


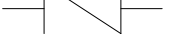

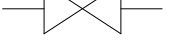







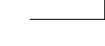


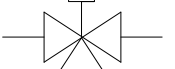

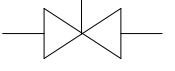

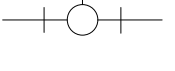

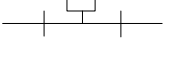

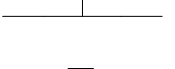





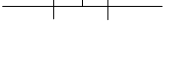
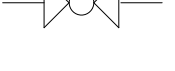

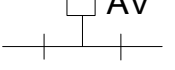





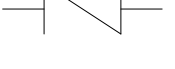

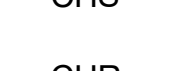

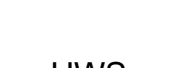



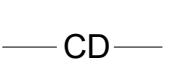

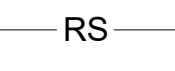









SYMBOLS	DESCRIPTION	SYMBOLS	DESCRIPTION
	<b>SMOKE DAMPER</b>		GATE VALVE
	<b>COMBINATION FIRE/SMOKE DAMPER</b>		CHECK VALVE
	<b>FIRE DAMPER</b>		GLOBE VALVE
	FIRESTAT		PLUG VALVE
	HUMIDSTAT		BUTTERFLY VALVE
	TEMPERATURE SENSOR		STRAINER
 OR 	ADJUSTABLE VOLUME DAMPER		3/4" GATE VALVE WITH HOSE CONNECTION
	MOTORIZED DAMPER		3-WAY CONTROL VALVE
	BAROMETRIC DAMPER		STRAIGHT THROUGH CONTROL VALVE
	OPPOSED BLADE DAMPER		BALL VALVE
	BACKDRAFT DAMPER		TEST PLUG
	CARBON DIOXIDE SENSOR		GAUGE STATION WITH COCK
	FREEZESTAT		THERMOMETER
	SMOKE DETECTOR (BY DIVISION 16)		THERMOMETER WELL
	AIR FLOW MONITORING STATION		PRESSURE RELIEF VALVE
07/M-3	INDICATES REFERENCE TO DETAIL 07, SHEET M-3. ALSO INDICATED BY: REF. 07/M-3.		PRESSURE REDUCING VALVE
	FILTER SECTION		AIR VENT
	FLEXIBLE CONNECTION		FLOW METER
	MECHANICAL EQUIPMENT		UNION OR FLANGE
	CEILING SUPPLY DIFFUSER		FLOW CONTROL VALVE
	CEILING SUPPLY DIFFUSER		CHILLED WATER SUPPLY
	CEILING SUPPLY DIFFUSER		CHILLED WATER RETURN
	INDICATES REFERENCE TO SEC. 01, SHEET M-3		HOT WATER SUPPLY
	DUCTWORK		HOT WATER RETURN
	STATIC PRESSURE SENSOR		CONDENSATE DRAIN
	STATIC PRESSURE SENSOR		REFRIGERANT SUCTION LINE
	POINT OF CONNECTION		REFRIGERANT LIQUID LINE
	VOLUME DAMPER	AHU	AIR HANDLING UNIT
	CAP SECTION	EF	EXHAUST FAN
CH	CHILLER	SA	SUPPLY AIR
VAV	VARIABLE AIR VOLUME	OA	OUTSIDE AIR
		RA	RETURN AIR
		ERU	ENERGY RECOVER UNIT
			TRANSFORMER
		WP	HOT WATER PUMP
		NG	NATURAL GAS
		ST	STEAM TRAP
		RH	ROOF HOOD
NOTE: NOT ALL SYMBOLS TABULATED ABOVE ARE NECESSARILY USED ON THE DRAWINGS.			
MECHANICAL SYMBOLS			

GENERAL NOTES	
A. SITE VISIT-THE CONTRACTOR AND SUBCONTRACTOR SHALL VISIT THE FACILITY AND THOROUGHLY FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS. NO CLAIMS FOR ADDITIONAL WORK DUE TO OBSERVABLE CONDITIONS WILL BE CONSIDERED.	
B. THE PLANS HAVE BEEN PREPARED BASED ON A RECENT SURVEY AND CONSTRUCTION DOCUMENTS FROM PREVIOUS PROJECTS AND ARE THE BEST SOURCES OR INFORMATION TO DATE. ALL PIPING, EQUIPMENT, UTILITIES, ETC. SHALL BE FIELD VERIFIED. PLANS SHALL NOT BE SCALED.	
C. REPORT ANY ALTERATION TO AND/OR DEVIATIONS FROM THE DRAWING AS REQUIRED BY THE REGULATORY AUTHORITIES TO THE ARCHITECT/ENGINEER AND SECURE HIS APPROVAL BEFORE STARTING ALTERATIONS.	
D. PROVIDE EQUIPMENT CLEARANCES IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND IN ACCORDANCE WITH ALL APPLICABLE CODES.	
E. ALL WORK AND EQUIPMENT SHALL MEET THE REQUIREMENTS OF THE MOST RECENTLY REVISED VERSION OF ALL APPLICABLE LAWS, RULES, REGULATION AND ORDINANCES OF FEDERAL, STATE, AND LOCAL AUTHORITIES, WHETHER INDICATED ON THE DRAWINGS OR NOT.	
F. PATCH ALL WALL PENETRATIONS WHERE PIPING OR EQUIPMENT IS REMOVED AND WHERE OPENING IS NOT BEING REUSED. WALL SHALL BE SEALED TO PRE-CONSTRUCTION CONDITION AND MEET EXISTING WALL RATING.	
G. PROVIDE FIRE STOPPING AT PENETRATIONS OR RATED ASSEMBLIES (SLAB AND RATED WALLS).	
H. THE PIPING SHOWN ON THESE DRAWINGS ARE DIAGRAMMATIC. CONTRACTOR SHALL ARRANGE WORK IN A NEAT AND ORDERLY MANNER. THE CONTRACTOR SHALL MAKE ANY OFFSETS, TRANSITIONS, AND OTHER MINOR ADJUSTMENTS AS REQUIRED FOR A COMPLETE AND WORKING SYSTEM INSTALLATION.	
I. DRAWINGS SHOW GENERAL SIZE AND APPROXIMATE LOCATIONS. THE DRAWINGS ARE INTENDED TO SHOW THE GENERAL ARRANGEMENT OF THE UTILITY SYSTEM. THE CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CONNECTIONS SIZE, LOCATION, DEPTH. THE CONTRACTOR SHALL INSTALL ALL SYSTEMS ACCORDING TO THE ACTUAL FIELD CONDITIONS FOUND. ANY MECHANICAL SYSTEM COMPONET INSTALLED INCORRECTLY DUE TO FIELD CONDITIONS SHALL BE REMOVED AND INSTALLED CORRECTLY AT THE EXPENSE OF THE CONTRACTOR. THE CONTRACTOR SHALL NOT CUT ANY STRUCTURAL MEMBERS OF BUILDING WITHOUT PRIOR CONSENT OF ARCHITECT AND/OR STRUCTURAL ENGINEER.	
J. ENGAGE A FACTORY AUTHORIZED SERVICE REPRESENTATIVE TO PERFORM START-UP SERVICES AND TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST. OPERATE AND MAINTAIN EQUIPMENT.	
K. PROVIDE OPERATION AND MAINTENANCE MANUALS TO OWNER FOR ALL INSTALLED EQUIPMENT.	
L. ALL PIPING ELEVATIONS INDICATED ON THIS DRAWING SET ARE APPROXIMATE AND ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL PIPING ELEVATIONS IN THE FIELD PRIOR TO SUBMITTING A BID.	

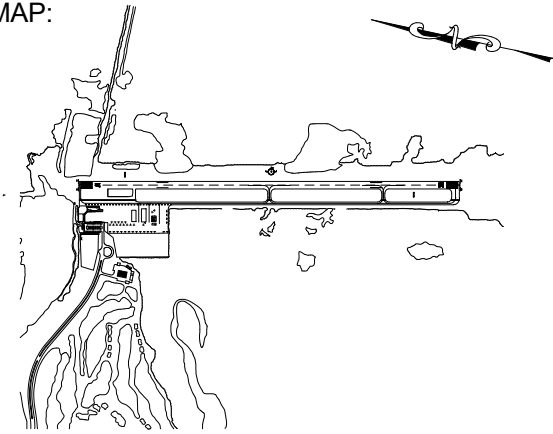
MARCO ISLAND  
EXECUTIVE AIRPORT  
COLLIER COUNTY, FLORIDA



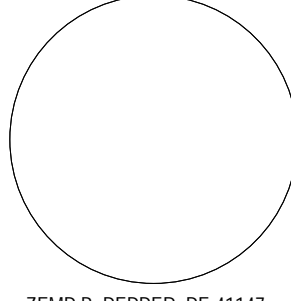
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KEY MAP:



DRAWING SCALE:

REVISIONS		
MARK	DESCRIPTION	DATE
PROJECT NAME: NEW TERMINAL FACILITY AND ASSOCIATED IMPROVEMENTS		
SHEET TITLE:  MECHANICAL SYMBOLS AND LEGEND		
VOLUME 2		
ENGINEER OF RECORD:		
 ZEMP B. PEPPER, PE #1147		
JOB NO.:	1620729	
DATE:	May 2017	
DRAWN:	SB	
DESIGN:	ZP	
CHECKED:	ZP	
NOTE: GENERAL CONTRACTOR(S) BIDDING SHALL PROVIDE WRITTEN VERIFICATION WITH THEIR BIDS THAT ALL OF THEIR SUBCONTRACTORS BIDDING THIS PROJECT HAVE BECOME FAMILIAR WITH ALL CONSTRUCTION DRAWING SHEETS & PROJECT MANUAL SPECIFICATIONS TO ENSURE THE GC AND SUB-CONTRACTORS CONSTRUCTION BIDS SHALL PROVIDE THE TOTALITY OF THE ENTIRE CONTRACT DOCUMENT REQUIREMENTS.		
SHEET NO.  M001		



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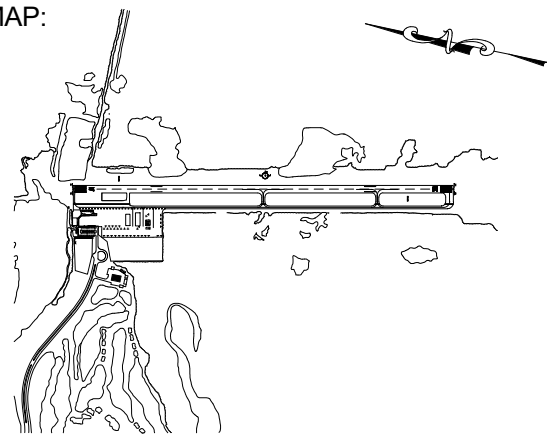


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**SCHENKELSHULTZ**  
ARCHITECTURE

KEY MAP:



DRAWING SCALE:

1/8" = 1'-0"

REVISIONS

MARK	DESCRIPTION	DATE
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PROJECT NAME:

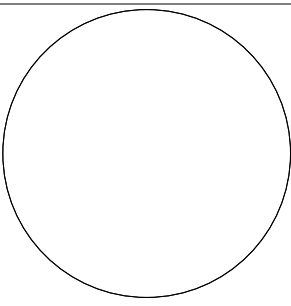
**NEW TERMINAL FACILITY  
AND ASSOCIATED  
IMPROVEMENTS**

SHEET TITLE:

**MECHANICAL FIRST  
FLOOR PLAN**

**VOLUME 2**

ENGINEER OF RECORD:



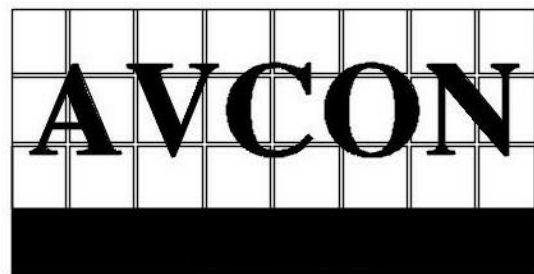
ZEMP B. PEPPER, PE #1147

JOB NO.:	1620729
DATE:	May 2017
DRAWN:	SB
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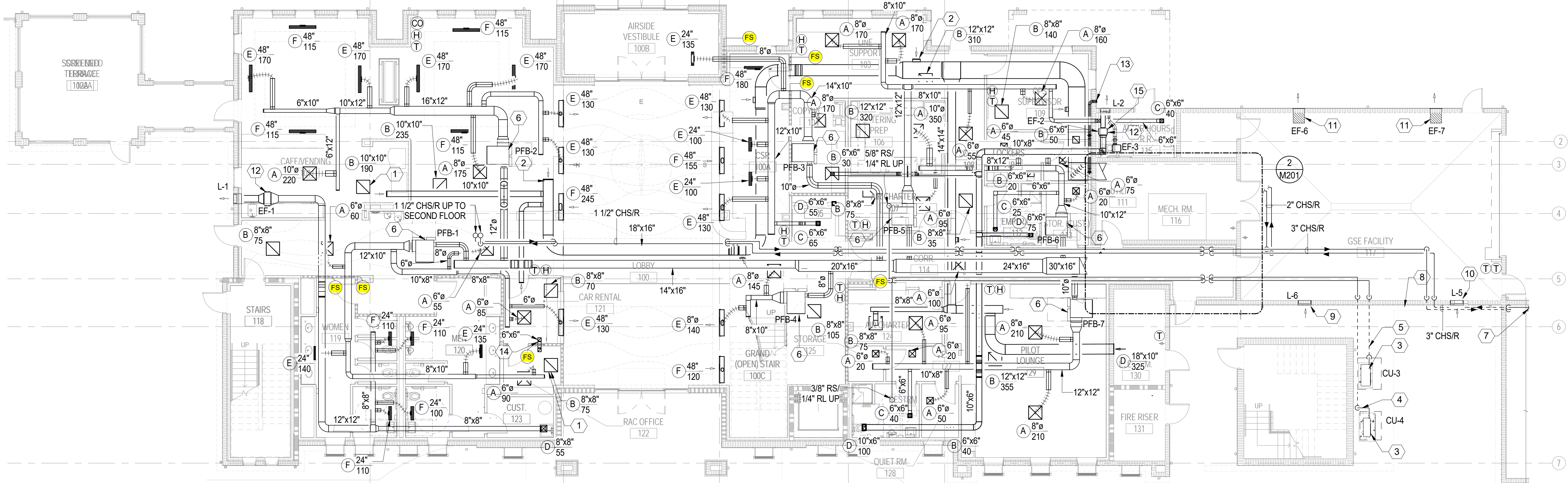
SHEET NO.

**M101**

NOTE: GENERAL CONTRACTORS (GC) BIDDING SHALL PROVIDE WRITTEN VERIFICATION WITH THEIR BIDS THAT ALL OF THEIR SUBCONTRACTORS BIDDING THIS PROJECT HAVE BECOME FAMILIAR WITH ALL CONSTRUCTION DRAWING SHEETS & PROJECT MANUAL SPECIFICATIONS TO ENSURE THE GC AND SUB CONTRACTORS CONSTRUCTION BIDS SHALL PROVIDE THE TOTALITY OF THE ENTIRE CONTRACT DOCUMENT REQUIREMENTS.



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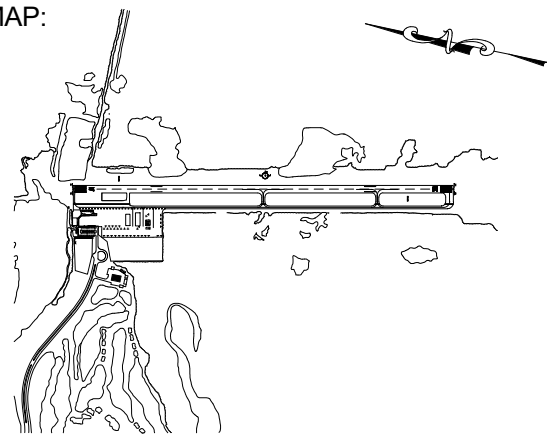


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SCHENKELSHULTZ  
ARCHITECTURE

KEY MAP:



DRAWING SCALE:

1/8" = 1'-0"

REVISIONS

MARK	DESCRIPTION	DATE
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PROJECT NAME:

NEW TERMINAL FACILITY  
AND ASSOCIATED  
IMPROVEMENTS

SHEET TITLE:

MECHANICAL SECOND  
FLOOR PLAN

VOLUME 2

ENGINEER OF RECORD:

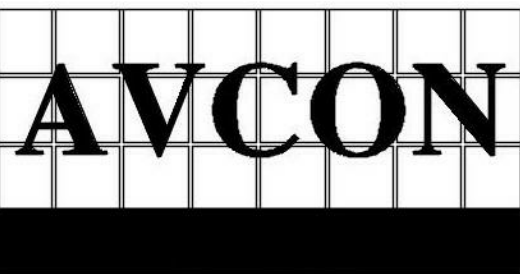
ZEMP B. PEPPER, PE #1147

JOB NO.: 1620729  
DATE: May 2017  
DRAWN: SB  
DESIGN: ZP  
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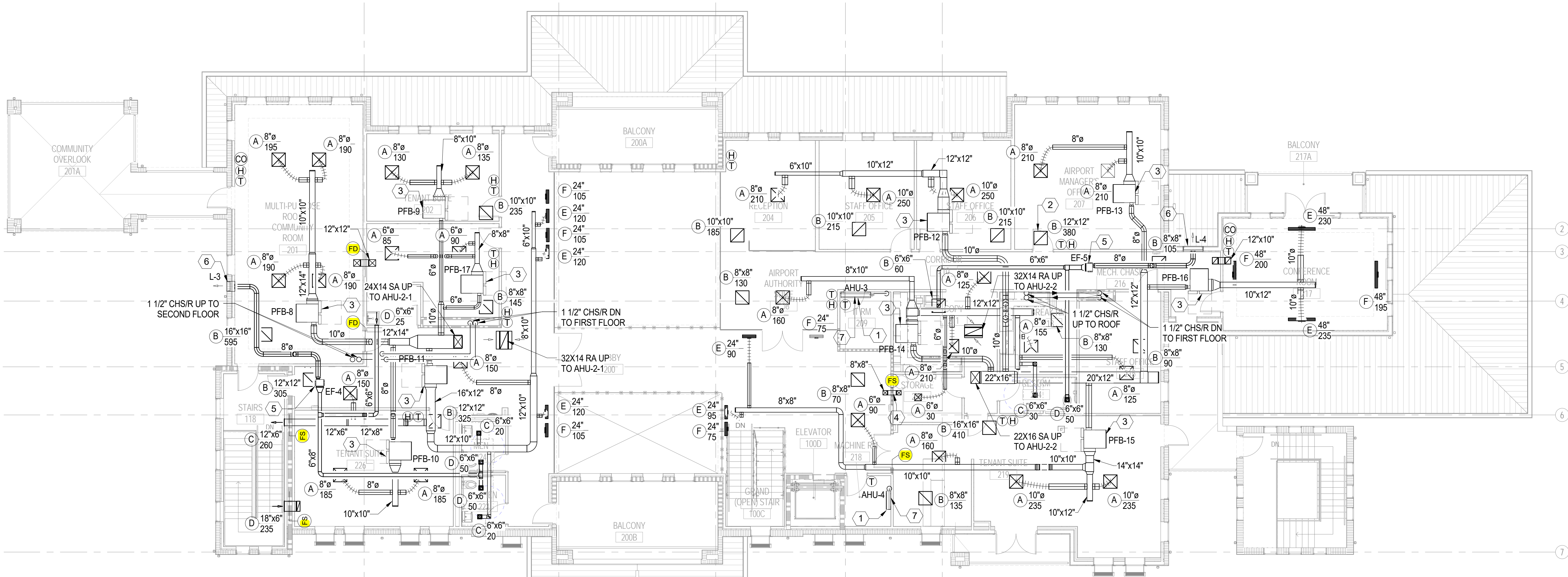
NOTE: GENERAL CONTRACTORS (GC) BIDDING SHALL PROVIDE WRITTEN VERIFICATION WITH THEIR BIDS THAT ALL OF THEIR SUBCONTRACTORS BIDDING THIS PROJECT HAVE BECOME FAMILIAR WITH ALL CONSTRUCTION DRAWING SHEETS & PROJECT MANUAL SPECIFICATIONS TO ENSURE THE GC AND SUB-CONTRACTORS CONSTRUCTION BIDS SHALL PROVIDE THE TOTALITY OF THE ENTIRE CONTRACT DOCUMENT REQUIREMENTS.

SHEET NO.

M102



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## MECHANICAL SECOND FLOOR PLAN

1/8" = 1'-0"

### MECHANICAL GENERAL NOTES

- SITE VISIT-THE CONTRACTOR AND SUBCONTRACTOR SHALL VISIT THE FACILITY AND THOROUGHLY FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS. NO CLAIMS FOR ADDITIONAL WORK DUE TO OBSERVABLE CONDITIONS WILL BE CONSIDERED.
- REPORT ANY ALTERATION TO AND/OR DEVIATIONS FROM THE DRAWING AS REQUIRED BY THE REGULATORY AUTHORITIES TO THE ARCHITECT/ENGINEER AND SECURE HIS APPROVAL BEFORE STARTING ALTERATIONS.
- PROVIDE EQUIPMENT CLEARANCES IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND IN ACCORDANCE WITH ALL APPLICABLE CODES.
- ALL WORK AND EQUIPMENT SHALL MEET THE REQUIREMENTS OF THE MOST RECENTLY REVISED VERSION OF ALL APPLICABLE LAWS, RULES, REGULATION AND ORDINANCES OF FEDERAL, STATE, AND LOCAL AUTHORITIES, WHETHER INDICATED ON THE DRAWINGS OR NOT.
- ROOM TEMPERATURE CONTROLLERS SHALL BE MOUNTED AT 48" AFF UNLESS NOTED OTHERWISE. DO NOT INSTALL ABOVE DIMMER.
- PROVIDE FIRE STOPPING AT PENETRATIONS OF RATED ASSEMBLIES (SLAB AND RATED WALLS).

### MECHANICAL KEYNOTES

1	MINI-SPLIT HANDLER UNIT MOUNTED AT MINIMUM OF 7'-6" AFF. REFER TO DETAIL 03/M502. REFER TO MINI-SPLIT SYSTEM SCHEDULE M601. EXACT LOCATION OF UNIT SHALL BE COORDINATED WITH IDF EQUIPMENT, CABLE BASKETS AND LIGHTING. REFER TO ELECTRICAL PLAN AND SYSTEMS PLANS (T SERIES SHEETS).
2	PROVIDE RETURN AIR REGISTER WITH ACOUSITCAL BOOT, TYPICAL. REFER TO DETAIL 07/M503.
3	FAN POWERED TERMINAL BOX, REFER TO DETAIL 05/M502 AND VAV TERMINAL SCHEDULE ON SHEET M602, TYPICAL.
4	PROVIDE TRANSFER DUCT AT PARTITION TO DECK, REFERENCE DETAIL 03/M505, TYPICAL.
5	INLINE EXHAUST FAN, REFERENCE DETAIL 05/M504 AND FAN SCHEDULE ON SHEET M602.
6	PROVIDE EXHAUST TERMINATION AT SIDEWALL LOUVER. PROVIDE SHEET METAL PLENUM AT LOUVER FOR DUCT CONNECTION. REFERENCE LOUVER SCHEDULE ON M602 AND ARCHITECTURAL ELEVATIONS.
7	REFER TO PLUMBING PLANS FOR CONDENSATE PIPING.





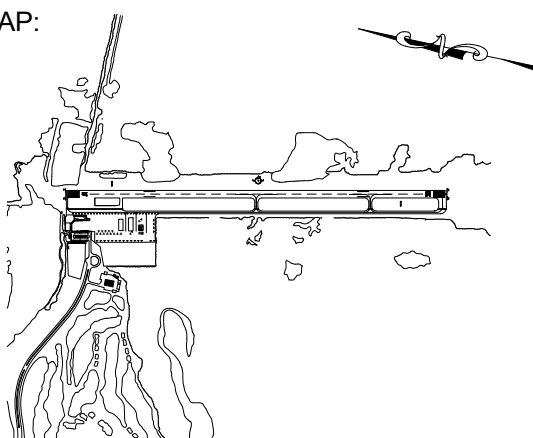
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**SCHENKELSHULTZ**  
ARCHITECTURE

KEY MAP:



DRAWING SCALE:

1/8" = 1'-0"

REVISIONS

MARK	DESCRIPTION	DATE
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PROJECT NAME:

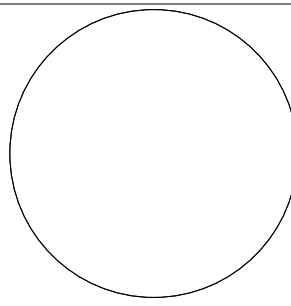
NEW TERMINAL FACILITY  
AND ASSOCIATED  
IMPROVEMENTS

SHEET TITLE:

MECHANICAL ROOF PLAN

VOLUME 2

ENGINEER OF RECORD:



ZEMP B. PEPPER, PE #1147

JOB NO.:

1620729

DATE:

May 2017

DRAWN:

SB

DESIGN:

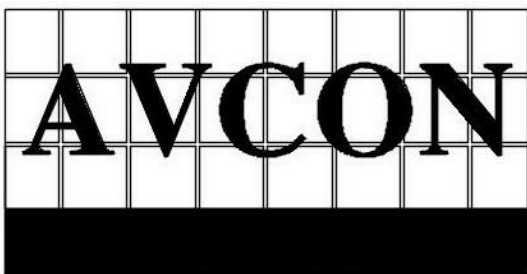
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CHECKED:

ZP

SHEET NO.

M103

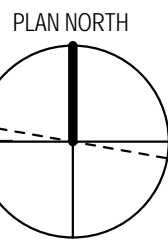


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1 MECHANICAL ROOF PLAN  
M103 1/8" = 1'-0"



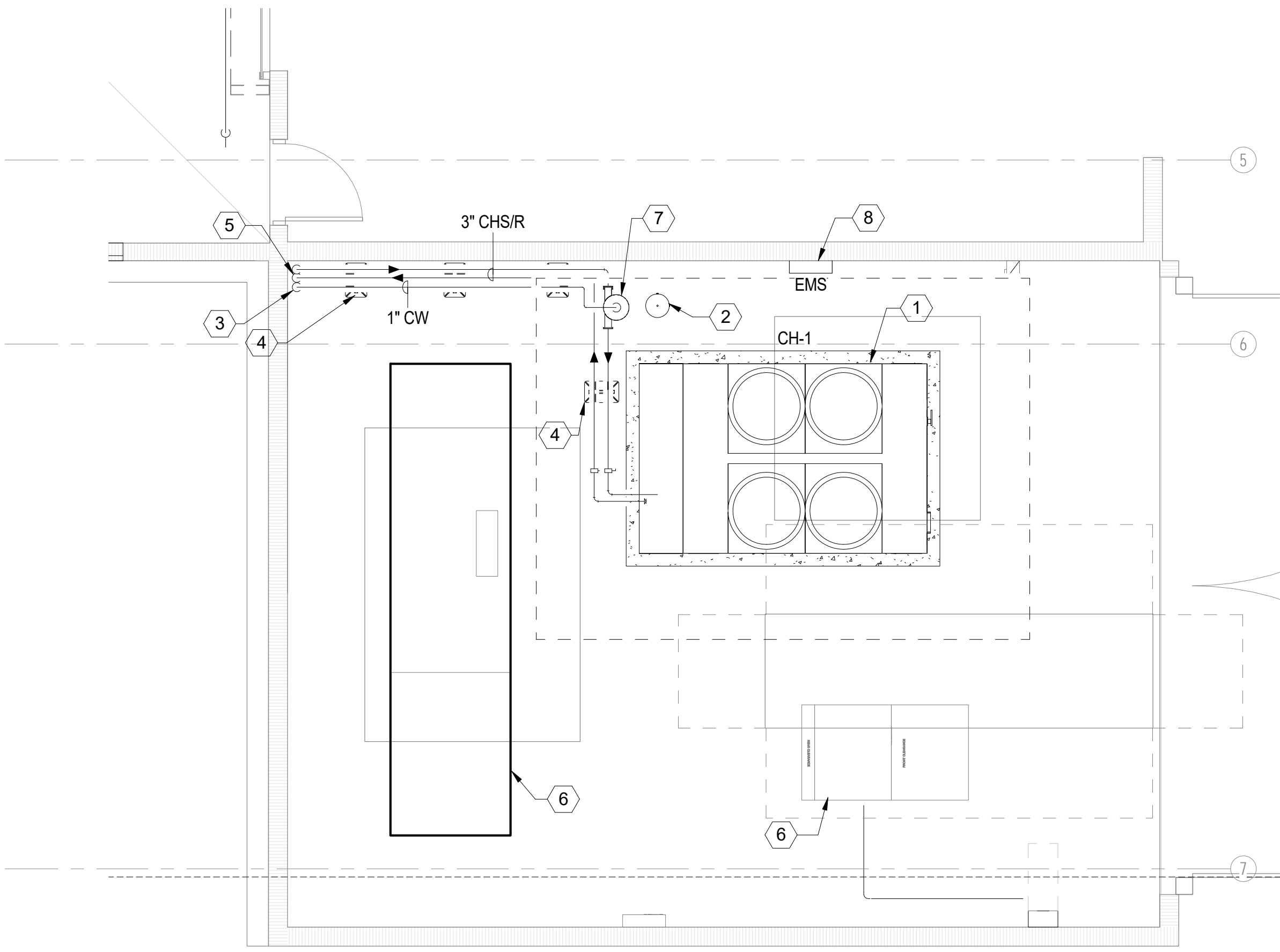
### MECHANICAL GENERAL NOTES

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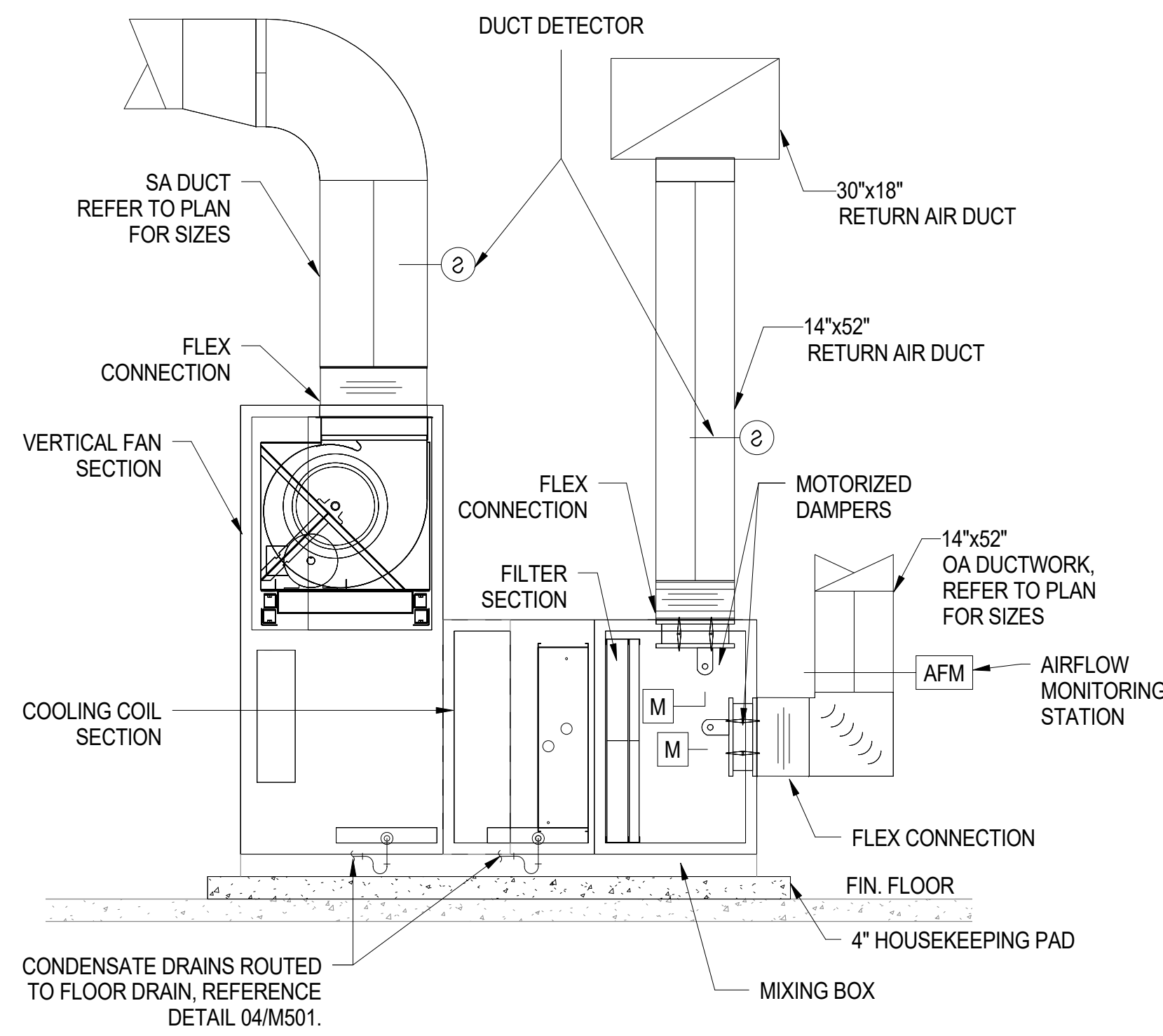
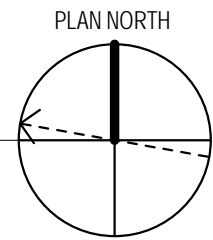
### MECHANICAL KEYNOTES

1	CHILLED WATER VAV ROOFTOP UNIT, REFER TO SHEET M601 FOR SCHEDULE AND CURB DETAIL 01/M505.
2	CONDENSATE DRAIN FOR ROOFTOP UNITS SHALL TERMINATE AT ROOF DRAIN/DOWNSPOUT WHICH IS CONNECTED DIRECTLY TO THE SITE DRAINAGE SYSTEM. CONDENSATE DRAIN SHALL BE IN ACCORDANCE WITH DETAIL 04/M501.
3	PROVIDE ROOF PIPE SUPPORTS SPACED IN ACCORDANCE WITH CODE. REFER TO DETAIL 06/M503.
4	CHS/R DOWN THROUGH ROOF JACK, REFERENCE DETAIL 02/M505.

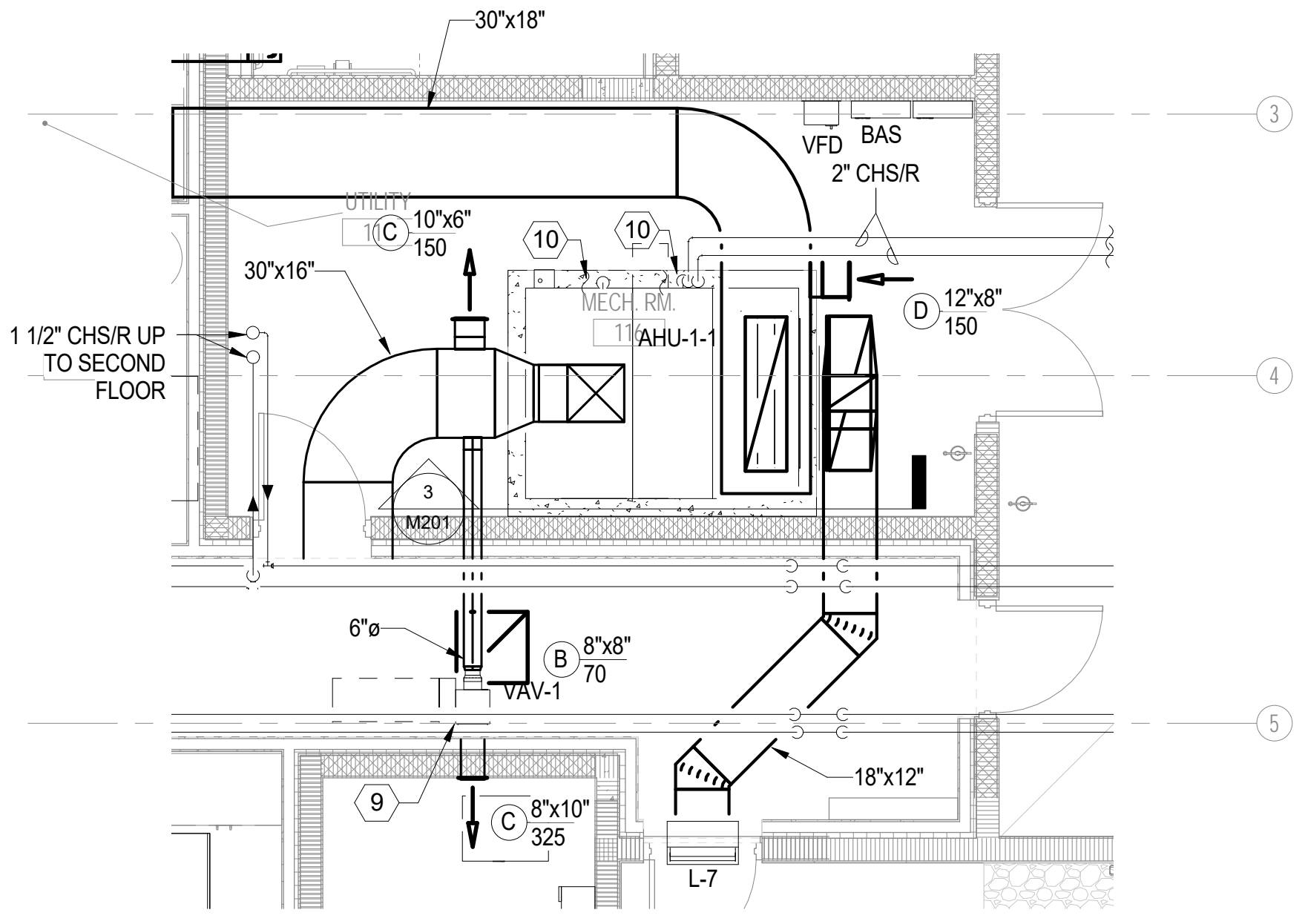




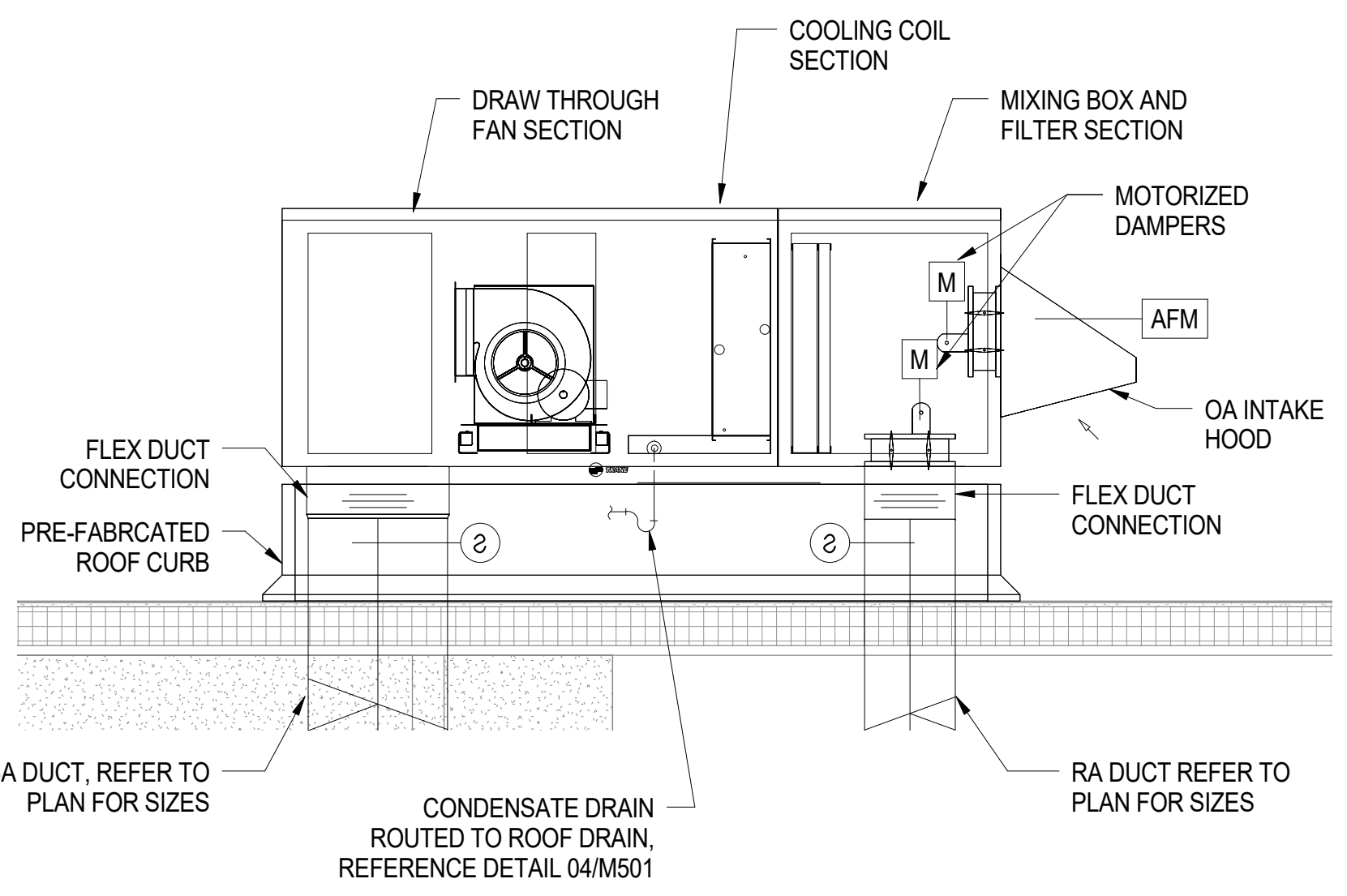
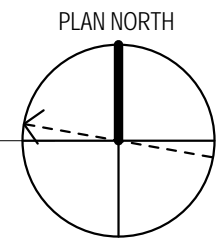
1  
M201  
1/4" = 1'-0"



3  
M201  
1/2" = 1'-0"



2  
M201  
1/4" = 1'-0"



4  
M201  
1/2" = 1'-0"

NOTES:  
PROVIDE TIE-DOWN STRAPS AS REQUIRED SUCH THAT PKG. ROOFTOP AC UNITS WILL BE ANCHORED TO MEET WIND LOADING. REFERENCE STRUCTURAL PLANS.  
IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY LOAD CARRYING CAPABILITY OF ROOF STRUCTURAL SYSTEM AND MAKE ANY REQUIRED MODIFICATIONS TO FRAMING. CONTRACTOR SHALL VERIFY RTU WEIGHT WITH MANUFACTURER WHO SUPPLIES UNIT. CONTRACTOR SHALL FURNISH ENGINEERED STRUCTURAL CALCULATIONS AS REQUIRED BY CODE AUTHORITY. ALL ROOF OPENINGS SHALL BE COORDINATED WITH STRUCTURE.

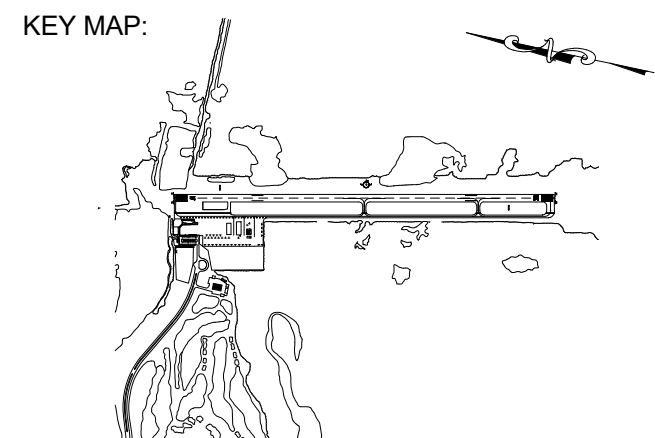
MECHANICAL KEYNOTES	
1	AIR COOLED CHILLER, REFER TO DETAIL 01/M503 AND CHILLED WATER FLOW DIAGRAM ON SHEET M702.
2	CHEMICAL TREATMENT TANK, REFER TO DETAIL 03/M503.
3	1" MAKE-UP WATER, REFERENCE SHEET P101 FOR CONTINUATION. PROVIDE BACKFLOW PREVENTER AND PIPE ACCESSORIES AS SHOWN ON DETAIL 05/M503.
4	PROVIDE PIPE SUPPORTS SPACED IN ACCORDANCE WITH CODE. REFER TO DETAIL 06/M503.
5	3" CHS/R PIPING, REFERENCE SHEET M101 FOR CONTINUATION.
6	ELECTRICAL EQUIPMENT, REFERENCE ELECTRICAL PLANS. PROVIDE CLEARANCE TO ALL ELECTRICAL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND CODE.
7	AIR SEPARATOR, REFERENCE DETAIL 05/M503.
8	BAS PANEL, NEMA 3R.
9	SINGLE DUCT VAV TERMINAL, REFER TO DETAIL 06/M502 AND VAV SCHEDULE ON SHEET M602.
10	ROUTE 1 1/4" CONDENSATE TO FLOOR DRAIN IN MECHANICAL ROOM, REFERENCE PLUMBING PLANS.

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SCHENKELSHULTZ  
ARCHITECTURE



DRAWING SCALE:  
As indicated

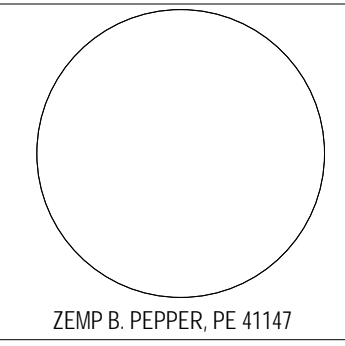
REVISIONS		
MARK	DESCRIPTION	DATE

PROJECT NAME:  
NEW TERMINAL FACILITY  
AND ASSOCIATED  
IMPROVEMENTS

SHEET TITLE:  
MECHANICAL ENLARGED  
FLOOR PLANS

VOLUME 2

ENGINEER OF RECORD:



JOB NO.: 1620729  
DATE: May 2017  
DRAWN: SB  
DESIGN: ZP  
CHECKED: ZP

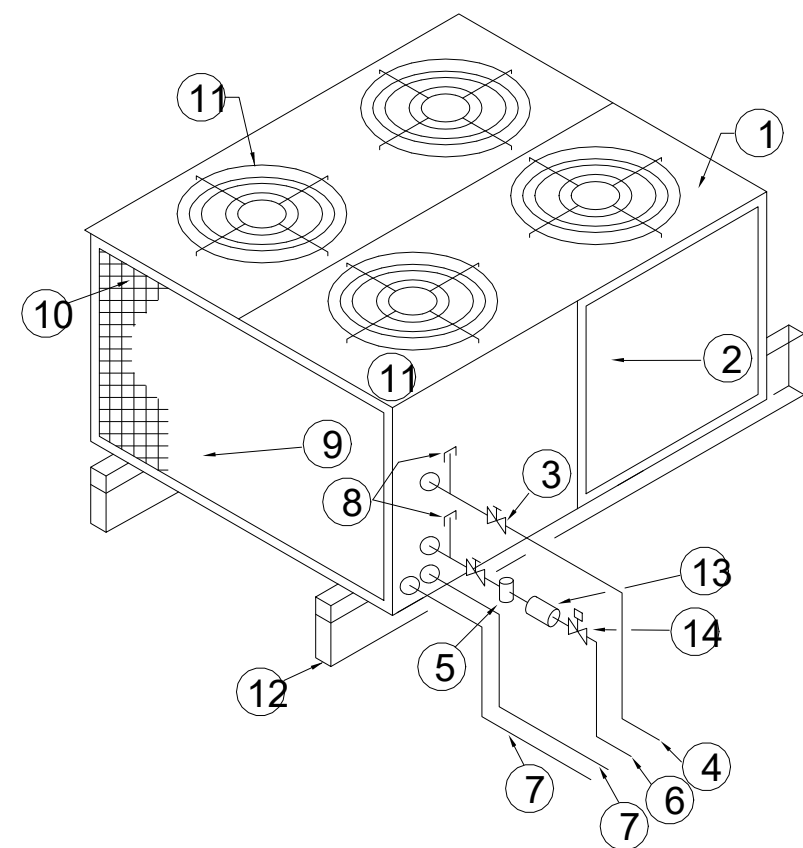
SHEET NO.

M201

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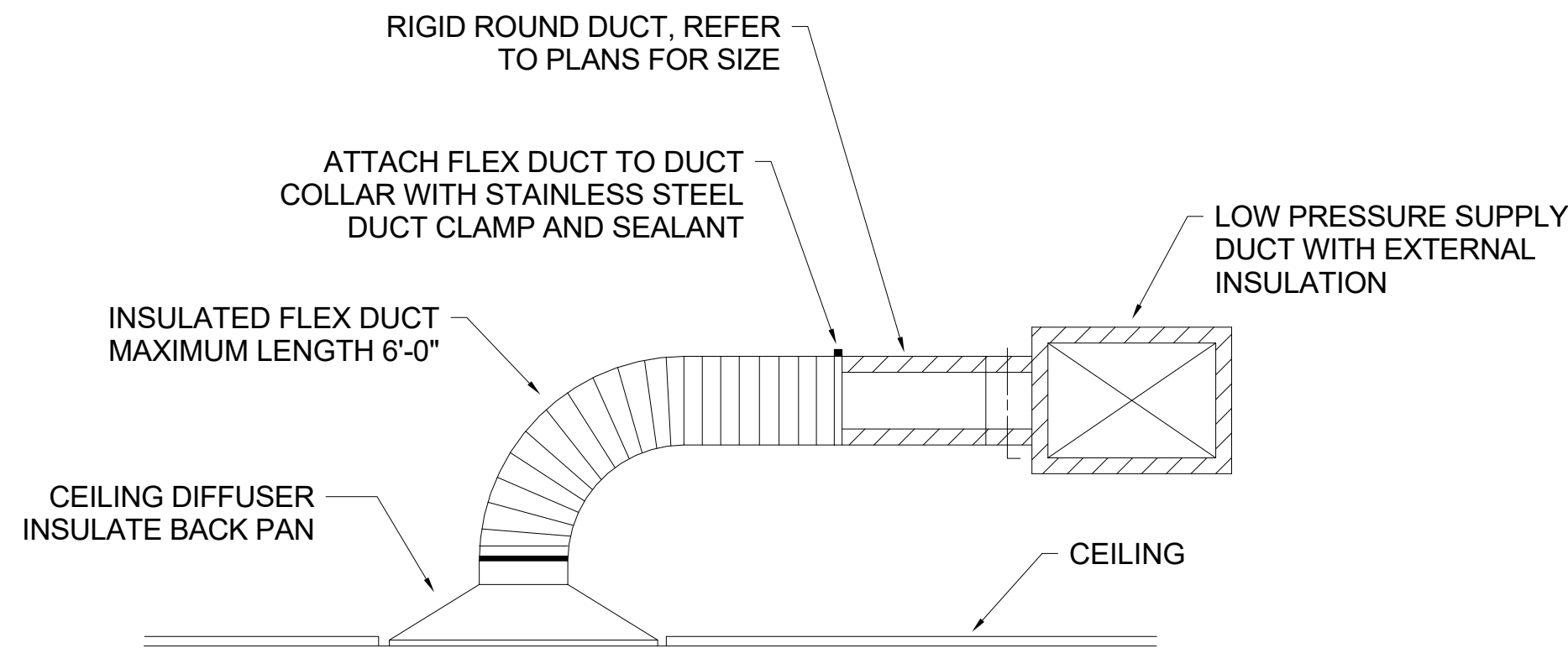


1. CONDENSING UNIT
2. COMPRESSOR ACCESS PANEL
3. BACK-SEATED REFRIGERANT VALVE
4. REFRIGERANT SUCTION LINE WITH INSULATION
5. SIGHT GLASS WITH MOISTURE INDICATOR
6. REFRIGERANT LIQUID LINE
7. CONDUIT - POWER AND CONTROL
8. REFRIGERANT GAUGE CONNECTION
9. CONDENSER COIL
10. COIL GUARD
11. FAN GUARD
12. EQUIPMENT RAILS FOR ROOF MOUNTING. REFER TO ROOF EQUIPMENT MOUNTING DETAIL. THIS SHEET.
13. REFRIGERANT FILTER DRYER
14. LIQUID LINE SOLENOID VALVE

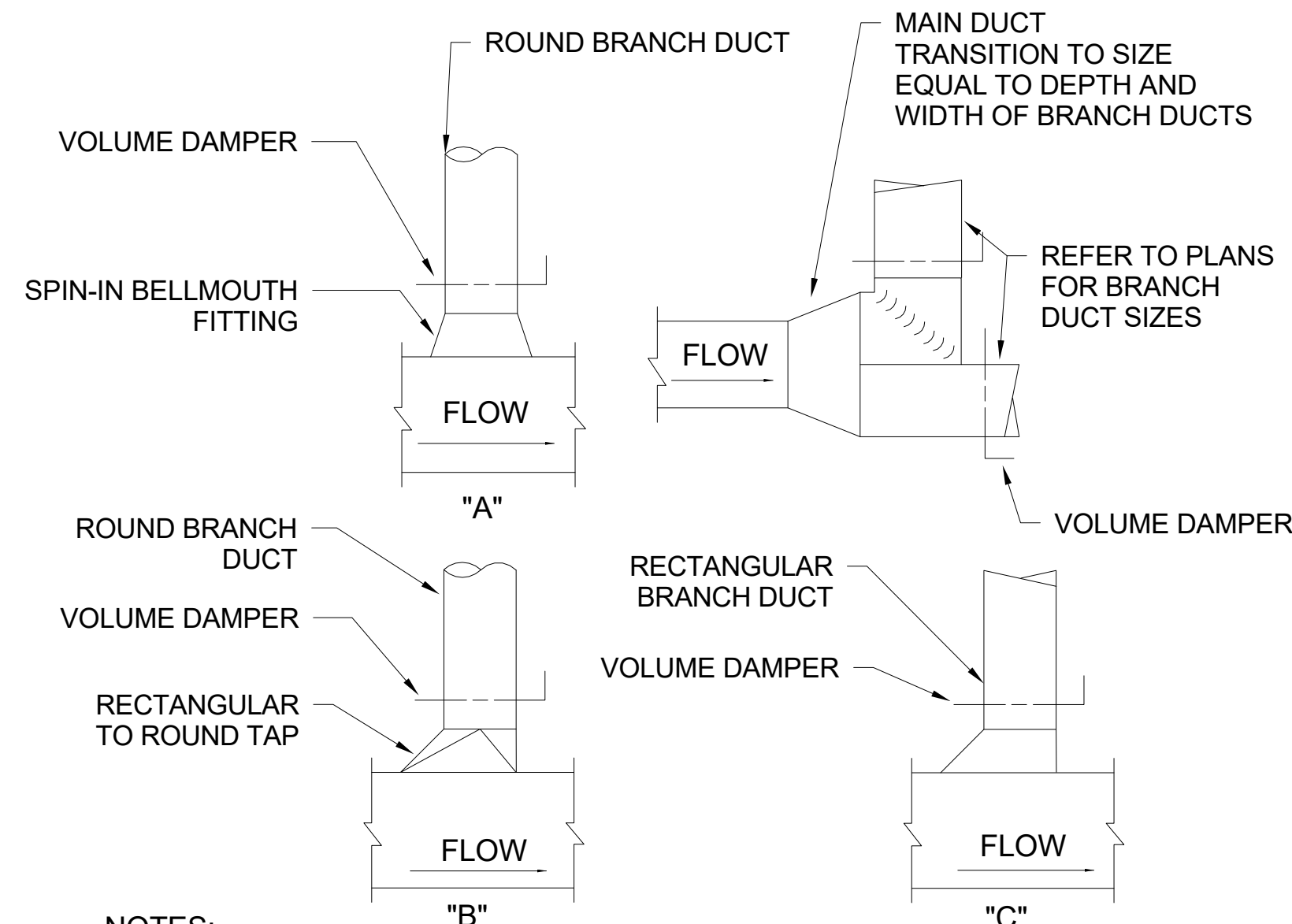
**NOTES:**

1. PROVIDE ACCESS TO CONDENSER UNIT PER MANUFACTURER'S RECOMMENDATIONS.
2. NOTE THAT THIS DETAIL SHOWS UNIT WITH 1 REFRIGERANT CIRCUIT. SHOULD UNIT HAVE 2 CIRCUITS THEN 2 SETS OF REFRIGERANT PIPING SHALL BE INSTALLED.
3. REFRIGERANT PIPING SHALL BE INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
4. PROVIDE TXV AND BULB SENSOR PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

**01 CONDENSER UNIT DETAIL**  
NOT TO SCALE



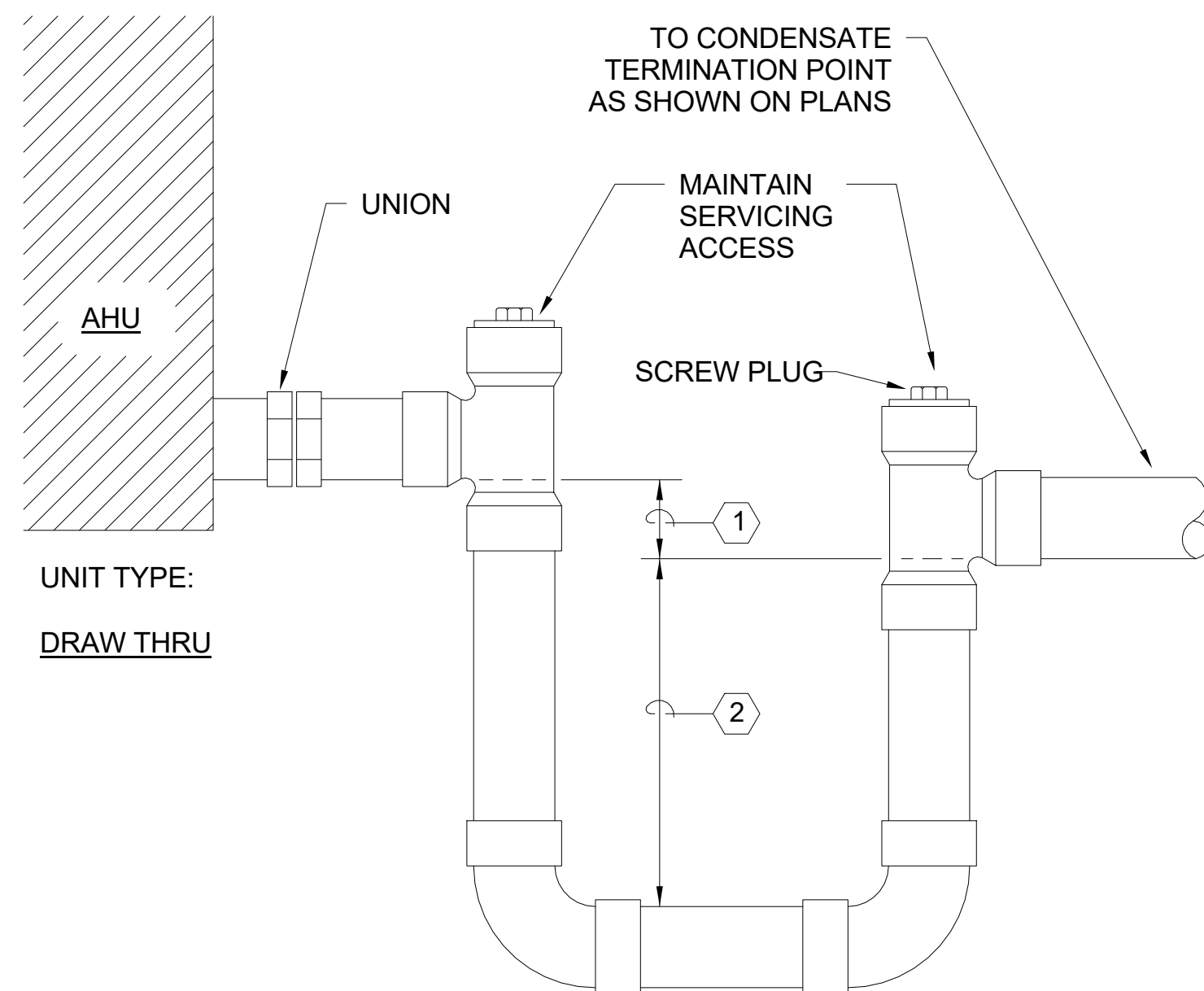
**02 CEILING DIFFUSER DETAIL**  
NOT TO SCALE



**NOTES:**

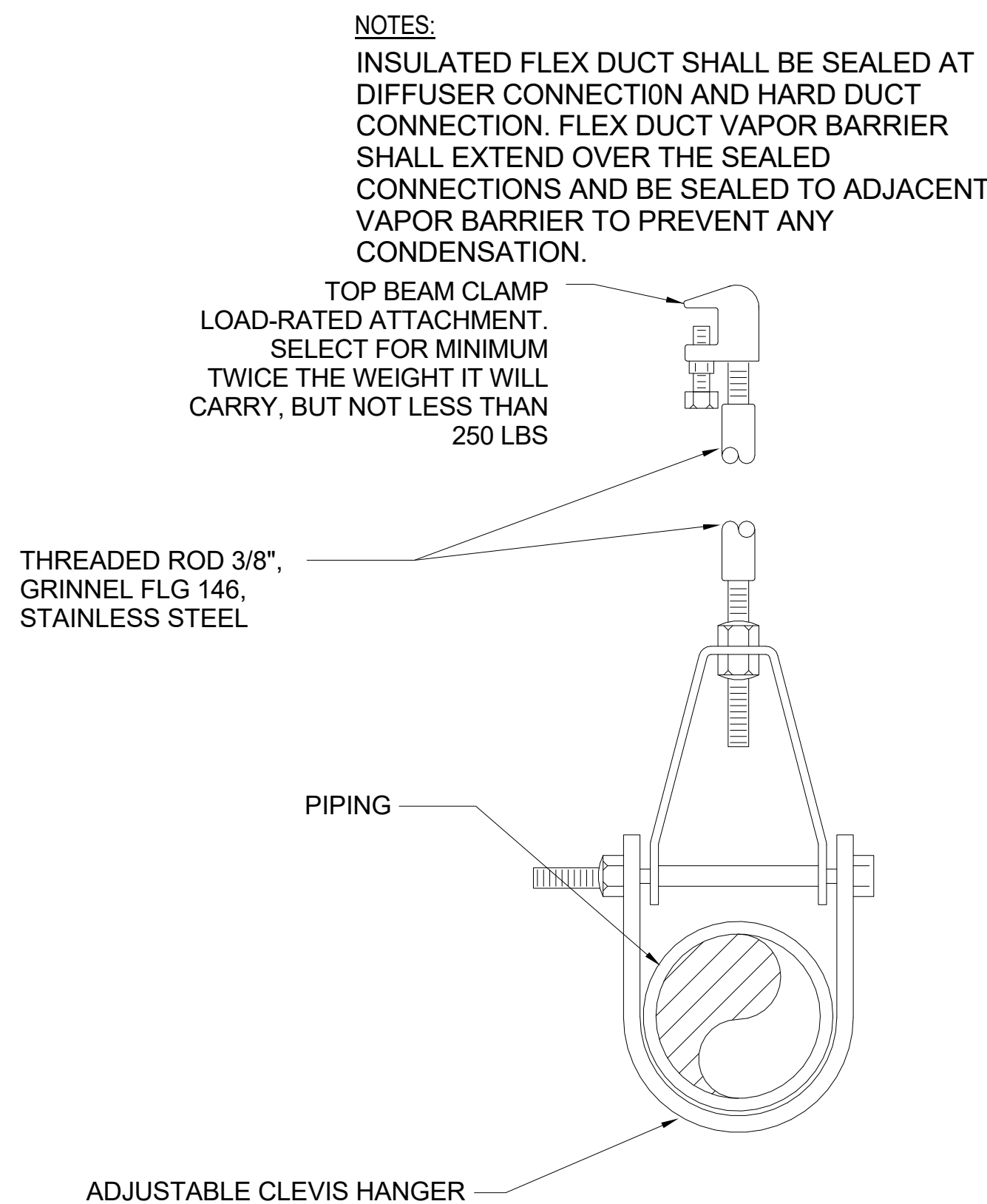
1. USE TYPE "A" CONNECTION ONLY FOR BRANCHES TO SINGLE DIFFUSERS, TERMINAL BOXES OR GRILLES FROM THE MAIN.
2. USE TYPE "B" OR "C" BRANCH WHERE BRANCH FLOW IS 20% OR LESS OF MAIN.
3. USE TEE SPLIT WHERE BRANCH FLOW IS MORE THAN 20% OF MAIN.
4. FOR TYPE "A" CONNECTION TO DIFFUSERS, THE ROUND DUCT RUN-OUT SIZE SHALL BE THE SAME SIZE AS THE NECK OF DIFFUSER, UNLESS OTHERWISE INDICATED.

**03 BRANCH DUCT DETAILS**  
NOT TO SCALE



- 1 DIMENSION TO BE 1" GREATER THAN SUCTION PRESSURE OF UNIT (IN. W.G.)
- 2 DIMENSION TO BE 1/2 TOTAL PRESSURE OF UNIT (IN. W.G.)

**04 CONDENSATE DRAIN**  
NOT TO SCALE



**05 PIPE HANGER DETAIL**  
NOT TO SCALE

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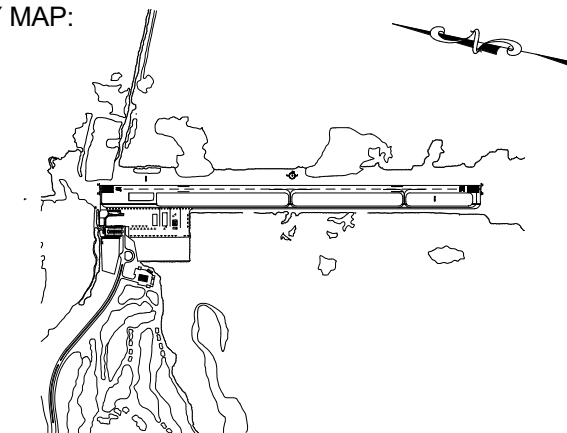


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**SCHENKELSHULTZ**  
ARCHITECTURE

KEY MAP:



DRAWING SCALE:

12" = 1'-0"

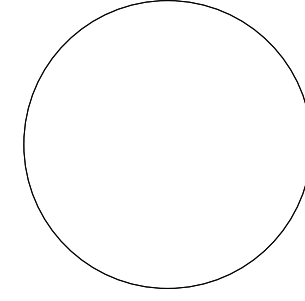
REVISIONS		
MARK	DESCRIPTION	DATE

PROJECT NAME:  
**NEW TERMINAL FACILITY  
AND ASSOCIATED  
IMPROVEMENTS**

SHEET TITLE:  
**MECHANICAL DETAILS**

**VOLUME 2**

ENGINEER OF RECORD:



ZEMP B. PEPPER, PE #1147

JOB NO.: 1620729  
DATE: May 2017  
DRAWN: SB  
DESIGN: ZP  
CHECKED: ZP

SHEET NO.

**M501**

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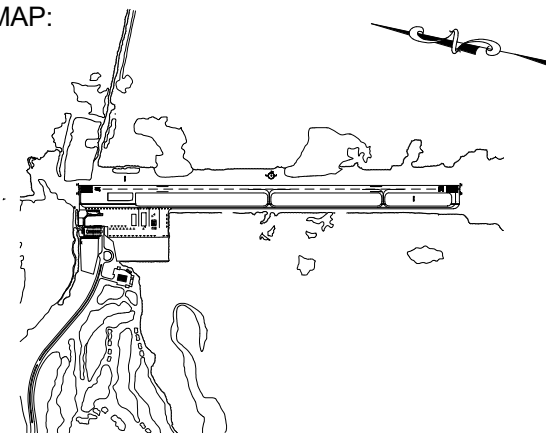


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REVISIONS

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PROJECT NAME:

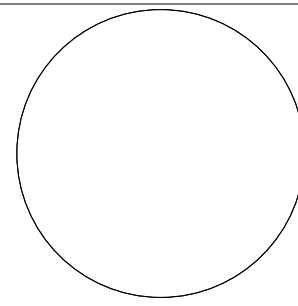
**NEW TERMINAL FACILITY  
AND ASSOCIATED  
IMPROVEMENTS**

SHEET TITLE:

**MECHANICAL DETAILS**

**VOLUME 2**

ENGINEER OF RECORD:



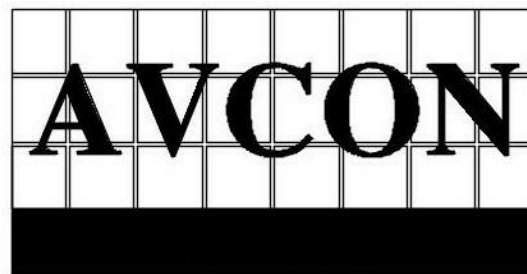
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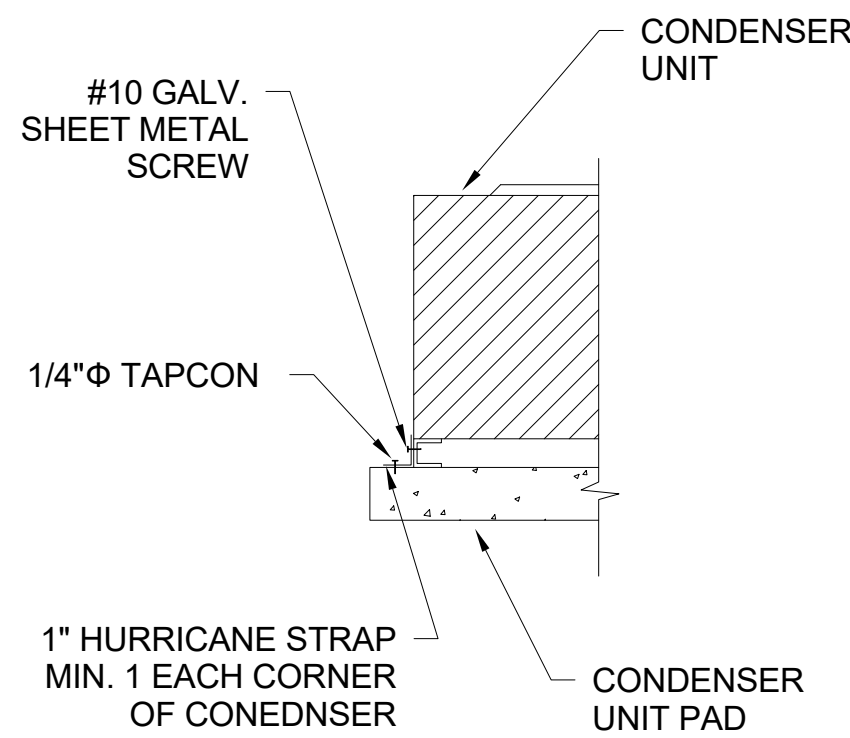
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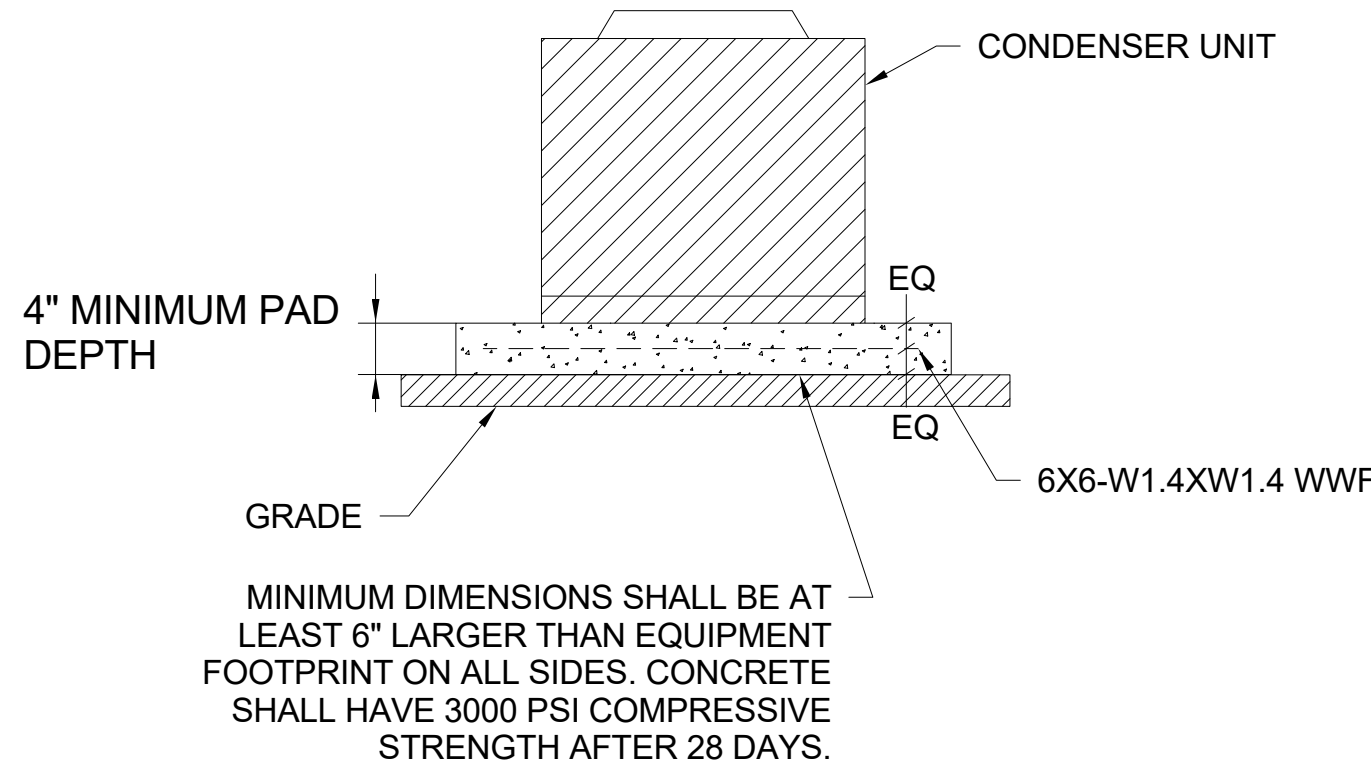
**M502**



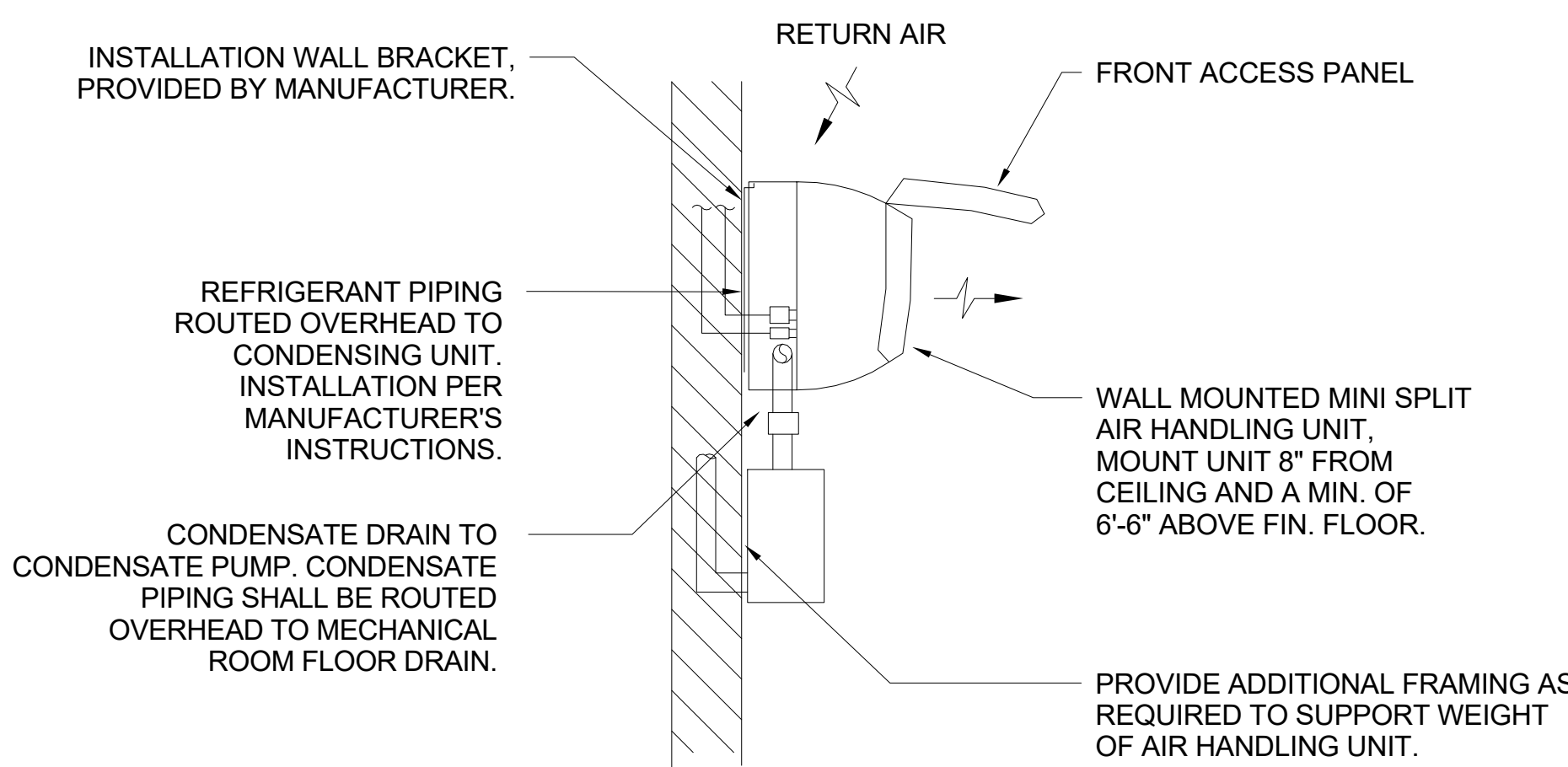
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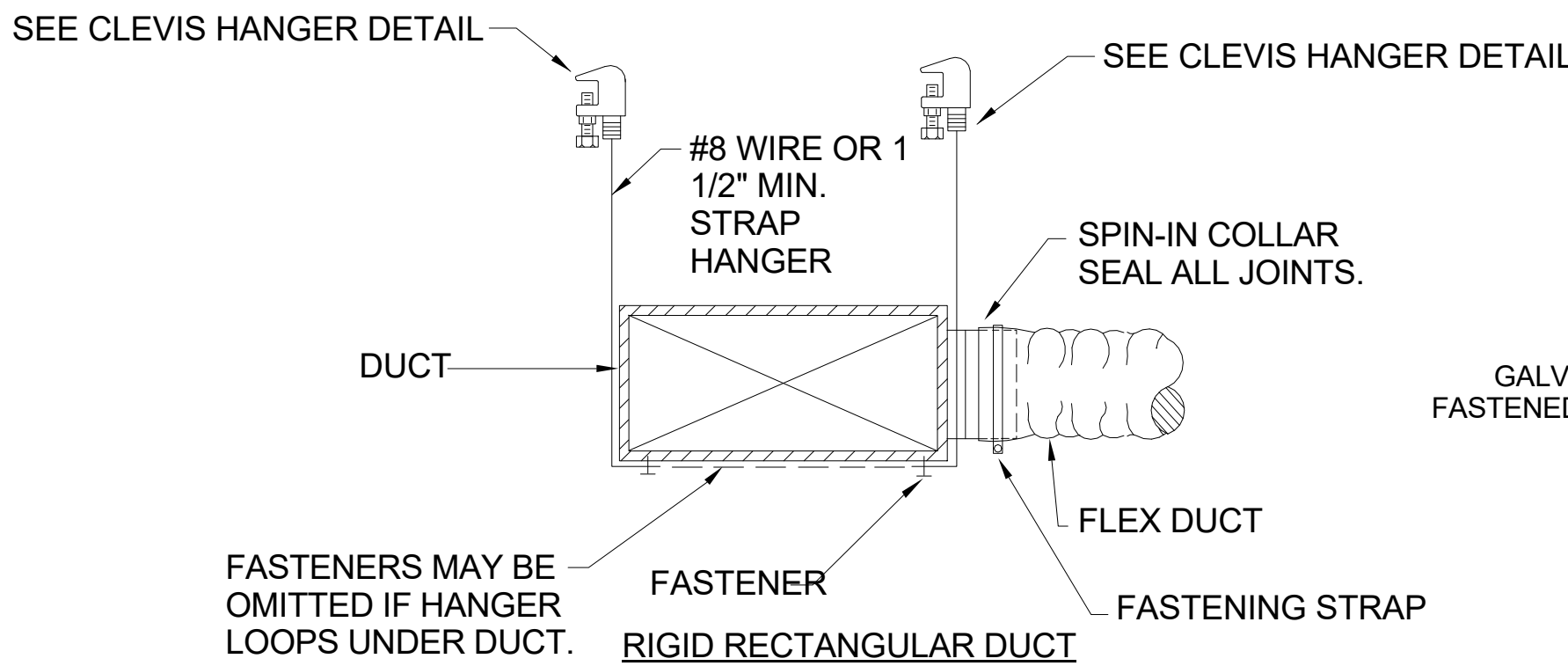
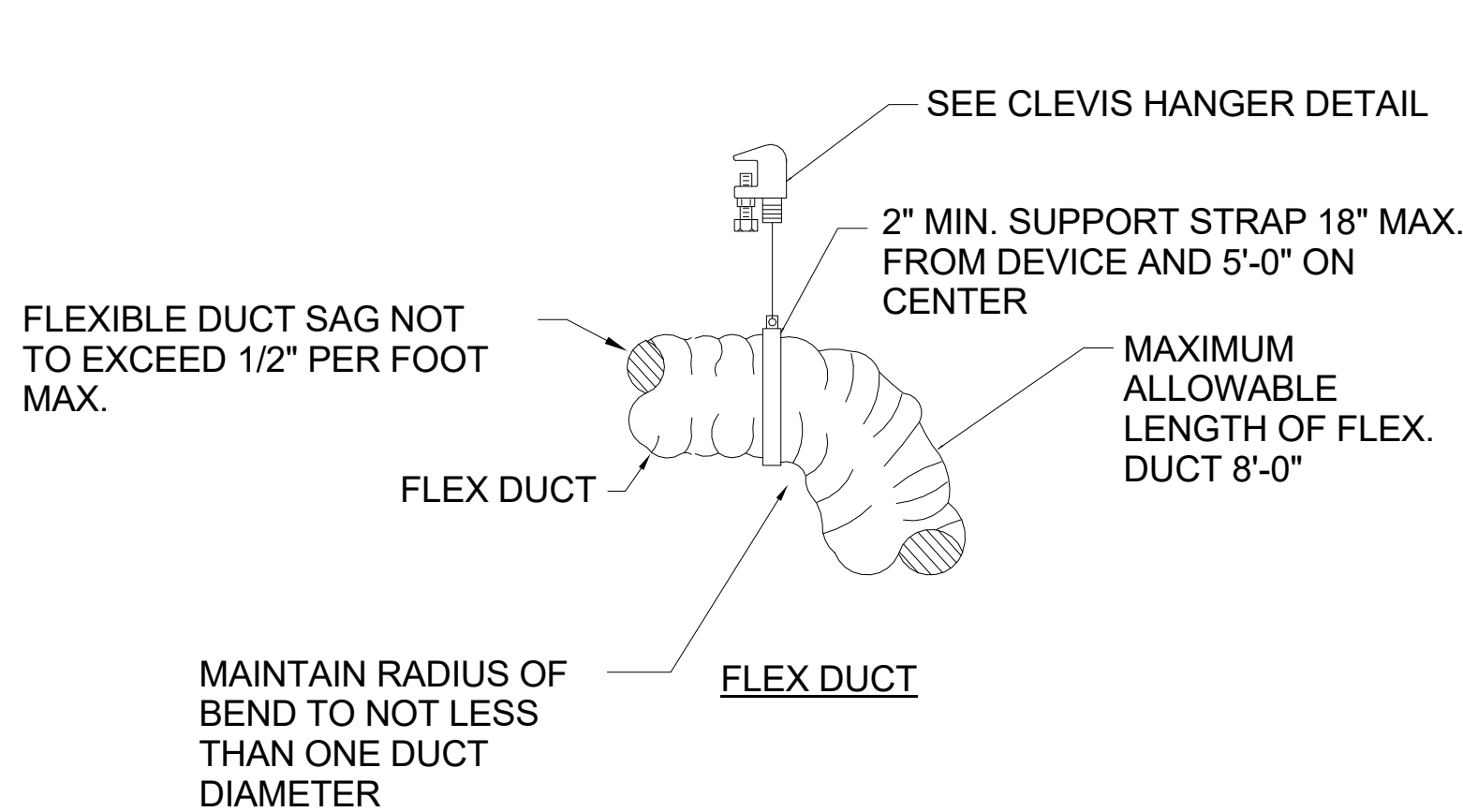
**01 CONDENSER UNIT TIE-DOWN DETAIL**  
NOT TO SCALE



**02 CONDENSER UNIT PAD DETAIL**  
NOT TO SCALE

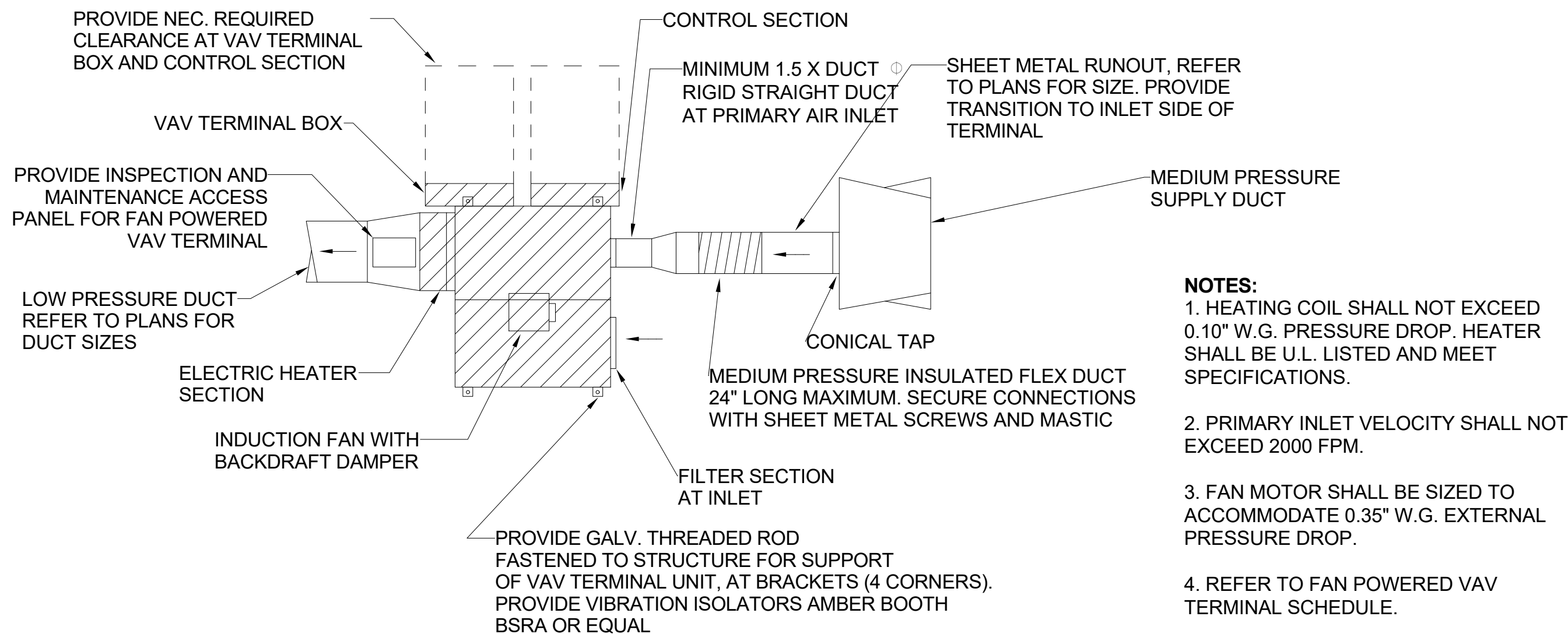


**03 MINI SPLIT AIR HANDLER DETAIL**  
NOT TO SCALE



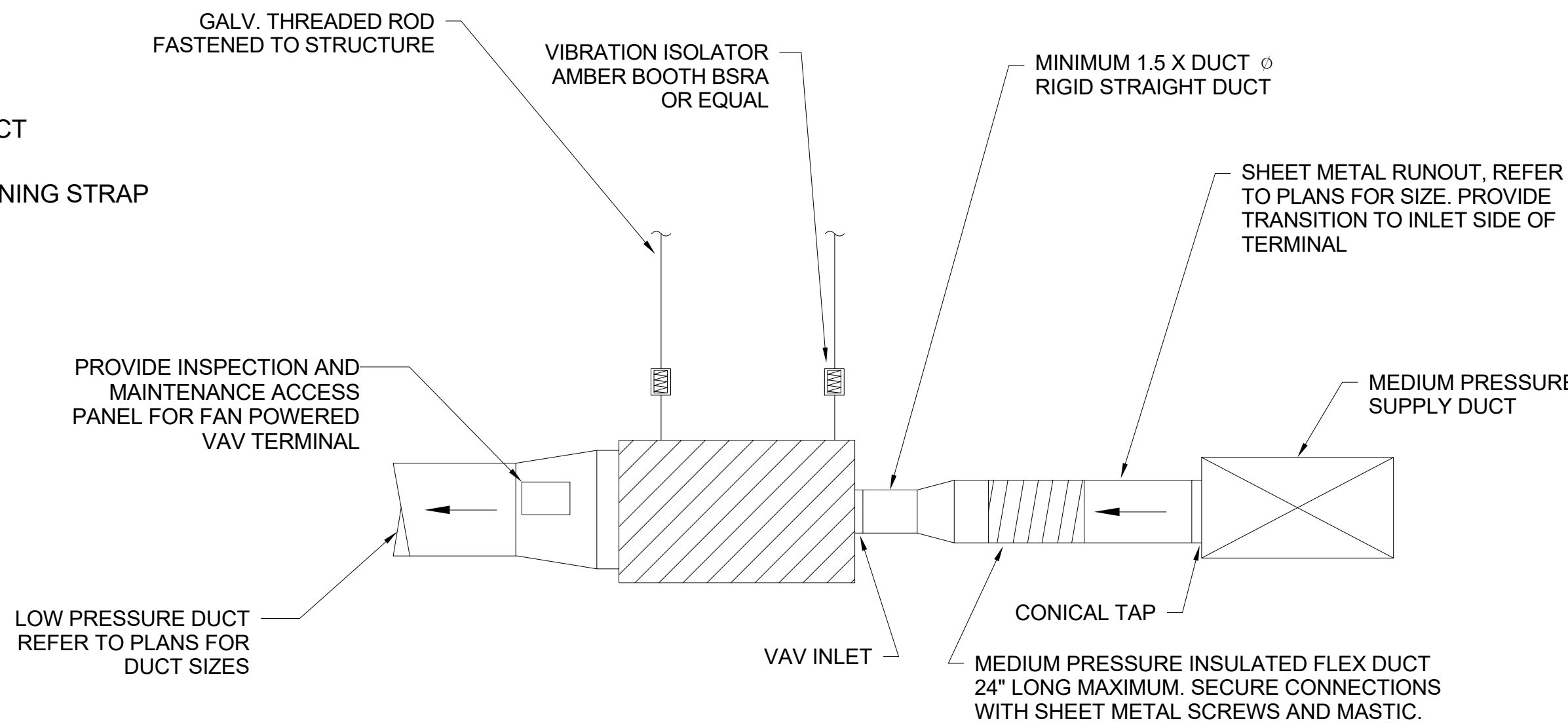
**04 DUCTWORK SUPPORT DETAILS**  
NOT TO SCALE

VAV TERMINAL INLET SIZING						
CFM RANGE	0-350	0-650	0-1000	0-1400	0-2000	0-2600
INLET SIZE	6"	8"	10"	12"	14"	16"



**05 PARALLEL FAN POWERED VAV TERMINAL DETAIL**  
NOT TO SCALE

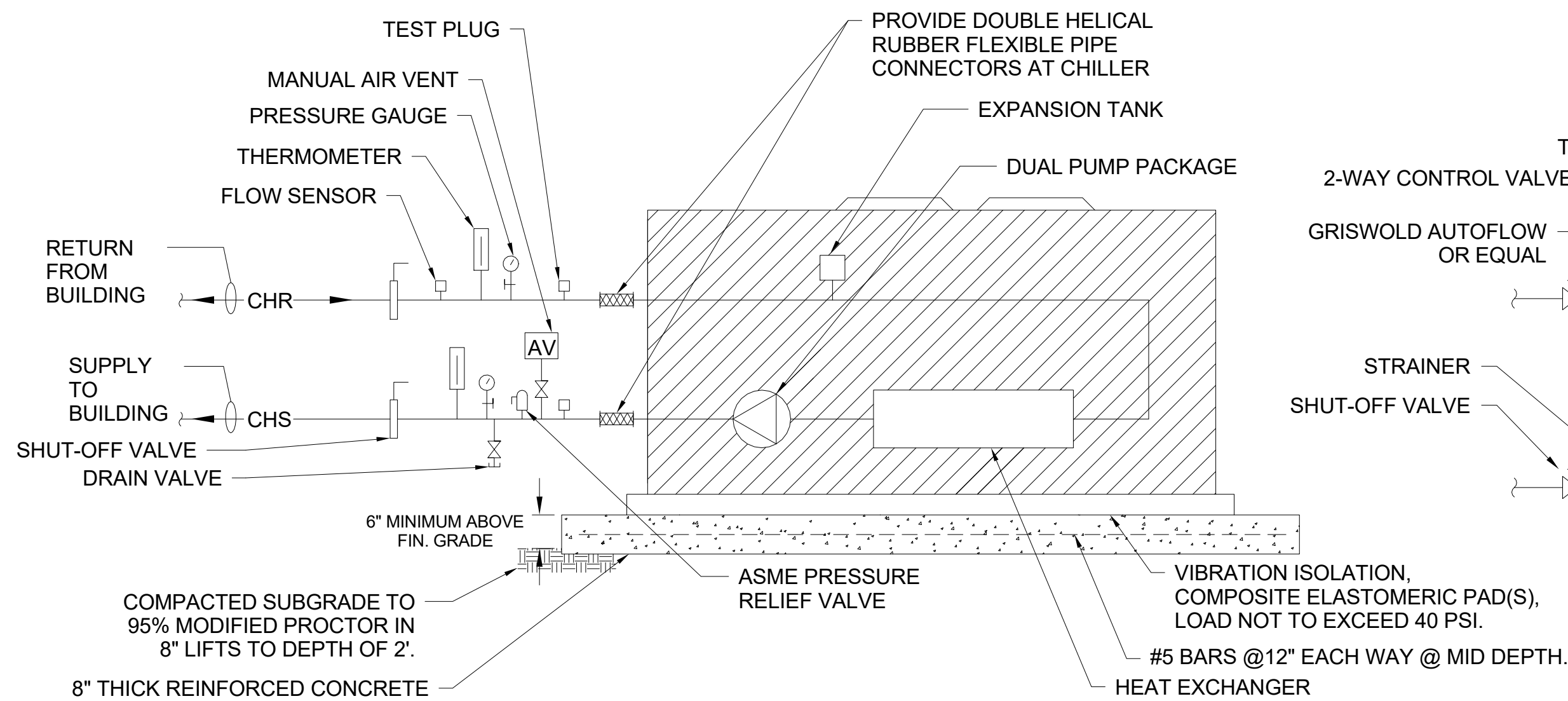
NOTE: ALL DIFFUSERS SERVED BY VAV TERMINAL SHALL BE LABELED WITH VAV #, VAV'S SERVED BY AIR HANDLER SHALL BE LABELED WITH AHU#. PROVIDE ACCESS PANEL AT HARD CEILING TO MAINTAIN UNIT. DO NOT LOCATED VAV TERMINAL ABOVE PERMANENT FURNITURE



**06 VAV TERMINAL DETAIL**  
NOT TO SCALE

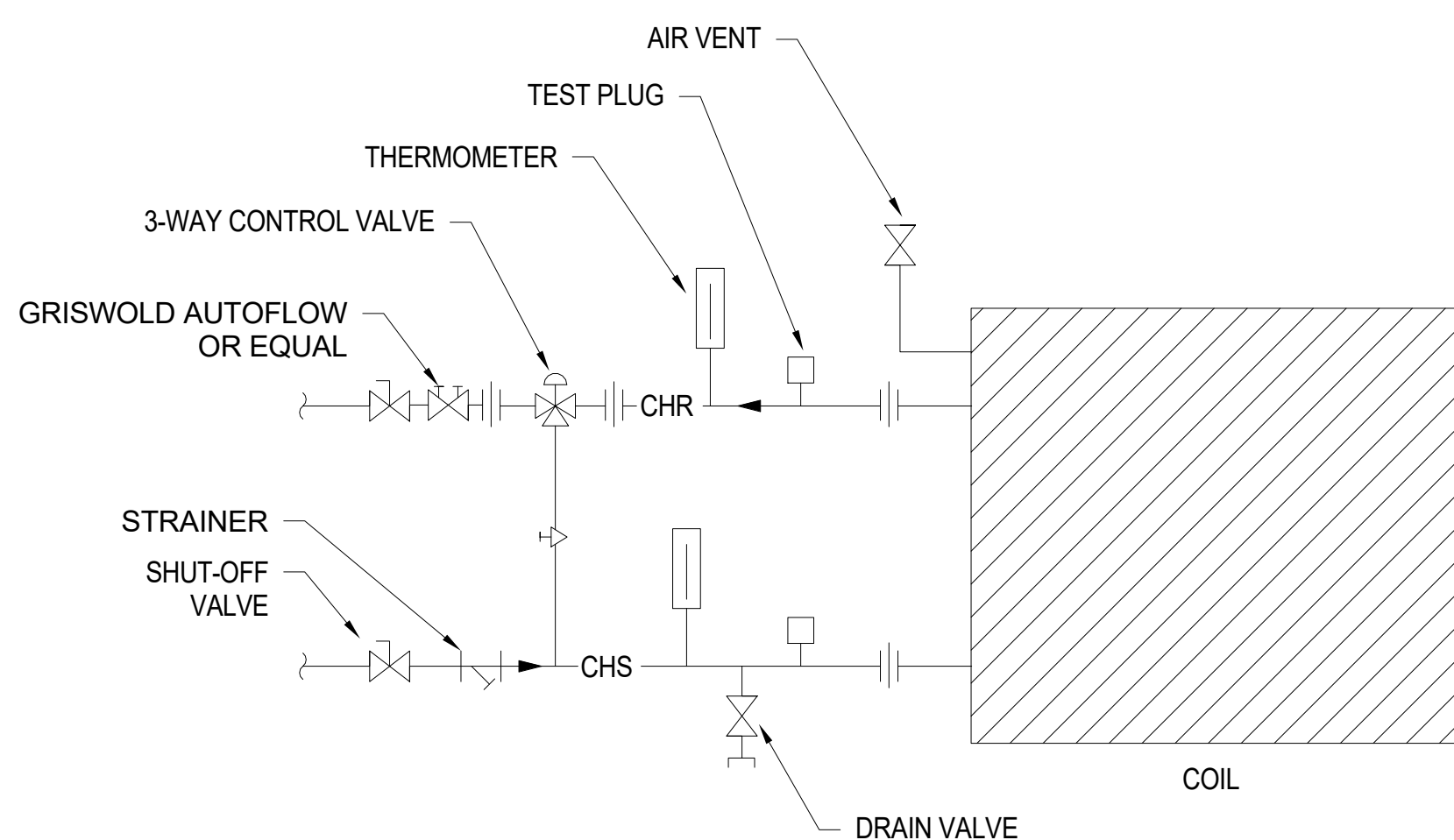
NOTE: ALL DIFFUSERS SERVED BY VAV TERMINAL SHALL BE LABELED WITH VAV #, VAV'S SERVED BY AIR HANDLER SHALL BE LABELED WITH AHU#. PROVIDE ACCESS PANEL AT HARD CEILING TO MAINTAIN UNIT. DO NOT LOCATED VAV TERMINAL ABOVE PERMANENT FURNITURE



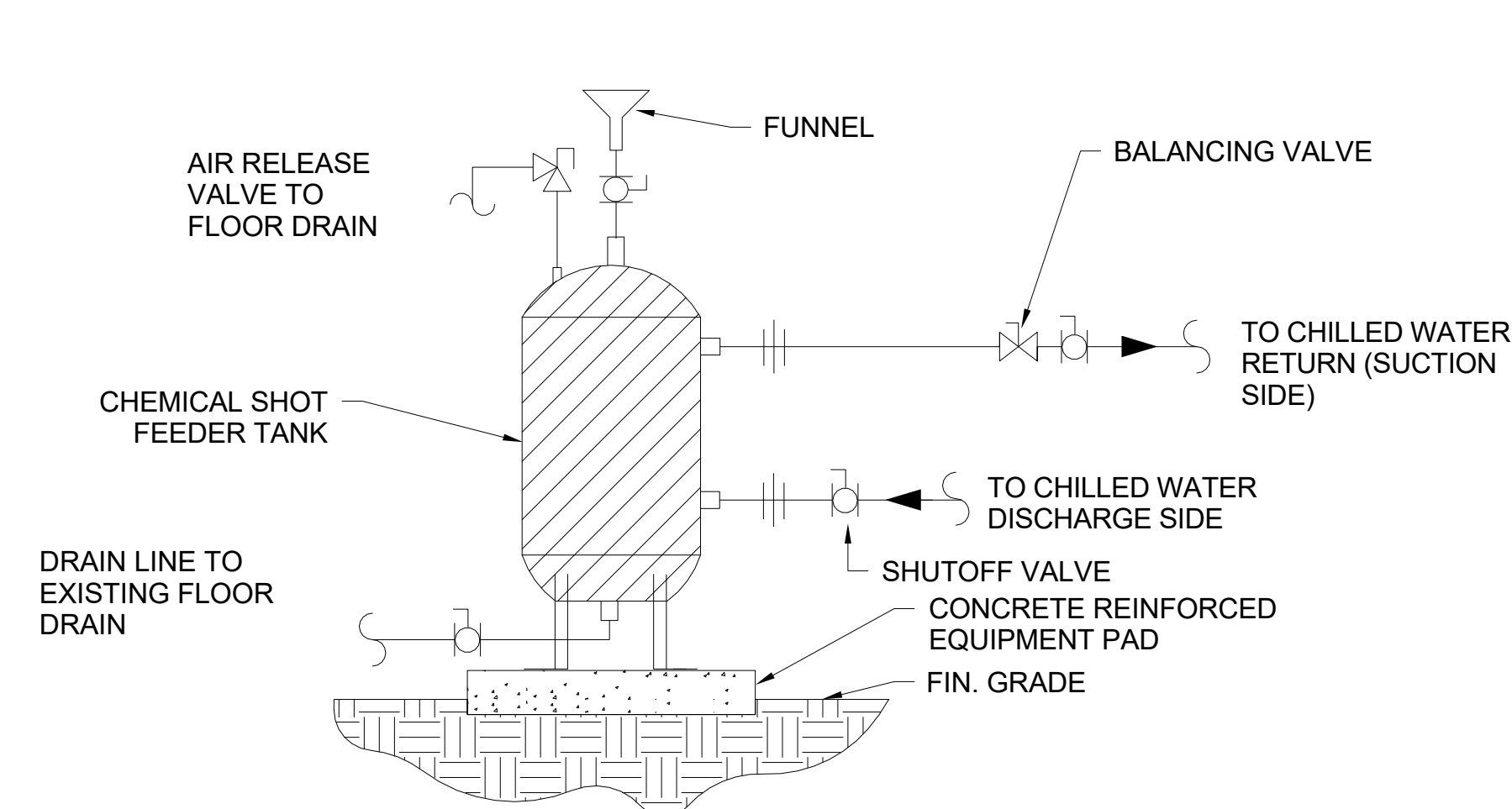


01 **AIR COOLED CHILLER DETAIL**  
NOT TO SCALE

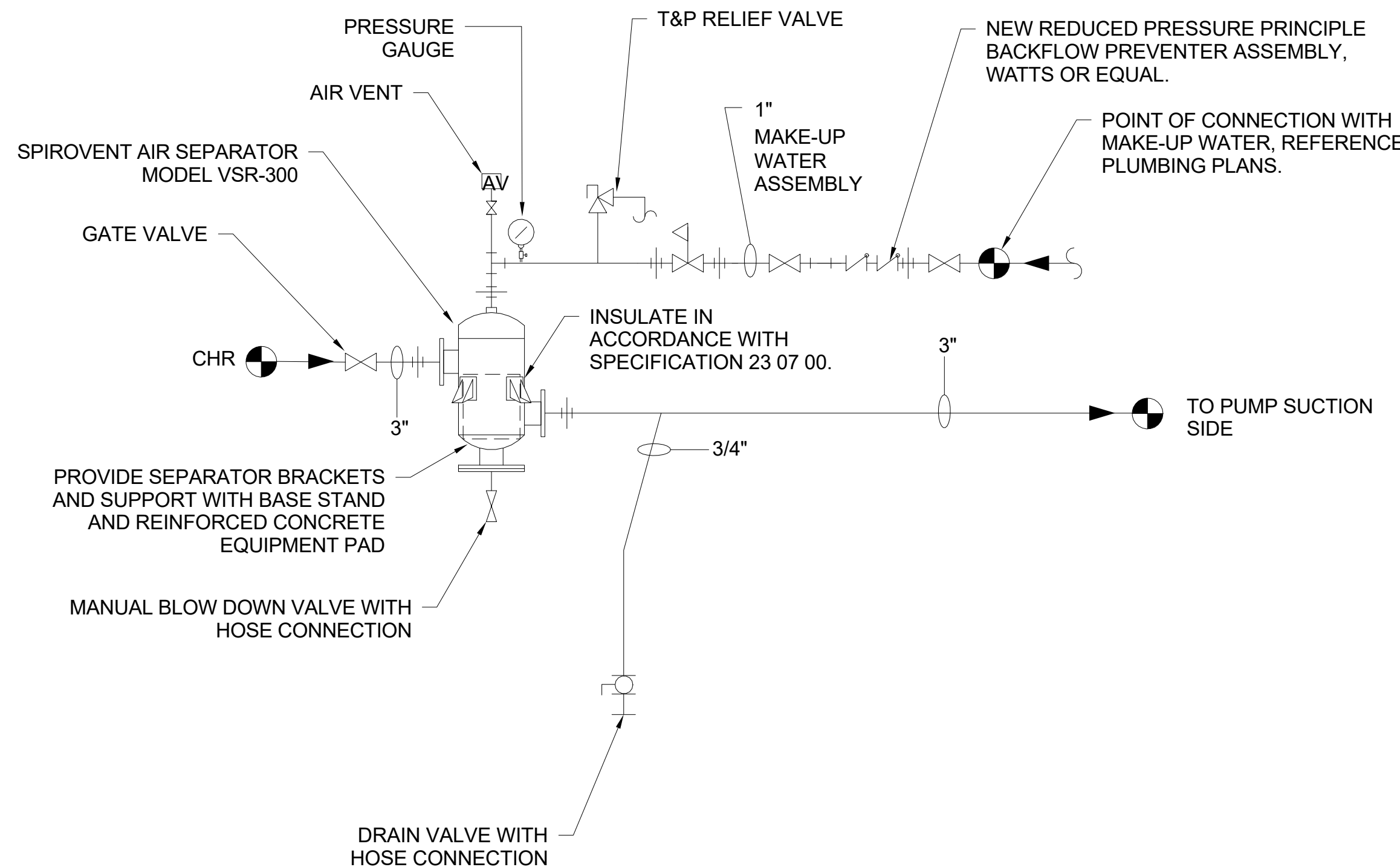
NOTE: ALL CHILLER INTERNAL COMPONENTS NOT SHOWN FOR CLARITY



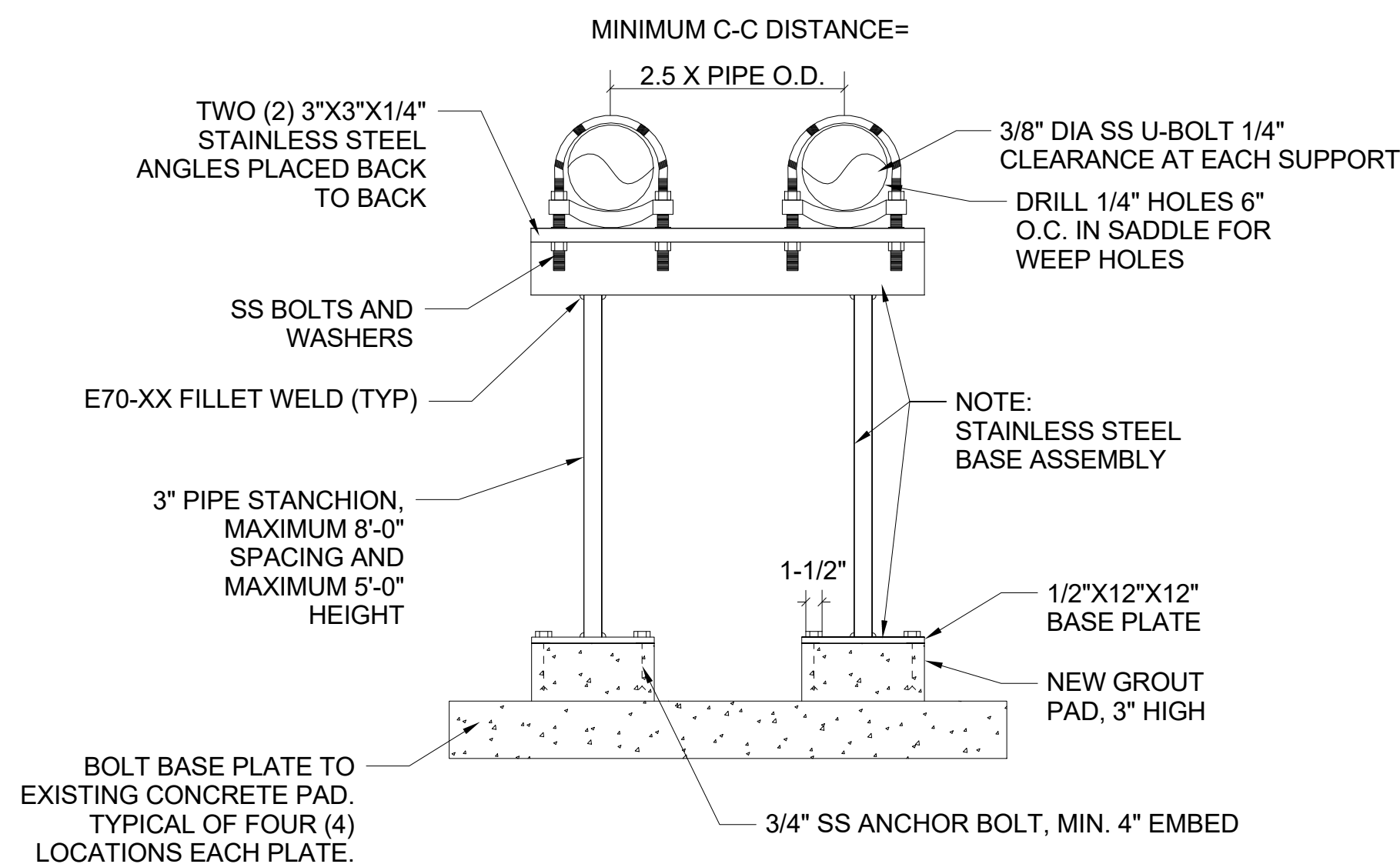
02 **COIL PIPING DETAIL (2-WAY)**  
NOT TO SCALE



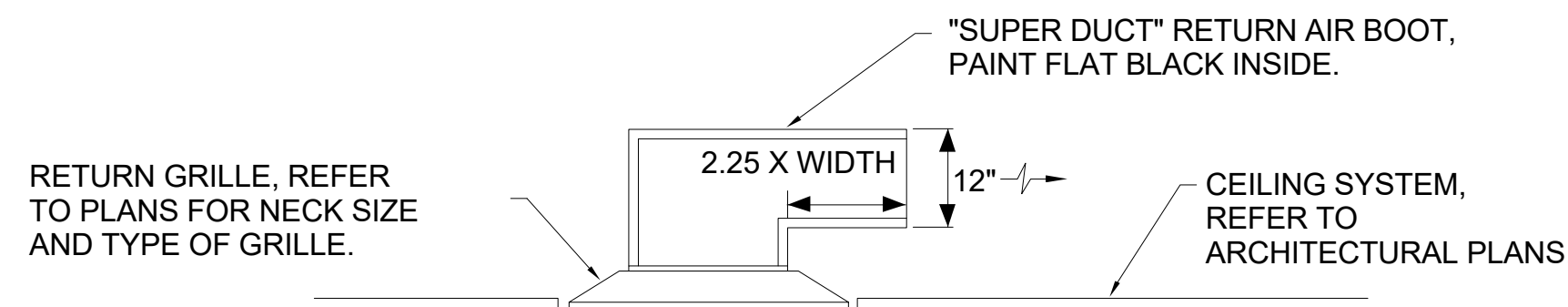
03 **CHEMICAL TREATMENT DETAIL**  
NOT TO SCALE



04 **COIL PIPING DETAIL (3-WAY)**  
NOT TO SCALE



05 **AIR SEPARATOR DETAIL**  
NOT TO SCALE



06 **STANCHION PIPE SUPPORT IN EQUIPMENT YARD**  
NOT TO SCALE

07 **RETURN AIR BOOT DETAIL**  
NOT TO SCALE

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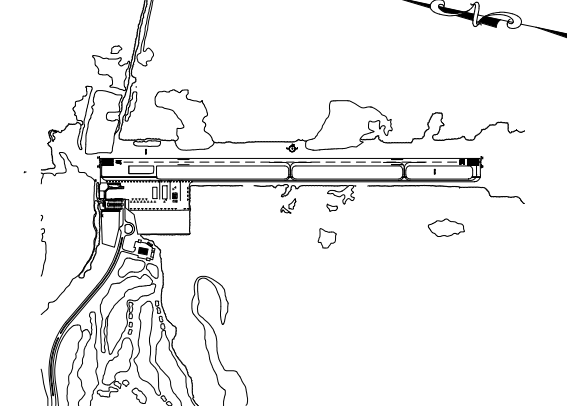


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**SCHENKELSHULTZ**  
ARCHITECTURE

KEY MAP:



DRAWING SCALE:

12" = 1'-0"

REVISIONS

MARK	DESCRIPTION	DATE

PROJECT NAME:

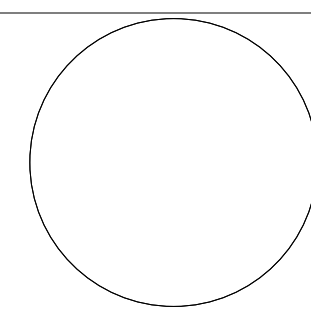
**NEW TERMINAL FACILITY  
AND ASSOCIATED  
IMPROVEMENTS**

SHEET TITLE:

**MECHANICAL DETAILS**

**VOLUME 2**

ENGINEER OF RECORD:



ZEMP B. PEPPER, PE #1147

JOB NO.:

1620729

DATE:

May 2017

DRAWN:

SB

DESIGN:

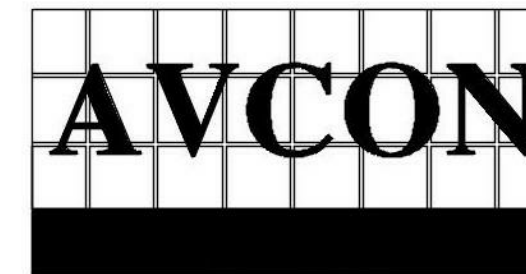
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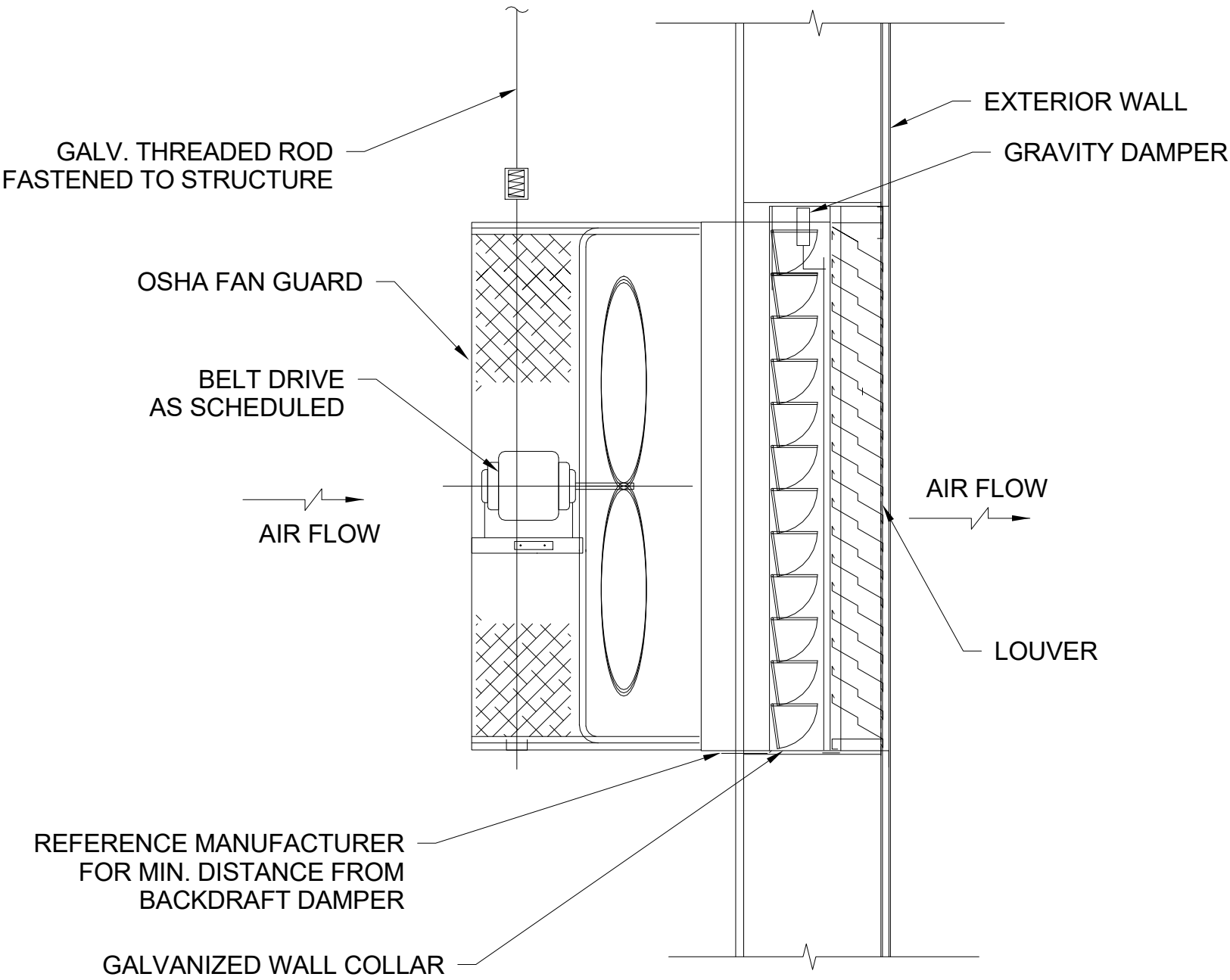
**M503**



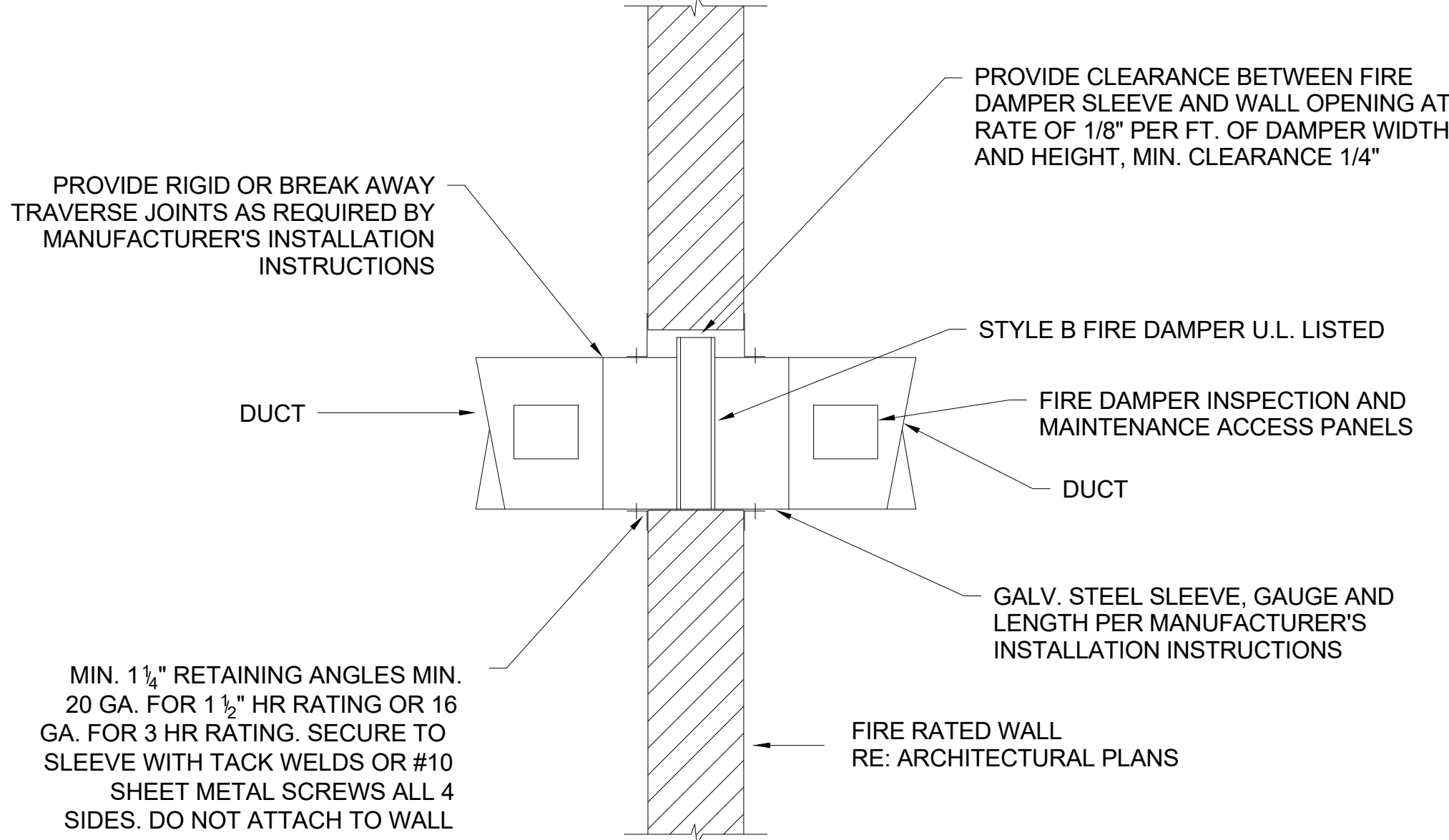
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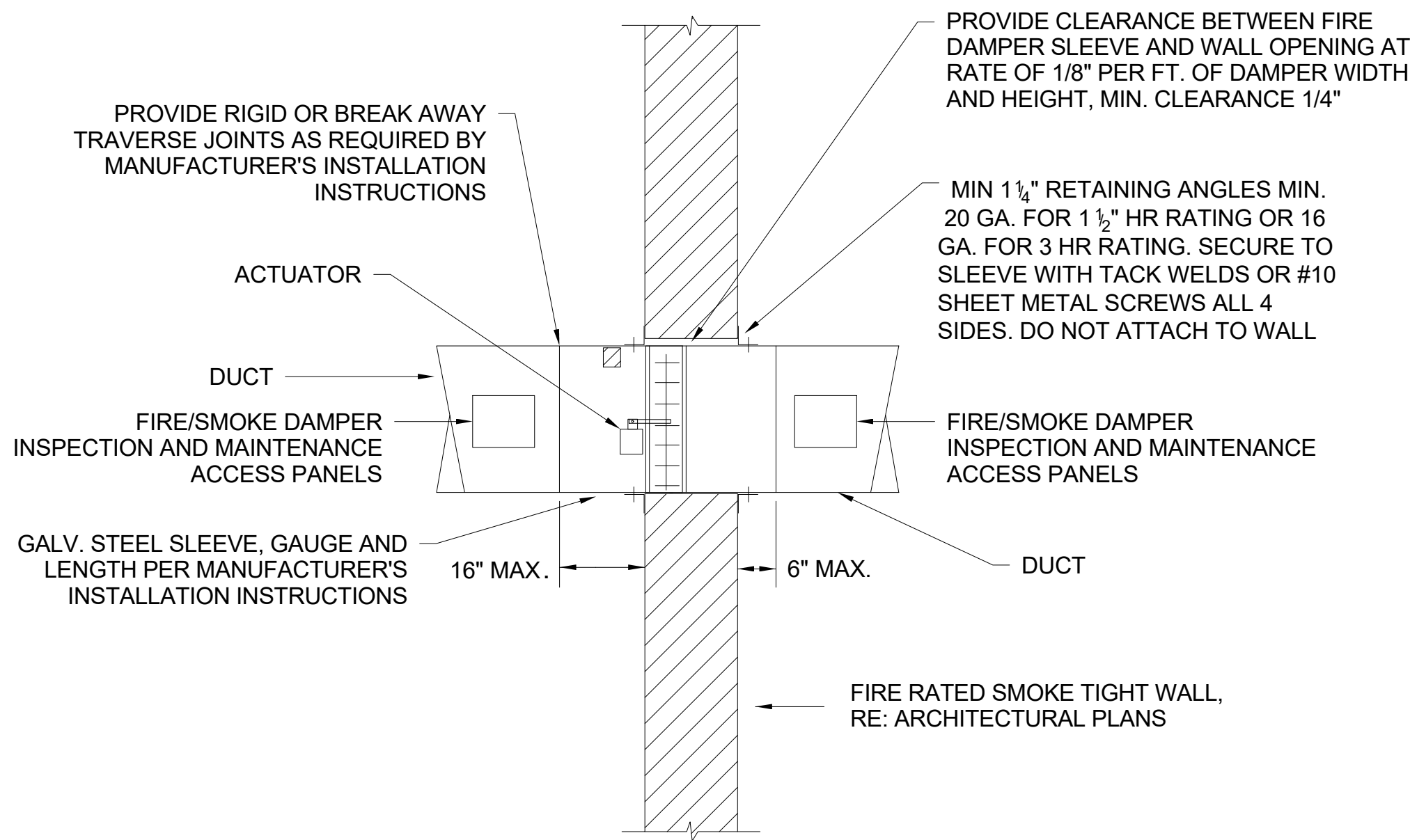




01 **SIDEWALL PROPELLER EXHAUST FAN**  
NOT TO SCALE



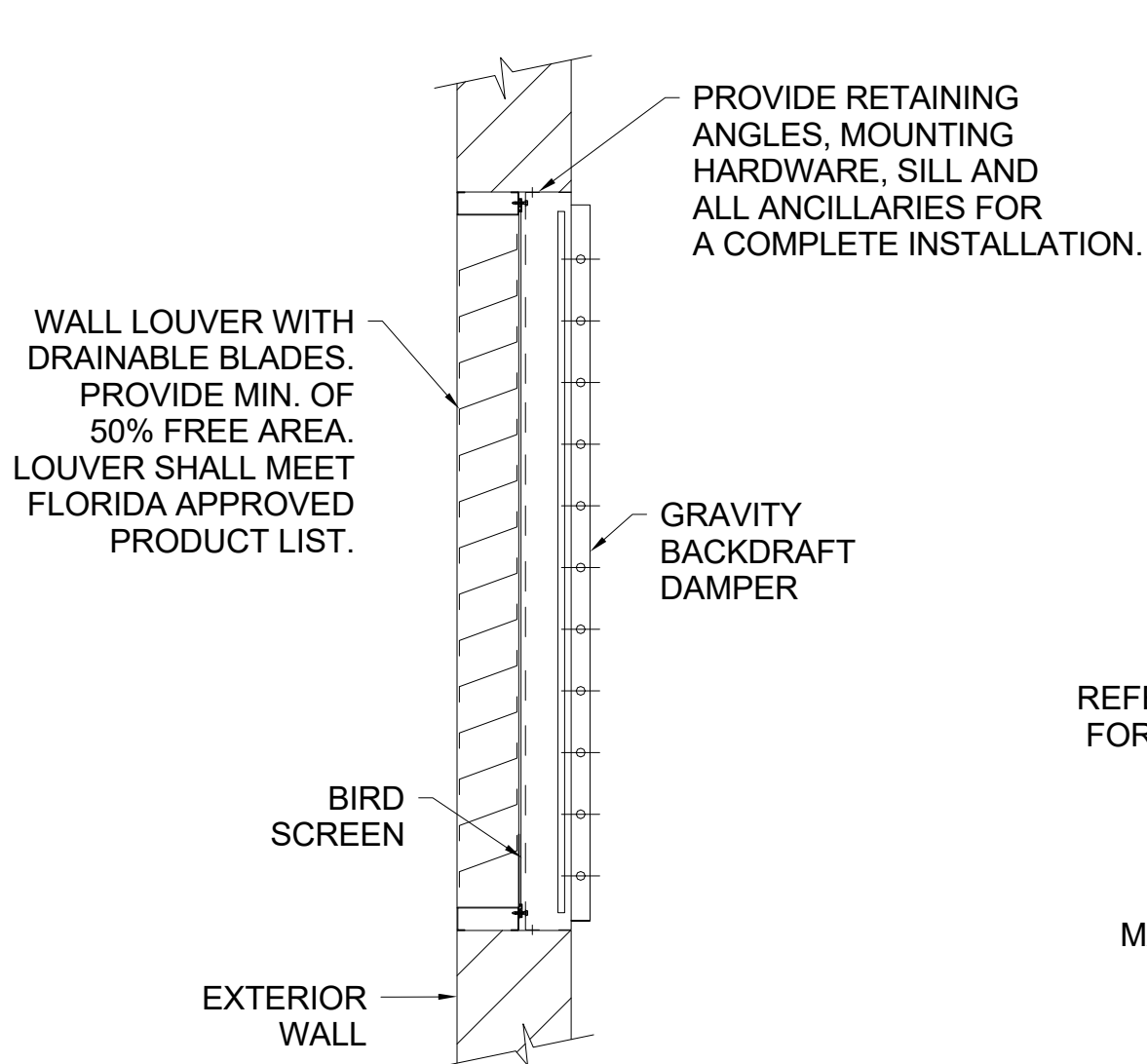
02 **FIRE DAMPER DETAIL**  
NOT TO SCALE



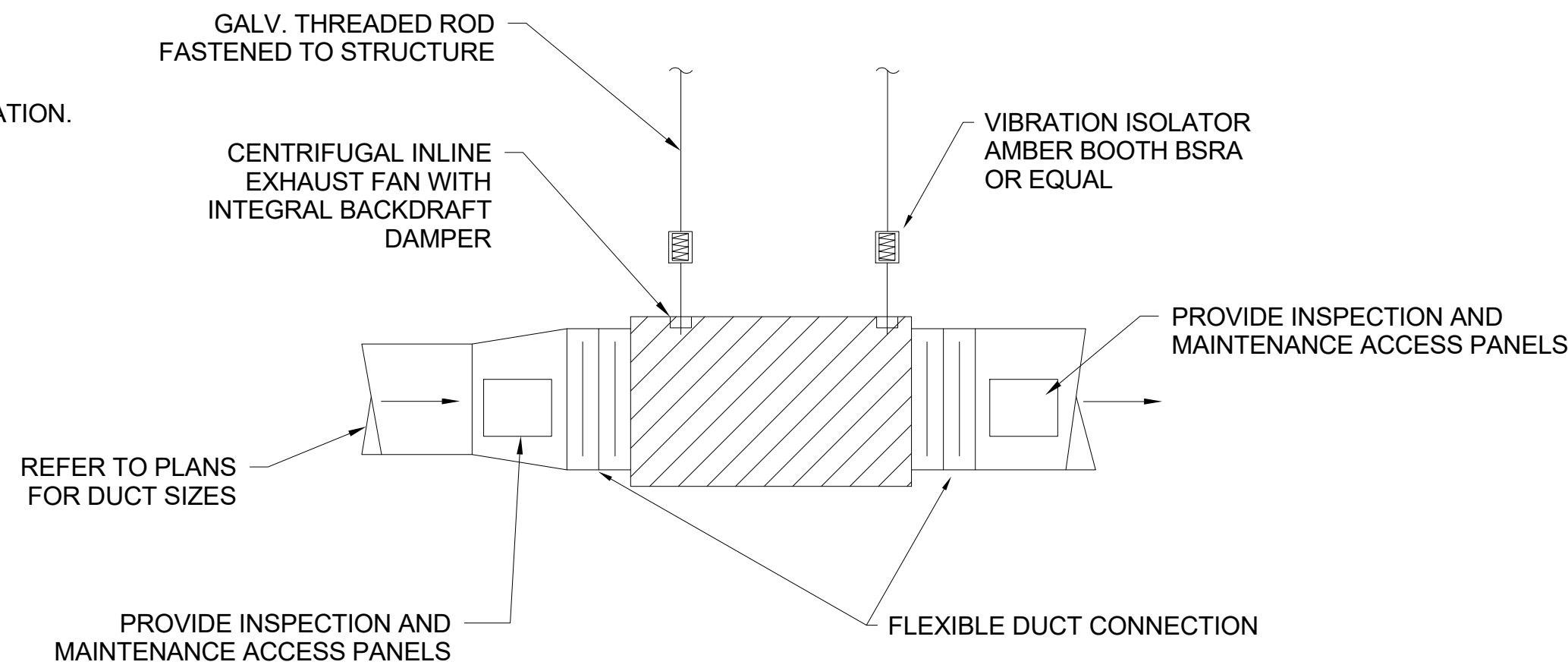
03 **FIRE/SMOKE DAMPER DETAIL**  
NOT TO SCALE

NOTE: COMBINATION FIRE/SMOKE DAMPERS SHALL BE U.L. LISTED UNDER U.L. 555 AND U.L. 555S WITH 350°F RATING.

OPTIONS: PROVIDE ACTUATOR END SWITCHES FOR REMOTE MONITORING AND CONTROL OF DAMPER, WIRING TO FIRE ALARM SYSTEM BY DIV. 26.



04 **LOUVER DETAIL**  
NOT TO SCALE



05 **INLINE FAN DETAIL**  
NOT TO SCALE

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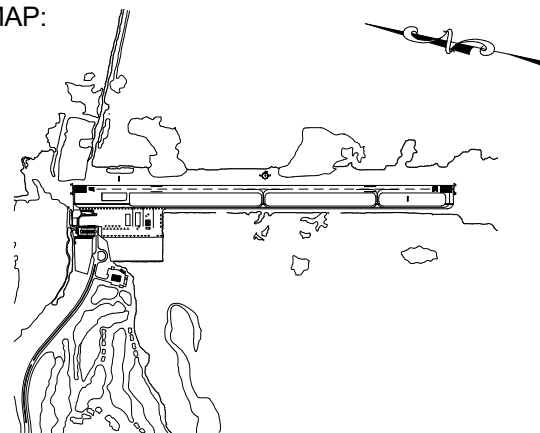


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**SCHENKELSHULTZ**  
ARCHITECTURE

KEY MAP:



DRAWING SCALE:

12" = 1'-0"

REVISIONS

MARK	DESCRIPTION	DATE
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PROJECT NAME:

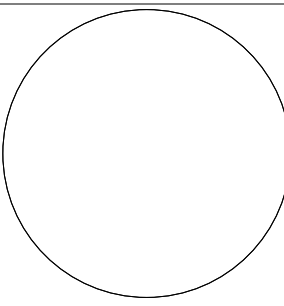
NEW TERMINAL FACILITY  
AND ASSOCIATED  
IMPROVEMENTS

SHEET TITLE:

MECHANICAL DETAILS

VOLUME 2

ENGINEER OF RECORD:

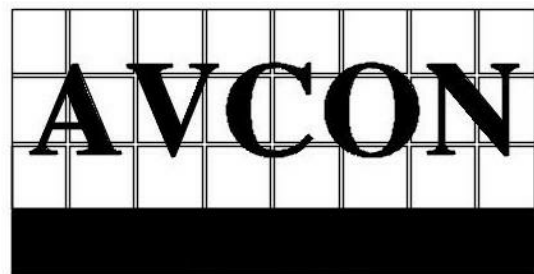


ZEMP B. PEPPER, PE #1147

JOB NO.:	1620729
DATE:	May 2017
DRAWN:	SB
DESIGN:	ZP
CHECKED:	ZP

SHEET NO.

M504



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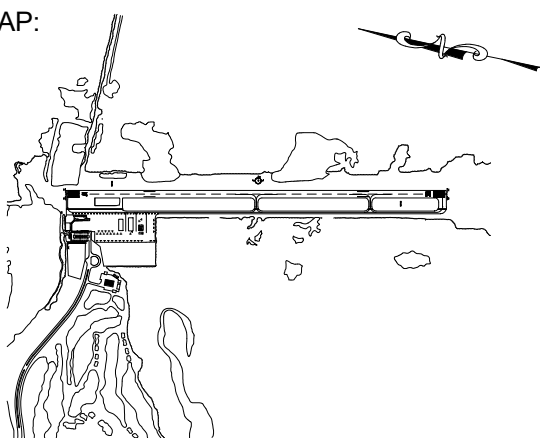


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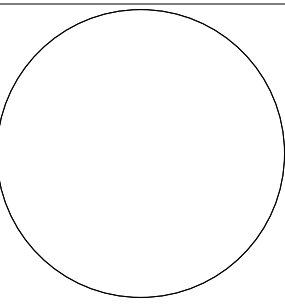
NEW TERMINAL FACILITY  
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SHEET TITLE:

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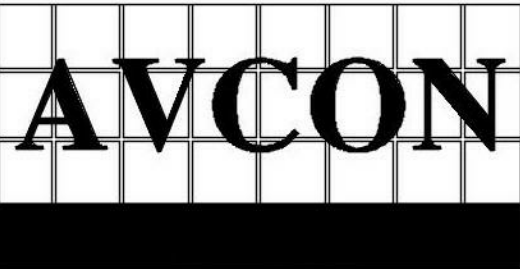
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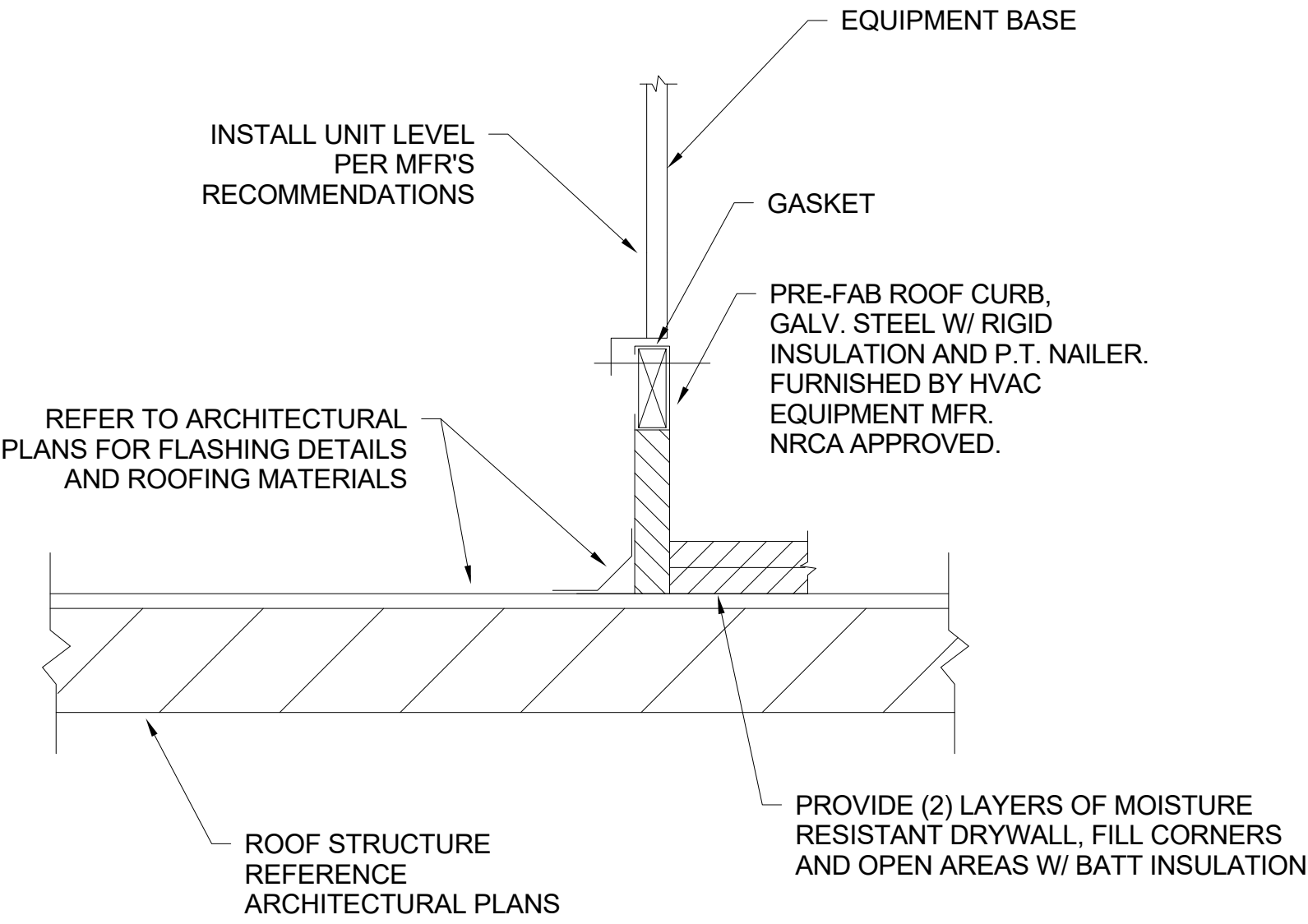
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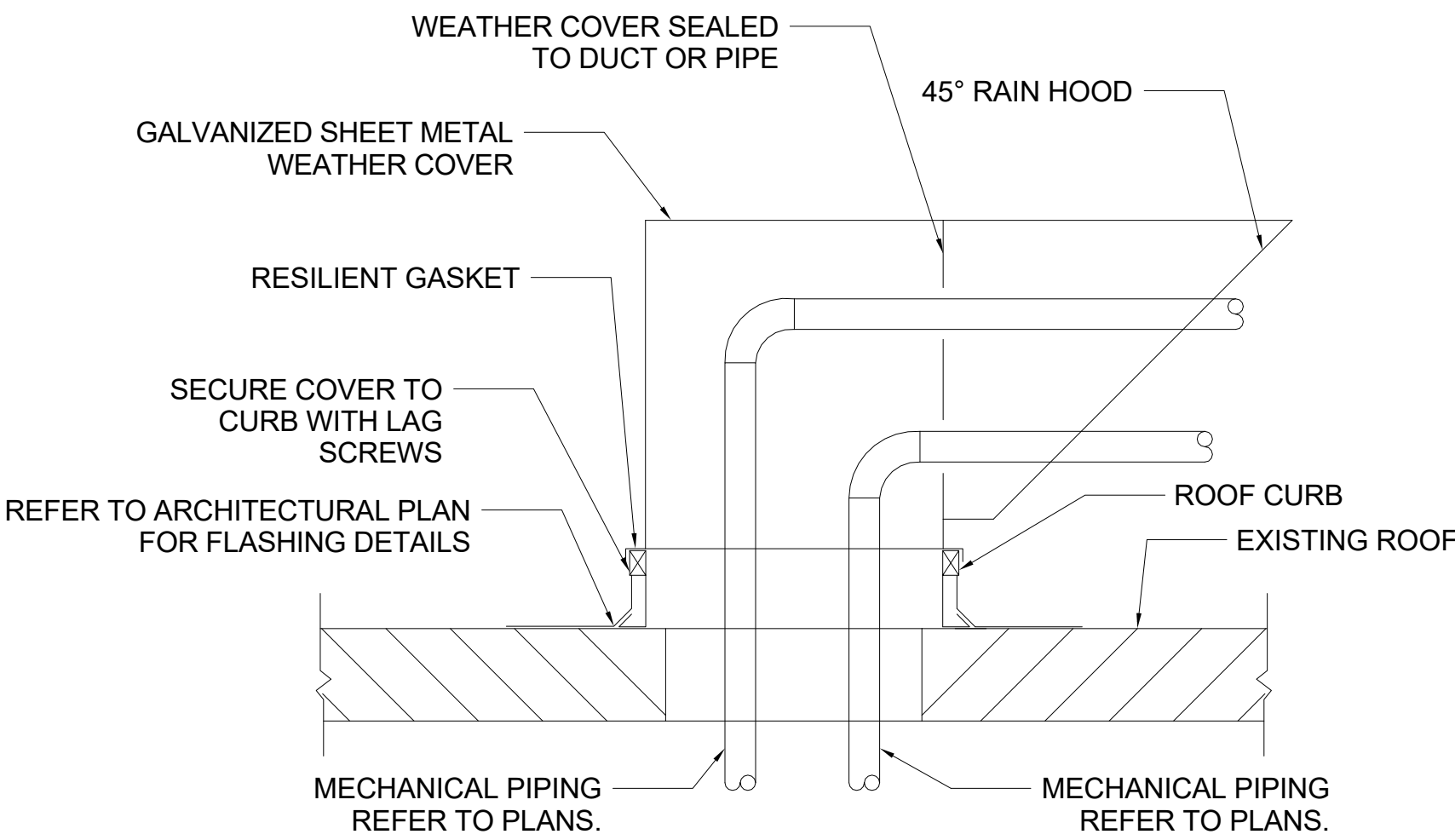
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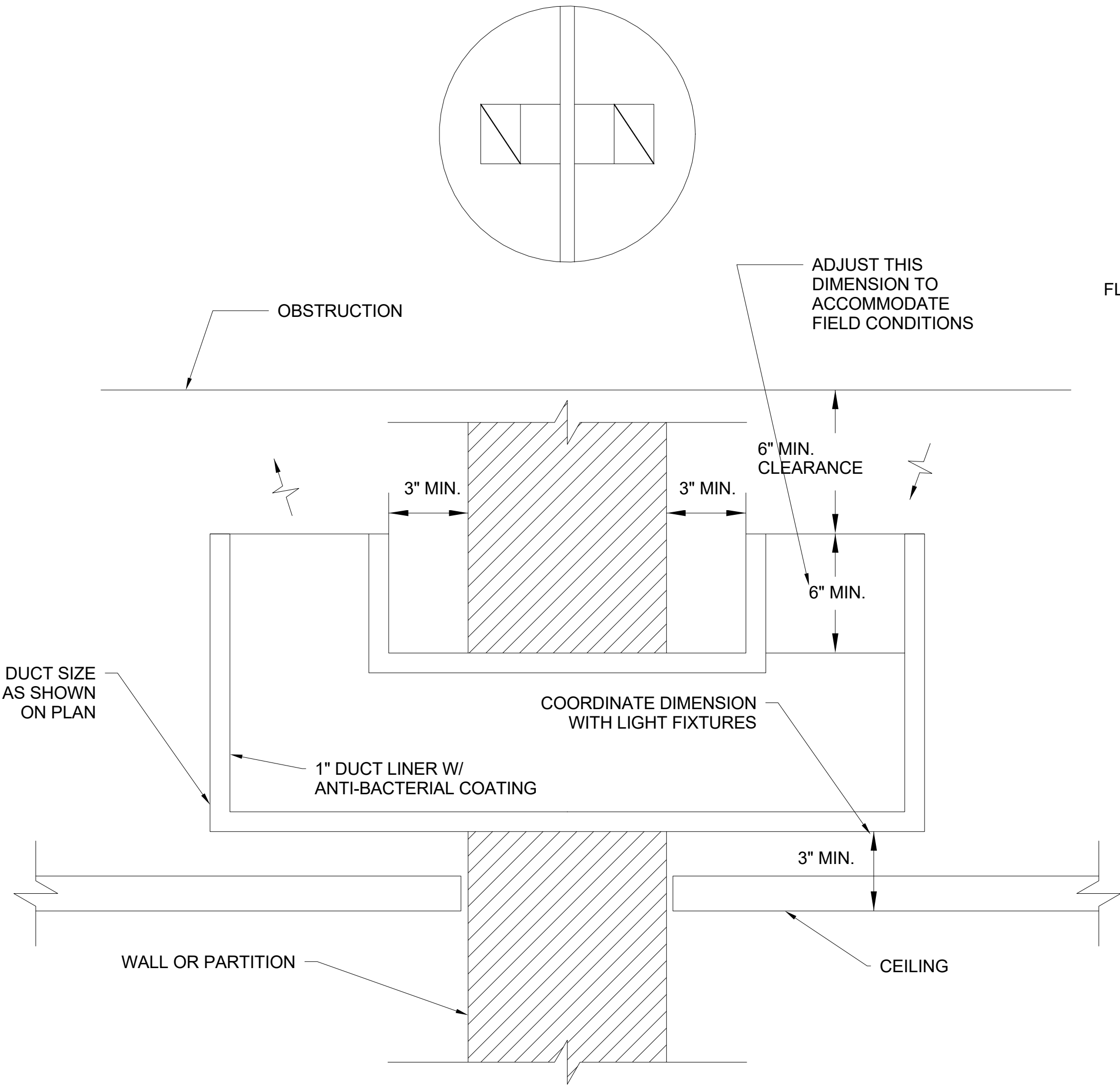
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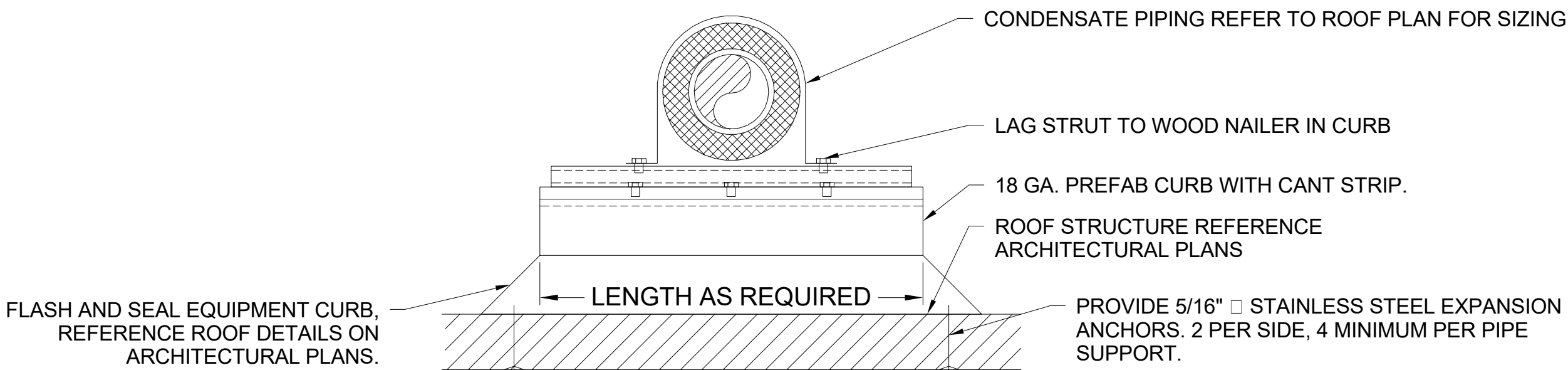
01 **ROOF CURB DETAIL FOR SINGLE ZONE RTU**  
NOT TO SCALE



02 **ROOF PIPE PENETRATION DETAIL**  
NOT TO SCALE



03 **TRANSFER DUCT DETAIL**  
NOT TO SCALE



04 **CONDENSATE PIPE SUPPORT DETAIL**  
NOT TO SCALE



AIR HANDLING UNIT SCHEDULE																																						
PLAN MARK	LOCATION	SERVES	FAN SECTION									COOLING COIL SECTION										HEATING COIL SECTION												DIMENSIONS (LxWxH) (FT)				
			TOTAL (CFM)	OSA (CFM)	WHEEL TYPE	R.P.M.	T.S.P. IN. WG.	E.S.P. IN. WG.	MOTOR DATA			TOTAL CAP. (MBH)	SENS. CAP. (MBH)	E.A.T. (°F)		L.A.T. (°F)		FACE VEL. (FPM)	MAX. AIR P.D. (IN.WG.)	ROWS/ FPI	G.P.M.	MAX. WTR P.D. FT.WG.)	E.W.T. (°F)	L.W.T. (°F)	HEATING CAP. (MBH)	E.A.T. (°F) D.B.	L.A.T. (°F) D.B.	FACE VEL. (FPM)	MAX. AIR P.D. (IN.WG.)	ROWS/ FPI	G.P.M.	MAX. WTR P.D. FT.WG.)	E.W.T. (°F)		L.W.T. (°F)	UNIT WT. (LBS)		
									H.P.	VOLTS	PH.			D.B.	W.B.	D.B.	W.B.																					
AHU-1-1	MECH. RM.	1ST FLOOR	5000	900	FC	FC	3.69	1.90	7.5	460	3	194.0	128.4	78.4	66.4	55.0	53.7	407	-	4/12	32.2	7.0	42	54	-	-	-	-	-	-	-	-	-	-	-	-	1414.5	92.07X71.0X80.06
AHU-2-1	ROOF	2ND FLOOR	2900	400	FC	1650	3.59	1.70	5	460	3	91.36	70.53	77.3	64.7	55.2	54.2	380	-	4/9	15.2	1.96	42	54	-	-	-	-	-	-	-	-	-	-	-	-	1283.9	110.83X51.0X42.3
AHU-2-2	ROOF	2ND FLOOR	3200	485	FC	1700	3.82	1.7	5	460	3	113.85	83.92	77.5	65.1	53.7	53.2	419	-	4/9	18.9	2.82	42	54	-	-	-	-	-	-	-	-	-	-	-	-	1291.6	110.83X51.0X42.3
NOTES:																																						
1.	AIR HANDLER UNIT CABINET SHALL BE DOUBLE WALL CONSTRUCTION WITH SOLID INNER LINER. INNER LINER SHALL BE TYPE 304 STAINLESS STEEL THERMAL BREAK CONSTRUCTION. PROVIDE MINIMUM R-13 CLOSED CELL INSULATION.																			10.	AIR HANDLING UNIT AHU-1-1 SHALL BE FURNISHED WITH BASE RAIL SUITABLE FOR SELF SUPPORTING AIR HANDLING UNIT ON EQUIPMENT PADS.																	
2.	PROVIDE DOUBLE SLOPED STAINLESS STEEL DRAIN PAIN AT EACH COIL SECTION.																			11.	AS SPACE CONDITIONS DICTATE, THE CONTRACTOR SHALL MAKE ALL NECESSARY PROVISIONS TO DISASSEMBLE AND MOVE UNIT INTO THE DESIGNATED MECHANICAL ROOM AND REASSEMBLE UNIT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.																	
3.	PROVIDE 2" MERV 8 PRE-FILTER AND MERV 13 4" CARTRIDGE FINAL FILTER IN UNIT.																			12.	AIR HANDLER AHU-1-1 SHALL BE VERTICAL DRAW THROUGH CONFIGURATION.																	
4.	UNIT SHALL HAVE MINIMUM DUAL BELT DRIVE FAN AS APPLICABLE.																			13.	AHU-1-1 SHALL HAVE REMOTE VARIABLE FREQUENCY DRIVE FOR VAV OPERATION. REFER TO PLANS.																	
5.	PROVIDE SIDE ACCESS PANELS ON BOTH SIDES OF UNIT.																			14.	AHU-2-1 AND AHU-2-2 SHALL BE ROOF MOUNTED AIR HANDLERS CONFIGURED FOR OUTDOOR INSTALLATION. EACH UNIT SHALL HAVE INTEGRAL VARIABLE FREQUENCY DRIVE FOR VAV CONTROL.																	
6.	PROVIDE PREMIUM EFFICIENCY DRAW THROUGH FORWARD CURVE FAN (FC) AS NOTED IN THE SCHEDULE.																			15.	PROVIDE AIR FLOW MONITORING STATION INTEGRAL TO AIR HANDLER FOR AHU-2-1 AND AHU-2-2. ACCUTROL IAQ-TEK.																	
7.	AIR HANDLER WITH RETURN AIR CONNECTIONS SHALL HAVE COPPER TUBE/COPPER FIN COILS WITH STAINLESS STEEL CASING.																			16.	PROVIDE AIR FLOW MONITORING STATION FOR AHU-1-1 REMOTE TO UNIT. ACCUTROL VORTEK VTF.																	
8.	PROVIDE ACCESS SECTIONS AT EACH COIL SECTION TO ALLOW FOR CLEANING OF COILS.																			17.	AHU-2-1 AND AHU-2-2 SHALL NOT EXCEED HEIGHT OF 62" INCLUDING 18" HIGH CURB.																	
9.	PROVIDE METALLIC NAMEPLATE WITH COMPLETE AIR HANDLER EQUIPMENT DATA MOUNTED ON INTERIOR OF UNIT ACCESS DOOR.																																					

MINI-SPLIT SYSTEM UNIT SCHEDULE																																	
PLAN MARK	LOCATION	SERVES	SEER	FAN SECTION						COOLING COIL SECTION						HEATING COIL SECTION						CONDENSER UNIT				ELECTRICAL DATA							
				TOTAL (CFM)	OSA (CFM)	WHEEL TYPE	E.S.P. IN. WG.	MOTOR DATA		TOTAL CAP. (MBH)	SENS. CAP. (MBH)	E.A.T. (°F)		L.A.T. (°F)		HEATING CAP. (MBH)	E.A.T. (°F) D.B.	L.A.T. (°F) D.B.	MAX AIR P.D. (IN. WG.)	PLAN MARK	NO. COMP.	CAPACITY STEPS	REFRIG.	TYPE	VOLTS	PH.	TYPE	VOLTS	PH.	UNIT WT. (LBS)	MANUFACTURER MODEL NO. (TRANE)		
								R.P.M.	H.P.			D.B.	W.B.	D.B.	W.B.																		
AHU-3/CU-3	WALL	IT ROOM	16.0	980	-	CENTRIF.	0.10	-	-	33.6	28.5	78.9	-	52.0	-	-	-	-	CU-3	1	1	R-410A	AHU-3	208	1	CU4	208	1	59.5 (AHU-3) 170 (CU-3)	4MXW8536A1 (AHU-3) 4TXK8536A1 (CU-3)			
AHU-4/CU-4	WALL	ELEV EQUIP	22.0	305	-	CENTRIF.	0.10	-	-	9.0	7.8	75.5	-	52.0	-	-	-	-	CU-4	1	1	R-410A	AHU-4	208	1	CU-5	208	1	28.6 (AHU-4) 90.3 (CU-4)	4MXW8509A1 (AHU-4) 4TXK8509A1 (CU-4)			
NOTES:																																	
1. AIR HANDLER SHALL BE CONFIGURED FOR HIGH WALL MOUNT INSTALLATION.										5. UNIT SHALL HAVE DIRECT DRIVE FAN WITH VARIABLE SPEED OPERATION.										8. PROVIDE FACTORY APPLIED COASTAL COATING ON CONDENSER COILS.													
2. PROVIDE SLOPED DRAIN PAN.										6. CONTROLS: PROVIDE PROGRAMMABLE THERMOSTAT, THERMOSTAT SHALL INCORPORATE 7-DAY OCCUPANCY SCHEDULE, SETBACKS, OVERRIDES. IN NORMAL OPERATION UNIT SHALL CYCLE TO MAINTAIN TEMPERATURE SETPOINTS.																							
3. PROVIDE 30% FILTER.										7. PROVIDE MSTP BACNET COMMUNICATION CARD FOR COMMUNICATION WITH JCI BAS.																							
4. PROVIDE FRONT ACCESS PANELS.																																	

AIR COOLED CHILLER SCHEDULE																														
PLAN MARK	TYPE	REFRIGERANT	NOMINAL CAPACITY (TONS)	MINIMUM		TURNDOWN CAPACITY	EVAPORATOR							COMPRESSORS		PUMPS						UNIT ELECTRICAL DATA				UNIT WT. (LBS)	MANUFACTURER - TRANE MODEL NO.			
				E.E.R.	I.P.L.V.		E.W.T. (°F)	L.W.T. (°F)	G.P.M. TOTAL	NO OF REF. CIRCUITS	FOULING FACTOR	PRESSURE DROP (FT.)	AMBIENT TEMPERATURE (°F)	QTY.	VOLTS/ PHASE	QTY.	TYPE	G.P.M.	TOTAL HEAD (FT)	H.P.	R.P.M.	VOLTS/ PHASE	M.C.A AMP CIRCUIT 1	M.O.C.P AMP CIRCUIT 1	UNIT K.W. INPUT			VOLTS/ PHASE		
CH-1	AIR COOLED	R410A	40	9.94	14.07	25%	54	42	70	2	0.0001	8.48	95	4	480/3	2	END SUCTION	70	65	5.0	1800	480/3	107.6	125.0	44.12	460/3	5732.5	CGAM 40		
NOTES:																														
1.	PROVIDE WITH ALL ALUMINUM FIN COPPER TUBE MICROCHANNEL CONDENSER COILS.										8.	PROVIDE WITH COMPRESSOR SUCTION AND DISCHARGE ISOLATION VALVES.										14.	PROVIDE 136 GALLON BUFFER TANK INTEGRAL WITH CHILLER PACKAGE TO INSURE ADEQUATE CHILLED SYSTEM VOLUME.							
2.	PROVIDE WITH REMOVABLE COMPRESSOR ACOUSITCAL SOUND ENCLOSURES.										9.	MAXIMUM 64 DBA A-WEIGHTED SOUND PRESSURE LEVEL AT 30' FROM CHILLER.										15.	PROVIDE INTEGRAL DUAL PUMP PACKAGE CHILLER OPTION WITH VARIABLE SPEED DRIVES. CHILLED WATER PUMPS SHALL OPERATE IN REDUNDANT, LEAD/LAG MODE.							
3.	PROVIDE WITH WYE-DELTA COMPRESSOR STARTERS.										10.	PROVIDE WITH COOLER FREEZE PROTECTION HEATER.										16.	PROVIDE 4.8 GALLON INTEGRAL EXPANSION TANK.							
4.	PROVIDE WITH SCROLL COMPRESSORS.										11.	PROVIDE SINGLE POINT POWER CONNECTION.										17.	CHILLER HEIGHT SHALL NOT EXCEED 102" WITH EQUIPMENT PAD AND SOUND ATTENUATORS.							
5.	PROVIDE COASTAL COATING ON CONDENSER COILS FOR CORROSION PROTECTION.										12.	PROVIDE MSTP BACNET INTERFACE FOR COMMUNICATION WITH JCI BAS.										18.	CHILLER SHALL BE FURNISHED WITH 30,000 AMPERE RMS SHORT-CIRCUIT CURRENT RATING.							
6.	PROVIDE WITH CONTROL POWER TRANSFORMER.																													
7.	PROVIDE WITH NON-FUSED DISCONNECT SWITCH.																													



FAN POWERED TERMINAL BOX SCHEDULE																	
UNIT DESIGNATION	PFB-1	PFB-2	PFB-3	PFB-4	PFB-5	PFB-6	PFB-7	PFB-8	PFB-9	PFB-10	PFB-11	PFB-12	PFB-13	PFB-14	PFB-15	PFB-16	PFB-17
MANUFACTURER	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE
MODEL NO.	VPEF08	VPEF10	VPEF08	VPEF06	VPEF08	VPEF-	VPEF08	VPEF08	VPEF06	VPEF06	VPEF10	VPEF08	VPEF06	VPEF08	VPEF10	VPEF06	VPEF06
COOLING CFM																	
MAX.	720	1350	860	400	590	620	750	780	275	380	1000	750	440	855	935	480	175
MIN.	215	405	260	120	180	185	225	235	115	115	300	225	135	260	280	145	60
FAN DATA																	
FAN CFM	360	675	430	200	295	310	375	390	190	190	500	375	220	430	470	240	170
MOTOR HP	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
VOLTAGE/PHASE	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1
ELECTRIC HEATING COIL																	
CFM	575	1080	690	320	475	495	600	625	305	305	800	600	355	685	750	385	230
KW	3	5.5	3.5	1.5	2.5	2.5	3	3	1.0	1.5	5.5	3	2	3.5	4	2	1.0
STEPS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOLTAGE/PHASE	277/1	480/3	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1	480/3	277/1	277/1	277/1	277/1	277/1	277/1
NOTES:																	
1. VAV TERMINALS SHALL BE PROVIDED WITH 24V CONTROL TRANSFORMER.																	
2. VAV TERMINALS WITH HEATING COIL KW > 4KW SHALL BE 480V/3PH.																	
3. VAV TERMINALS SHALL MAINTAIN A ROOM NC-30 SOUND CRITERIA. SOUND ATTENUATION SHALL BE PROVIDED IF NECESSARY TO MEET THIS CONDITION.																	
4. MAXIMUM PRESSURE DROP SHALL NOT EXCEED 0.25" WG AT MAXIMUM DESIGN FLOW RATE.																	
5. PROVIDE ELECTRICALLY COMMUTED MOTORS (ECM) FOR ALL FAN POWERED TERMINALS.																	
6. FAN POWERED TERMINALS SHALL HAVE INTERMITTENT FAN OPERATION IN PARALLEL CONFIGURATION.																	
7. PROVIDE ACCESS PANEL FOR INSPECTION AND MAINTENANCE OF FAN POWERED TERMINAL UNIT.																	

LOUVER SCHEDULE									
PLAN MARK	FUNCTION	SERVICE	MANUFACTURER	MODEL NO.	CFM	PRESSURE DROP (IN WG)	SIZE (W" X H" X D")	FREE AREA (FT2)	DAMPER TYPE
L-1	EXHAUST	RESTROOMS	GREENHECK	EVH-501D	495	0.07	18 X 12 X 5	0.79	-
L-2	EXHAUST	RESTROOMS	GREENHECK	EVH-501D	255	0.04	18 X 12 X 5	0.23	-
L-3	EXHAUST	RESTROOMS	GREENHECK	EVH-501D	125	0.05	18 X 12 X 5	0.23	-
L-4	EXHAUST	RESTROOMS	GREENHECK	EVH-501D	110	0.04	12 X 12 X 5	0.23	-
L-5	INTAKE	GSE FACILITY	GREENHECK	EVH-501D	1200	0.05	24 X 30 X 5	2.26	GRAVITY
L-6	INTAKE	GSE FACILITY	GREENHECK	EVH-501D	1200	0.05	24 X 30 X 5	2.26	GRAVITY
L-7	INTAKE	OUTSIDE AIR	GREENHECK	EVH-501D	900	0.05	24 X 24 X 5	1.7	-
NOTES:									
1. LOUVERS SHALL BE 5" DEEP LOUVER, EXTRUDED ALUMINUM CONSTRUCTION, AND EPOXY COATED, PROVIDE EXPANDED, FLATTENED ALUMINUM BIRDSCREEN IN REMOVABLE FRAME. COLOR SHALL BE SELECTED BY ARCHITECT.									
2. LOUVERS SHALL MEET AMCA 550 CRITERIA FOR HIGH VELOCITY WIND DRIVEN RAIN RESISTANT LOUVERS AND SHALL HAVE FLORIDA PRODUCT APPROVAL.									
3. CONTRACTOR SHALL PROVIDE WALL SLEEVE AND OTHER APPURTENANCES NECESSARY FOR A COMPLETE OPERATING SYSTEM.									
4. GRAVITY DAMPERS SHALL BE EXTRUDED ALUMINUM CONSTRUCTION WITH COUNTER BALANCED WEIGHTS. DAMPERS SHALL BE RATED FOR VELOCITY OF 2000 FPM AND PRESSURE TO 2.5" W.G. DAMPERS SHALL BE MOUNTED VERTICALLY FOR HORIZONTAL AIR FLOW. PROVIDE WALL SLEEVE WITH LENGTH AS REQUIRED TO MAINTAIN MANUFACTURER'S REQUIRED CLEARANCE BETWEEN LOUVER, DAMPER AND FAN.									
5. PROVIDE SPRING RETURN ACTUATOR FOR MOTORIZED DAMPERS WITH TORQUE RATING AND TIMING IN ACCORDANCE WITH LOUVER MANUFACTURER'S REQUIREMENTS. ACTUATORS SHALL BE 120V/1PHASE MANUFACTURED BY BELIMO OR HONEYWELL.									

FAN SCHEDULE															
PLAN MARK	LOCATION	SERVES	TYPE	CFM	R.P.M.	S.P. IN. WG.	DRIVE	MOTOR DATA				UNIT WGT. (LBS)	DIMENSIONS (LxWxH)	MANUFACTURER MODEL NO.	NOTES
								H.P.	R.P.M.	VOLTS	PH.				
EF-1	VENDING	RESTROOMS	INLINE	495	879	0.50	DIRECT	-	-	115	1	34	23.6X11.6X11.6	GREENHECK CSP-A700	INTERLOCK WITH AHU-1-1
EF-2	RESTROOMS	RESTROOMS	INLINE	205	994	0.50	DIRECT	-	-	115	1	23	14X11.9X10	GREENHECK CSP-A290	INTERLOCK WITH AHU-1-1
EF-3	CEILING	RESTROOMS	CEILING	50	862	0.30	DIRECT	-	-	115	1	9	13.9X11.5X7	GREENHECK SP-B80	OCCUPANCY SENSOR
EF-4	COMMUNITY	RESTROOMS	INLINE	125	844	0.50	DIRECT	-	-	115	1	11	13.9X11.5X7	GREENHECK CSP-B200	INTERLOCK WITH AHU-2-1
EF-5	OFFICE	RESTROOMS	INLINE	110	859	0.50	DIRECT	-	-	115	1	11	13.9X11.5X7	GREENHECK CSP-B150	INTERLOCK WITH AHU-2-2
EF-6	SIDEWALL	GSE FACILITY	PROPELLER	1200	1594	0.35	BELT	1/2	1725	115	1	34	26X20.3X20.3	GREENHECK SE1-14-440-VG	THERMOSTAT CONTROLLED
EF-7	SIDEWALL	GSE FACILITY	PROPELLER	1200	1594	0.35	BELT	1/2	1725	115	1	34	26X20.3X20.3	GREENHECK SE1-14-440-VG	THERMOSTAT CONTROLLED
NOTES:															
1. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH.				3. EXHAUST FANS SHALL BE GREENHECK OR APPROVED EQUAL.				6. PROVIDE LINE VOLTAGE THERMOSTAT FOR EF-6 AND EF-7 CONTROL.							
2. PROVIDE GRAVITY BACKDRAFT DAMPER FOR INLINE AND CEILING EXHAUST FANS				4. FAN CONTROL WHERE SHOWN ON THE PLANS.				7. PROVIDE ECM MOTOR FOR MANUAL SPEED CONTROL WITH POTENTIOMETER DIAL FOR ALL SINGLE FAN MOTORS.							
				5. PROVIDE ACCESS PANEL FOR INSPECTION AND MAINTENANCE OF IN-LINE FANS.											

VAV SCHEDULE-SINGLE DUCT BOX					
UNIT DESIGNATION	VAV-1				
MANUFACTURER	TRANE				
MODEL NO.	VCCF05				
INLET SIZE (IN.)	5				
COOLING CFM					
MAX.	325				
MIN.	85				
VOLTAGE/PHASE	-				
ELECTRIC HEATING COIL					
CFM	-				
KW	-				
STEPS	-				
NOTES:					
1. VAV TERMINALS SHALL BE PROVIDED WITH 24V CONTROL TRANSFORMER.					
2. VAV TERMINALS WITH HEATING COIL KW>4KW SHALL BE 480/3PH.					
3. PROVIDE DIGITAL VAV CONTROLLER COMPATIBLE WITH EXISTING EMS SYSTEM.					
4. PROVIDE ACCESS PANEL FOR INSPECTION AND MAINTENANCE OF VAV TERMINAL.					

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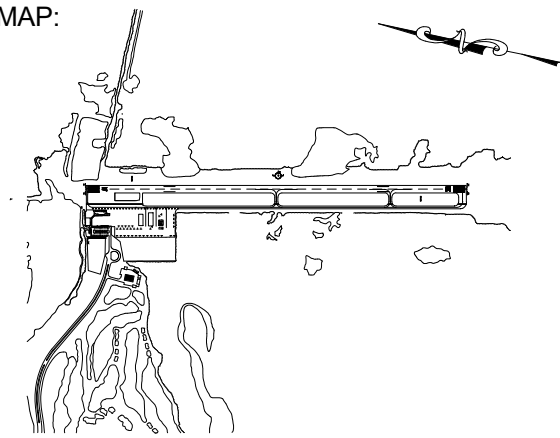


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ARCHITECTURE

KEY MAP:



DRAWING SCALE:

REVISIONS

MARK	DESCRIPTION	DATE
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PROJECT NAME:

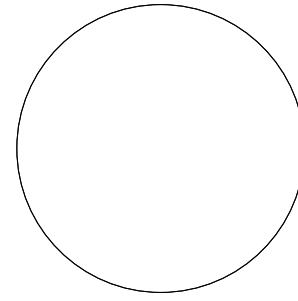
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SHEET TITLE:

MECHANICAL SCHEDULES

VOLUME 2

ENGINEER OF RECORD:



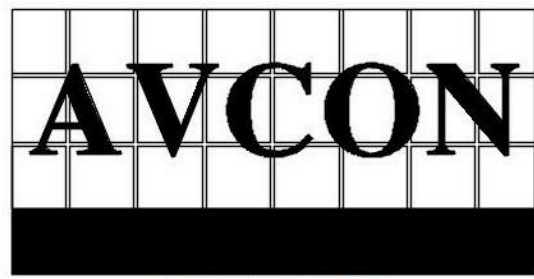
ZEMP B. PEPPER, PE #1147

JOB NO.: 1620729  
DATE: May 2017  
DRAWN: SB  
DESIGN: ZP  
CHECKED: ZP

NOTE: GENERAL CONTRACTOR(S) BIDDING SHALL PROVIDE WRITTEN VERIFICATION WITH THEIR BIDS THAT ALL OF THEIR SUBCONTRACTORS BIDDING THIS PROJECT HAVE BECOME FAMILIAR WITH ALL CONSTRUCTION DRAWING SHEETS & PROJECT MANUAL SPECIFICATIONS TO ENSURE THE GC AND SUB-CONTRACTORS CONSTRUCTION BIDS SHALL PROVIDE THE TOTALITY OF THE ENTIRE CONTRACT DOCUMENT REQUIREMENTS.

SHEET NO.

M602



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CONTROLS LEGEND	
AI	ANALOG INPUT
AO	ANALOG OUTPUT
CC	COOLING COIL
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
EHC	ELECTRICAL HEATING COIL
M	MOTORIZED DAMPER
OA	OUTSIDE AIR
OC	OVERRIDE CONTROL
⌘	SMOKE DETECTOR
TS	TEMPERATURE SENSOR
VD	MANUAL VOLUME DAMPER
SP	STATIC PRESSURE SENSOR
AFM	AIR FLOW MONITORING STATION
CV	CONTROL VALVE
FM	FLOW METER

SEQUENCE OF OPERATIONS: VAV AIR HANDLER

UNOCCUPIED MODE: THE UNIT FAN SHALL BE STOPPED, THE OUTSIDE AIR DAMPER SHALL BE CLOSED, THE CHILLED WATER CONTROL VALVE CLOSED, RETURN AIR DAMPER FULLY OPEN, INTERLOCKED EXHAUST FANS SHUT-DOWN.

NIGHT SETBACK: SPACE TEMPERATURE SENSOR SHALL SIGNAL THE UNIT TO START WHEN TEMPERATURE RISES TO 85°F (ADJUSTABLE) IN ANY ZONE AND SHALL STOP WHEN TEMPERATURE REACHES 80°F (ADJUSTABLE). SIMILARLY THE UNIT SHALL START WHEN SPACE TEMPERATURE DROPS TO 60°F (ADJUSTABLE) IN ANY ZONE AND SHALL STOP WHEN TEMPERATURES REACHES 65°F (ADJUSTABLE). UNIT SHALL OPERATE AS NOTED IN OPTIMAL-START.

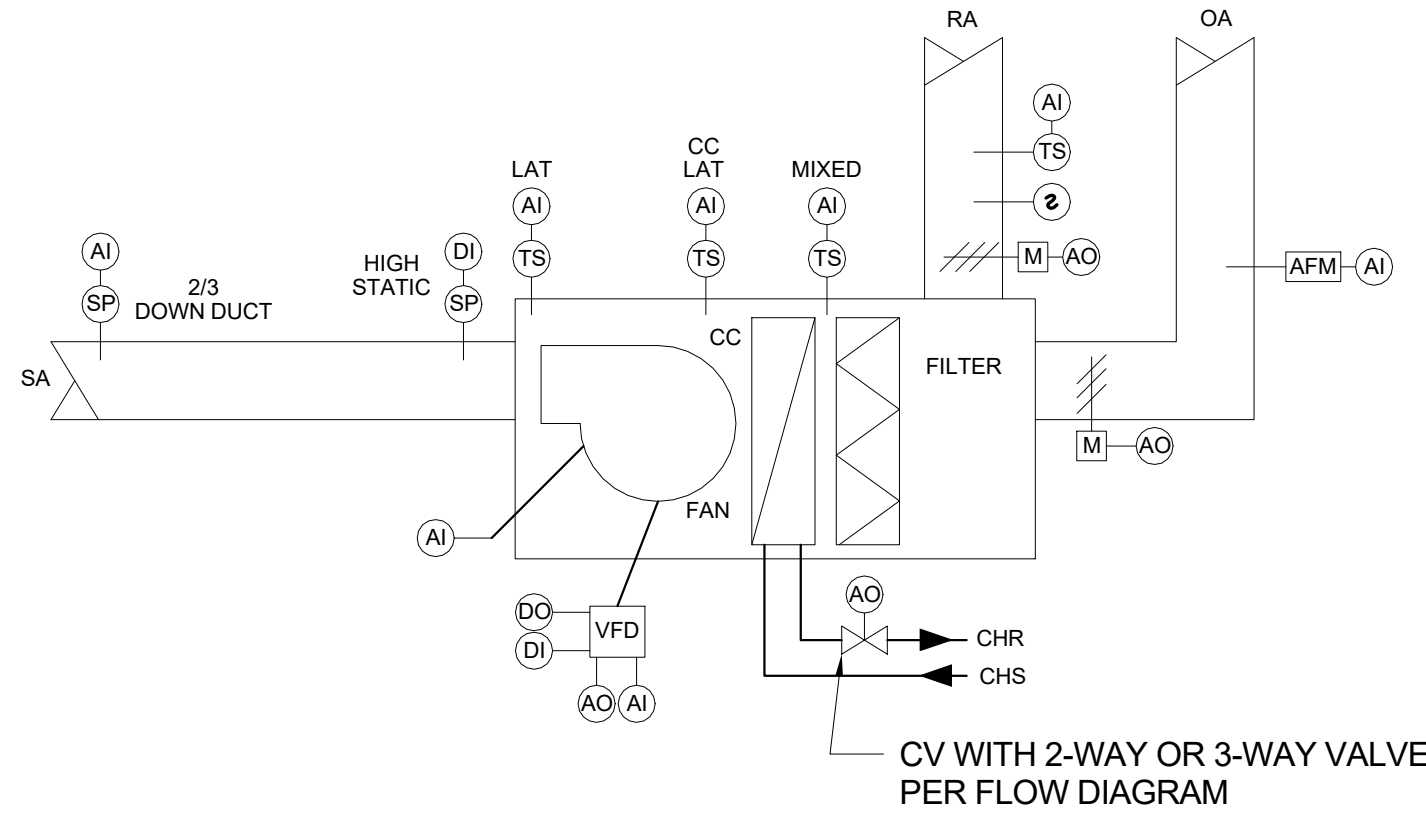
OPTIMAL START: 30 MINUTES PRIOR TO OCCUPIED MODE, THE CHILLED WATER SYSTEM SHALL BE COMMANDED ON AND THE AIR HANDLER UNIT(S) SHALL BE STARTED. THE UNIT SHALL OPERATE WITH OUTSIDE AIR DAMPER CLOSED, RETURN AIR DAMPER FULLY OPEN AND INTERLOCKED EXHAUST FANS OFF. UNIT CHILLED WATER CONTROL VALVE SHALL BE MODULATED OPEN TO MAINTAIN LAT SETPOINT.

OCCUPIED MODE: UNIT FAN SHALL BE COMMANDED ON IN THE OCCUPIED MODE AND THE OUTSIDE AIR DAMPER SHALL BE MODULATED WITH THE RETURN AIR DAMPER TO MAINTAIN THE SCHEDULED OUTSIDE AIR RATE AS MEASURED BY THE AIR FLOW MONITORING STATION. INTERLOCKED EXHAUST FANS SHALL BE STARTED. THE CHILLED WATER CONTROL VALVE SHALL BE MODULATED TO MAINTAIN THE SCHEDULED LAT.

AFTER HOURS OVERRIDE: AN OVERRIDE MODE SHALL BE PROVIDED THAT WILL ALLOW OPERATION OF UNIT FOR AN ADJUSTABLE TIME PERIOD. THE UNIT SHALL SERVE THE ZONE OR ZONES REQUESTING OVERRIDE. THE UNIT SHALL OPERATE SIMILAR TO OCCUPIED MODE BUT WITH OUTSIDE AIR DAMPER CLOSED AND INTERLOCKED EXHAUST FANS OFF. OVERRIDE SHALL BE ENABLED BY OVERRIDE BUTTON IN THE SPACE OR BY MANUAL INPUT AT THE BAS.

SUPPLY FAN CONTROL: VAV SUPPLY FAN SPEED WILL BE MODULATED TO MAINTAIN DUCT STATIC PRESSURE SETPOINT 0.5"WG (ADJUSTABLE 0-1.5"WG). STATIC PRESSURE SENSOR SHALL BE LOCATED IN THE SUPPLY DUCT 2/3 DOWN THE LONGEST RUN. PROVIDE HARDWIRED HIGH STATIC PRESSURE CUT-OFF SWITCH INTERLOCKED WITH THE VFD. IF HIGH STATIC PRESSURE SWITCH IS TRIPPED FAN SHALL STOP AND MANUAL RESET IS REQUIRED.

SMOKE CONTROL: IF PRODUCTS OF COMBUSTION ARE DETECTED BY DUCT DETECTORS THE SUPPLY FAN SHALL BE STOPPED AND THE OA DAMPER CLOSED BY MEANS OF THE FIRE ALARM SYSTEM.



01 VAV AIR HANDLER CONTROL DIAGRAM  
NOT TO SCALE

NOTE: EXHAUST FANS SHALL BE INTERLOCKED WITH ASSOCIATED AIR HANDLER AS NOTED IN FAN SCHEDULE ON SHEET M602.

SEQUENCE OF OPERATIONS: PARALLEL FAN POWERED VAV TERMINAL WITH ELECTRIC HEAT

UNOCCUPIED MODE: THE TERMINAL DAMPER SHALL BE CLOSED, UNIT FAN SHUT-OFF AND ELECTRICAL HEAT SHUT-OFF.

NIGHT SETBACK: WHEN SPACE TEMPERATURE RISES TO 85°F (ADJUSTABLE) UNIT DAMPER SHALL OPEN AND AIR HANDLER SHALL BE STARTED. THE AIR HANDLER SHALL SHUT-DOWN WHEN SPACE TEMPERATURE REACHES 80°F (ADJUSTABLE) AND UNIT DAMPER SHALL CLOSE. SIMILARLY WHEN SPACE TEMPERATURE DROPS TO 60°F (ADJUSTABLE) THE AIR HANDLER SHALL START, THE UNIT DAMPER SHALL OPEN TO MINIMUM POSITION. TERMINAL FAN SHALL BE ENERGIZED AND 1ST STAGE OF ELECTRIC HEAT SHALL BE COMMANDED ON. THE AIR HANDLER SHALL SHUT-DOWN WHEN SPACE TEMPERATURE REACHES 65°F (ADJUSTABLE), TERMINAL UNIT FAN AND ELECTRIC HEAT SHALL BE SHUT-OFF AND UNIT DAMPER CLOSED.

OCCUPIED MODE: TERMINAL DAMPER SHALL BE MODULATED TO MAINTAIN SPACE TEMPERATURE SETPOINT IN COOLING OPERATION, ENERGIZER FAN AND CIRCULATE PLENUM AIR MID-RANGE AFTER PRIMARY AIR IS AT MINIMUM POSITION, AND ENERGIZE ELECTRIC HEATING COIL IN STAGES FOR HEATING OPERATION.

SEQUENCE OF OPERATIONS: VAV TERMINAL

VAV-1 SERVING MAIN ELECTRICAL ROOM

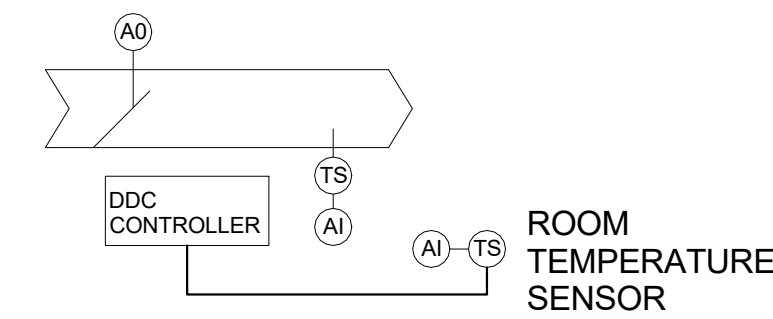
UNOCCUPIED MODE: NO UNOCCUPIED MODE OPERATION

NIGHT SETBACK: NO NIGHT SETBACK OPERATION

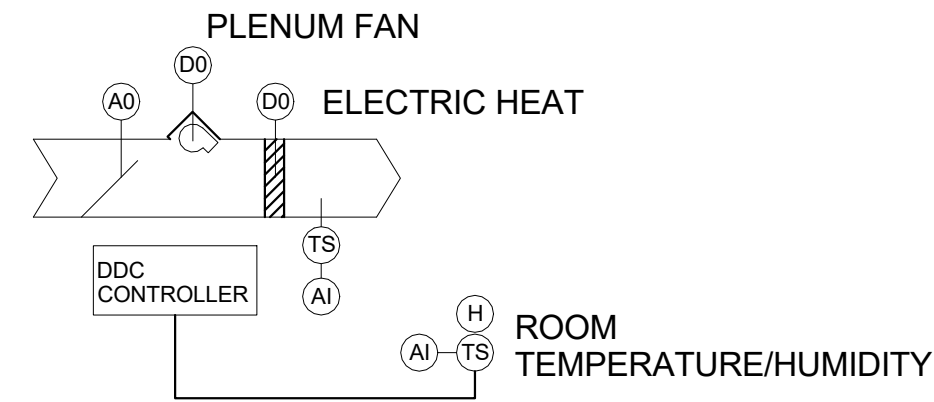
OCCUPIED MODE: TERMIANL UNIT DAMPER SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE SETPOINT

LIGHTING CONTROL SYSTEM INTERFACE

THE BAS SHALL PROVIDE LOCAL AND REMOTE MONITORING AND CONTROL OF ALL LIGHTING ZONES IN THE TERMINAL BUILDING AND APRON AND PARKING AREAS. THE BAS SHALL INTERFACE WITH THE LIGHTING CONTROL SYSTEM BY MEANS OF BACNET COMMUNICATION. THE BAS SHALL PROVIDE GRAPHIC REPRESENTATION OF BUILDING FLOOR PLANS WITH LIGHTING ZONE STATUS, ALLOW LIGHTING ZONE OVERRIDE OPERATION AND THE ABILITY TO CHANGE OPERATION SCHEDULES. THE SAME FEATURES SHALL BE PROVIDED FOR THE PARKING AREAS. REFER TO THE ELECTRICAL PLANS FOR LIGHTING CONTROL SYSTEM DETAILS. THE APRON LIGHTING SHALL BE MONITORED REMOTELY BUT CONTROLLED LOCALLY ONLY FOR SAFETY MEASURES.



01 VAV TERMINAL CONTROL DIAGRAM  
NOT TO SCALE



02 FAN POWERED VAV TERMINAL CONTROL DIAGRAM  
NOT TO SCALE

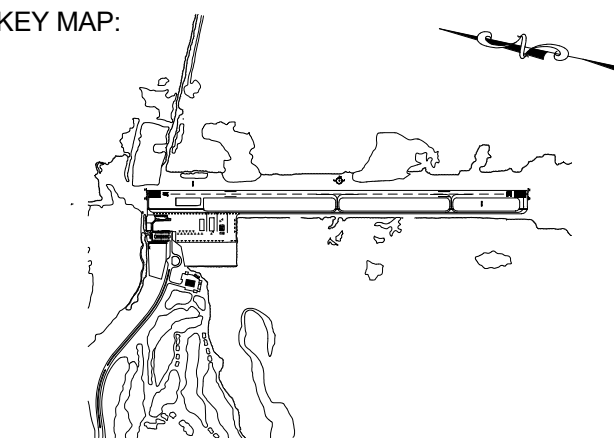
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ARCHITECTURE



DRAWING SCALE:

12" = 1'-0"

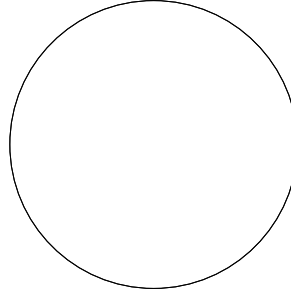
REVISIONS		
MARK	DESCRIPTION	DATE

PROJECT NAME:  
NEW TERMINAL FACILITY  
AND ASSOCIATED  
IMPROVEMENTS

SHEET TITLE:  
CONTROL DIAGRAMS AND  
SEQUENCE OF  
OPERATIONS

VOLUME 2

ENGINEER OF RECORD:



ZEMP B. PEPPER, PE #1147

JOB NO.: 1620729  
DATE: May 2017  
DRAWN: SB  
DESIGN: ZP  
CHECKED: ZP

SHEET NO.

M701

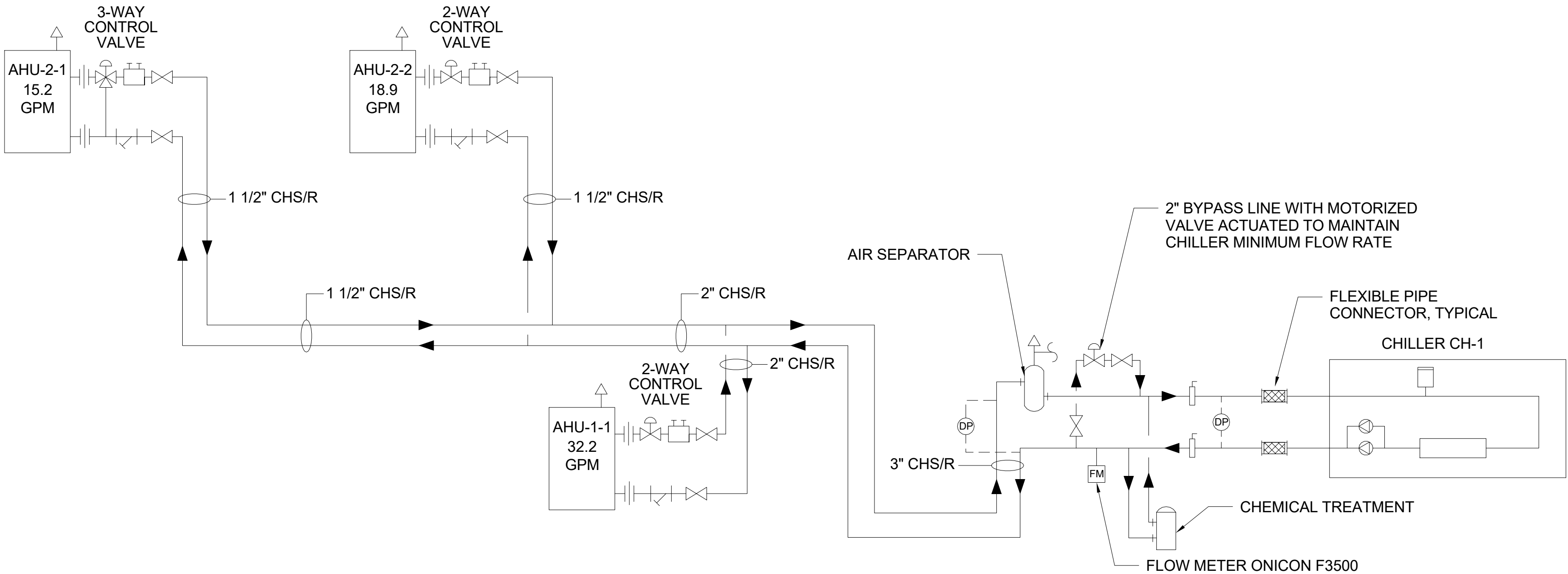
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NOTE: GENERAL CONTRACTORS (GC) BIDDING SHALL PROVIDE WRITTEN VERIFICATION WITH THEIR BIDS THAT ALL OF THEIR SUBCONTRACTORS BIDDING THIS PROJECT HAVE BECOME FAMILIAR WITH ALL CONSTRUCTION DRAWING SHEETS & PROJECT MANUAL SPECIFICATIONS TO ENSURE THE GC AND SUB-CONTRACTORS CONSTRUCTION BIDS SHALL PROVIDE THE TOTALITY OF THE ENTIRE CONTRACT DOCUMENT REQUIREMENTS.



CHILLER POINT LIST:			
DESCRIPTION	TYPE	ALARM	NOTES
OUTSIDE AIR TEMPERATURE	AI		
OUTSIDE AIR RELATIVE HUMIDITY	AI		
CHILLED WATER PUMP 1 START/STOP	D0		
CHILLED WATER PUMP 2 START/STOP	D0		
CHILLED WATER PUMP 1 STATUS	DI	A	DP
CHILLED WATER PUMP 2 STATUS	DI	A	DP
CHILLED WATER PUMP 1 VFD SIGNAL	A0		
CHILLED WATER PUMP 2 VFD SIGNAL	A0		
CHILLED WATER PUMP 1 VFD FAULT	DI	A	
CHILLED WATER PUMP 2 VFD FAULT	DI	A	
CHILLER START/STOP	D0	A	
CHILLER FAULT ALARM	DI	A	
CHILLER BACNET POINTS	MULTIPLE	A	
CHILLED WATER SUPPLY TEMPERATURE	AI	A	
CHILLED WATER RETURN TEMPERATURE	AI	A	
CHILLED WATER LOOP DIFFERENTIAL PRESSURE	AI	A	
CHILLED WATER FLOW RATE	AI		FLOW METER ONICON F3500 MIN CHILLER FLOW
BYPASS VALVE (MOTORIZED)	A0	A	POSITION

SEQUENCE OF OPERATIONS: CHILLER CH-1 AND PACKAGED PUMP SYSTEM	
ON/OFF: AUTOMATIC BY BAS. UNIT SHALL START WHEN COOL-DOWN MODE IS INITIATED AND RUN CONTINUOUSLY IN THE OCCUPIED MODE, DURING SETBACK COOLING MODE, DURING MANUAL OVERRIDE AT BAS, LOCAL CONTROLLER OR STARTER.	
UPON CALL FOR COOLING THE LEAD CHILLED WATER PUMP SHALL BE ENABLED. CHILLED WATER PUMP STATUS SHALL BE MONITORED BY CHILLER FLOW SWITCH. AFTER TIME DELAY, OA CONDITION IS ABOVE 45°F (ADJUSTABLE), AND FLOW IS PROVEN, THE CHILLER SHALL BE COMMANDED ON. CHILLER REFRIGERATION CAPACITY SHALL BE STAGED BY INTERNAL CONTROLS TO MEET LWT SETPOINT (42°F ADJUSTABLE). SHOULD LOAD BE SATISFIED AT LOWEST CHILLER CAPACITY SETTING, UNIT SHALL BE SHUT-OFF. CHILLED WATER PUMP SHALL CONTINUE TO OPERATE. SHOULD LOAD INCREASE (LWT SETPOINT NOT BE MET) CHILLER SHALL BE RESTARTED. CHILLER AND PUMP(S) SHALL BE SHUT-OFF AT END OF OCCUPIED MODE.	
MINIMUM CHILLER FLOW THROUGH THE EVAPORATOR SHALL BE MAINTAINED BY MEASURING FLOW RATE THROUGH THE CHS SUPPLY MAIN BY MEANS OF ONICON F3500 FLOW METER. THE FLOW RATE SHALL BE COMPARED TO THE DETERMINED MINIMUM FLOW RATE. AS THE FLOW RATE APPROACHES THE MINIMUM FLOW THE BYPASS VALVE SHALL BE MODULATED OPEN TO MAINTAIN REQUIRED FLOW RATE. THE DIFFERENTIAL PRESSURE ACROSS THE EVAPORATOR MAY ALSO BE MEASURED AND CONVERTED TO GPM FLOW RATE AS A VERIFICATION.	
CHILLED WATER PUMP SYSTEM CONTROL:	
LEAD CHILLED WATER PUMP SHALL BE COMMANDED ON BY BAS. SHOULD PUMP BE ENABLED AND DIFFERENTIAL PRESSURE ACROSS PUMP INDICATES FAILURE, ALARM CONDITION SHALL BE ANNUNCIATED AT BAS. LAG PUMP SHALL THEN BE COMMANDED ON.	
CHILLED WATER PUMP(S) SHALL BE PROVIDED WITH VARIABLE FREQUENCY DRIVES FOR SPEED CONTROL. PUMP VFD SHALL BE CONTROLLED TO MAINTAIN A DIFFERETIAL SETPOINT BETWEEN THE CHILLED WATER SUPPLY AND RETURN MAINS (ADJUSTABLE PSI SETTING). LEAD/LAG PUMP STATUS SHALL BE AUTOMATICALLY SWITCHED ON A WEEKLY BASIS TO MAINTAIN CONSISTENT RUN TIMES.	
FREEZE PROTECTION: SHOULD THE AMBIENT OUTDOOR AIR TEMPERATURE DROP TO 35°F THE LEAD CHILLED WATER PUMP SHALL BE COMMANDED ON AND THE CHILLED WATER VALVES MODULATED OPEN TO ALLOW FLOW. PUMP SHALL BE DISABLED WHEN OUTSIDE AIR RISES TO 38°F.	
EMERGENCY POWER OPERATION MODE: IN THE EVENT OF UTILITY POWER OUTAGE AND EMERGENCY GENERATOR OPERATION, THE BAS SHALL RECEIVE SIGNAL FROM THE EMERGENCY POWER SYSTEM AND RESTART THE HVAC SYSTEM IN ORDERED SEQUENCE. THE CHILLER SHALL OPERATE WITH TWO (2) ACTIVE COMPRESSORS, AND TWO (2) COMPRESSORS LOCKED OUT. AIR HANDLERS AHU-1-1, AHU-2-2 AND ASSOCIATED VAV TERMINALS SHALL BE ENERGIZED. AHU-2-1 AND ASSOCIATED VAV TERMINALS SHALL NOT BE OPERATIONAL.	



## 01 CHILLED WATER FLOW DIAGRAM

NOT TO SCALE

NOTE: THIS SHEET IS DIAGRAMMATIC IN NATURE AND DOES NOT SHOW ALL PIPING OFFSETS, FITTINGS, GAUGES, HYDRONIC ACCESSORIES, OR CONTROL DEVICES. REFER TO MECHANICAL PLANS AND MECHANICAL DETAILS FOR FURTHER INFORMATION.

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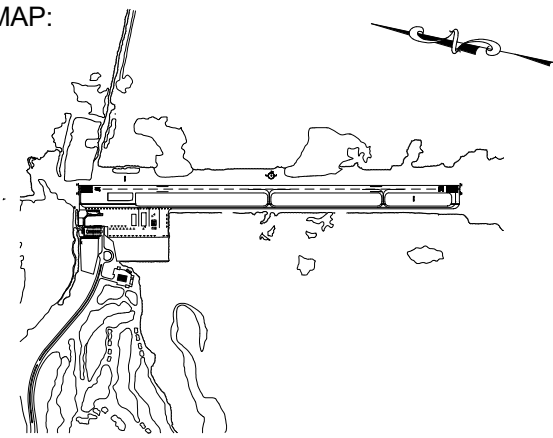


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ARCHITECTURE

KEY MAP:



DRAWING SCALE:

12" = 1'-0"

REVISIONS

MARK	DESCRIPTION	DATE
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PROJECT NAME:

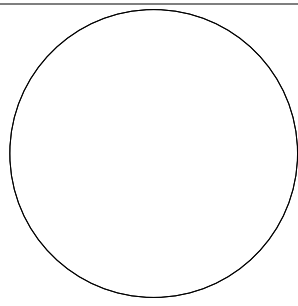
NEW TERMINAL FACILITY  
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ENGINEER OF RECORD:



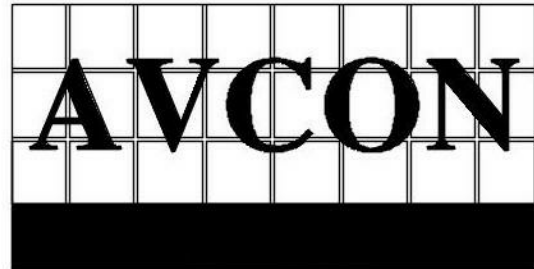
ZEMP B. PEPPER, PE #1147

JOB NO.:	1620729
DATE:	May 2017
DRAWN:	SB
DESIGN:	ZP
CHECKED:	ZP

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SHEET NO.

M702



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