

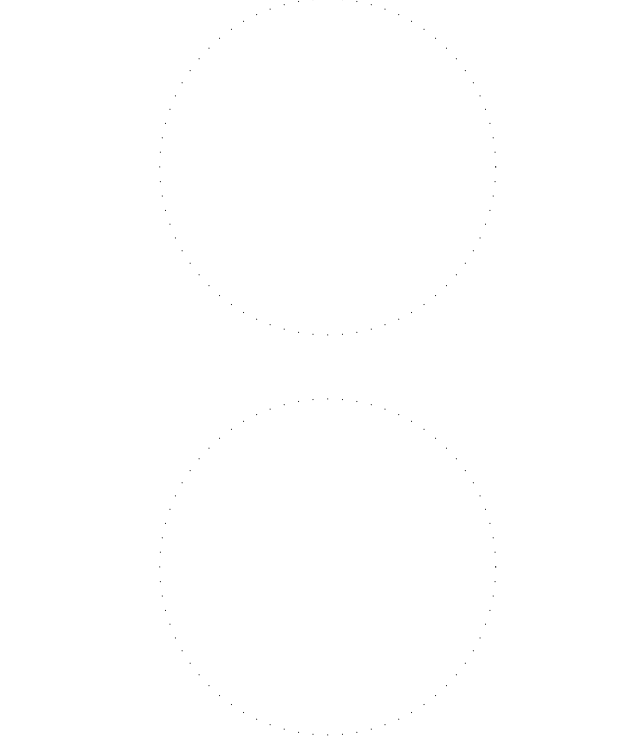
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consultants



project name  
University of South Carolina  
Building 1 Classroom B1  
AHU Replacement  
State Project # H27-6111  
A/E project number  
15007.01

seals/signature

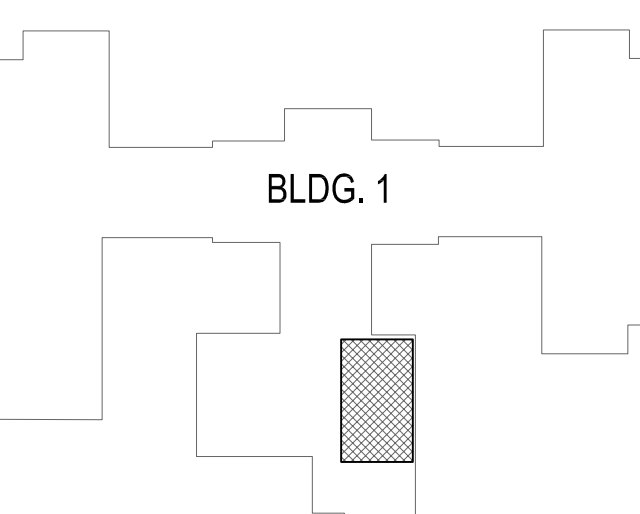


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key plan

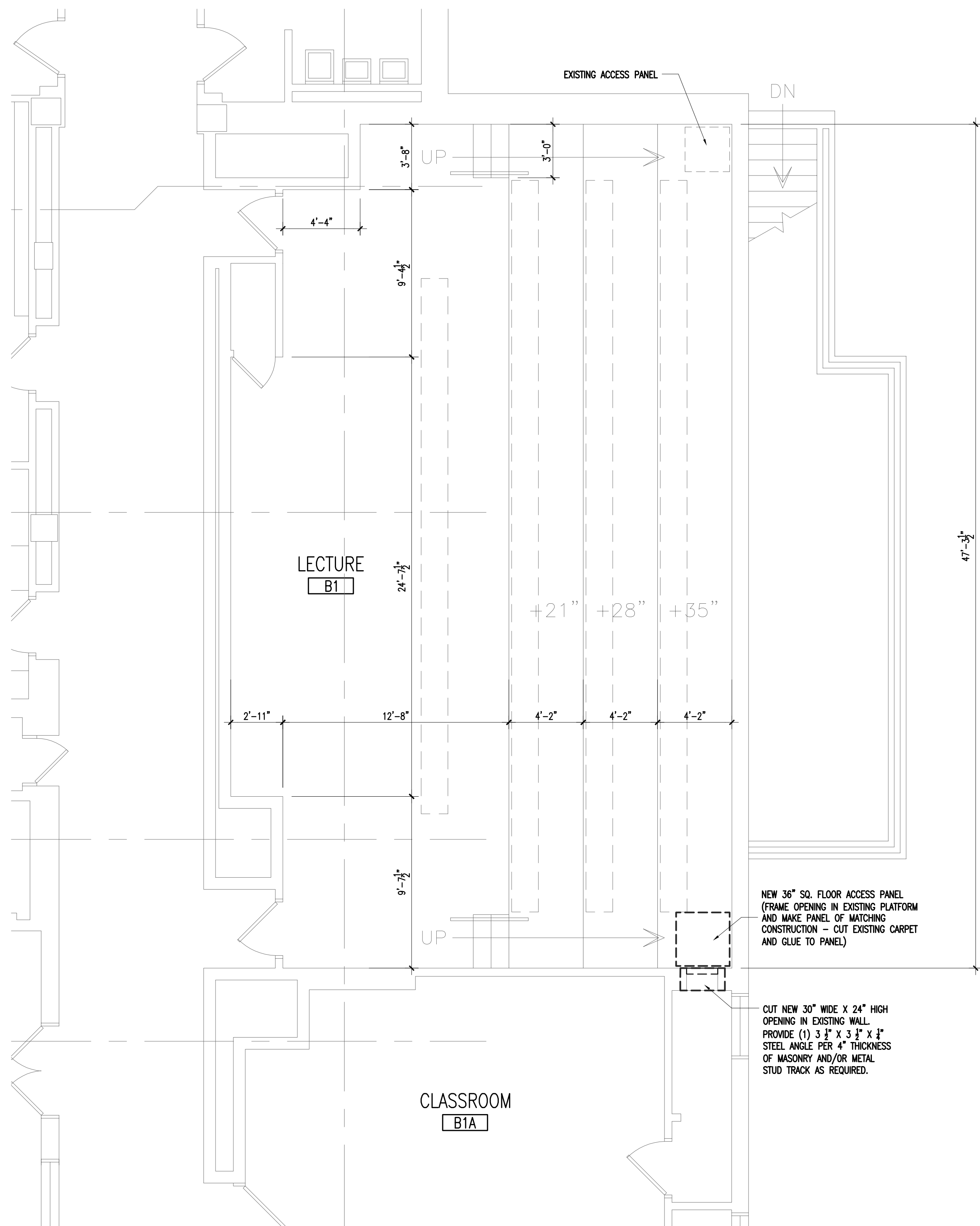


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REFLECTED CEILING PLANS

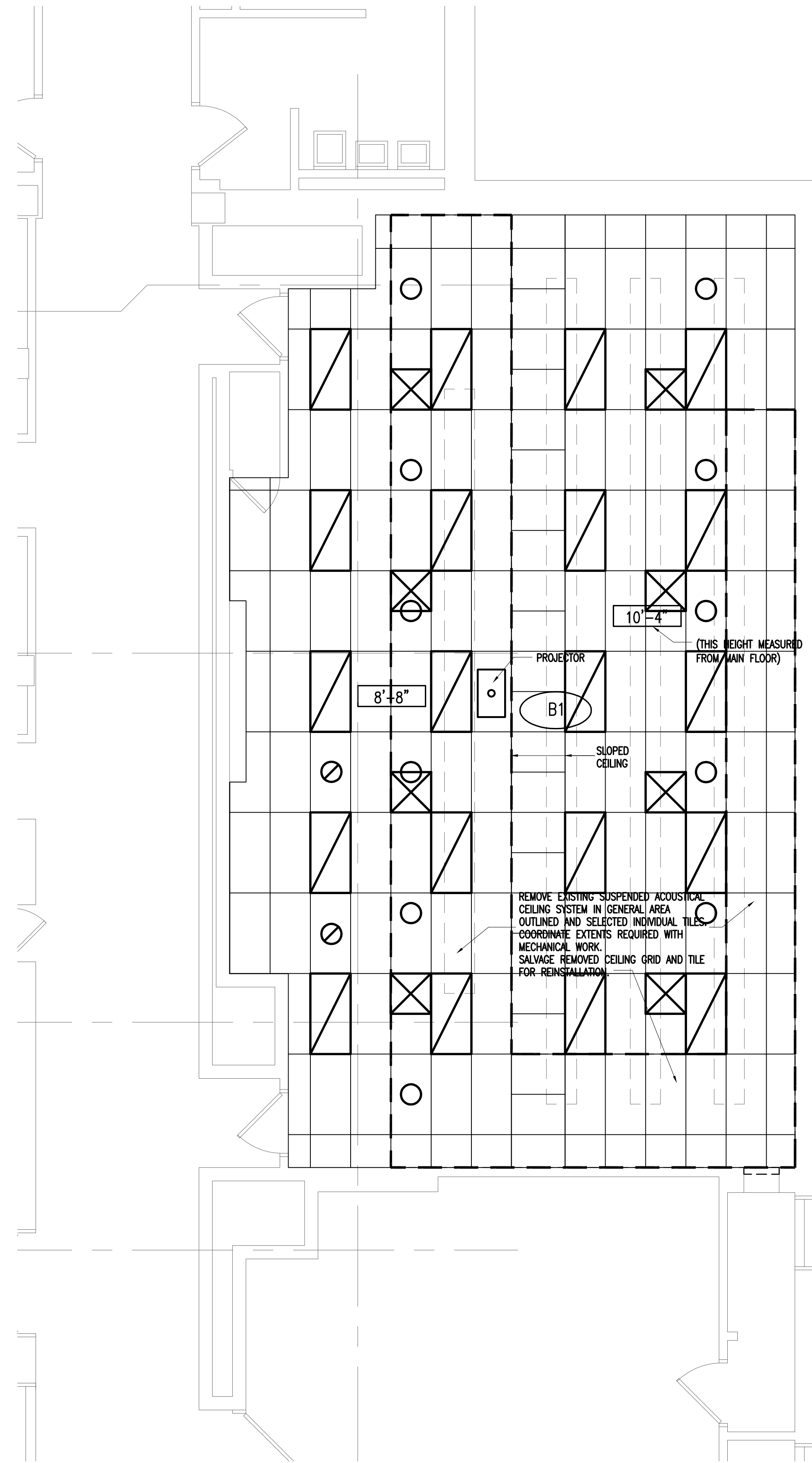
sheet number

**A2.1**

drawn by RTC  
checked by TMW



① PARTIAL FIRST FLOOR PLAN  
1/4"=1'-0"

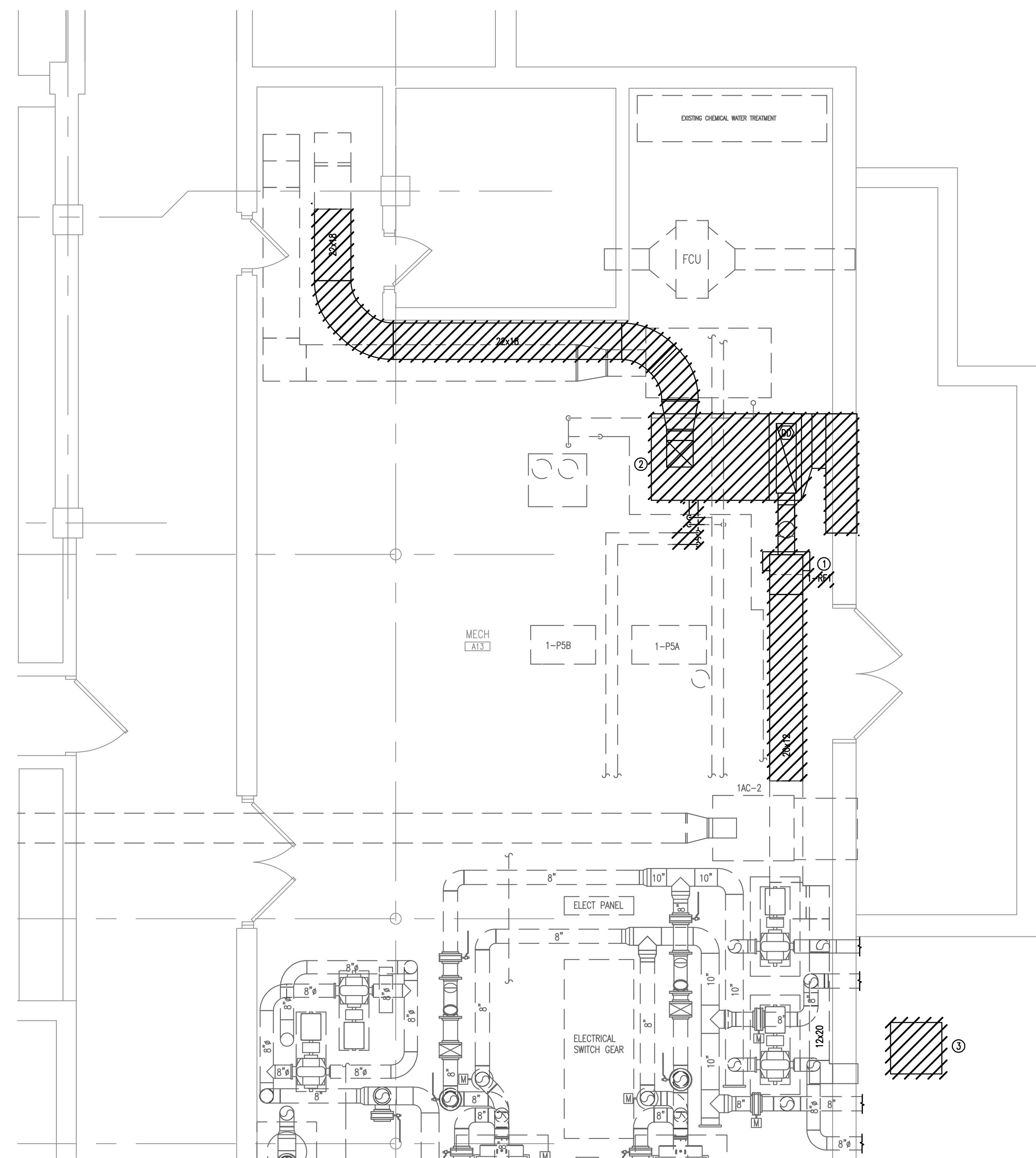
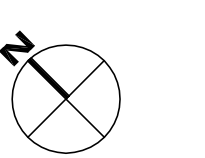
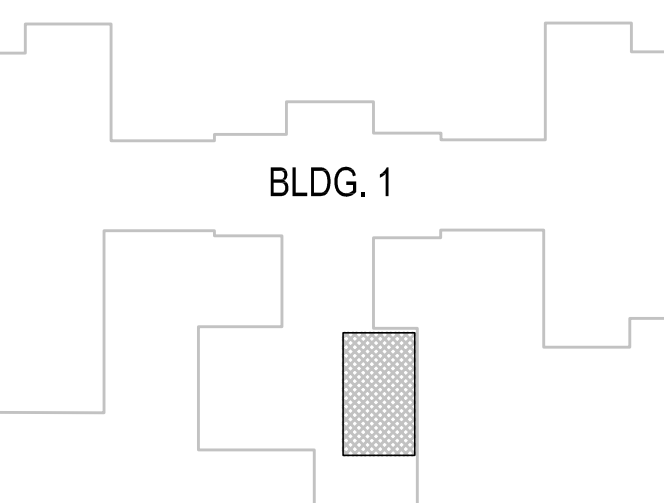


② PARTIAL FIRST FLOOR REFLECTED CEILING PLAN  
1/4"=1'-0"

**SYMBOL LEGEND:**

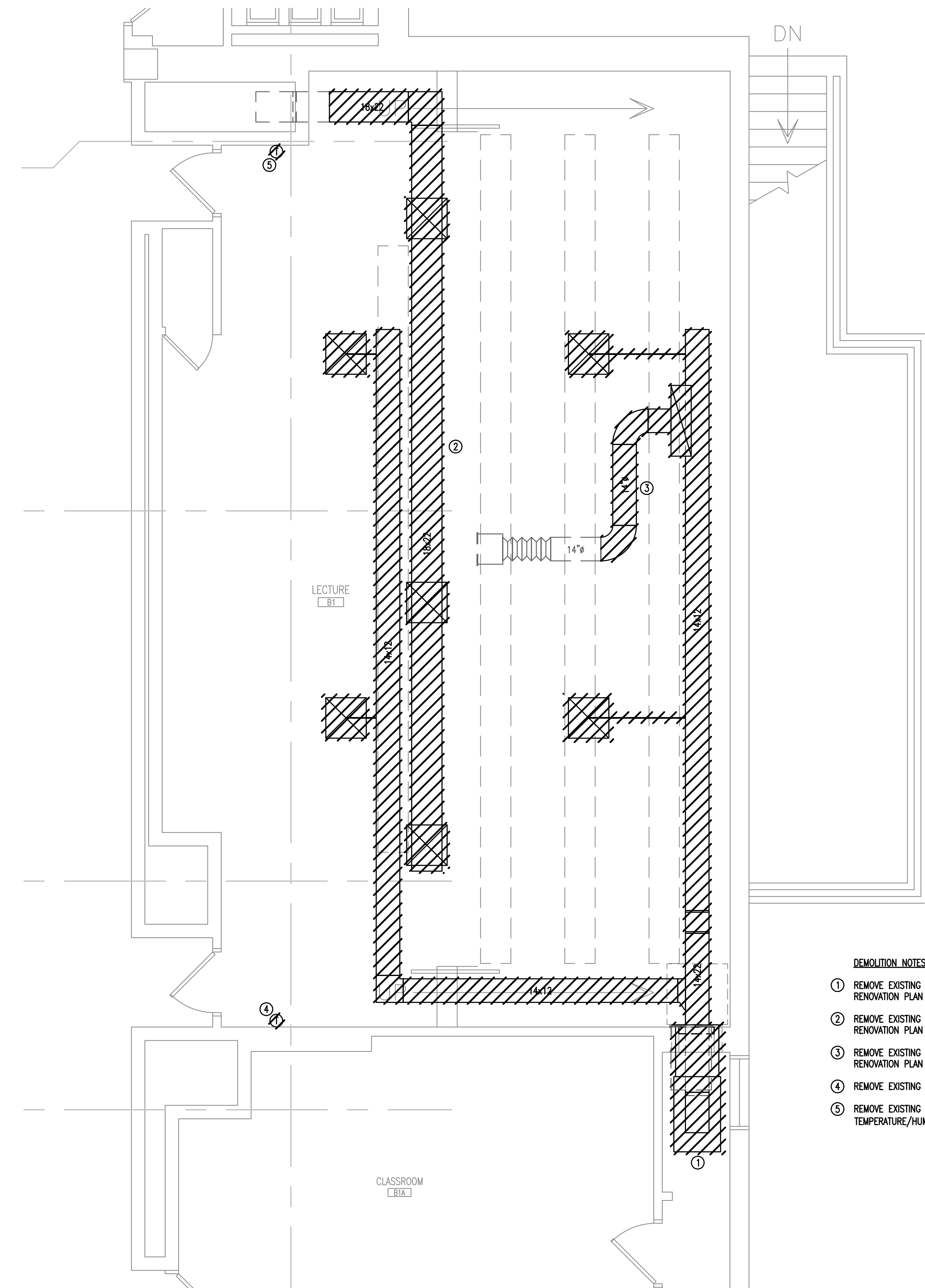
- ACOUSTIC TILE
- LAY-IN LIGHT FIXTURE
- RECESSED LIGHT FIXTURE
- REMOVED DIFFUSER
- NEW DIFFUSER

number	item	date



- DEMOLITION NOTES:
- ① REMOVE EXISTING 1-RF1, ASSOCIATED CONTROLS, AND DUCTWORK. SEE RENOVATION PLAN FOR ADDITIONAL INFORMATION.
  - ② REMOVE EXISTING 1-AC1, ASSOCIATED CONTROLS, DUCTWORK, PIPING. SEE RENOVATION PLAN FOR ADDITIONAL INFORMATION.
  - ③ REMOVE EXISTING CONDENSING UNIT (ON GRADE), ASSOCIATED, CONTROLS, AND PIPING.

**① PARTIAL BASEMENT FLOOR PLAN - HVAC DEMOLITION**  
1/4"=1'-0"



- DEMOLITION NOTES:
- ① REMOVE EXISTING AIR HANDLER, ASSOCIATED CONTROLS, AND DUCTWORK. SEE RENOVATION PLAN FOR ADDITIONAL INFORMATION.
  - ② REMOVE EXISTING SUPPLY DUCT UP TO POINT SHOWN ON DRAWINGS. REFER TO RENOVATION PLAN FOR ADDITIONAL INFORMATION.
  - ③ REMOVE EXISTING RETURN DUCT UP TO POINT SHOWN ON DRAWINGS. REFER TO RENOVATION PLAN FOR ADDITIONAL INFORMATION.
  - ④ REMOVE EXISTING THERMOSTAT FOR SPLIT SYSTEM AND BLANK OFF OPENING.
  - ⑤ REMOVE EXISTING THERMOSTAT FOR 1-AC1 AND INSTALL NEW TEMPERATURE/HUMIDITY SENSOR AT THE SAME LOCATION.

**② PARTIAL FIRST FLOOR PLAN - HVAC DEMOLITION**  
1/4"=1'-0"



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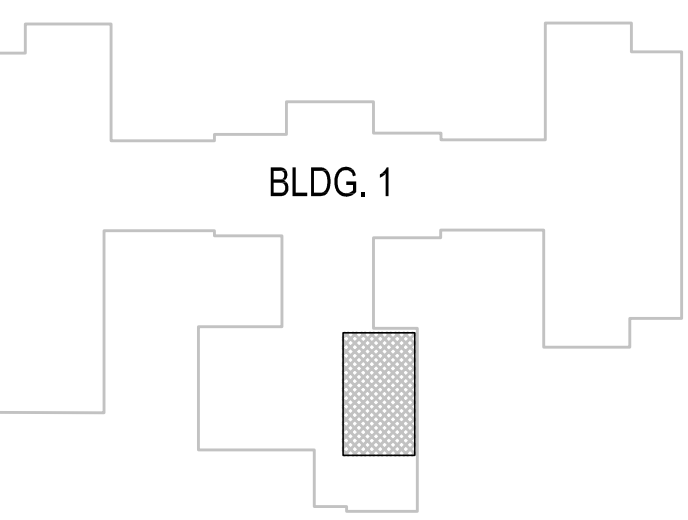
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key plan

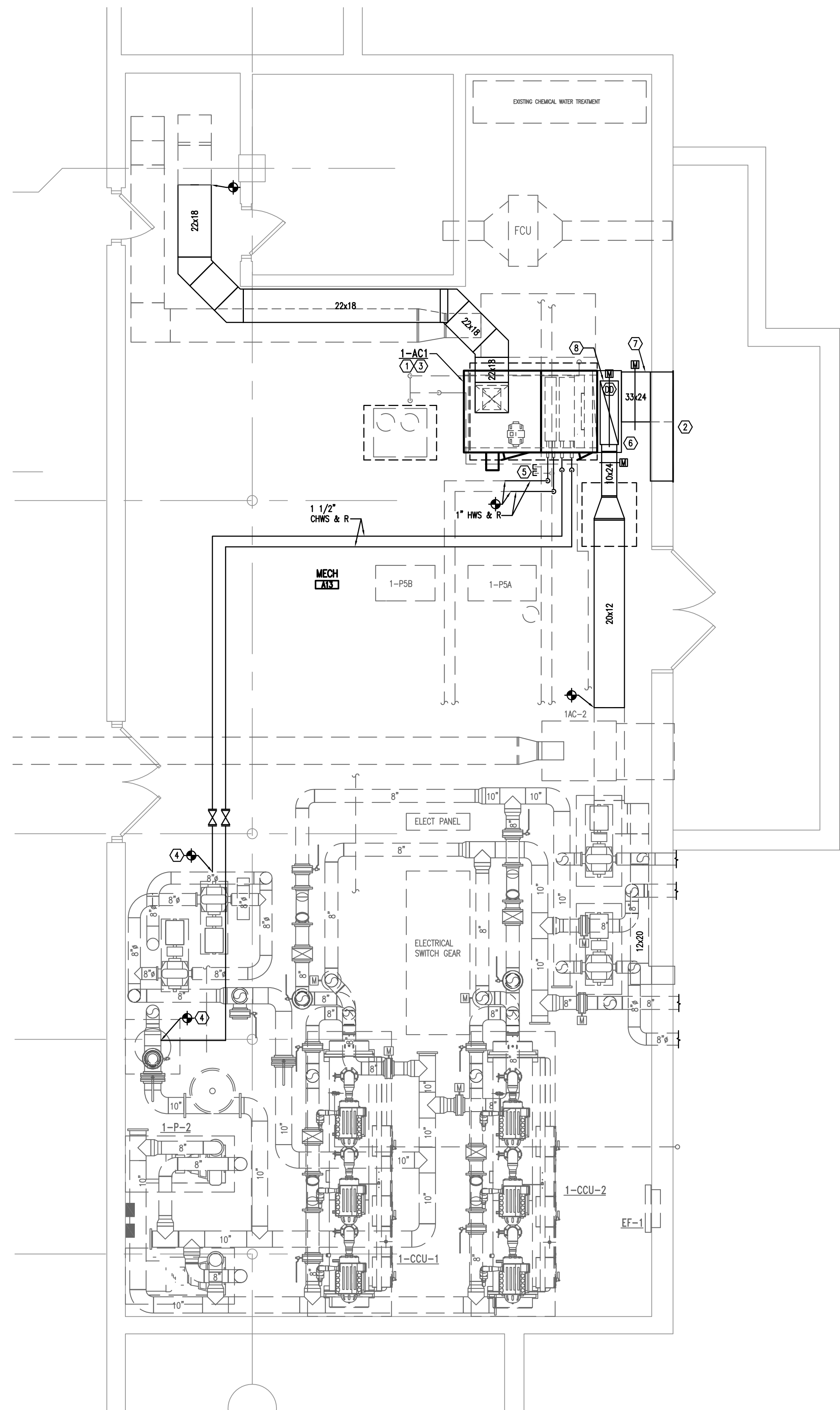


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**PARTIAL BASEMENT AND FIRST FLOOR PLAN - HVAC RENOVATION**

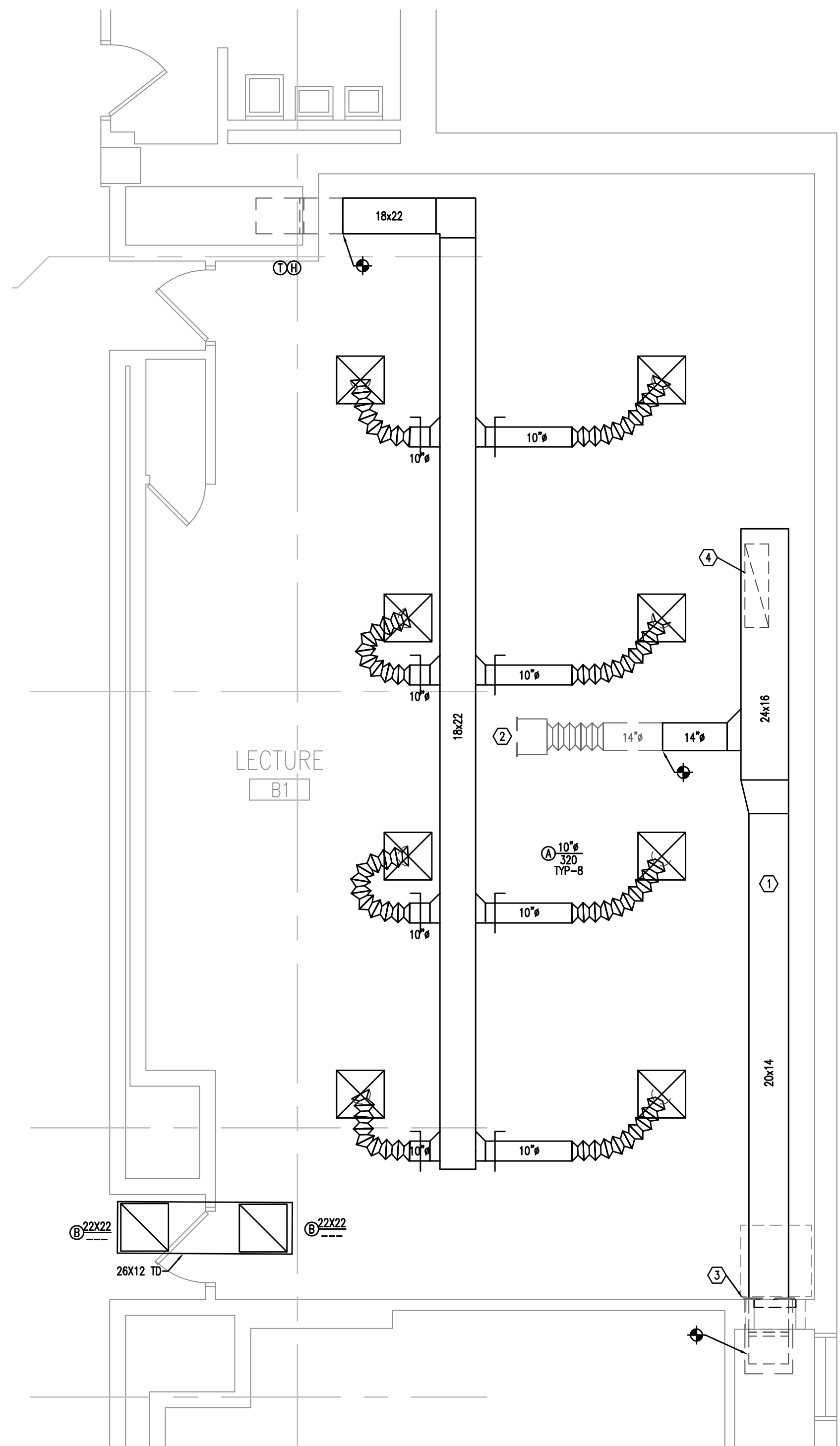
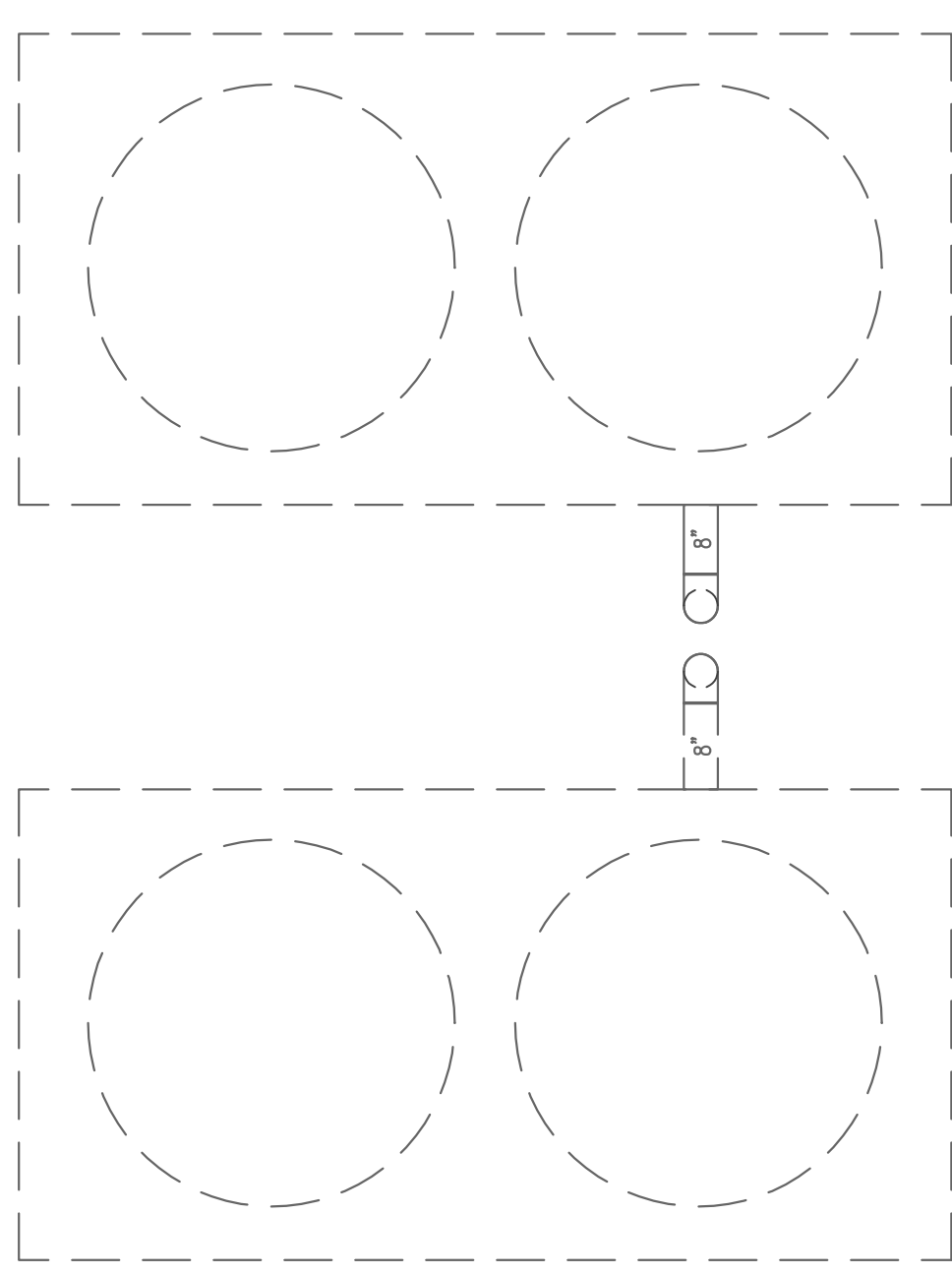
sheet number

**M2.1**

drawn by **JDR**  
checked by **JWB**



- NOTES:
- ① PROVIDE DEEP SEAL P-TRAP FULL SIZE OF UNIT CONNECTION AND SPILL CONDENSATE FROM UNIT TO NEAREST FLOOR DRAIN.
  - ② PROVIDE NEW 72x24 INTAKE LOUVER AND INSTALL IN EXISTING OPENING. CONTRACTOR SHALL FIELD VERIFY LOUVER SIZE. LOUVER SHALL BE GREENBOOK ESD-635 OR APPROVED EQUAL. LOUVER PERFORMANCE SHALL HAVE A QPMF LESS THAN 1077 FT/MIN AND PRESSURE DROP LESS THAN 0.14 IN. W.G. AT 2500 CFM.
  - ③ INSTALL NEW 1-AC1 ON EXISTING HOUSEKEEPING PAD.
  - ④ HOT TAP EXISTING 8" CHILLED WATER SUPPLY AND RETURN PIPING WITH NEW 1 1/2" CHILLED WATER TAPS.
  - ⑤ CAP EXISTING CHILLED WATER TAP AND REINSULATE.
  - ⑥ FIELD FABRICATE A SHEET METAL PLENUM FULL SIZE OF UNIT OPENING FOR RETURN AND OUTSIDE AIR CONNECTIONS. INSULATE PLENUM WITH 2" RIGID INSULATION.
  - ⑦ CONNECT 33X24 OUTSIDE AIR DUCT TO INTAKE LOUVER. BALANCE OF LOUVER SHALL REMAIN OPEN TO MECHANICAL ROOM.
  - ⑧ NEW RETURN DUCT WITH MOTORIZED DAMPER IN VERTICAL SHALL BE APPROXIMATELY 42X12 AND EXTEND UP THROUGH FLOOR SLAB. SEE FIRST FLOOR PLAN FOR CONTINUATION. CONTRACTOR SHALL FIELD VERIFY SLAB OPENING BEFORE FABRICATING RETURN DUCT.

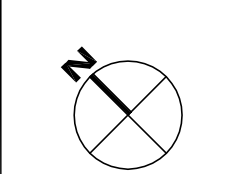
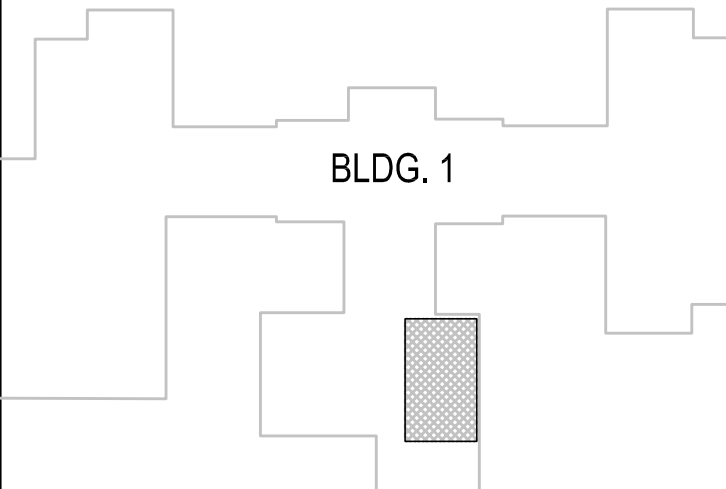


- NOTES:
- ① ROUTE RETURN DUCT BELOW RAISE FLOOR AND CONNECT TO EXISTING RETURN GRILLES.
  - ② BALANCE EXISTING RETURN GRILLE TO 800 CFM.
  - ③ BALANCE EXISTING RETURN GRILLE TO 2200 CFM.
  - ④ RETURN DOWN THROUGH EXISTING OPENING AND CONNECT TO UNIT IN BASEMENT. REFER TO BASEMENT PLAN FOR CONTINUATION.

② **PARTIAL FIRST FLOOR PLAN - HVAC RENOVATION**  
1/4"=1'-0"

① **PARTIAL BASEMENT FLOOR PLAN - HVAC RENOVATION**  
1/4"=1'-0"

number	item	date



**ABBREVIATIONS**

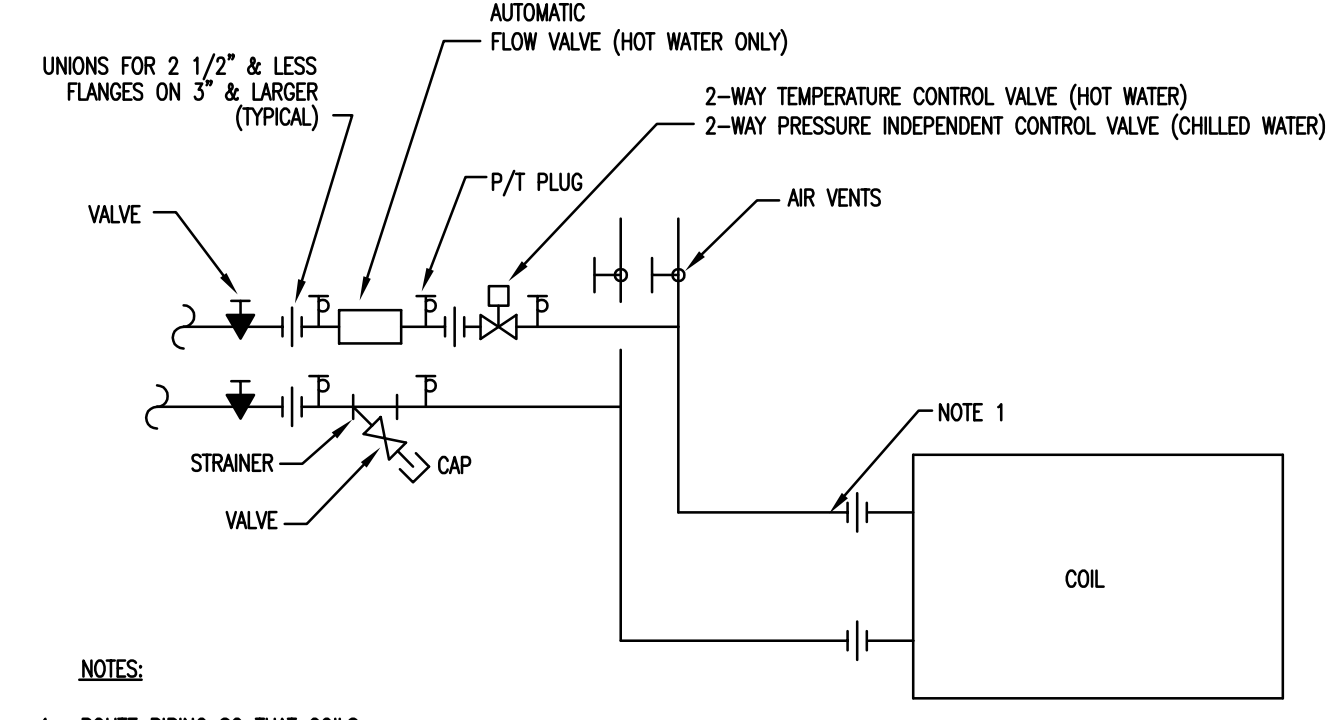
A/C	Air Conditioning	N/A	Not Applicable
ABV	Above	NC	Not to Contract
AF	Above Finished Floor	NIS	Not to Scale
BHP	Brake Horsepower	OSD	Opposed Blade Damper
CFM	Cubic Feet Per Minute	OD	Outside Damper
CD	Duct Smoke Detector	PD	Pressure Drop
DB	Dry Bulb Temperature	RA	Return Air
EAT	Entering Air Temperature	RET	Return Air
EAC	Electric or Electrical	RH	Relative Humidity
EWB	Entering Air Wet Bulb	SA	Supply Air
EXH	Exhaust	SPT	Static Pressure
FD	Fire Damper	SPEC	Specifications
F	Floor	SPL	Supply
HP	Horsepower	T	Thermostat
LAT	Leaving Air Temperature	TEMP	Temperature
LWB	Leaving Air Wet Bulb	TSTAT	Thermostat
MAX	Maximum	TYP	Typical
M	Minimum	WB	Wet Bulb Temperature
MIN	Minimum		

**MECHANICAL GENERAL NOTES**

- DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF DOORS, WINDOWS, CEILING, DIFFUSERS, ETC.
- ALL DUCTWORK INSULATION SHALL BE RUN CONTINUOUSLY THROUGH FLOORS, ROOFS AND PARTITIONS EXCEPT WHERE PROHIBITED BY FIRE CODES.
- LOCATE ALL THERMOSTATS 4'-0" ABOVE FINISH FLOOR; ALIGN WITH LIGHT SWITCHES.
- ALL DUCTWORK LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS TO AVOID INTERFERENCE.
- CORRECT SETTINGS ON ALL BALANCING FITTINGS SHALL BE PERMANENTLY MARKED.
- AIR DISTRIBUTION SYSTEMS WITH MORE THAN ONE BRANCH OR MULTIPLE OUTLETS ON A BRANCH, SHALL HAVE VOLUME DAMPERS TO BALANCE AIR FLOWS. SPRING AIR FITTINGS ARE PERMITTED FOR CONNECTING FLEX DUCT TO BRANCH OR TRUNK DUCTS WHERE FLEX DUCTS ARE INDICATED. IF FLEX DUCT CANNOT BE CONNECTED WITH A SPRING, A HARD DUCTED TAKEOFF MUST BE PROVIDED.
- HIGH EFFICIENCY TAKEOFFS SHALL BE USED ON ALL HARD DUCTED SUPPLY BRANCHES.
- PROVIDE ALL TRANSITIONS REQUIRED FOR INSTALLATION OF DUCT, EXHAUST FANS, AND ALL OTHER EQUIPMENT AND APPURTENANCES.
- ALL DUCT IS GALVANIZED SHEET METAL EXCEPT AS NOTED.
- DUCT SIZES ARE CLEAR INSIDE DIMENSIONS.
- AIR DISTRIBUTION UNITS SHALL HAVE TRIM REQUIRED FOR FINISHED SERVICE.

**MECHANICAL DEMOLITION NOTES**

- DRAWINGS SHOW GENERAL INTENT OF DEMOLITION. QUANTITIES, LOCATIONS, SIZES AND EQUIPMENT ARE SHOWN TO INDICATE TYPE OF SYSTEM INSTALLED AND DOES NOT NECESSARILY REPRESENT EXACT CONDITIONS. CONTRACTOR SHALL FIELD VERIFY BEFORE BIDDING.
- DEMOLITION OF EQUIPMENT, SYSTEMS, AND COMPONENTS SHALL INCLUDE ALL SUPPORTS, PADS, HANGERS, INSULATION, CONTROLS, STARTERS, ACCESSORIES, AND APPURTENANCES NOT REQUIRED FOR THE INSTALLATION OF THE NEW SYSTEM.
- WHEN PARTIAL DEMOLITION OF A SYSTEM IS INDICATED, THE PART OF THE SYSTEM SHOWN TO REMOVED SHALL BE REMOVED TO THE ACTIVE MAIN OR BRANCH IF NOT REQUIRED FOR THE INSTALLATION OF THE NEW SYSTEM. THE ACTIVE MAIN OR BRANCH SHALL BE REPAIRED TO MATCH NEW INSTALLATION AS MUCH AS PRACTICAL. IF SYSTEM IS INSULATED, INSULATION SHALL BE PATCHED AND FINISHED REPAIR (E.G. VAPOR BARRIER, COATING, ETC.).
- PATCHING OF BUILDING STRUCTURES AND FINISHES SHALL PERTAIN TO ALL WALLS, FLOORS, SLABS, ROOFS, STRUCTURES, AND FINISHES. PATCHES SHALL MATCH EXISTING STRUCTURE, FIRE RATING AND FINISH.
- ALL OPENINGS CREATED BY THE ABANDONMENT OR REMOVAL OF EXISTING SYSTEMS SHALL BE PATCHED.
- ALL WALLS, ROOFS, SLABS, STRUCTURES, AND FINISHES WHOSE FINISH IS IRREGULAR DUE TO THE REMOVAL OF SYSTEMS, SUPPORTS, PADS, ACCESSORIES, AND APPURTENANCES SHALL BE PATCHED.
- ALL FINISHES SHALL MATCH EXISTING FINISH. WHEN FINISH OBVIOUSLY DOES NOT MATCH EXISTING FINISH SUCH AS SHADE OF PAINT, AGE OF FINISH, ETC., THE FINISH SHALL BE APPLIED TO THE PATCH AND THE SURFACE IN ALL DIRECTIONS UNTIL A SURFACE CHANGE OF A MINIMUM OF 45 DEGREES.
- REMOVAL OF SYSTEMS SHALL INCLUDE COMPLETE SYSTEM WHENEVER PRACTICAL. IF NOT, SYSTEM (E.G. PIPE, CONDUIT, ETC.) SHALL BE REMOVED TO 1 INCH BELOW SURFACE.



**1 TWO WAY COIL PIPING DETAIL**  
NTS

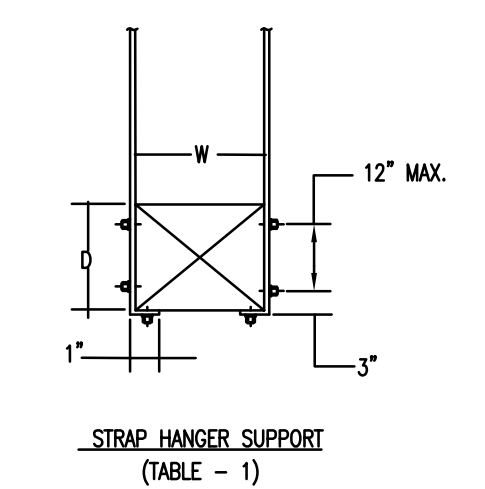
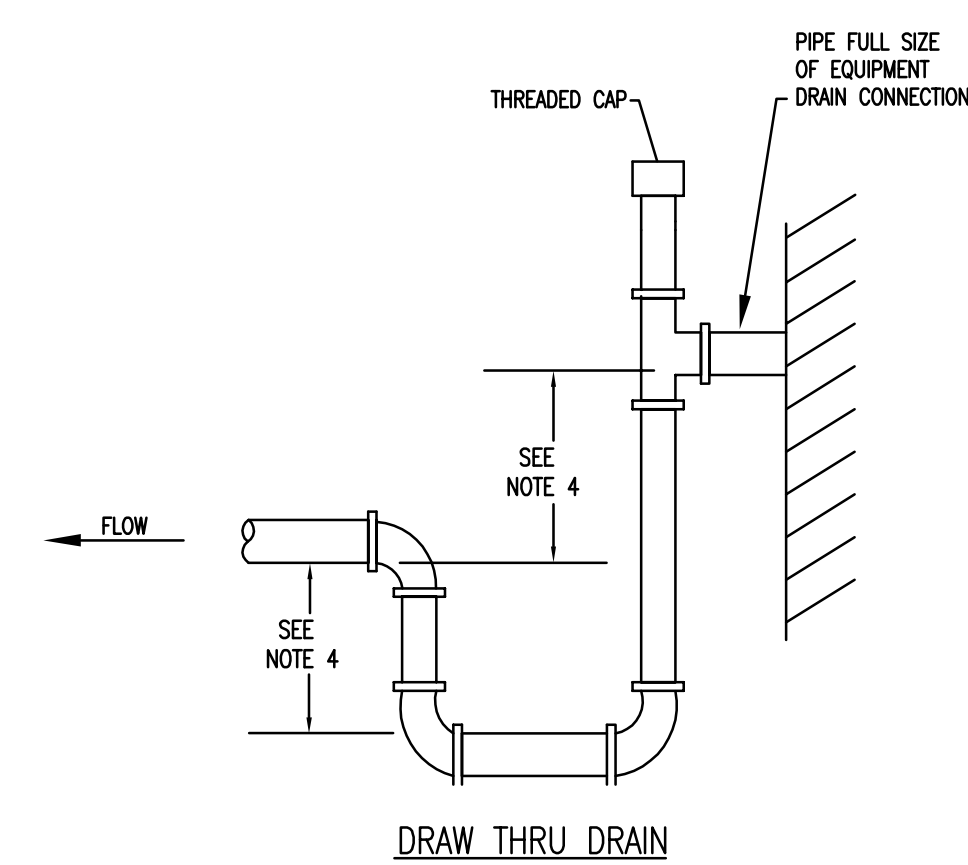
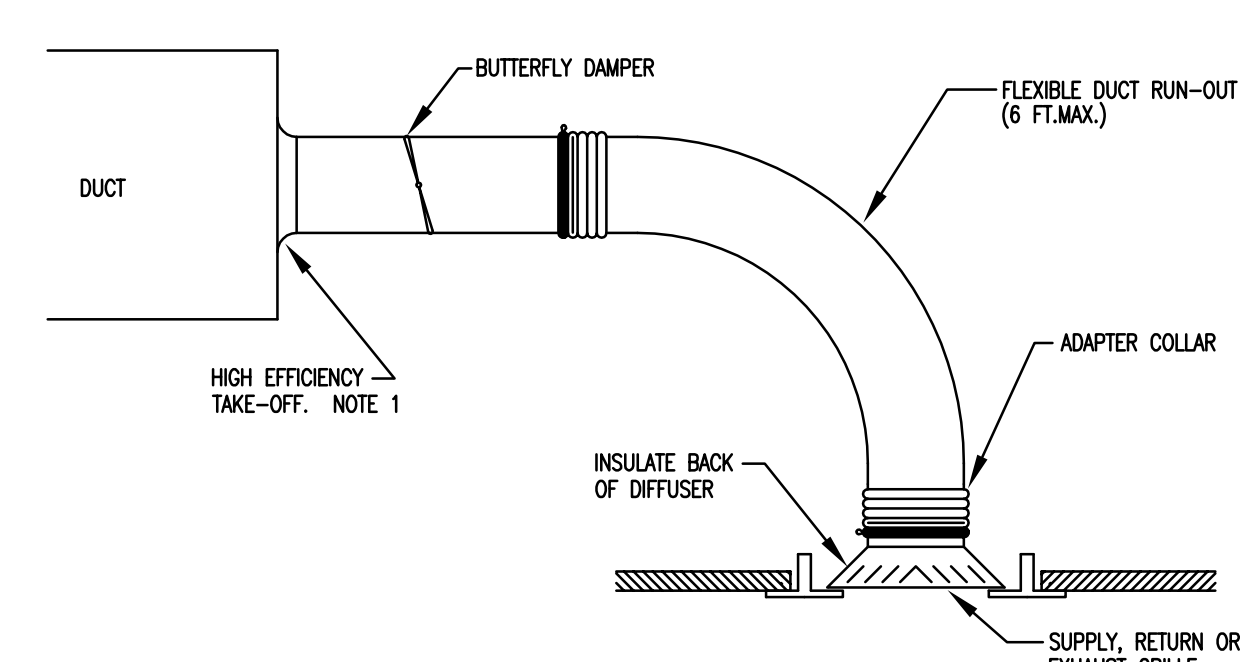


TABLE - 1. STRAP HANGERS (PAIR) SPACED (TABLE - 1)			
W x D	10'-0" MAX.	8'-0" MAX.	5'-0" OR LESS
72" x 22ga	1' x 22ga	1' x 22ga	1' x 22ga
96" x 22ga	1' x 20ga	1' x 22ga	1' x 22ga
120" x 22ga	1' x 18ga	1' x 22ga	1' x 22ga
168" x 22ga	1' x 18ga	1' x 18ga	1' x 18ga
192" x 22ga	1' x 18ga	1' x 18ga	1' x 18ga

**2 DUCT AND EQUIPMENT SUPPORT DETAILS**  
NTS



**3 EQUIPMENT CONDENSATE DRAIN DETAIL**  
NTS



**4 FLEXIBLE DUCT CONNECTION TO GRILL**  
NTS

**HVAC LEGEND**

☒	SUPPLY DIFFUSER
☐	RETURN DIFFUSER
⊙	DUCT SMOKE DETECTOR
⊕	THERMOSTAT
⊞	RUN-OUT/FLEXIBLE DUCT
---	CHANGE IN DUCT ELEVATION (DUCT RISE UNLESS SPECIFIED)
⊥	DUCT TURNING DOWN
⊓	DUCT TURNING UP
⊖	NECK SIZE
⊙	DIFFUSER, GRILLE, LOUVER OR REGISTER TYPE
○	PEAK LOAD CFM

**AIR DISTRIBUTION SCHEDULE**

TAG	DESCRIPTION	NECK	MODULE SIZE	MOUNT	CONSTR.	MFR.	MAX. NC.	MODEL	NOTES
A	PERFORATED CEILING SUPPLY	AS SHOWN	24 X 24	LAY-IN	ALUMINUM	PRICE	35	AP00	3.68
B	PERFORATED CEILING RETURN/EXHAUST	AS SHOWN	24 X 24	LAY-IN	ALUMINUM	PRICE	35	AP00	4

NOTES:  
1. FINISH WITH ODB  
2. 4-WAY DEFLECTION (UNLESS OTHERWISE NOTED)  
3. FINISH WITH INSULATED ROOF PLENUM  
4. BRAD CHAMFER OFF-WHITE FINISH  
5. HEAVY DUTY GRILLE  
6. FACTORY INSULATED BACK PAN

**COIL SCHEDULE**

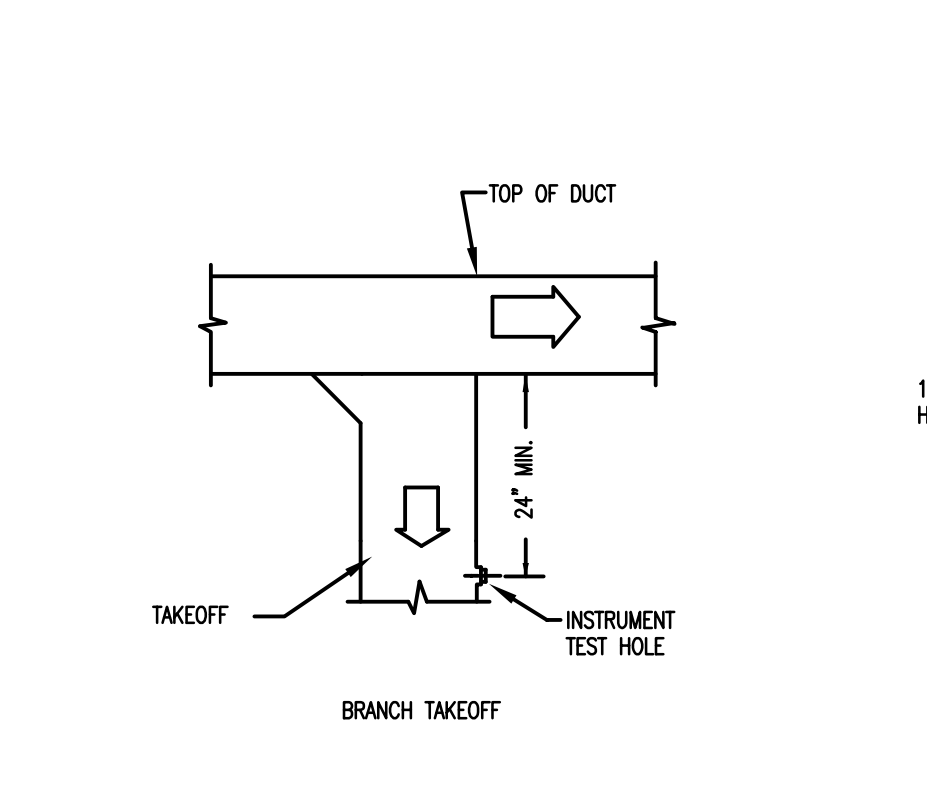
TAG	LOCATION	CAPACITY CFM	MAX. AIR VELOCITY (FPM)	AIR PRESS. DROP (IN. WG)	CAPACITY		AIR TEMPERATURE			WATER		MAXIMUM NO. OF FINS/IN.	NOTES			
					TOTAL	SENS.	ENTERING	LEAVING	ENTERING	LEAVING						
CS-1	1-AC1	3000	500	0.49	122.3	74.8	44	56	20.4	6.0	11	---	---			
HC-1	1-AC1	2000	500	0.02	110.8	---	42.0	---	91.0	---	150	160	11.4	3.4	11	---

**AIR HANDLER UNIT SCHEDULE**

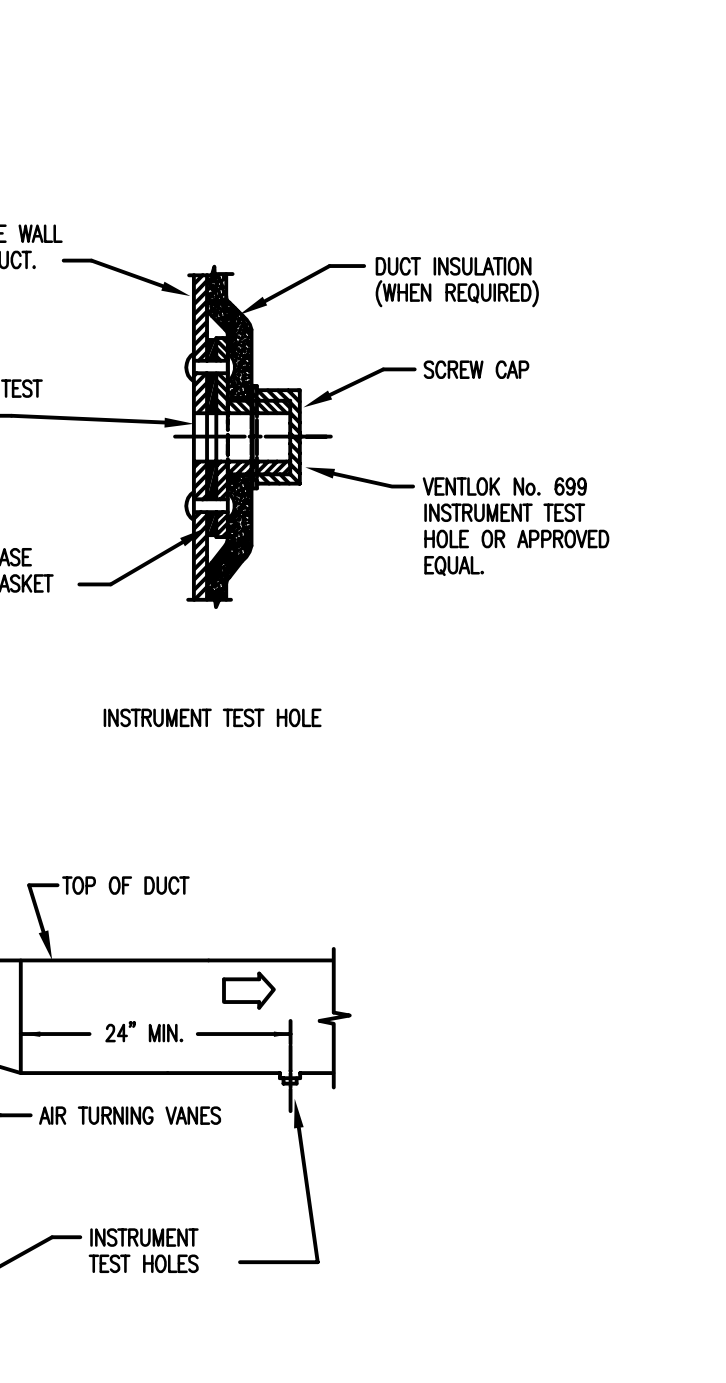
TAG	CAPACITY CFM	MINIMUM O.A.	SUPPLY FAN		MOTOR		ELECTRICAL VOLTS/PHASE	AIR VOLUME CONTROL	COOLING COIL EQ. NO.	REFREIGERANT TYPE	REHEAT COIL EQ. NO.	ACCESSORIES	MANUFACTURER	REMARKS		
			TOTAL	EXT.	BHP	HP										
1-AC1	3000	500	3000	AF	2.71	2.0	2.12	3.0	460/3	VD	CC-1	MW 8	HC-1	---	JD SOLUTION INDOOR AHU	1.2

NOTES:  
1. SINGLE POINT CONNECTION  
2. FACTORY MOUNTED VFD WITH INTEGRAL DISCONNECT

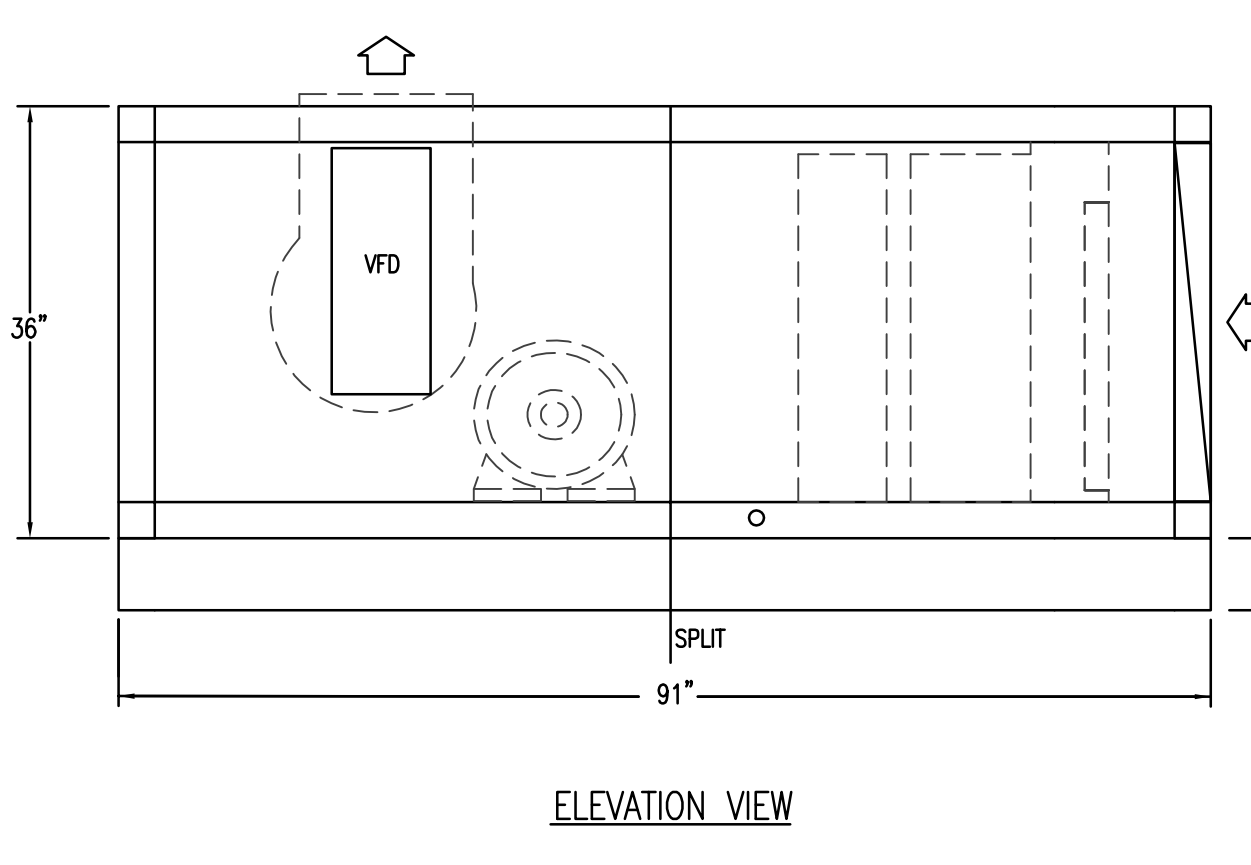
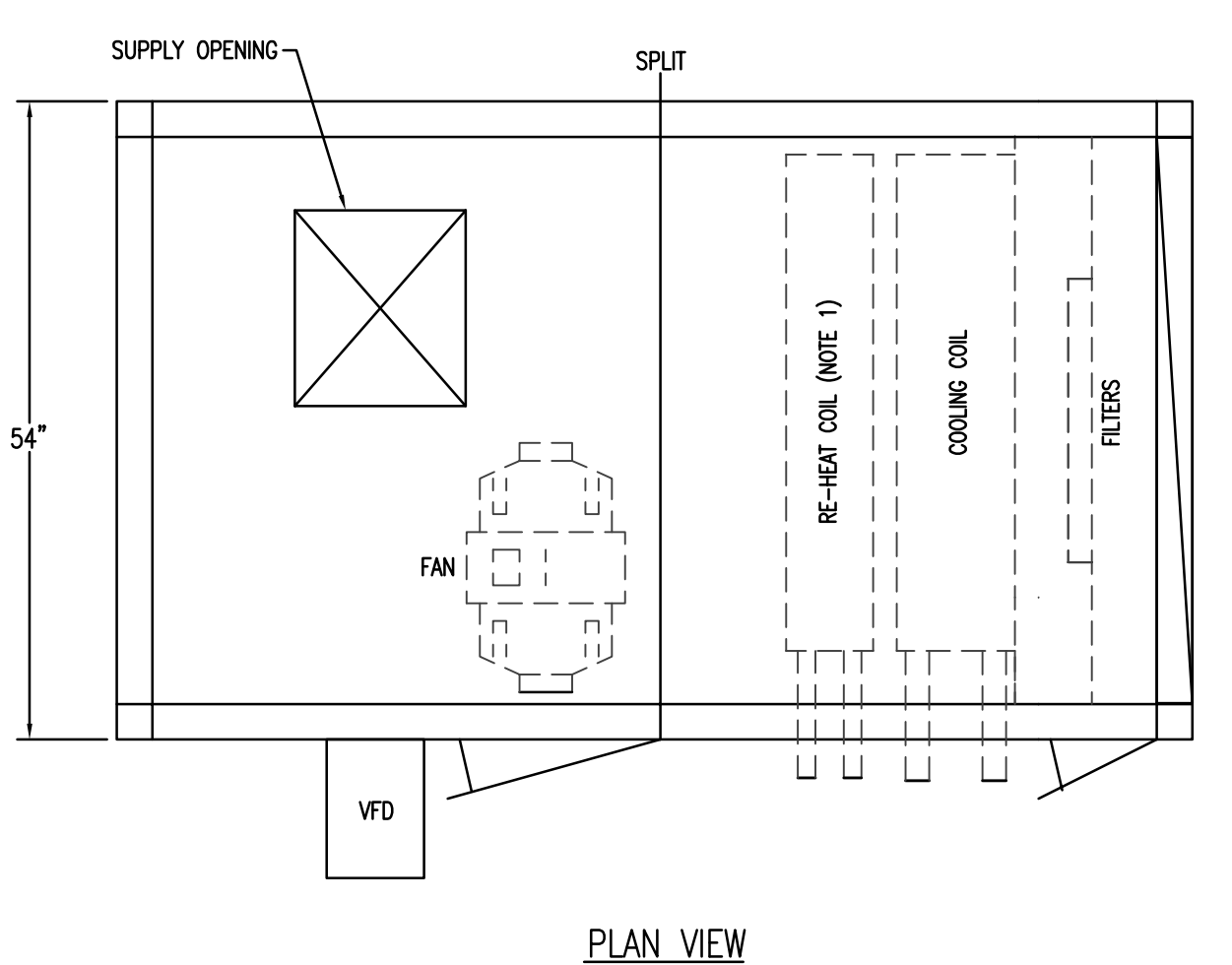
**6 DUCT THRU NON-RATED WALL**  
NTS



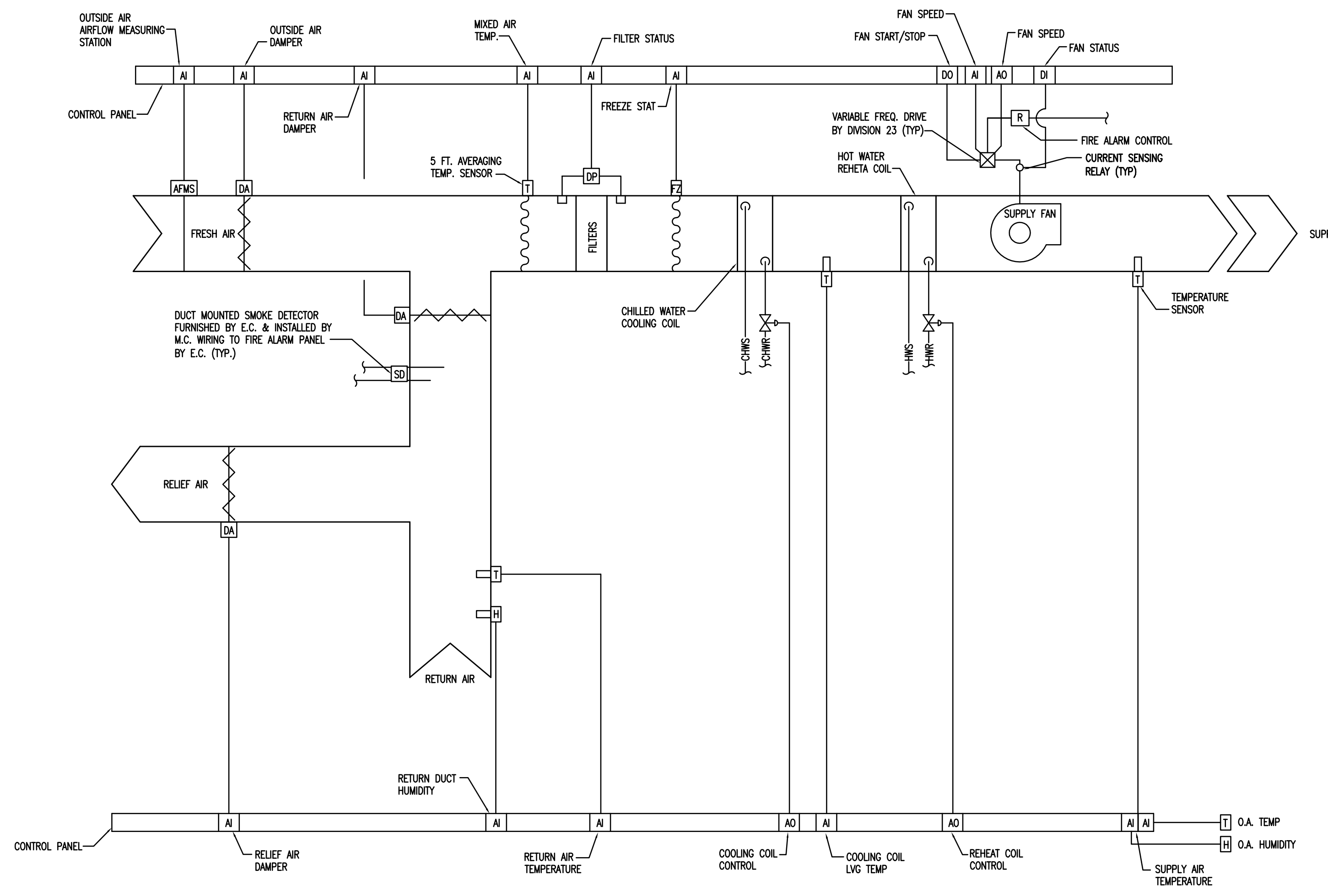
**7 LOUVER DETAIL TYPE - 2**  
NTS



**8 TYPICAL LOW PRESSURE DUCT DETAILS**  
NTS



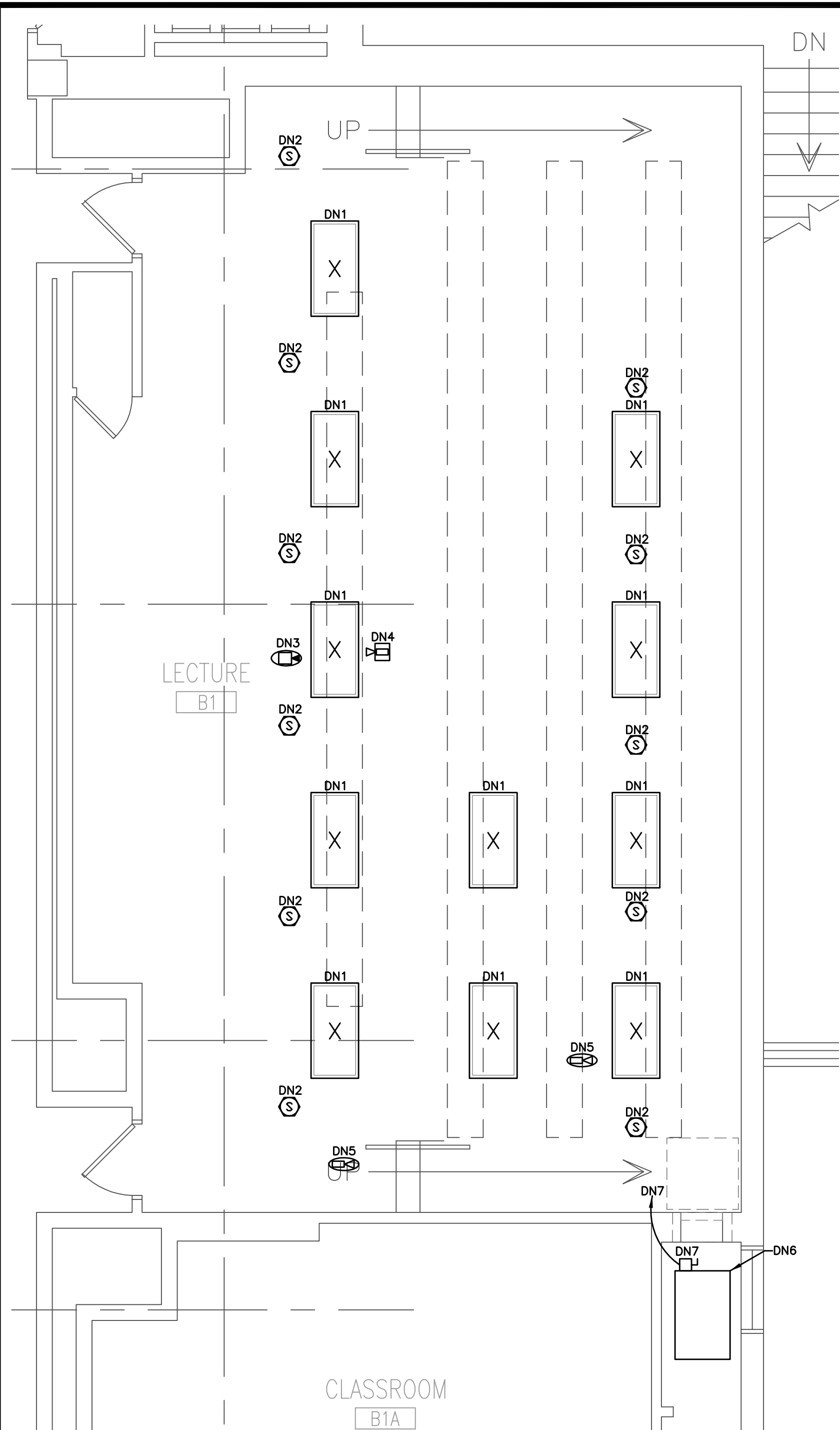
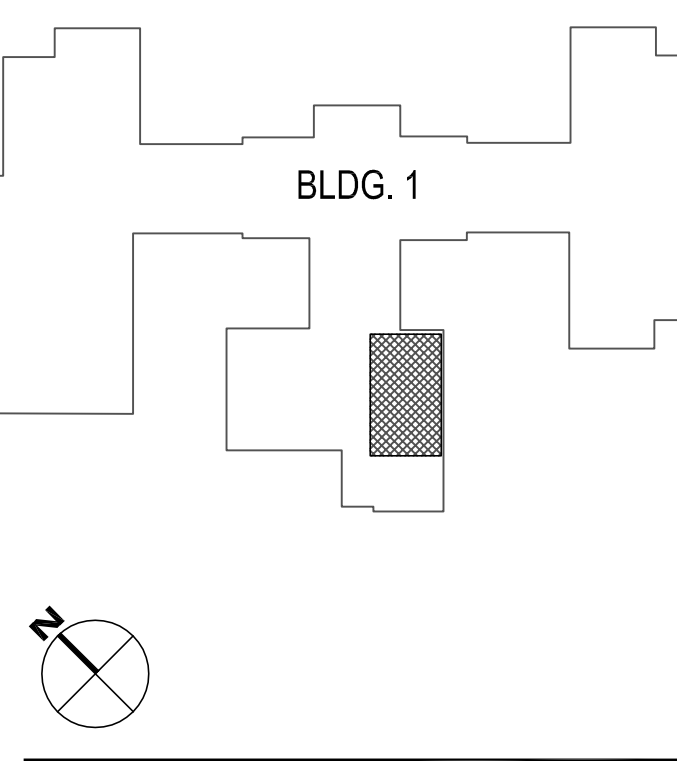
**9 1-AC1 CONFIGURATION DETAIL**  
NTS



**9 1-AC1 CONTROL SCHEMATIC**  
NTS

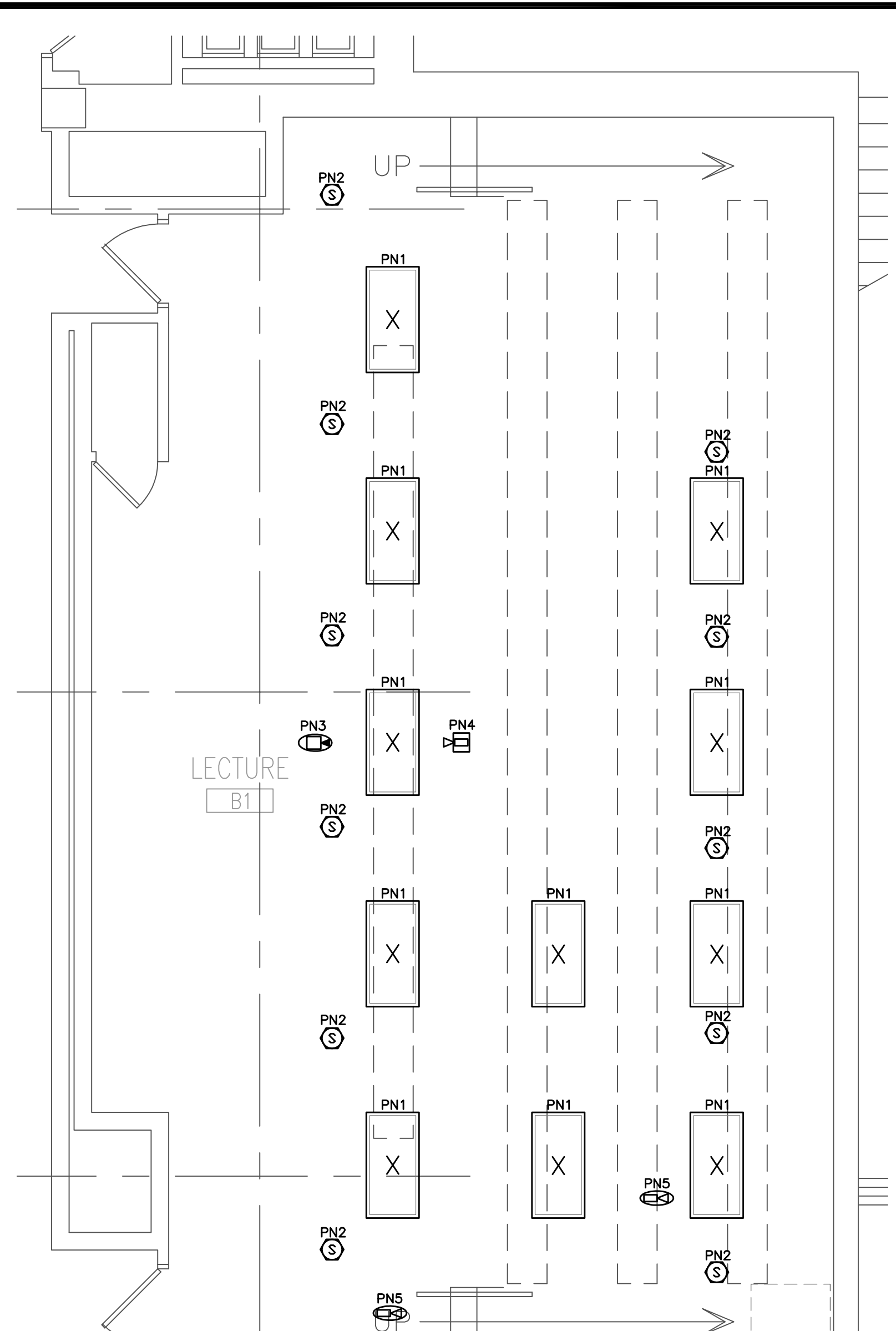
- NOTES:  
1. PROVIDE ACCESS ROOFS AND COIL CONNECTIONS, AS SHOWN ABOVE. (ORIENTATION DETERMINED BY "FACING" DISCHARGE AIRFLOW).

number	item	date



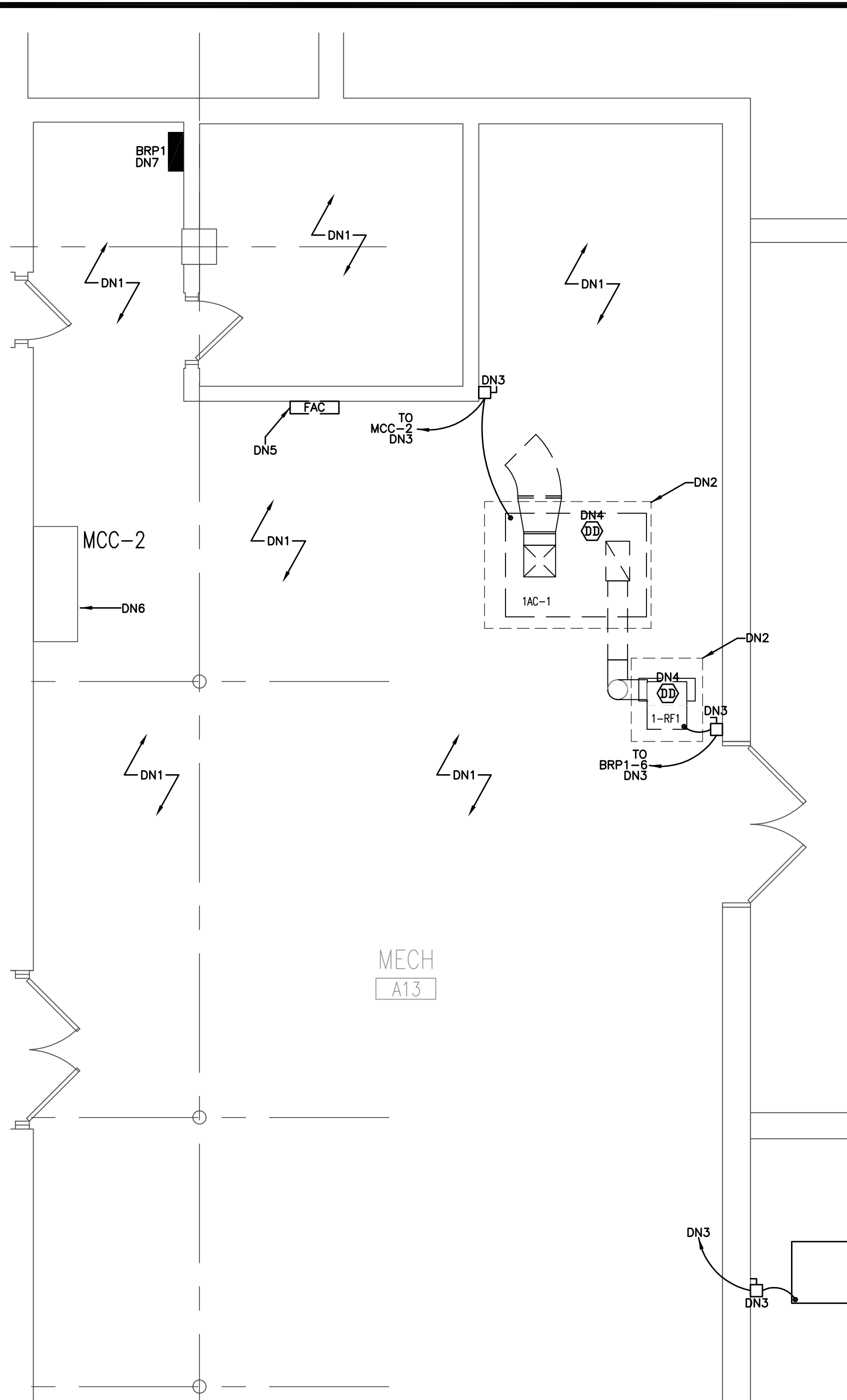
**1 PARTIAL FIRST FLOOR PLAN - DEMOLITION**  
1/4"=1'-0"

- DEMOLITION NOTES (DN):**
- EXISTING LIGHT FIXTURE SHALL BE DISCONNECTED, REMOVED, AND STORED FOR RE-INSTALLATION IN RENOVATION. EXISTING LIGHTING CIRCUIT SHALL REMAIN.
  - EXISTING SPEAKER SHALL BE DISCONNECTED, REMOVED, AND STORED FOR RE-INSTALLATION. EXISTING SPEAKER CIRCUIT SHALL REMAIN AS-IS.
  - EXISTING CEILING MOUNTED FIRE ALARM DEVICE SHALL BE DISCONNECTED FROM EXISTING FIRE ALARM CIRCUIT AND STORED FOR REINSTALLATION. EXISTING FIRE ALARM CIRCUIT SHALL REMAIN AS-IS. SEE RENOVATION PLAN THIS SHEET.
  - EC SHALL DISCONNECT ELECTRICAL CONNECTIONS TO EXISTING CEILING MOUNTED PROJECTOR. EC SHALL COORDINATE REMOVAL OF PROJECTOR WITH USC PERSONNEL.
  - EC SHALL DISCONNECT EXISTING CEILING MOUNTED PROJECTOR WITH USC PERSONNEL. EC SHALL COORDINATE REMOVAL OF CAMERA WITH USC PERSONNEL.
  - DISCONNECT EXISTING CIRCUIT FROM EXISTING HVAC UNIT, MC TO REMOVE EXISTING UNIT.
  - EXISTING WALL MOUNTED HVAC UNIT DISCONNECT SWITCH SHALL BE REMOVED. EXISTING MAIN HVAC FEEDER AND CONDUIT SHALL BE REMOVED BACK TO SOURCE ELECTRICAL PANEL. MARK EXISTING BREAKER IN EXISTING PANEL AS A SPARE. COORDINATE.



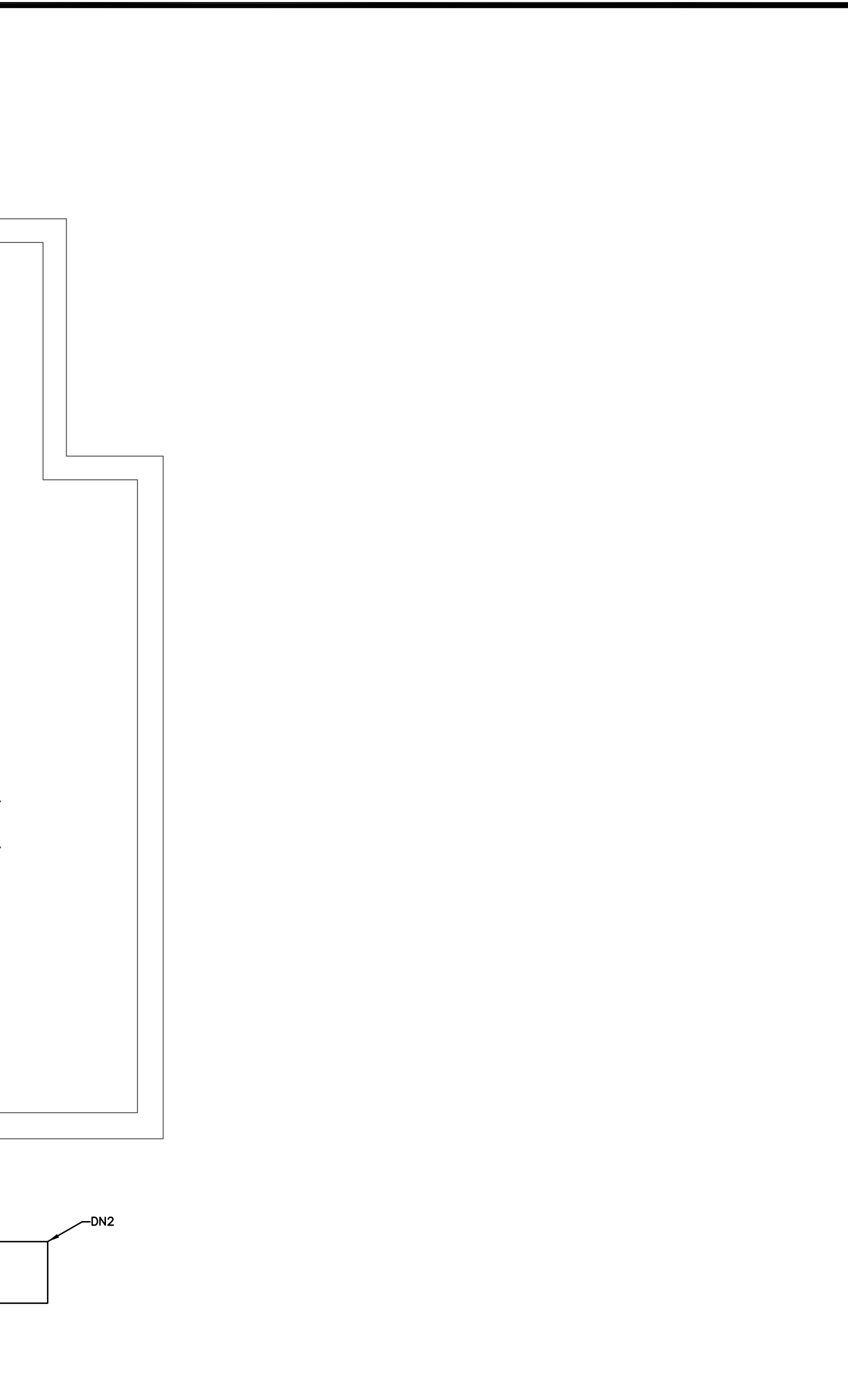
**2 PARTIAL FIRST FLOOR PLAN - RENOVATION**  
1/4"=1'-0"

- GENERAL NOTES (GN):**
- EC SHALL DISCONNECT, EXTEND, AND RE-ROUTE ANY AND ALL ELECTRICAL CIRCUITS OR DEVICES IN THE PATH OF NEW DUCTWORK. COORDINATE WITH MECHANICAL CONTRACTOR.
- POWER NOTES (PN):**
- EXISTING LIGHT FIXTURE FROM DEMOLITION. EC SHALL RE-INSTALL AND RE-CONNECT TO EXISTING LIGHTING CIRCUIT FROM DEMOLITION. COORDINATE.
  - EXISTING SPEAKER FROM DEMOLITION. EC SHALL RE-INSTALL AND RE-CONNECT TO EXISTING SPEAKER CIRCUIT FROM DEMOLITION. COORDINATE.
  - EXISTING FIRE ALARM DEVICE FROM DEMOLITION SHALL BE RECONNECTED TO EXISTING FIRE ALARM CIRCUIT FROM DEMOLITION.
  - EC SHALL COORDINATE MOUNTING OF EXISTING PROJECTOR WITH USC PERSONNEL. EC SHALL MAKE ALL NECESSARY ELECTRICAL CONNECTIONS TO MAKE EXISTING PROJECTOR OPERABLE.
  - EC SHALL COORDINATE MOUNTING OF EXISTING CAMERA WITH USC PERSONNEL. EC SHALL MAKE ALL NECESSARY ELECTRICAL CONNECTIONS TO MAKE EXISTING CEILING MOUNTED CAMERA OPERABLE.



**3 PARTIAL BASEMENT FLOOR PLAN - DEMOLITION**  
1/4"=1'-0"

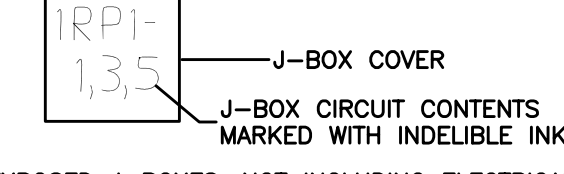
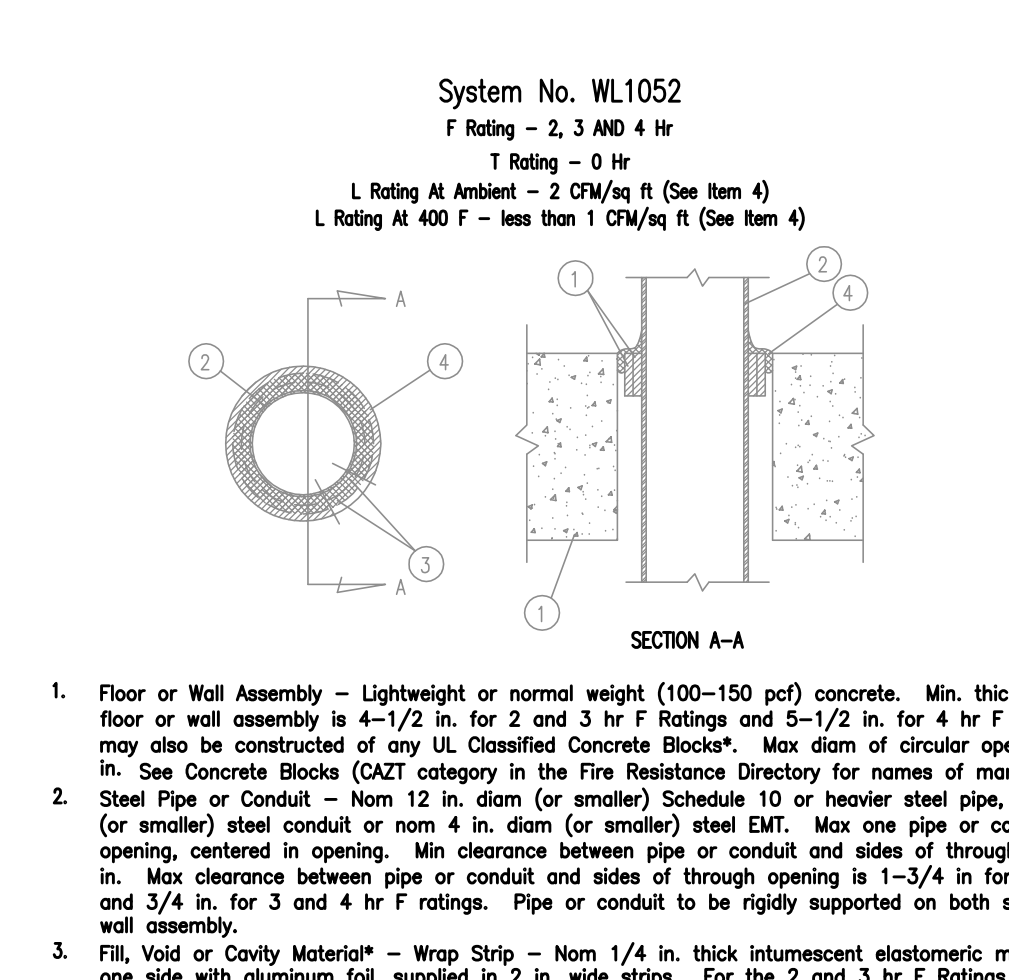
- DEMOLITION NOTES (DN):**
- EXISTING ELECTRICAL ELEMENTS SHALL REMAIN AS-IS UNLESS OTHERWISE NOTED.
  - DISCONNECT EXISTING CIRCUIT FROM EXISTING HVAC UNIT, MC TO REMOVE EXISTING UNIT.
  - EXISTING WALL MOUNTED HVAC UNIT DISCONNECT SWITCH SHALL BE REMOVED. EXISTING MAIN HVAC FEEDER AND CONDUIT SHALL BE REMOVED BACK TO SOURCE ELECTRICAL PANEL. COORDINATE.
  - EXISTING HVAC UNIT DUCT DETECTOR, DISCONNECT AND REMOVE EXISTING DUCT DETECTOR AND FIRE ALARM CIRCUIT TO EXISTING FAC. COORDINATE.
  - EXISTING FIRE ALARM CONTROL PANEL SHALL REMAIN AS-IS UNLESS OTHERWISE NOTED.
  - EXISTING COMBINATION STARTER FOR AIR HANDLER 1A11 IN MCC-2 SHALL BE DISCONNECTED AND REMOVED.
  - MARK EXISTING 20A/120V/1P BREAKER IN SPACE 6 FEEDING EXISTING FAN FOR HVAC UNIT 1-RF1 AS A SPARE. COORDINATE.



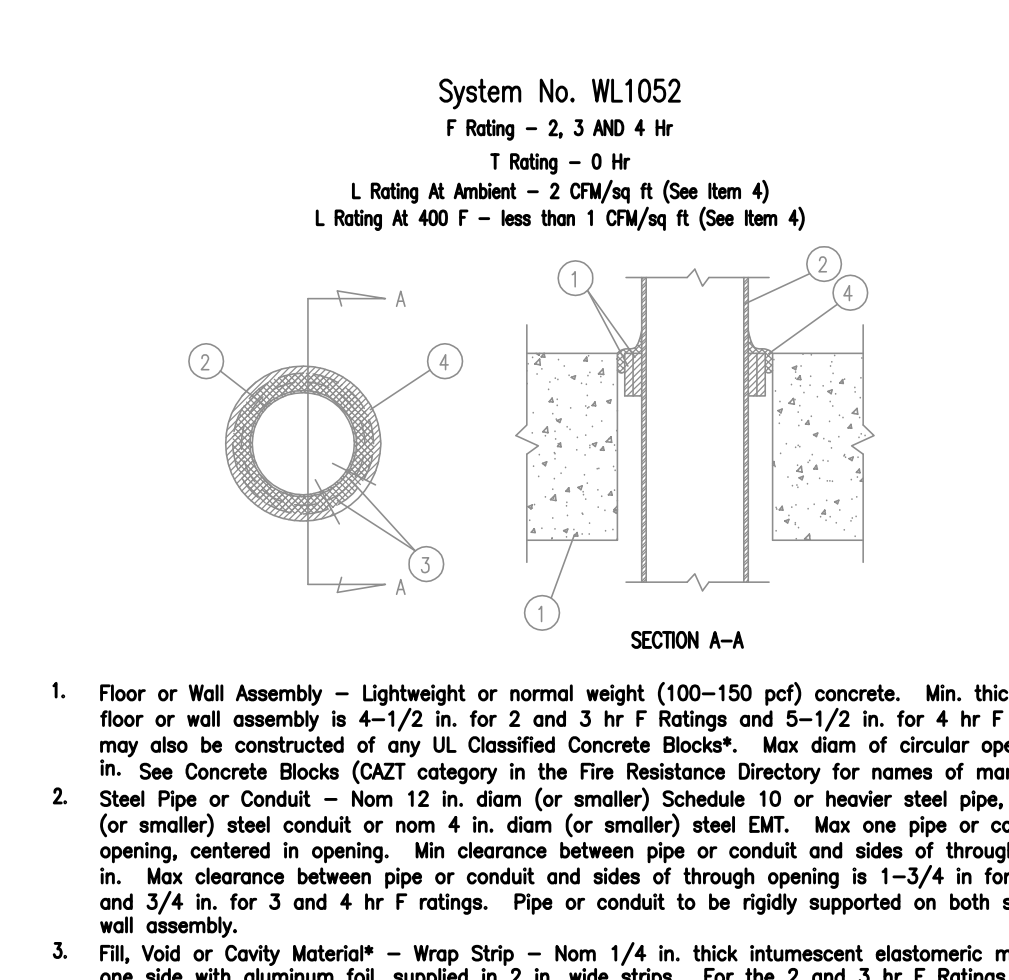
**4 PARTIAL BASEMENT FLOOR PLAN - RENOVATION**  
1/4"=1'-0"

- GENERAL NOTES (GN):**
- EC SHALL DISCONNECT, EXTEND, AND RE-ROUTE ANY AND ALL ELECTRICAL CIRCUITS OR DEVICES IN THE PATH OF NEW DUCTWORK. COORDINATE WITH MECHANICAL CONTRACTOR.
- POWER NOTES (PN):**
- MC SHALL FURNISH AND INSTALL HVAC UNIT MOUNTED VFD. EC TO WIRE. COORDINATE EXACT LOCATION WITH MC PRIOR TO ANY ROUGH-INS.
  - EC SHALL FURNISH AND INSTALL (1) GE 8000 LINE 20A/3 PHASE/480V BREAKER IN EXISTING COMBINATION STARTER BUCKET SPACE FROM DEMOLITION TO FEED NEW HVAC UNIT. NEW DUCT DETECTOR FOR HVAC UNIT 1-AC1 LOCATED IN HVAC DUCT. DETECTOR SHALL BE FURNISHED BY ELECTRICAL CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR AND WIRED BY ELECTRICAL CONTRACTOR TO EXISTING FIRE ALARM CONTROL PANEL LOCATED IN THE BASEMENT MECHANICAL ROOM.

SYMBOL	DESCRIPTION	ABBREVIATIONS
LR1-2.4	BRANCH CIRCUIT RACEWAY, RUN CONCEALED IN CEILING OR WALLS. ARROWHEAD DENOTES HOMERUN TO PANEL. CROSSELINES DENOTE NUMBER OF PHASE AND NEUTRAL CONDUCTORS WHEN MORE THAN TWO ARE TO BE INSTALLED. TEXT DENOTES PANEL NAME AND CIRCUIT NUMBERS FOR HOMERUN. INCLUDE GROUND WIRE IN ALL CIRCUITS. #12 AMP MINIMUM AND AS PER CODE, WHERE ALLOWED BY CODE. ALL 20 AMP LIGHTING AND RECEPTACLE CIRCUITS SHALL BE TYPE NM CABLE, OTHER CIRCUITS WHERE INDICATED ON PLANS SHALL BE IN CONDUIT.	AFF AMPERE AFF ABOVE FINISHED FLOOR. ATS AUTOMATIC TRANSFER SWITCH BKR BREAKER C CONDUIT EC ELECTRICAL CONTRACTOR, DIVISION 16. FCU FAN COIL UNIT FCU GENERAL CONTRACTOR, DIVISION 00 THROUGH 14. GF GROUND FAULT CIRCUIT INTERRUPTER. JB or J-BOX JUNCTION BOX. KVA KILOWATT AMPERES. MC MECHANICAL CONTRACTOR, DIVISION 15. MNP MAIN DISTRIBUTION PANEL. MIN MINIMUM. VOLT VARIABLE FREQUENCY DRIVE. NEC 2011 NATIONAL ELECTRICAL CODE. (NFPA 70). SWBD SWITCHBOARD. TYP TYPICAL. WPR WEATHER PROOF. X TRANSFORMER.
LP1-2.4	BRANCH CIRCUIT, SAME AS ABOVE EXCEPT RUN IN AND/OR UNDER SLAB.	
(Symbol)	FLEXIBLE CONDUIT, WEATHERPROOF TYPE WHEN CONNECTED TO MOTORS. CROSSELINES DENOTE NUMBER OF PHASE AND NEUTRAL CONDUCTORS WHEN MORE THAN TWO ARE INSTALLED. INSTALL GROUND WIRE #12 AWG MINIMUM.	
(Symbol)	SPACE NAME AND NUMBER. COORDINATE WITH ARCHITECTURAL SPACE NUMBER.	
(X)	CEILING MOUNTED FLUORESCENT LIGHT FIXTURE. LETTER "X" DENOTES EXISTING FIXTURE.	
(Symbol)	PHOTODETECTING SMOKE DETECTOR MOUNTED ON AIR DUCT WITH SAMPLING TUBE THE FULL WIDTH OF DUCT, FURNISHED AND WIRED BY THE EC, INSTALLED BY THE MC.	
(Symbol)	CEILING MOUNTED FIRE ALARM VISUAL UNIT WITH STROBE LIGHT. NUMBER DENOTES CANDELLA LEVEL.	
(Symbol)	CAMERA, CEILING MOUNTED.	
(Symbol)	SPEAKER, CEILING MOUNTED.	
(Symbol)	SURFACE WALL MOUNTED DISCONNECT SWITCH. HEAVY DUTY. NOTATION DENOTES TYPE ON SCHEDULE.	
(Symbol)	PROJECTOR, CEILING MOUNTED.	
(Symbol)	ELECTRICAL CIRCUIT BREAKER PANELBOARD.	



- 5 J-BOX COVER DETAIL**
- ALL EXPOSED J-BOXES, NOT INCLUDING ELECTRICAL OR MECHANICAL ROOMS, SHALL BE MARKED ON THE OUTSIDE. ALL OTHERS SHALL BE MARKED ON THE OUTSIDE.
- ALL J-BOXES CONTAINING FIRE ALARM CIRCUITS SHALL BE PAINTED RED.



- 1. Floor or Wall Assembly -** Lightweight or normal weight (100-150 pcf) concrete. Min. thickness of concrete floor or wall assembly is 4-1/2 in. for 2 and 3 hr F Ratings and 5-1/2 in. for 4 hr F Rating. Wall may also be constructed of any UL Classified Concrete Block<sup>1</sup>. Max diam of circular opening is 13-1/2 in. See Concrete Block (C&T) category in the Fire Resistance Directory for names of manufacturers.
- 2. Steel Pipe or Conduit -** Nom 12 in. diam (or smaller) Schedule 10 or heavier steel pipe, nom 6 in. diam (or smaller) steel conduit or nom 4 in. diam (or smaller) steel EMT. Max one pipe or conduit per opening, centered in opening. Min clearance between pipe or conduit and sides of through opening is 1/4 in. Max clearance between pipe or conduit and sides of through opening is 1-3/4 in for 2 hr F Rating and 3/4 in. for 3 and 4 hr F ratings. Pipe or conduit to be rigidly supported on both sides of floor or wall assembly.
- 3. Fill Void or Cavity Material<sup>2</sup> -** Wrap Strip - Nom 1/4 in. thick intumescent elastomeric material faced on one side with aluminum foil, supplied in 2 in. wide strips. For the 2 and 3 hr F Ratings, min 1 in. wide strip(s) wrapped around pipe/conduit (full side exposed) until OD of wrap strip is equal to or max 3/16 in. less than ID of circular through opening. Wrap strip tightly bound with steel tie wire or pressure sensitive tape and slid into through opening such that the top edge of the wrap strip(s) is recessed 1/4 in. from the top surface of floor or, in wall assemblies, such that the wrap strip(s) is centered in the wall thickness. For the 4 hr F Rating, nom 2 in. wide strip(s) wrapped around pipe/conduit (full side exposed) on each side of the floor or wall assembly until OD of wrap strip is equal to or max 3/16 in. less than ID of circular through opening. Wrap strip tightly bound with steel tie wire or pressure sensitive tape and slid into through opening on each side of floor or wall assembly such that the exposed edges are recessed 1/4 in. from the floor or wall surfaces.
- 4. Fill Void or Cavity Material<sup>3</sup> -** Caulk - Nom 1/4 in. thickness of caulk to be applied to the exposed edges of the wrap strip and to fill all voids between the pipe/conduit and the periphery of the through opening. For a 2 or 3 hr F rating in floor assemblies, caulk to be installed flush with top surface of floor. For wall assemblies and for the 4 hour F Rating in floor assemblies, caulk to be applied on both sides of wall assembly.
- <sup>1</sup>Minnesota Mining & Mfg. Co. - Types CP-25 S/L, CP-25 N/S, CP-25 WB, CP-25 WB+ (Note: L Ratings apply only when Type CP-25 WB caulk is used.)  
<sup>2</sup>Bearing the UL Classification Markings.  
<sup>3</sup>Minnesota Mining & Mfg. Co. - CP 25WB+.

System No. W-L-1001  
F Rating - 1, 2, 3 and 4 Hr (See Item 2 and 3)  
T Rating - 0, 1, 2, 3, and 4 Hr (See Item 3)  
L Rating of Ambient - less than 1 CH/mq ft.  
L Rating of 400° F - less than 1 CH/mq ft.

Layer	Thickness, in.	F Rating, hr	T Rating, hr
1	0 to 3/16	1 or 2	0, 1 or 2
2	1/4 to 1/2	3 or 4	3 or 4
3	0 to 1-1/2	1 or 2	1 or 2
4	1/4 to 1/8	3 or 4	3 or 4
5	0 to 1/2	0	0

\*When copper pipe is used, T Rating is 0 hr.  
\*Bearing the UL Classification Markings.