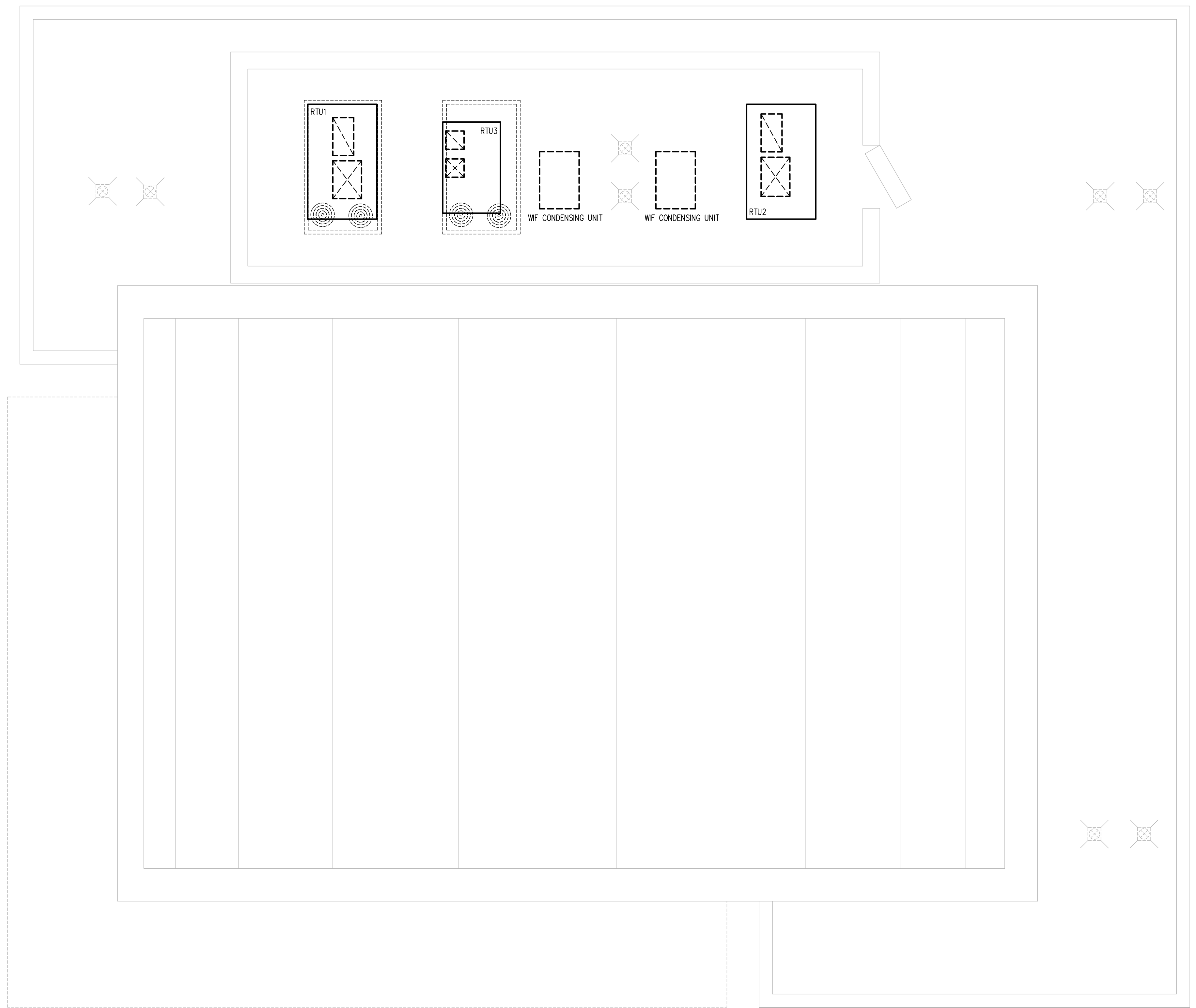




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Wild Fork



PROJECT NAME:
A BUILDING RENOVATION for:
WILD FORK FOODS
 1625 S. VOSS ROAD
 HOUSTON, TEXAS
 SHEET NAME:
ROOF HVAC PLAN



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DRAWN BY: **BOTI** CHECKED BY: **SMC**

REV. #	DATE	DESCRIPTION

PROJECT NUMBER: 22018
 RELEASE DATE: 06/03/2022

M-03

1 ROOF HVAC PLAN
 M-03 1/4" = 1'-0"



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 Steven Mark Colvin
 137871 6/3/22
 LICENSED PROFESSIONAL ENGINEER
 STEVEN MARK COLVIN
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Wild Fork

PROJECT NAME:
A BUILDING RENOVATION FOR:
WILD FORK FOODS
1625 S. VOSS ROAD
 HOUSTON, TEXAS
 SHEET NAME:
MECHANICAL DETAILS



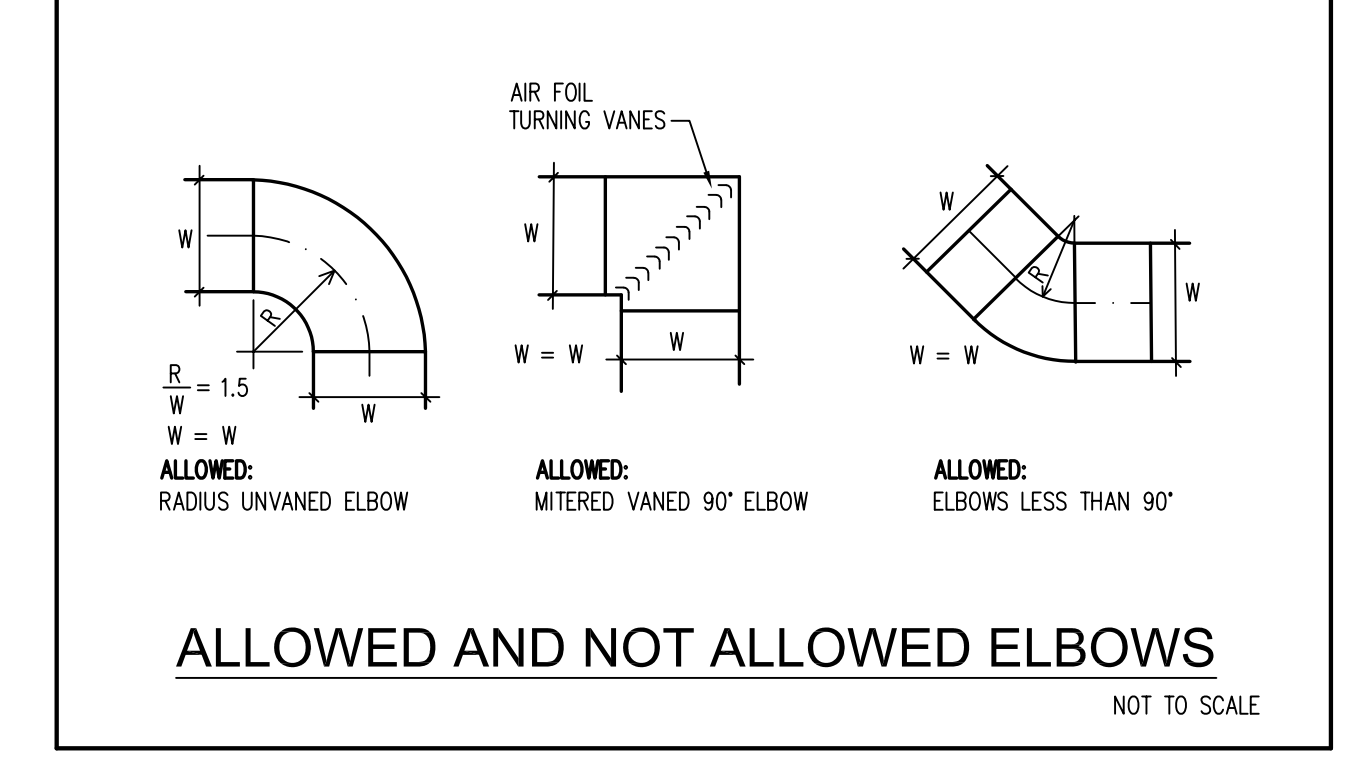
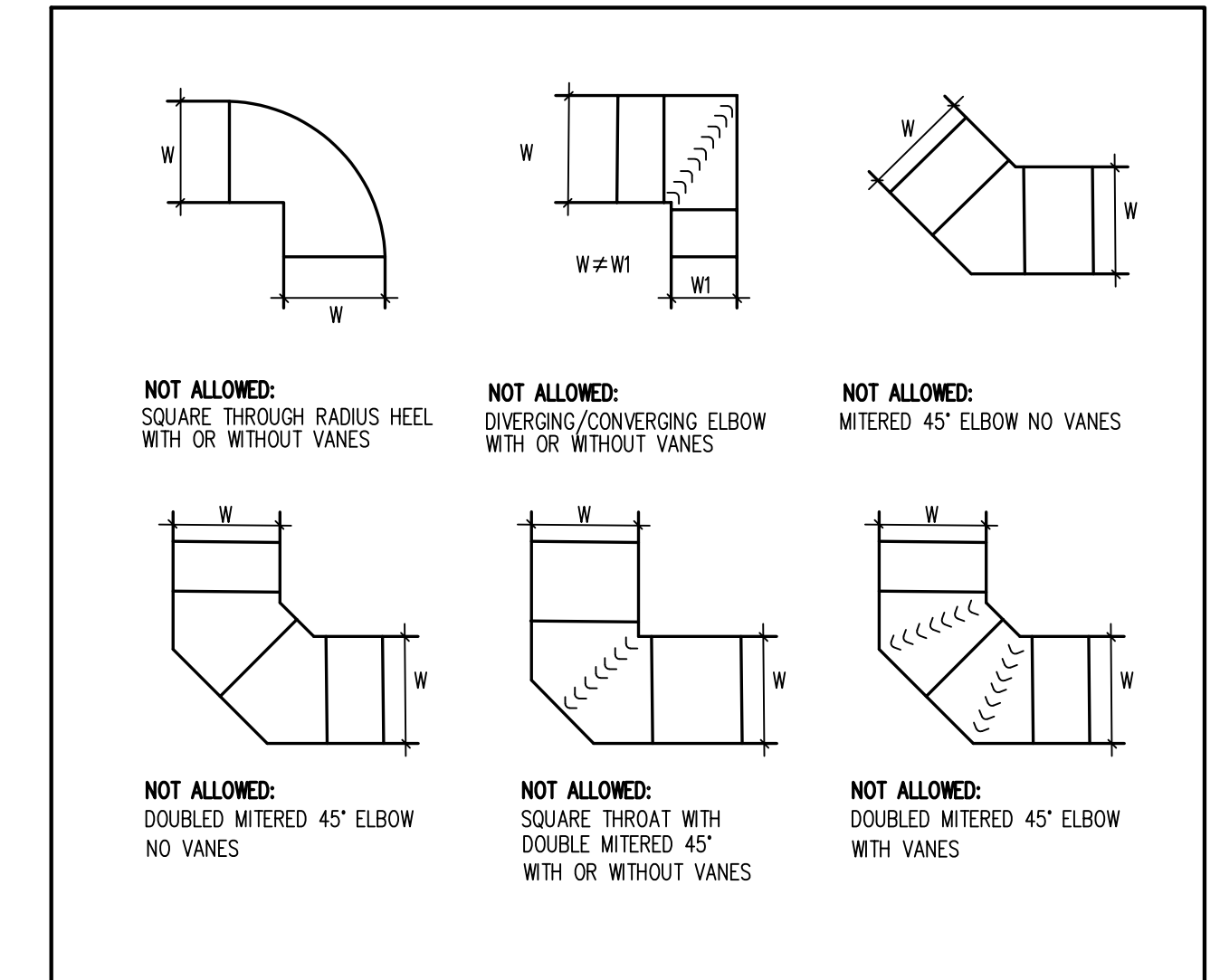
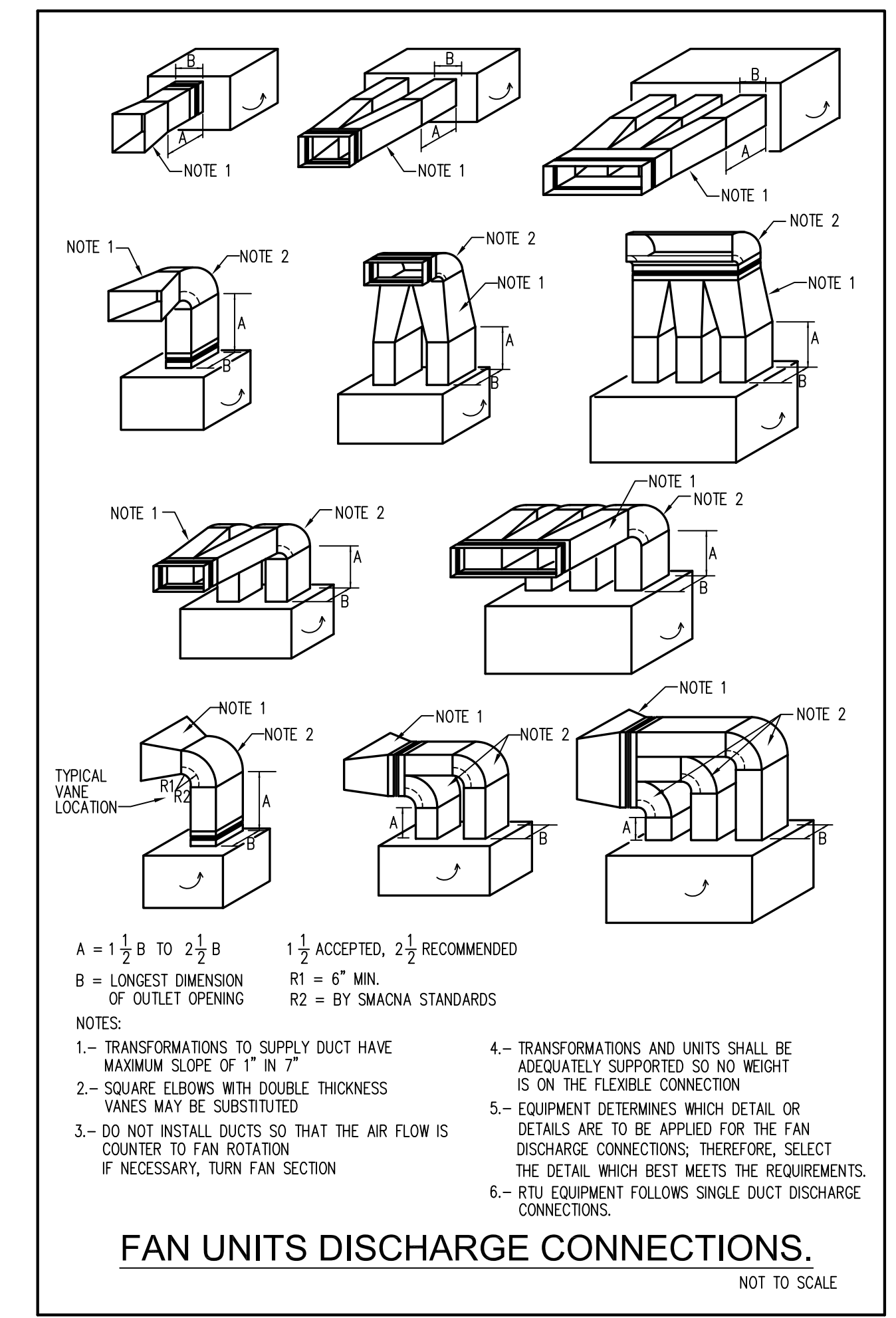
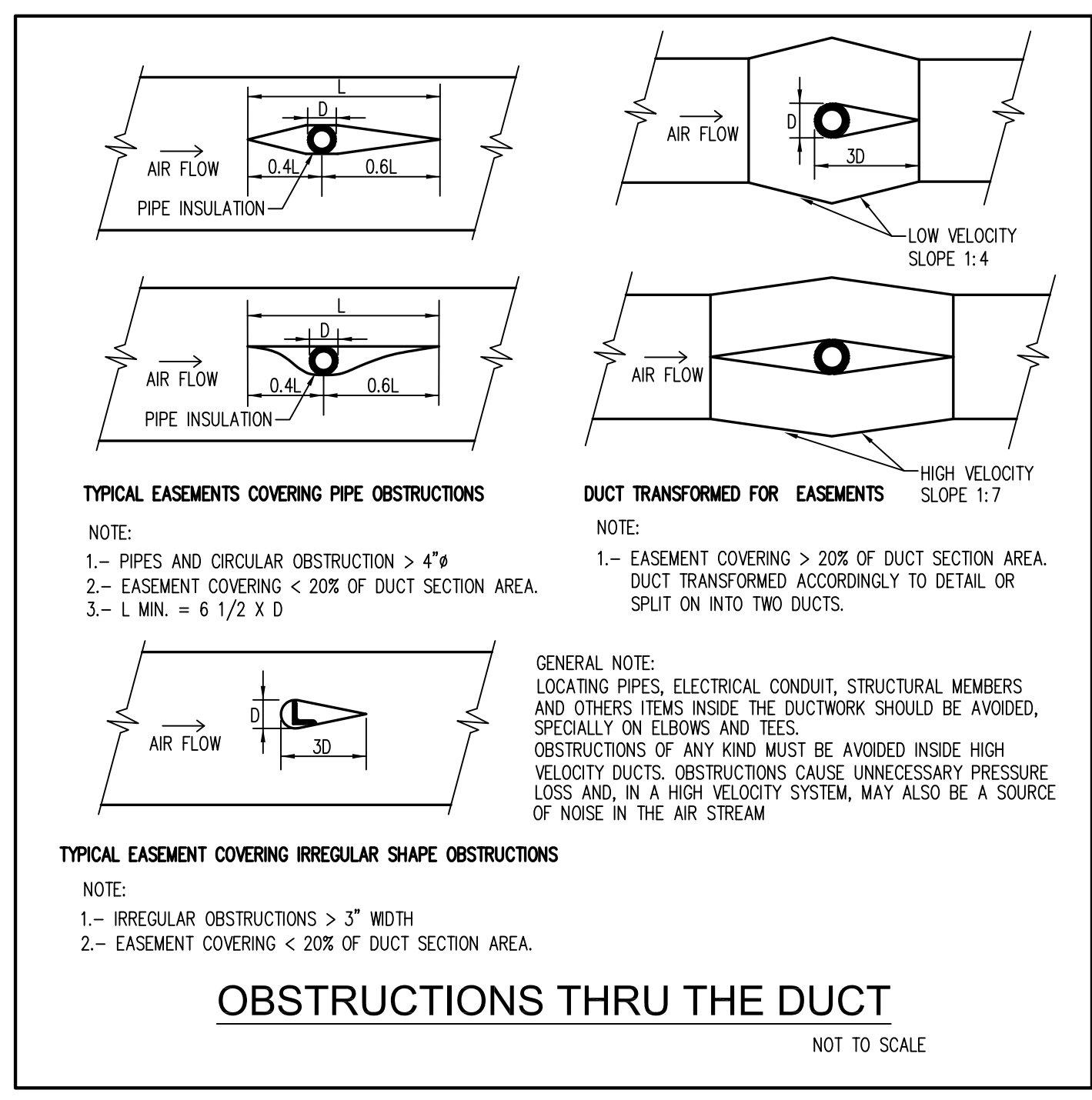
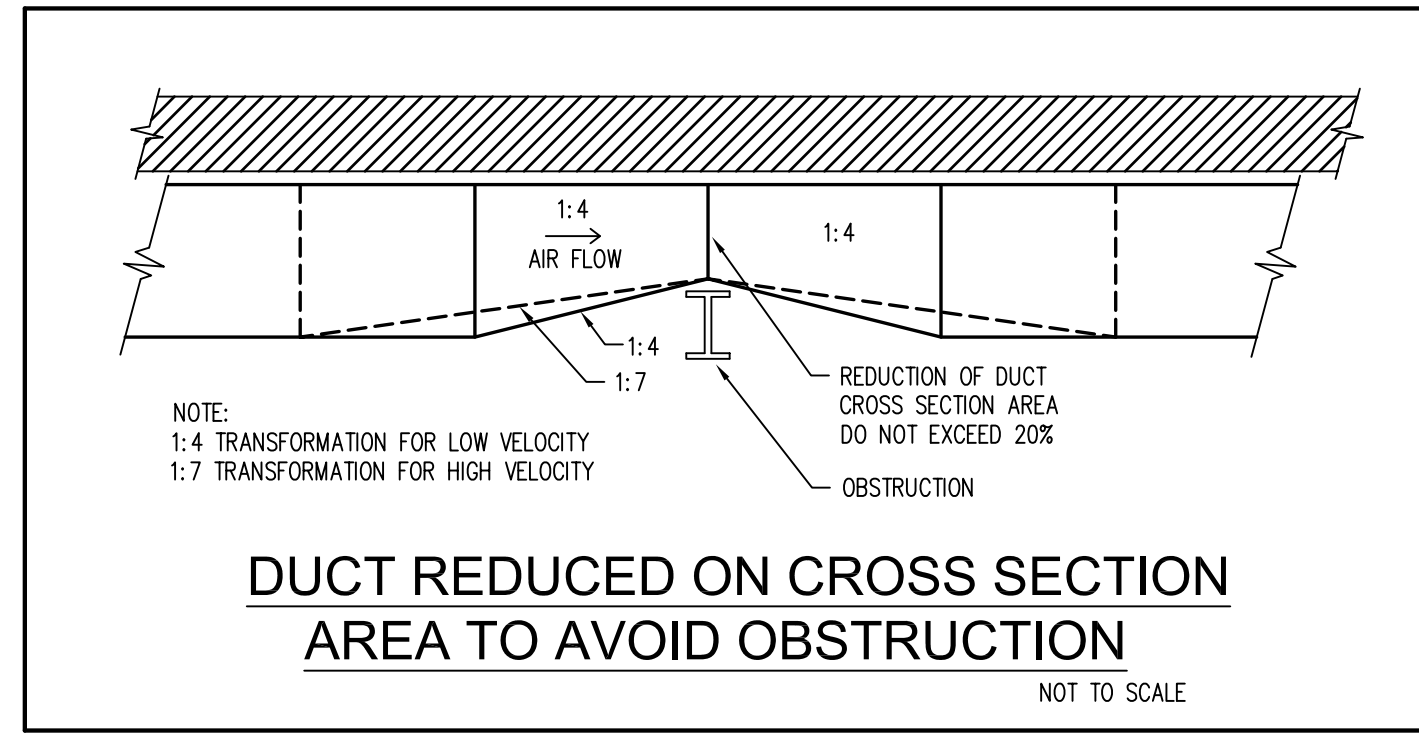
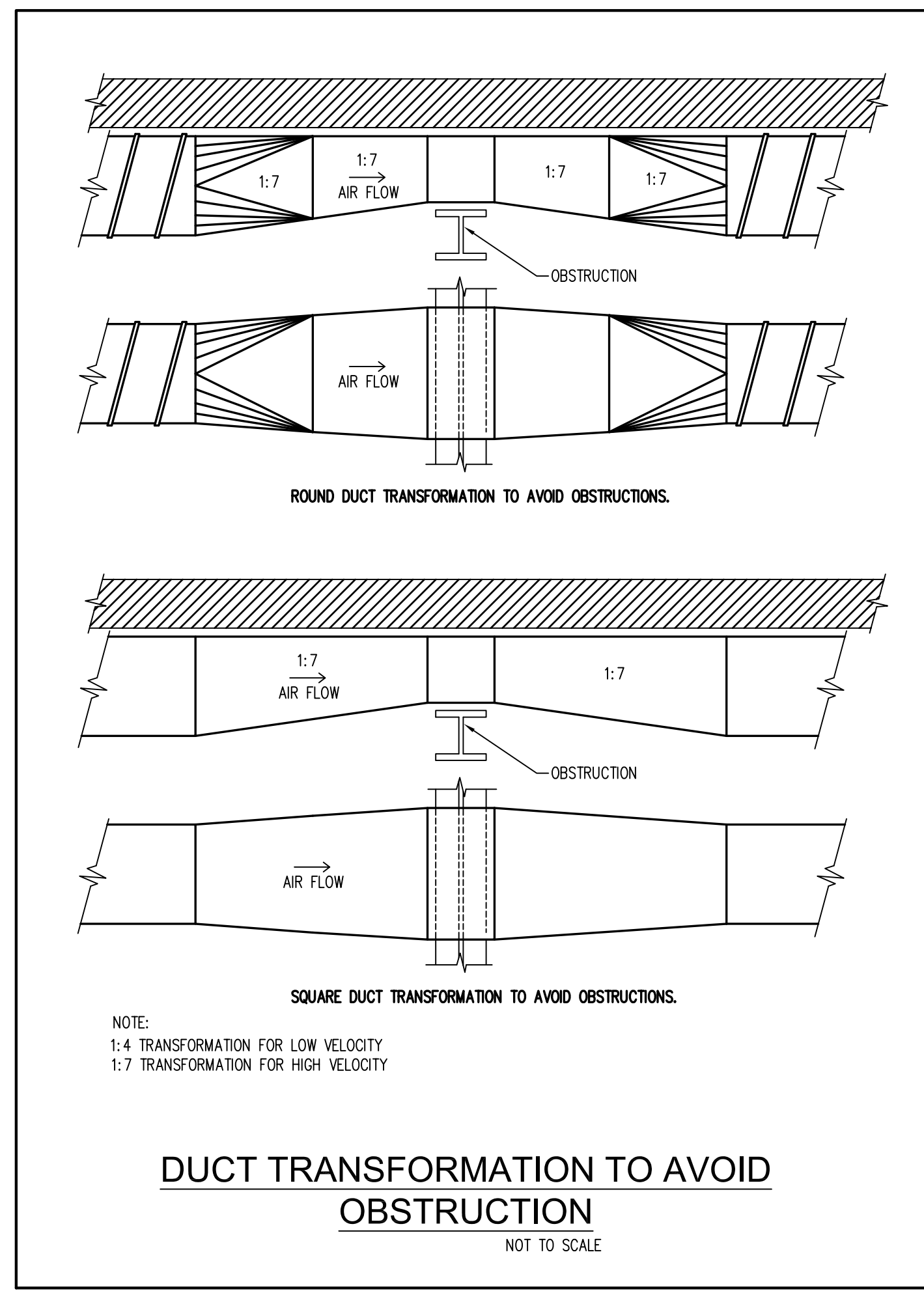
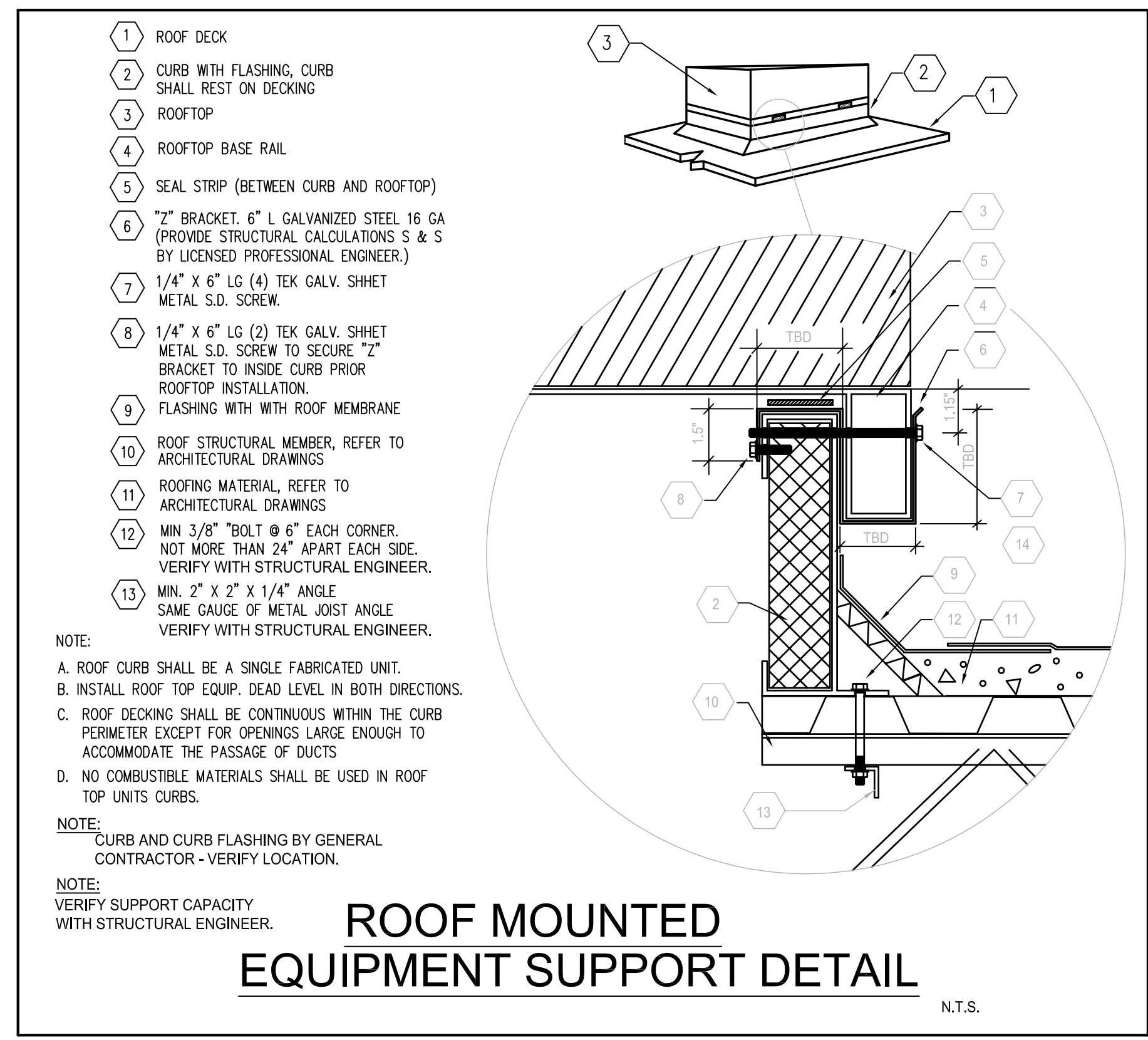
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REV. #	DATE	DESCRIPTION

PROJECT NUMBER: 22018
 RELEASE DATE: 06/03/2022

M-04





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 Expiration Date: 03/01/2022

Wild Fork

PROJECT NAME:
A BUILDING RENOVATION FOR:
WILD FORK FOODS
 1625 S. VOSS ROAD
 HOUSTON, TEXAS

SHEET NAME:
MECHANICAL DETAILS

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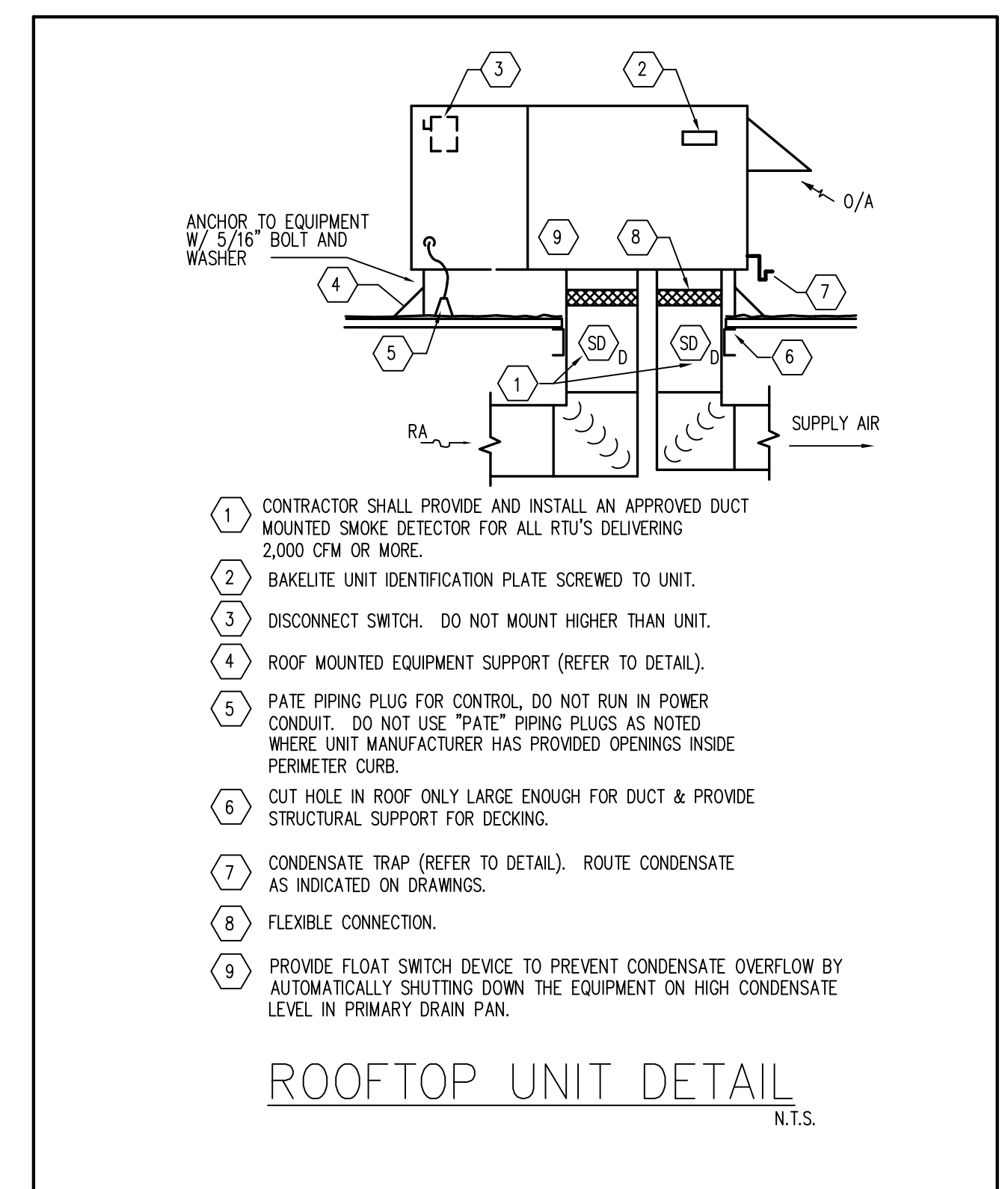
Contractor is responsible for confirming and correlating dimensions at job site; the Engineer will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the project.

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REV. #	DATE	DESCRIPTION

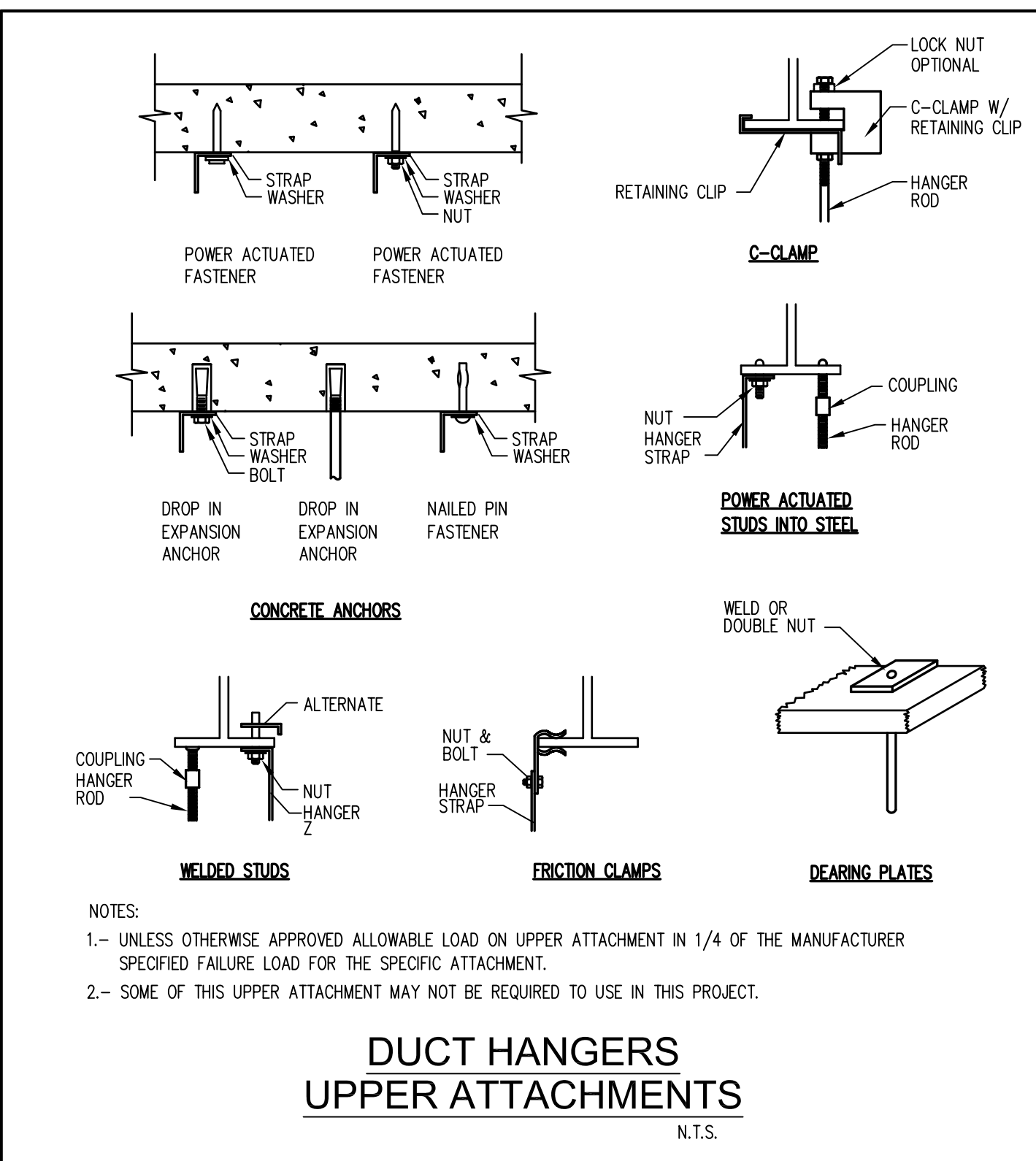
PROJECT NUMBER: 22018
 RELEASE DATE: 06/03/2022

M-05



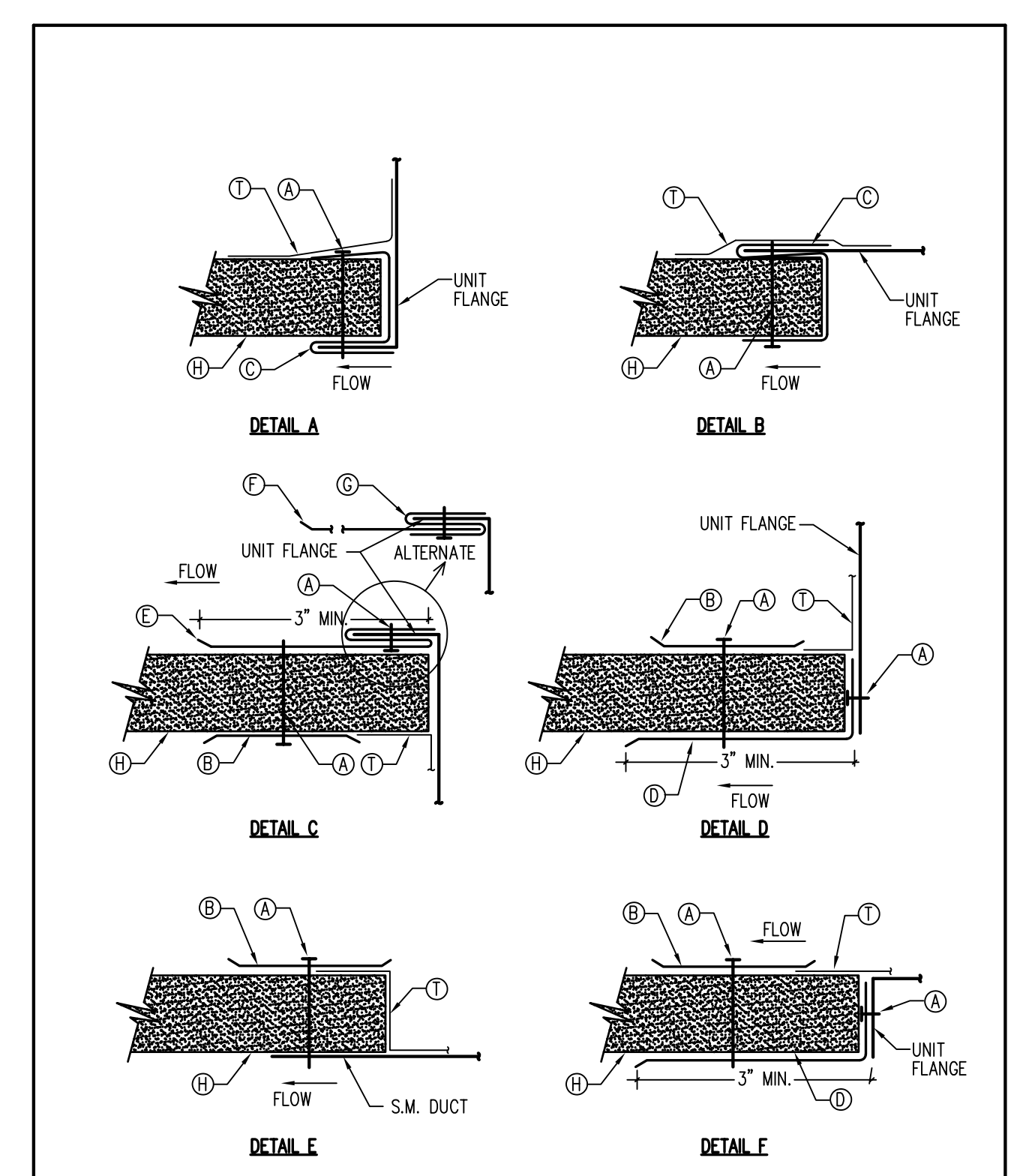
- 1 CONTRACTOR SHALL PROVIDE AND INSTALL AN APPROVED DUCT MOUNTED SMOKE DETECTOR FOR ALL RTU'S DELIVERING 2,000 CFM OR MORE.
- 2 BAKELITE UNIT IDENTIFICATION PLATE SCREWED TO UNIT.
- 3 DISCONNECT SWITCH. DO NOT MOUNT HIGHER THAN UNIT.
- 4 ROOF MOUNTED EQUIPMENT SUPPORT (REFER TO DETAIL).
- 5 PATE PIPING PLUG FOR CONTROL, DO NOT RUN IN POWER CONDUIT. DO NOT USE "PATE" PIPING PLUGS AS NOTED WHERE UNIT MANUFACTURER HAS PROVIDED OPENINGS INSIDE PERIMETER CURB.
- 6 CUT HOLE IN ROOF ONLY LARGE ENOUGH FOR DUCT & PROVIDE STRUCTURAL SUPPORT FOR DECKING.
- 7 CONDENSATE TRAP (REFER TO DETAIL). ROUTE CONDENSATE AS INDICATED ON DRAWINGS.
- 8 FLEXIBLE CONNECTION.
- 9 PROVIDE FLOAT SWITCH DEVICE TO PREVENT CONDENSATE OVERFLOW BY AUTOMATICALLY SHUTTING DOWN THE EQUIPMENT ON HIGH CONDENSATE LEVEL IN PRIMARY DRAIN PAN.

ROOFTOP UNIT DETAIL
 N.T.S.



- NOTES:
- 1.- UNLESS OTHERWISE APPROVED ALLOWABLE LOAD ON UPPER ATTACHMENT IN 1/4 OF THE MANUFACTURER SPECIFIED FAILURE LOAD FOR THE SPECIFIC ATTACHMENT.
 - 2.- SOME OF THIS UPPER ATTACHMENT MAY NOT BE REQUIRED TO USE IN THIS PROJECT.

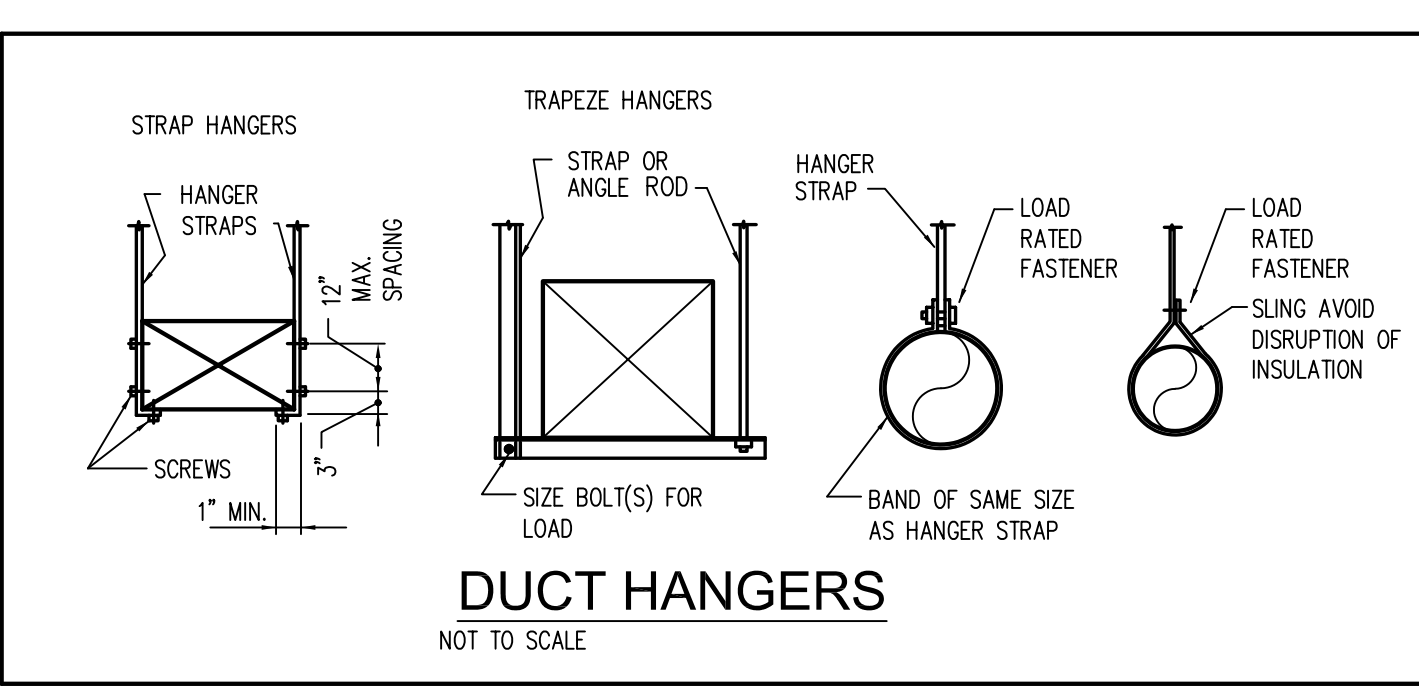
DUCT HANGERS UPPER ATTACHMENTS
 N.T.S.



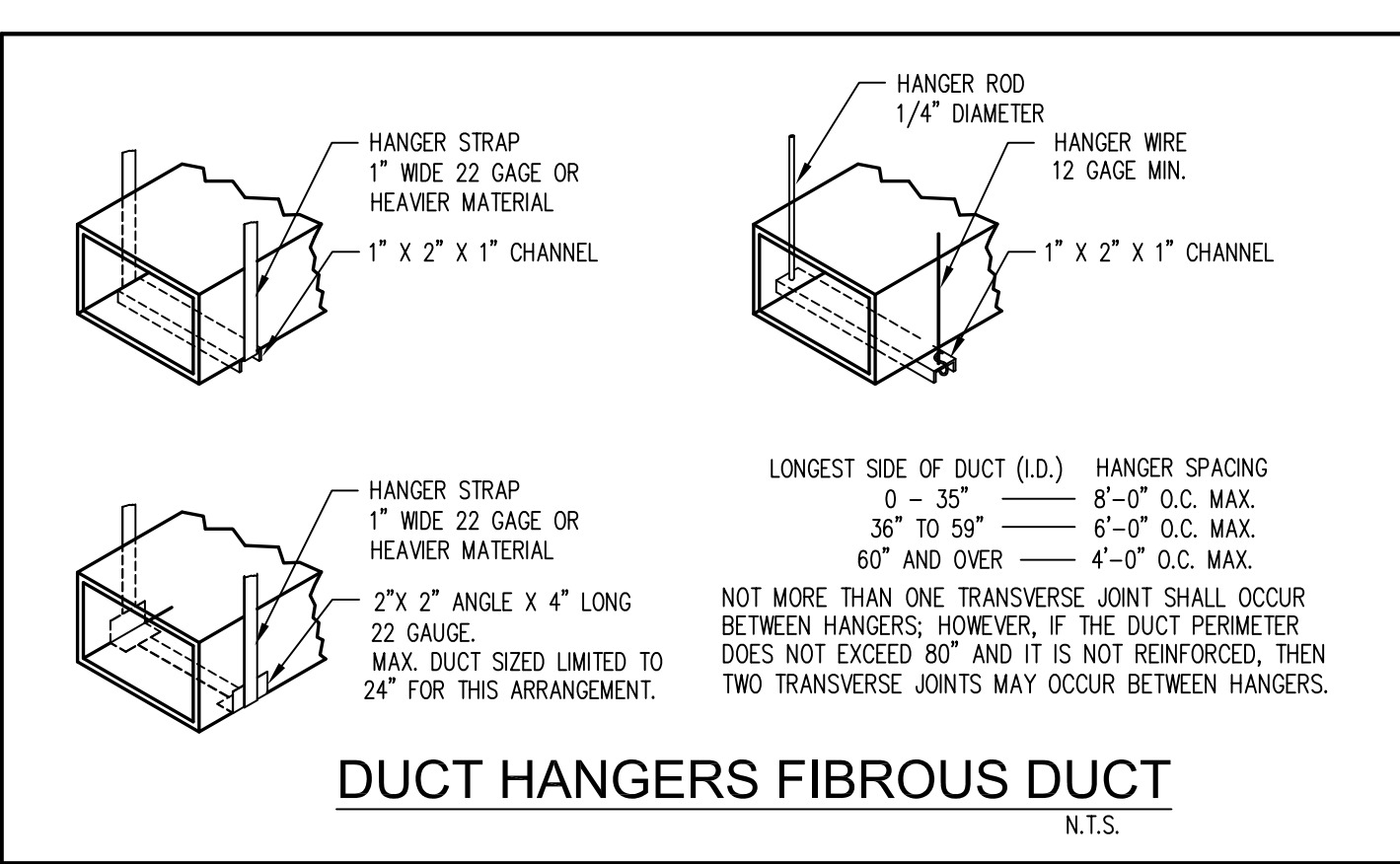
- LEGEND:
- (A) PLATED SHEET METAL SCREW.
 - (B) 1 1/2" METAL WASHER.
 - (C) FORMED POCKET CLIP WITH BUTTON PUNCH SNAP LOCK - MINIMUM 22 GAUGE.
 - (D) 3" x 1" FORMED SHEET METAL ANGLE - MINIMUM 22 GAUGE.
 - (E) FORMED SHEET METAL "S" SLIP - MINIMUM 22 GAUGE.
 - (F) 3" LONG SHEET METAL CLIP - MINIMUM 22 GAUGE.
 - (G) DUCT TAPE.
 - (H) FIBROUS GLASS DUCT

NOTE: DETAILS ILLUSTRATE THE DIFFERENT EQUIPMENT CONNECTION DETAILS FOR FIBROUS GLASS DUCT PER SMACNA FIBROUS GLASS CONSTRUCTION STANDARDS. EQUIPMENT DETERMINES WHICH DETAIL OR DETAILS ARE TO BE APPLIED FOR THE FABRICATION OF CONNECTIONS. FLANGES OR COLLARS VARY; THEREFORE, SELECT THE DETAIL WHICH BEST MEETS THE REQUIREMENTS.

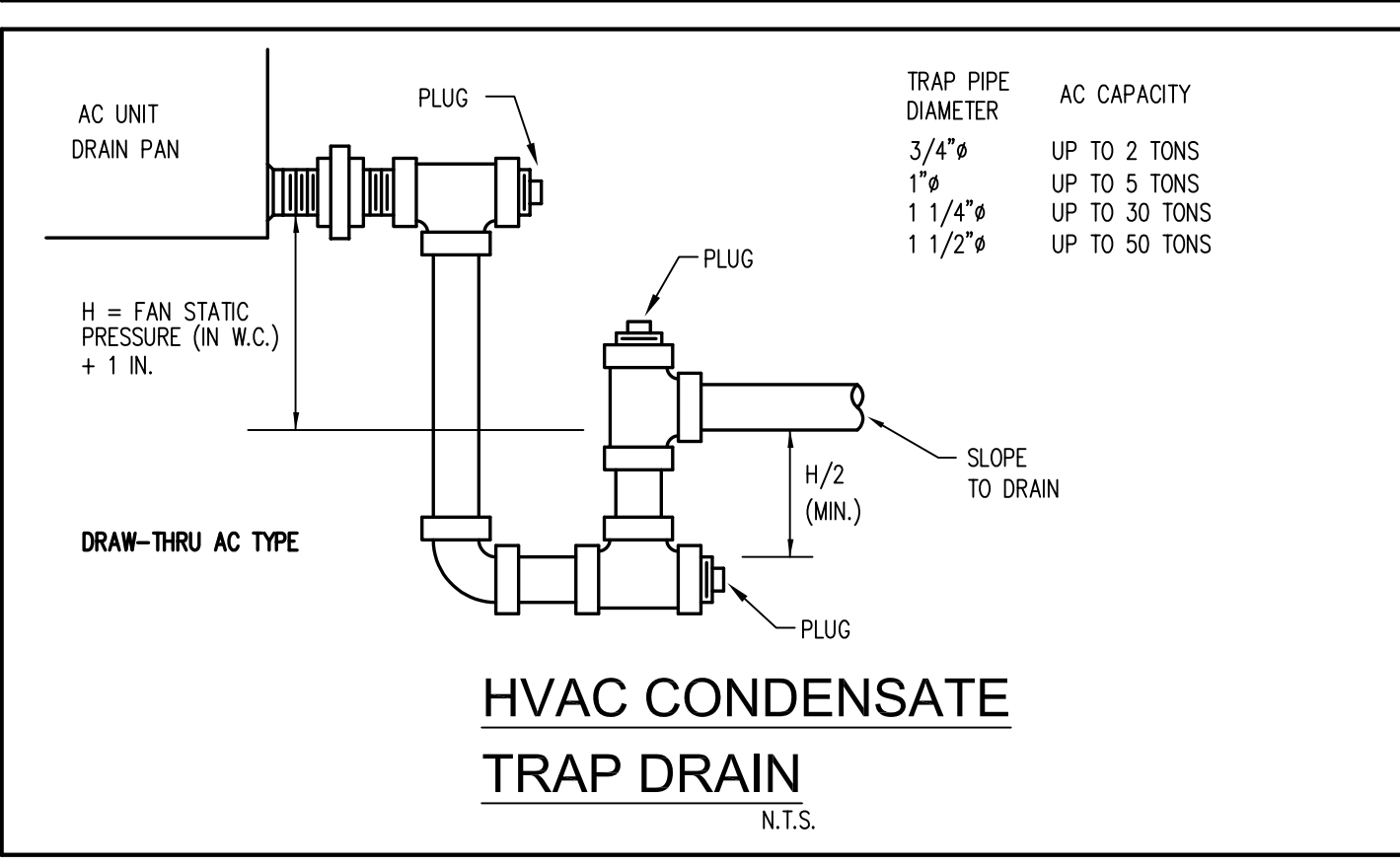
EQUIPMENT CONNECTION DETAILS.
 N.T.S.



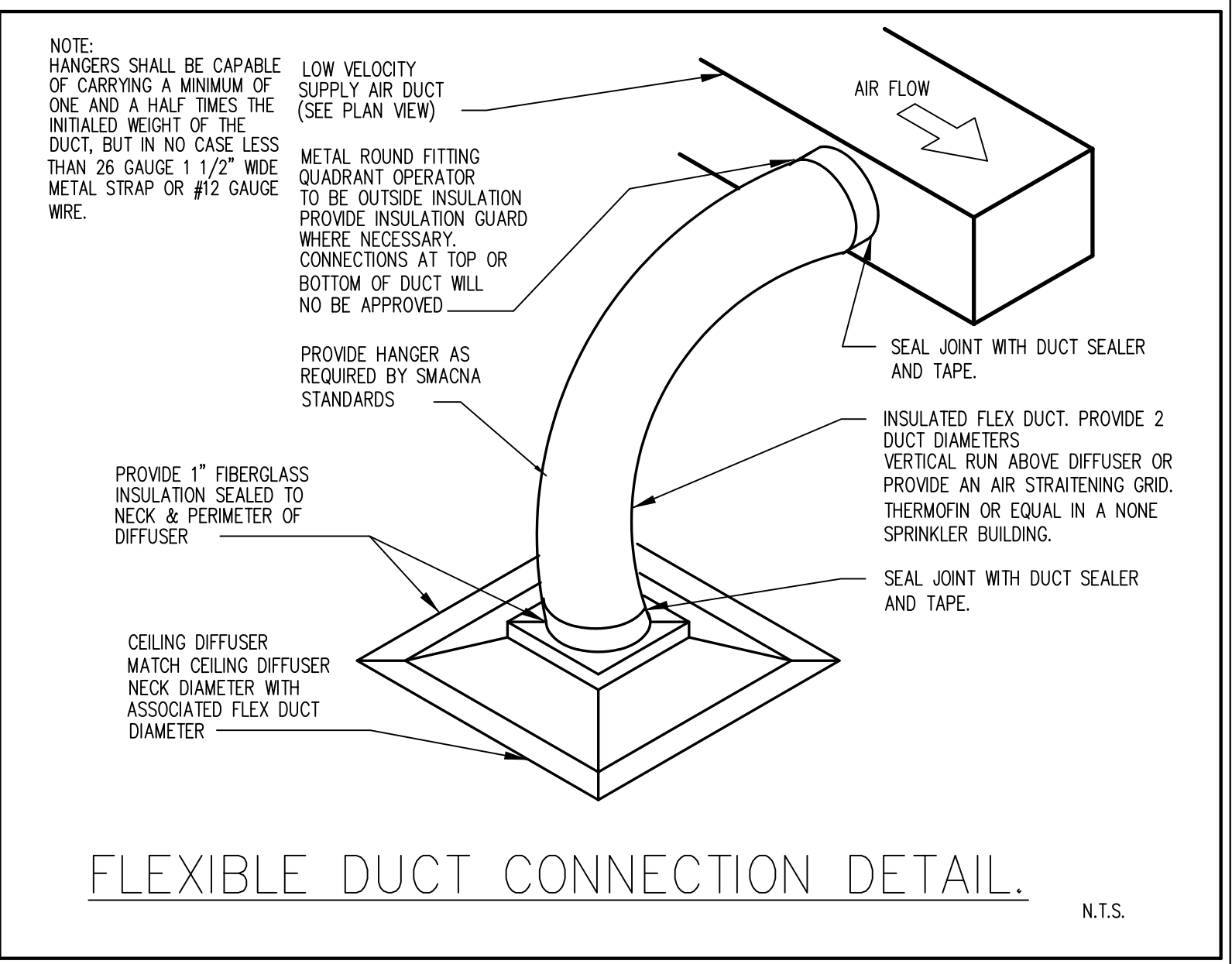
DUCT HANGERS
 NOT TO SCALE



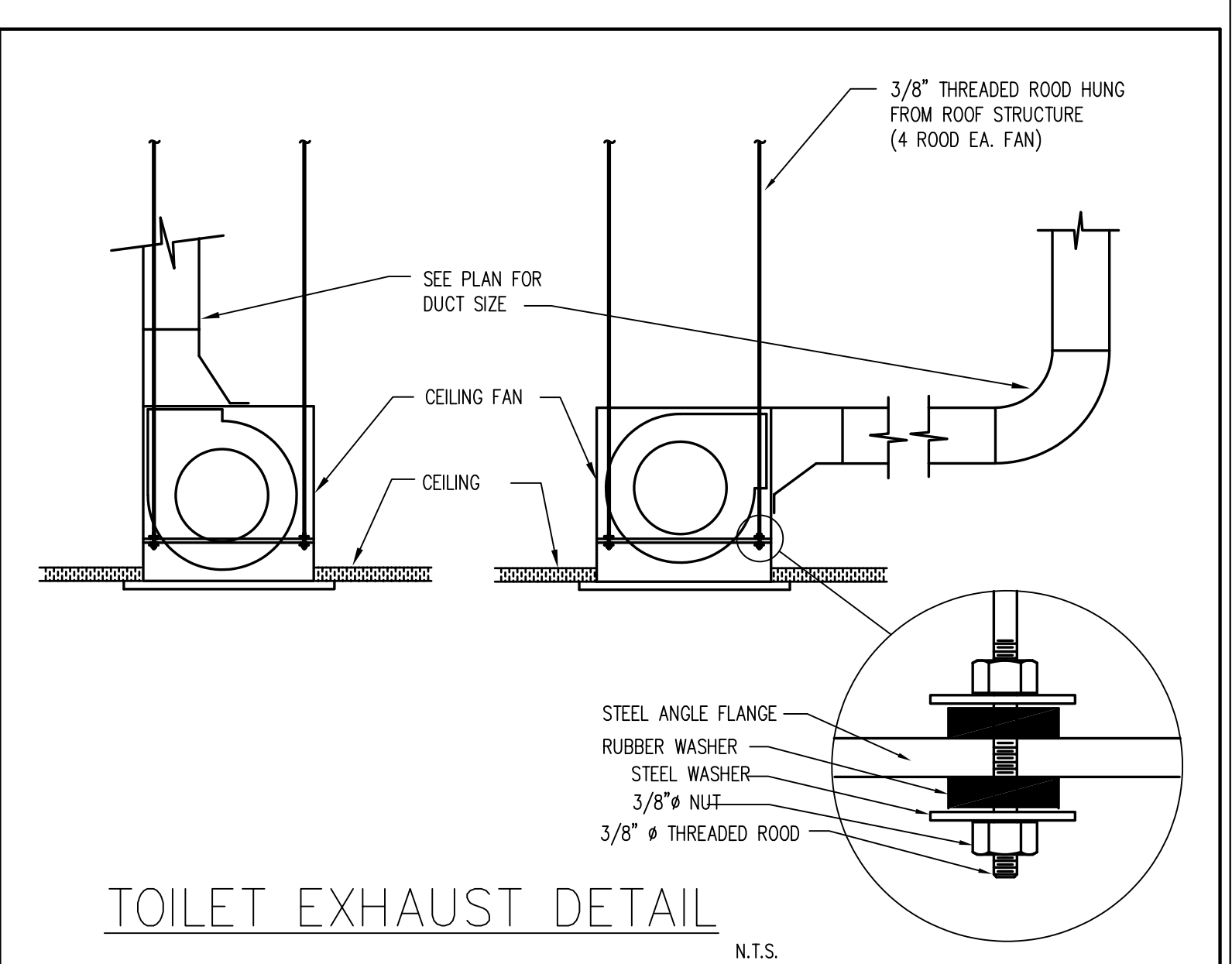
DUCT HANGERS FIBROUS DUCT
 N.T.S.



HVAC CONDENSATE TRAP DRAIN
 N.T.S.



FLEXIBLE DUCT CONNECTION DETAIL.
 N.T.S.



TOILET EXHAUST DETAIL
 N.T.S.

MAXIMUM HALF OF DUCT PERIMETER	RECTANGULAR DUCT HANGERS MINIMUM SIZES								RECOMMENDED HANGER SIZES FOR ROUND DUCT		
	PAIR AT 10 FT. SPACING	PAIR AT 8 FT. SPACING	PAIR AT 5 FT. SPACING	PAIR AT 4 FT. SPACING	DUCT DIAMETER	STRAP HANGERS	MAXIMUM SPACING				
P = 72"	1" x 22GA.	1/4" x 22GA.	1/4" x 22GA.	1/4" x 22GA.	1"	ONE 1" x 22 GA.	12 FT.				
P = 96"	1" x 18GA.	3/8" x 20GA.	1/4" x 22GA.	1/4" x 22GA.	1 1/2"	ONE 1" x 18 GA.	12 FT.				
P = 120"	1" x 16GA.	3/8" x 18GA.	3/8" x 22GA.	1/4" x 22GA.	2"	ONE 1" x 16 GA.	12 FT.				
P = 168"	1 1/2" x 16GA.	1/2" x 18GA.	3/8" x 18GA.	3/8" x 18GA.	3"	TWO 1" x 18 GA.	12 FT.				
P = 192"	1 1/2" x 16GA.	1/2" x 16GA.	1/2" x 16GA.	3/8" x 16GA.	3 1/2"	TWO 1" x 16 GA.	12 FT.				

WHEN STRAPS ARE LAP JOINED USE THESE MINIMUM FASTENERS:
 1" x 18 GA.-TWO #10
 1" x 16 GA.-TWO 1/4" DIA.
 1 1/2" x 16 GA.-TWO 3/8" DIA.
 PLACE FASTENERS IN SERIES, NOT SIDE BY SIDE.

SINGLE HANGER MAX. ALLOW. LOAD:
 1" x 22 GA.-260 LBS.
 1" x 20 GA.-320 LBS.
 1" x 18 GA.-420 LBS.
 1" x 16 GA.-700 LBS.
 1 1/2" x 16 GA.-1,100 LBS.

1/4" DIA. 270 LBS.
 3/8" DIA. 680 LBS.
 1/2" DIA. 1,250 LBS.
 5/8" DIA. 2,000 LBS.
 3/4" DIA. 3,000 LBS.

Air System Sizing Summary for RTU 1 & 2 - SALES AREA		08/08/2022 12:16PM	
Project Name: WFF - S VOSS HOUSTON TX Prepared by: Boti Architects			
Air System Information		Number of zones: 1	
Air System Name: RTU 1 & 2 - SALES AREA		Floor Area: 2665.0 sq ft	
Equipment Class: PKG ROOF		Location: Houston, Texas	
Air System Type: SZCAV			
Sizing Calculation Information			
Calculation Months: Jan to Dec		Zone CFM Sizing: Sum of space airflow rates	
Sizing Date: User-Modified		Space CFM Sizing: Individual peak space loads	
Central Cooling Coil Sizing Data			
Total coil load: 16.6 Tons		Load occurs at: Jun 1600	
Total coil load: 199.9 MBH		OA DB / WB: 94.5 / 76.9 °F	
Sensible coil load: 174.5 MBH		Entering DB / WB: 77.0 / 64.0 °F	
Coil CFM at Jun 1600: 8000 CFM		Leaving DB / WB: 56.7 / 55.5 °F	
Max block CFM: 8000 CFM		Coil ADP: 54.5	
Sum of peak zone CFM: 8000 CFM		Bypass Factor: 0.100	
Sensible heat ratio: 0.879		Resulting RH: 49 %	
CFM/Ton: 482.4		Design supply temp: 49.0 °F	
rT/Ton: 160.7		Zone Total Check: 1 of 1 OK	
BTU/(hr-ft): 74.7		Max zone temperature deviation: 0.0 °F	
Water flow @ 10.0 °F rise: N/A			
Central Heating Coil Sizing Data			
Max coil load: 89.3 MBH		Load occurs at: Des Htg	
Coil CFM at Des Htg: 8000 CFM		BTU/(hr-ft): 33.5	
Max coil CFM: 8000 CFM		Ent. DB / Lvg DB: 66.6 / 76.9 °F	
Water flow @ 20.0 °F drop: N/A			
Supply Fan Sizing Data			
Actual max CFM: 8000 CFM		Fan motor BHP: 0.00 BHP	
Standard CFM: 7959 CFM		Fan motor kW: 0.00 kW	
Actual max CFM/R²: 3.00 CFM/R²		Fan static: 0.00 in wg	
Outdoor Ventilation Air Data			
Design airflow CFM: 520 CFM		CFM/person: 13.38 CFM/person	
CFM/R²: 0.20 CFM/R²			

Air System Sizing Summary for RTU3 - BACK OF HOUSE		08/08/2022 12:16PM	
Project Name: WFF - S VOSS HOUSTON TX Prepared by: Boti Architects			
Air System Information		Number of zones: 1	
Air System Name: RTU3 - BACK OF HOUSE		Floor Area: 1365.0 sq ft	
Equipment Class: PKG ROOF		Location: Houston, Texas	
Air System Type: SZCAV			
Sizing Calculation Information			
Calculation Months: Jan to Dec		Zone CFM Sizing: Sum of space airflow rates	
Sizing Date: User-Modified		Space CFM Sizing: Individual peak space loads	
Central Cooling Coil Sizing Data			
Total coil load: 2.4 Tons		Load occurs at: Jul 1400	
Total coil load: 28.9 MBH		OA DB / WB: 95.5 / 78.9 °F	
Sensible coil load: 24.4 MBH		Entering DB / WB: 78.5 / 66.2 °F	
Coil CFM at Jul 1400: 1200 CFM		Leaving DB / WB: 59.5 / 58.4 °F	
Max block CFM: 1200 CFM		Coil ADP: 57.4	
Sum of peak zone CFM: 1200 CFM		Bypass Factor: 0.100	
Sensible heat ratio: 0.846		Resulting RH: 53 %	
CFM/Ton: 498.9		Design supply temp: 58.0 °F	
rT/Ton: 579.8		Zone Total Check: 1 of 1 OK	
BTU/(hr-ft): 20.7		Max zone temperature deviation: 0.0 °F	
Water flow @ 10.0 °F rise: N/A			
Central Heating Coil Sizing Data			
Max coil load: 16.7 MBH		Load occurs at: Des Htg	
Coil CFM at Des Htg: 1200 CFM		BTU/(hr-ft): 12.0	
Max coil CFM: 1200 CFM		Ent. DB / Lvg DB: 64.5 / 77.5 °F	
Water flow @ 20.0 °F drop: N/A			
Supply Fan Sizing Data			
Actual max CFM: 1200 CFM		Fan motor BHP: 0.00 BHP	
Standard CFM: 1195 CFM		Fan motor kW: 0.00 kW	
Actual max CFM/R²: 0.86 CFM/R²		Fan static: 0.00 in wg	
Outdoor Ventilation Air Data			
Design airflow CFM: 140 CFM		CFM/person: 70.00 CFM/person	
CFM/R²: 0.10 CFM/R²			

OUTSIDE AIR CALCULATIONS

RTU-1 & 2

Vbz = Rp*Pz + Ro*Az (EQ 4-1)
 Vbz: OUTDOOR AIR REQUIREMENT BREATHING ZONE
 Az: ZONE FLOOR AREA (SQ.FT)
 Pz: ZONE POPULATION
 Rp: PEOPLE OUTDOOR AIR RATE (TABLE 403.3)
 Ro: AREA OUTDOOR AIR RATE (TABLE 403.3)
 Voz = Vbz / Ez (EQ 4-2)
 Voz: ZONE OUTDOOR AIRFLOW
 Ez: ZONE AIR DISTRIBUTION EFFECTIVENESS (TABLE 403.3.1.2)
 Ez = 1 CEILING AIR DISTRIBUTION.
 THEN
 Voz = (Rp*Pz) + (Ro*Az)

ZONE DESCRIPTION	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE Rp (CFM/PERSON)	DEFAULT OCCUPANT DENSITY (#/1,000 FT2)	ZONE AREA Az (FT2)	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE Ra (CFM/FT2)	ZONE AREA Az (FT2)	ZONE OUTDOOR AIRFLOW = Voz (CFM)
SALES	7.5	15	2240	0.12	2,838	516
HALL (CORRIDOR)	-	-	64	0.06	64	4

TOTAL OA REQUIRED = 520
 TOTAL EXHAUST AC AREA = 0 CFM
 TOTAL OA PROVIDED = 520 CFM RTU-1 = 400 CFM RTU-2 = 300 CFM

NOTE:
 ALL CALCULATIONS BASED ON FBC 2007 7TH EDITION
 AREAS SQ.FT. (EXCLUDING EXTERNAL WALLS, COLUMNS, PARTITIONS, CHASES AND TOILETS.)

OUTSIDE AIR CALCULATIONS

RTU-3

Vbz = Rp*Pz + Ro*Az (EQ 4-1)
 Vbz: OUTDOOR AIR REQUIREMENT BREATHING ZONE
 Az: ZONE FLOOR AREA (SQ.FT)
 Pz: ZONE POPULATION
 Rp: PEOPLE OUTDOOR AIR RATE (TABLE 403.3)
 Ro: AREA OUTDOOR AIR RATE (TABLE 403.3)
 Voz = Vbz / Ez (EQ 4-2)
 Voz: ZONE OUTDOOR AIRFLOW
 Ez: ZONE AIR DISTRIBUTION EFFECTIVENESS (TABLE 403.3.1.2)
 Ez = 1 CEILING AIR DISTRIBUTION.
 THEN
 Voz = (Rp*Pz) + (Ro*Az)

ZONE DESCRIPTION	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE Rp (CFM/PERSON)	DEFAULT OCCUPANT DENSITY (#/1,000 FT2)	ZONE AREA Az (FT2)	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE Ra (CFM/FT2)	ZONE AREA Az (FT2)	ZONE OUTDOOR AIRFLOW = Voz (CFM)
BACK OF THE HOUSE	10	2	581	0.12	581	90
COOLER	-	-	587	0.06	587	35

TOTAL OA REQUIRED = 125 CFM
 TOTAL EXHAUST AC AREA = 140 CFM
 TOTAL OA PROVIDED = 125 CFM

NOTE:
 AREAS SQ.FT. (EXCLUDING EXTERNAL WALLS, COLUMNS, PARTITIONS, AND CHASES.)

AIR CONDITIONING SCHEDULE

TYPE: PACKAGE COOLING

UNIT NO.	RTU-1	RTU-2	RTU-3
NOMINAL TON	10	10	3
EER / SEER	12.4	12.4	14.0 SEER
MANUFACTURER	TRANE	TRANE	TRANE
MODEL NO.	TH120F3EG	TH120F3EG	TH0363E3A
ELECTRICAL CHARACTERISTICS	208/3/60	208/3/60	208/3/60
COOLING C.F.M. / OUTSIDE AIR C.F.M.	4,000 / 400	4,000 / 400	1,200 / 150
RTU TOTAL COOLING CAPACITY (MBH)	112.2	112.2	35.8
RTU SENSIBLE CAPACITY (MBH)	107.7	107.7	27.8
COMPRESSOR QTY - TYPE	2 - SCROLL	2 - SCROLL	1 - SCROLL
SUPPLY FAN EXTERNAL SP (WG) / RPM / BHP	0.8 / 1,426 / 1.89	0.8 / 1,426 / 1.89	0.8 / 1,463 / 2.04
ELECTRIC HEATER KW	18	18	3.8
MCA	64.8	64.8	30.1
MOCP	70	70	45
DIMENS (L X W X H) IN.	100 X 64 X 51	100 X 64 X 51	68 X 45 X 37
WEIGHT (RTU) (LBS)	1,156	1,156	532
REF/LBS.	R 410 A / 18	R 410 A / 18	R 410 A / 5.4

NOTES:
 1.- PROVIDE SHUTDOWN OF RTU'S AND ASSOCIATES EXHAUST FANS UPON ACTIVATION OF FIRE ALARM SYSTEM.
 2.- PROVIDE DUCT SMOKE DETECTORS IN RTU RETURN AND SUPPLY DUCTS W/ VISUAL AND AUDIBLE FIRE ALARM. LOCATE SMOKE DETECTOR REMOTE TEST / RESET / ALARM INDICATOR KIT BENEATH THE RTU AT CEILING LEVEL (SMOKE DETECTOR KIT SUPPLY BY MECHANICAL CONTRACTOR AND INSTALL BY ELECTRICAL CONTRACTOR.)
 3.- HEATING AND COOLING EQUIPMENT SHALL NOT EXCEED THE CALCULATED LOADS SEE AIR CONDITIONING LOAD SUMMARY OR HEAT LOAD CALCULATIONS) A SINGLE PIECE OF EQUIPMENT PROVIDING BOTH HEATING AND COOLING MUST SATISFY THIS PROVISION FOR ONE FUNCTION WITH THE CAPACITY FOR THE OTHER FUNCTION AS SMALL AS POSSIBLE, WITHIN AVAILABLE EQUIPMENT OPTIONS.
 4.- PROVIDE TWO STAGE THERMOSTAT 7 DAYS PROGRAMMABLE THERMOSTAT. COOLING SHOULD BE AVAILABLE DURING NON BUSINESS HOURS.
 5.- PROVIDE ONE STAGE THERMOSTAT 7 DAYS PROGRAMMABLE THERMOSTAT. COOLING SHOULD BE AVAILABLE DURING NON BUSINESS HOURS.
 6.- PROVIDE MOTORIZED OA / EXHAUST DAMPER TO CLOSE OA DURING NON OPERATIONAL HOURS. (OFF/ON TYPE) PROVIDE MODULATED ACTUATOR.
 7.- PROVIDE MOTORIZED OA DAMPER TO CLOSE OA DURING NON OPERATIONAL HOURS. (OFF/ON TYPE) PROVIDE MODULATED ACTUATOR.
 8.- PROVIDE ANTI SHORT CYCLE TIMER.
 9.- PROVIDE ROOF CURB 24" TALL.
 10.- THRU-THE BOTTOM ELECTRICAL CONNECTIONS
 11.- INSTALL EQUIPMENT AT DEAD LEVEL.
 12.- PROVIDE LOW AMBIENT CONTROL AND WINTER START KIT
 13.- PROVIDE LOUVERED HALL GUARD
 14.- PROVIDE FACTORY OIL/AL CONDENSER COIL PRE-COAT
 15.- PROVIDE FACTORY OIL/AL COOLING COIL.
 16.- STANDARD STATIC FAN OPTION.
 17.- PROVIDE MEDIUM STATIC FAN DRIVE. A FIELD-SUPPLIED DRIVE IS REQUIRED.
 18.- PROVIDE HIGH STATIC FAN DRIVE. A FIELD-SUPPLIED DRIVE IS REQUIRED.
 19.- PROVIDE SILICON CONTROL RECTIFIER (CSR) TO ELECTRICAL HEATER.
 20.- PROVIDE EXHAUST ISOLATION.
 21.- PROVIDE HOT GAS BY-PASS (HGBP)
 22.- PROVIDE APR CONTROL VALVE TO COMPRESSOR 1 (RAWAL VALVE)
 23.- PROVIDE VARIABLE TWO SPEED DRIVER (VFD)
 24.- PROVIDE ENERGY RECOVERY VENTILATOR (ERV)
 25.- PROVIDE ENTHALPY ECONOMIZER. (ECONOMIZER PROVIDE THE ABILITY TO CLOSE OA DURING NON OPERATIONAL HOURS.)
 26.- PROVIDE DEMAND CONTROL VENTILATION (CO2 SENSORS)
 27.- PROVIDE POWER EXHAUST
 28.- PROVIDE BAROMETRIC RELEASE DAMPER.
 29.- PROVIDE MANUFACTURER WIND LOAD CALCULATIONS S&S BY P.E.
 30.- PROVIDE TEST AND BALANCE OF THE COMPLETE AC SYSTEM. ALL FINAL READINGS INSIDE 10% OF THE DESIGN VALUE.

NOT ALL NOTES ARE USED IN THIS PROJECT

FAN SCHEDULE

FAN No.	EF-1	EF-2
AREA SERVED	TOILETS	JANITOR
LOCATION	CEILING	CEILING
TYPE	CENTRIFUGAL	CENTRIFUGAL
SONES	2.0	2.0
CFM	70	70
STATIC PRESS. (IN. WG)	-	-
TYPE DRIVE	DIRECT	DIRECT
AMPS	0.4	0.4
ELECTRIC CHARACT.	120/1/60	120/1/60
MANUFACT. & MODEL NO.	BROAN HD-80	BROAN HD-80
WEIGH (LBS)	-	-
REMARKS	F,J,K,	F,J,K

- A) ROOF CURB; B) SAFETY SWITCH; C) INSIDE GRILLE; D) BIRD SCREEN
 E) EXPLOSION PROOF MOTOR; F) BACK DRAFT DAMPER G) WALL CAP
 H) PROVIDE INSULATED FAN HOUSING. I) INTERCONNECT WITH LIGHT
 J) WALL SWITCH K) PROVIDE TRANSFORMER IF REQUIRED L) ROOF CAP
 M) PROVIDE CONTACTORS TO INTERCONNECT W/ RTU
 N) PROVIDE MOVEMENT SENSOR TO CONTROL FAN AND LIGHTS



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PROJECT NAME:
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MECHANICAL SCHEDULES



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 Contractor is responsible for confirming and correlating dimensions at job site; the Engineer will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the project.

DRAWN BY:	CHECKED BY:	
BOTI	SMC	
REV. #	DATE	DESCRIPTION

PROJECT NUMBER: 22018
 RELEASE DATE: 06/03/2022

M-06



STEVEN M. COLVIN, P.E. License # 137871
 Expiration Date: 03/31/2023
 Engineering Certificate of Authority # 21837
 Expiration Date: 03/02/22

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Wild Fork

STEVEN M. COLVIN
 HOUSTON, TEXAS

PROJECT NAME:
**A BUILDING RENOVATION FOR:
 WILD FORK FOODS**
1625 S. VOSS ROAD
 HOUSTON, TEXAS



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DRAWN BY: **BOTI** CHECKED BY: **SMC**

REV. #	DATE	DESCRIPTION

PROJECT NUMBER: 22018
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M-07

HVAC SYMBOLS.

GENERAL	AIR DISTRIBUTION
① THERMOSTAT	CD-1 PERFORATED SUPPLY AIR DIFFUSER ALL ALUMINIUM 24 X 24 MODULE SQUARE NECK SIZE EQUAL TO FLEX DUCT DIAMETER. FOR AIR PATTERN SEE DWG MFR. TITUS
(H) HUMIDISTAT	
(CO2) CO2 SENSOR	
(M) MOVEMENT SENSOR	
CFM CUBIC FEET PER MINUTE	
A/C AIR CONDITIONING	CD-2 SUPPLY AIR DIFFUSER ALL ALUMINIUM FOR SIZE SEE DWG SQUARE NECK SIZE EQUAL TO FLEX DUCT DIAMETER. FOR AIR PATTERN SEE DWG MFR. TITUS
EF EXHAUST FAN	
SF SUPPLY FAN	
BRD BAROMETRIC RELEASE DAMPER	
Ø ROUND	
NK NECK	
UD UNDERCUT DOOR	
ØBD OPPOSED BLADE DAMPER	RD-1 ALL ALUMINIUM 24 X 24 MODULE MODEL PAR-AA COLOR WHITE INSULATE DIFFUSER ABOVE CEILING
CD CONDENSATE DRAIN	
DN DOWN	
UP UP	
RTU ROOF TOP UNIT	RG-2 ALL ALUMINIUM FOR SIZE SEE DWG MFR. TITUS MODEL 350 FS COLOR WHITE INSULATE DIFFUSER ABOVE CEILING
VAV VARIABLE AIR VOLUME	
AHU AIR HANDLER UNIT	
CU CONDENSER UNIT	TC-1 PERFORATE TRANSFER GRILLE ALL ALUMINIUM 24 X 24 MODULE MFR. TITUS MODEL PAR-AA COLOR WHITE INSULATE DIFFUSER ABOVE CEILING
O/A OUTSIDE AIR	
UD UNDERCUT DOOR	
SP STATIC PRESSURE	
↔ INDICATES RETURN OR EXHAUST AIR	
(SD) SMOKE DETECTOR SYSTEM SENSOR MODEL NUMBER DNR WITH DCOIL, DST3, RTIS1	TC-2 LOUVERED TRANSFER GRILLE ALL ALUMINIUM FOR SIZE SEE DWG MFR. TITUS MODEL 350 FS COLOR WHITE INSULATE DIFFUSER ABOVE CEILING
FD FIRE DAMPER	
FSD FIRE SMOKE DAMPER	
SD SMOKE DAMPER	SG-1 SUPPLY GRILLE DOUBLE DEFLECTION ALL ALUMINIUM FOR SIZE SEE DWG FOR AIR PATTERN SEE DWG MFR. TITUS MODEL 272 FS W/O.B.D. COLOR WHITE
DUCT	
VOLUME DAMPER	
DUCT TRANSITION	EG-1 EXHAUST GRILLE ALL ALUMINIUM FOR SIZE SEE DWG MFR. TITUS MODEL 350 FS W/O.B.D. COLOR WHITE INSULATE DIFFUSER ABOVE CEILING
Tab-off DUCT WITH VOLUME DAMPER	
INSULATED FLEXIBLE AIR DUCT	
AIR DISTRIBUTION NOTES: 1.- PROVIDE EXTRUDED ALUMINIUM ALLOY BLADES AND FRAME WITH SATIN ANODIZED FINISH. 2.- PROVIDE INJECTION-MOLDED NYLON BUSHING SEPARATORS BETWEEN BLADES AND FRAME OR RIGID PVC TRACK FOR THE SAME PURPOSE. 3.- PROVIDE VINYL BULB GASKET AT THE OUTER OF THE FRAME.	DC-1 DOOR GRILLE SIGHT PROOF ALL ALUMINIUM FOR SIZE SEE DWG MFR. TITUS MODEL CT-700 COLOR BY ARCHITECT FOR FLANGE AND AUXILIARY BOUNDING
	RD-1 ROUND CEILING DIFFUSER ALL ALUMINIUM MFR. TITUS MODEL TMRA-AA PROVIDE VOLUME DAMPER COLOR WHITE INSULATE DIFFUSER ABOVE CEILING
	LSO-1 LINEAR SLOT DIFFUSER ALL ALUMINIUM FOR SIZE SEE DWGS. PROVIDE DAMPER (PATTERN CONTROLLER) PROVIDE VOLUME DAMPER MFR. TITUS MODEL ML COLOR WHITE
	LSR-1 LINEAR SLOT CEILING RETURN ALL ALUMINIUM FOR SIZE SEE DWGS. MFR. TITUS MODEL ML COLOR WHITE

NOTE:
 THIS SET OF MEP, ENGINEERING DRAWINGS IS A PART OF THE WHOLE SET OF CONTRACT DOCUMENTS. THE COMPLETE SCOPE OF WORK CAN ONLY BE DETERMINED USING ALL THE CONTRACT DOCUMENT TOGETHER INCLUDING EQUIPMENT VENDOR DRAWINGS AND INFO PROVIDED BY MANUFACTURERS. FAILURE BY THE GENERAL CONTRACTOR TO USE OR PROVIDE TO SUBCONTRACTORS THE COMPLETE SET OF DRAWINGS, AND ALL OF THE DOCUMENTS, TO CROSS REFERENCE ANT TO ANOTHER, SHALL NOT BE CAUSE FOR ADDITIONAL COST. COORDINATION OF THE WORK AND SUBCONTRACTORS IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR

WORKING NOTES:

- PROVIDE 6 EQUIVALENT DUCT DIAMETERS BETWEEN SUPPLY DUCT ELBOWS AND SUBSEQUENT DIFFUSER TAP.
- TAPPING FOR CEILING DIFFUSERS FOR CONTIGUOUS OFFICES SHALL BE AT ADEQUATE CLEARANCES, TO AVOID CROSS-TALK.
- USE OF EXTRACTORS AT MAIN DUCT WILL NOT BE APPROVED.
- PROVIDE THE NECESSARY SPACE AROUND COMPONENTS OF THE DUCT SYSTEM TO ALLOW THE TEST AND BALANCE TECHNICIAN TO TAKE PROPER READINGS. ALLOW STRAIGHT DUCT SECTIONS OF 7 1/2' EQUIVALENT DUCT DIAMETERS FROM FAN OUTLETS, ELBOWS, OR OPEN DUCT ENDS FOR ACCURATE TRANSVERSE READINGS.
- ALL RFI OR SIMILAR TO ENGINEER OFFICE TO BE SUBMITTED ON WRITING THROUGH ARCHITECT OFFICE.
- IF ARCHITECTURAL CHANGES ARE MADE AFTER THE COMPLETION OF THE ENGINEERING DRAWINGS, CONTACT ARCHITECT OFFICE FOR FIELD COORDINATION.
- DELETED
- DELETED
- DELETED
- DELETED
- DO NOT PLACE AC UNIT AND DUCTWORK ABOVE ELECTRICAL PANELS, GUTTER, DISCONNECTS, ETC.
- CONTRACTOR SHALL PATCH AND REPAIR EXISTING ROOFING MATERIAL AS REQUIRED BY AN APPROVED ROOFING CONTRACTOR FOR ROOFING MEMBRANE ORIGINALLY INSTALLED SO AS NOT TO VOID WARRANTY.
- CONTRACTOR IS TO PROVIDE OPENING IN ROOF FOR HVAC EQUIPMENT AND REQUIRED STRUCTURAL FRAME WORK FOR ADDITIONAL SUPPORT. CONTRACTOR IS RESPONSIBLE FOR ACQUIRING A STRUCTURAL ENGINEER FOR SIZING OF STRUCTURAL STEEL FRAME WORK INDICATED.
- MAINTAIN MINIMUM OF 10'-0" SEPARATION BETWEEN ANY ROOF TOP UNIT OR OUTSIDE AIR INTAKE AND ALL EXHAUST AND/OR PLUMBING SANITARY VENT TERMINATION THROUGH ROOF.
- CONTRACTOR SHALL SAW CUT EXISTING CONCRETE SLAB AS REQUIRED TO ACCOMMODATE NEW ELECTRICAL, MECHANICAL, & PLUMBING WORK TO BE DONE AND REMOVE DEBRIS FROM SITE. ONCE LATTER WORK HAS BEEN COMPLETED, CONTRACTOR SHALL INFILL NEW TRENCHES AND EXISTING TRENCHES WITHIN SPACE WITH A NEW 5" CONCRETE SLAB (4,000 PSI) W/ 6 X 6, W2.9 X W2.9 W.W.F. OVER VAPOR BARRIER ON WELL COMPACTED FILL W/IN AFFECTED AREAS, ALIGN FLUSH WITH EXISTING.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ANY OPENING AND SECURING ACCESS WITHIN AREA OF WORK ON A DAILY 24 HR BASIS.
- NO CHANGE ORDERS WILL BE APPROVED WITHOUT THE WRITING AUTHORIZATION OF THE ENGINEER.
- ALL A/C UNITS WITH A CAPABILITY OF DELIVERING 2,000 CFM MUST HAVE A SMOKE DETECTOR INSTALLED IN THE SUPPLY AIR DUCT WITH AUDIBLE & VISIBLE ALARM AND TROUBLE SIGNAL LIGHT. (TROUBLE LIGHTS BY ELECTRICAL CONTRACTOR)
- ALL MATERIALS INSTALLED IN PLENUMS SHALL NOT EXCEED: FLAME SPREAD 25 AND SMOKE DEVELOPMENT 50.
- WHEN ALL AHU'S SERVING A ONE COMMON AREA THEN ALL SMOKE DETECTORS SHALL BE INTERCONNECTED ELECTRICALLY TO STOPS FANS AND SOUND THE ALARM.
- UNDERGROUND CONDENSATE DRAIN LINES SHALL BE 2 INCHES DIAM. MINIMUM.
- ALL EXHAUST DUCTS SHALL BE CONSTRUCTED OF SHEET METAL. TERMINATE OUTSIDE THE BUILDING, AND BE EQUIPPED WITH A BACK DRAFT DAMPER. (NO T-FIN ALLOWED.)
- ALL TOILET ROOMS, NOT HAVING AN OUTSIDE OPERABLE WINDOW, SHALL BE PROVIDED WITH A MECHANICAL EXHAUST SYSTEM, TO PRODUCE 1 COMPLETE CHANGE EACH 3 MINUTES, EXCEPT WHERE THE VENTILATING AIR HAS BEEN CONDITIONED, THERE SHALL BE A COMPLETE CHANGE EVERY 7.5 MINUTES.
- DUCTS FROM "TOILET ROOM" SHALL DISCHARGE TO OUTSIDE OF THE BUILDING, SHALL BE TERMINATED NOT LESS THAN 6 INCHES ABOVE THE FINISHED ROOF SURFACE, AND SHALL BE SCHEDULED WITH A CORROSION RESISTANT MATERIAL HAVING A MESH SIZE NOT LARGER THAN 1/2 INCH. (PROVIDE GOOSE NECK OR RAIN CAP ON ROOF PENETRATIONS.)
- AS BUILT DRAWINGS ARE RESPONSIBILITY OF THE CONTRACTOR.
- PARTIAL OR FINAL AS BUILT DRAWINGS REQUIRED BY BUILDING INSPECTORS DUE TO FIELD CONDITIONS ARE RESPONSIBILITY OF THE CONTRACTOR - THE ENGINEER IS NOT RESPONSIBLE OF THE EXECUTION OF ANY AS BUILT DRAWINGS.
- ANY CHANGES REQUESTED BY CONTRACTOR DURING THE CONSTRUCTION PROCESS SHOULD BE SUBMITTED TO THE ENGINEER THROUGH SHOP DRAWING FOR REVIEW AND APPROVAL. SUBMIT IN AMPLE TIME TO AVOID CONSTRUCTION DELAYS.
- THE ENGINEER WILL PROVIDE UPON REQUEST ADDITIONAL FIELD SUPERVISION SERVICES (THIS SERVICE IS NOT INCLUDED IN THE DESIGN FEE ADDITIONAL FEE IS REQUIRED). IT IS REQUIRED TO BE PRESENT ON SITE AT TIME OF FIELD VISIT THE APPROVAL SET OF DRAWINGS, AS BUILT DRAWINGS AND THE TEST AND BALANCE REPORT.
- AUXILIARY DRAIN PANS SHALL BE INSTALLED UNDER ALL COILS WHICH CONDENSATION WILL OCCUR AND UNDER UNITS CONTAINING COILS THAT ARE LOCATED IN ATTIC SPACES, SUSPENDED CEILING SPACES, FURRED SPACES OR ANY AREA WHERE DAMAGE WILL OCCUR TO THE BUILDING CONTENT AS A RESULT OF AN OVERFLOW OF THE EQUIPMENT OR APPLIANCE DRAIN PAN OR A STOPPAGE IN THE CONDENSATE DRAIN PIPING. AUXILIARY DRAIN PAN 1 1/2" DEEP AND 3" LARGER THAN THE UNIT WITH LENGTH ON ALL SIDES AND SHALL BE CONSTRUCTED OF AN APPROVED CORROSION RESISTANT MATERIAL. METALLIC PANS SHALL HAVE A MINIMUM THICKNESS OF NOT LESS THAN 0.0275" GALVANIZED SHEET STEEL. (24 GAGE) NONMETALLIC PANS HAVE A MINIMUM THICKNESS OF NOT LESS THAN 0.0625".
- A SEPARATE DRAIN LINE SHALL EXTEND FROM THE PAN AND SERVE AS AN ALARM WHICH INDICATES THAT THE PRIMARY DRAIN IS RESTRICTED.
- AS AN ALTERNATIVE TO A SEPARATE DRAIN LINE, AN APPROVED WATER LEVER DETECTOR OR FLOAT SWITCH DEVICE SHALL BE USED TO CONTROL OVERFLOW BY AUTOMATICALLY SHOOTING DOWN THE EQUIPMENT.
- WHERE AN AUXILIARY DRAIN PAN CANNOT BE INSTALLED UNDER UNITS CONTAINING COOLING COILS, A DRAIN PIPE SHALL BE CONNECTED TO THE SECONDARY DRAIN (OVERFLOW) CONNECTION SO THAT THE OVERFLOWING CONDENSATE RESULTING FROM FLOW RESTRICTIONS IN THE PRIMARY DRAIN PIPE WILL BE CARRIED AWAY WITHOUT CAUSING DAMAGE TO THE UNIT AND ITS SURROUNDING. THE OVERFLOWING CONDENSATE SHALL BE DRAINED TO A CONSPICUOUS POINT AND SERVE AS AN ALARM WHICH INDICATES THAT THE PRIMARY DRAIN PIPE IS RESTRICTED.
- AS AN ALTERNATIVE, OVERFLOWING CONDENSATE SHALL BE PIPED TO A SECONDARY DRAIN PAN, FIRMLY SECURED AND LOCATED ALONG THE SIDE OF THE COOLING UNIT, FROM WHICH THE CONDENSATE WILL BE DRAINED TO A CONSPICUOUS POINT.
- A SECONDARY DRAIN PAN SHALL HAVE CAPACITY OF NOT LESS THAN THE CAPACITY OF THE CONDENSATE DRAIN PAN, SHALL BE NOT LESS THAN 1 1/2" DEEP, AND SHALL BE CONSTRUCTED OF NOT LESS THAN 0.0275" THICK GALVANIZED SHEET METAL. (24 GAGE)
- AS AN ALTERNATIVE TO A SEPARATE DRAIN LINE, AN APPROVED WATER LEVER DETECTOR OR FLOAT SWITCH DEVICE SHALL BE USED TO CONTROL OVERFLOW BY AUTOMATICALLY SHOOTING DOWN THE EQUIPMENT.
- IF PROPER CONDENSATE DRAIN SLOPE TO DISPOSAL POINT IS NOT POSSIBLE TO ACHIEVE, PROVIDE CONDENSATE PUMP AND ALL ELECTRICAL AND MECHANICAL CONNECTIONS FOR PROPER OPERATION.
- SUBSTITUTION OF 90 DEGREE ELBOW BY TWO ADJACENT 45 DEGREE ELBOWS IS NOT ALLOWED.
- SUBSTITUTION OF 90 DEGREE ELBOWS BY FULL RADIUS RECTANGULAR ELBOW WITH VANES IS APPROVED. FOLLOW SMACNA INSTRUCTIONS FOR DIMENSION AND LOCATION OF VANES.
- AIR DUCT MAX WITH / HIGH RATIO APPROVED EQUAL TO 4:1. IF SITE CONDITIONS DO NOT ALLOW FOR REQUIRED HIGH TO MAINTAIN 4:1 RATIO USE MULTIPLE DUCTS TO KEEP 1 IN 4 RATIO. PROVIDE SHOP DRAWINGS.
- PROVIDE AC UNIT LEAVING DUCT MIN LENGTH L = 1.5 TO 2.5 X (LONGEST DIMENSION OF AC DUCT SUPPLY OPENING). 1.5 ACCEPTED, 2.5 RECOMMENDED.
- TRANSFORMATIONS TO SUPPLY DUCT ADJACENT TO AHU HAVE MAXIMUM SLOPE OF 1 IN 7. TRANSFORMATIONS ON SUPPLY / RETURNS AIR DUCTS ON THE REST OF THE SYSTEM HAVE MAXIMUM SLOPE OF 1 IN 4.
- ALL 90 DEGREE SQUARE THROAT, SQUARE HEEL ELBOWS OTHER THAN THOSE IN TRANSFER AIR DUCTS SHALL HAVE TURNING VANES. ELBOWS WITH MOLDED FIBROUS GLASS VANES MUST HAVE THE ROD OR CHANNEL REINFORCEMENT ON CHEEKS TO PREVENT WALL DEFLECTION. PROVIDE APPROVED DOUBLE THICK TURNING VANES.

AIR CONDITIONING NOTES:

- ALL WORK SHALL CONFORM WITH ALL LOCAL ORDINANCES F.B.C. 7TH EDITION 2020 AND BUILDING CODES GOVERNING THE INSTALLATION OF THE AIR CONDITIONING SYSTEM INCLUDING SMACNA AND AMCA MANUALS. IF WORK AS LAID OUT, INDICATED OR SPECIFIED IS CONTRARY TO OR CONFLICTS WITH LOCAL ORDINANCES, BUILDING CODES AND REGULATIONS, THE CONTRACTOR SHALL REPORT IN WRITING TO THE ARCHITECT / ENGINEER BEFORE SUBMITTING A BID. THE ARCHITECT / ENGINEER WILL THEN ISSUE INSTRUCTIONS AS HOW TO PROCEED.
- THE DRAWINGS ARE TO BE CONSIDERED DIAGRAMMATIC, NOT NECESSARY SHOWING IN DETAIL OR TO SCALE ALL OF THE MINOR ITEMS, UNLESS SPECIFIC DIMENSIONS ARE SHOWN. THE STRUCTURAL, ARCHITECTURAL AND SITE CONDITIONS SHALL GOVERN THE EXACT LOCATIONS, CONTRACTOR SHALL FOLLOW DRAWINGS IN LAYING OUT WORK, CHECK DRAWINGS OF ALL TRADES TO VERIFY SPACES IN WHICH WORK WILL BE INSTALLED AND MAINTAIN MAXIMUM HEAD ROOM, AND SPACE CONDITIONS AT ALL POINTS. WHERE HEAD ROOM OR SPACE CONDITIONS APPEAR INADEQUATE, ARCHITECT OR ENGINEER SHALL BE NOTIFIED ON WRITING BEFORE PROCEEDING WITH INSTALLATION, THIS CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE FIELD MODIFICATION IN LAYOUT AS NEEDED TO PREVENT CONFLICT WORK OF VARIOUS TRADES OF FOR PROPER EXECUTION OF THE WORK.
- EXAMINE ALL DRAWINGS CAREFULLY AND VERIFY EXISTING CONDITION IN FIELD PRIOR TO SUBMITTING A BID. CONTRACTORS WILL BE REQUIRED TO FURNISH, INSTALL AND/OR CONNECT WITH APPROPRIATE SERVICES ALL AIR CONDITIONING ITEMS SHOWN ON ANY OF THE ARCHITECTURAL, PLUMBING, ELECTRICAL AND SPRINKLER DRAWINGS WITHOUT ADDITIONAL EXPENSE TO THE OWNER IF DISCREPANCIES, CONFLICTS, INTERFERENCE OR OMISSIONS OCCUR BETWEEN DRAWINGS, NOTIFY IN WRITING THE ARCHITECT / ENGINEER IN AMPLE TIME TO TO PERMIT REVISIONS BEFORE THE BIDS ARE SUBMITTED.
- INSTALL MATERIALS AND EQUIPMENT IN A NEAT AND FIRST CLASS WORKMANLIKE MANNER. THE OWNER RESERVES THE RIGHT TO DIRECT REMOVAL AND REPLACEMENT OF ITEMS WHICH, IN HIS OPINION, DO NOT PRESENT A NEAT AND WORKMANLIKE APPEARANCE, REMOVAL AND REPLACEMENT IS TO BE DONE IMMEDIATELY WHEN DIRECTED BY THE OWNER IN WRITING, AT THE SOLE EXPENSE OF CONTRACTOR.
- START OF WORK BY CONTRACTOR SHALL BE CONSIDERED AS ACCEPTANCE BY HIM OF ALL CLAIMS OR QUESTIONS AS TO SUITABILITY OF THE WORK OF OTHER TRADES OR OTHER CONTRACTORS TO RECEIVE HIS WORK. THIS CONTRACTOR SHALL REMOVE AND REPLACE, AT HIS EXPENSE, ALL AIR CONDITIONING WORK WHICH MAY HAVE TO BE REMOVED BECAUSE OF INTERFERENCE WITH OTHER TRADES.
- START OF WORK BY CONTRACTOR SHALL BE CONSIDERED AS ACCEPTANCE BY HIM OF COMPLY WITH ALL THE SPECIFICATIONS AND NOTES INCLUDED ON THE SET OF CONTRACT DRAWINGS, AS WELL AS THE INSTRUCTIONS SUPPLY ON WRITING BY THE ENGINEER OFFICE THROUGHOUT RFI OR SIMILAR.
- THIS CONTRACTOR SHALL OBTAIN AND PAY ALL INSURANCE, FEES, PERMITS ASSOCIATION DUES, ROYALTIES, AND TAXES OF WHATEVER NATURE SHALL APPLY TO THIS WORK. HE SHALL ALSO PAY ALL INSPECTION FEES AS MAY BE REQUIRED BY LAW OR ORDINANCE AND SHALL KEEP THE OWNER HARMLESS FROM ANY DAMAGE AND EXPENSE ARISING FROM ANY VIOLATION OF THE LAWS, RULES OR ORDINANCES.
- THE WORD "AIR CONDITIONING" MEANS HEATING, VENTILATION, AIR CONDITIONING, DUCT WORK, PIPING, REFRIGERANT LINES, CONTROLS, SMOKE AND FIRE /SMOKE DAMPERS ETC.
- PROVIDE MEANS "FURNISH AND INSTALL"
- DO A COMPLETE JOB, EVERYTHING CONNECTED, READY FOR USE.
- SHOP DRAWINGS: THIS CONTRACTOR SHALL FURNISH THE ARCHITECT WITH (6) SETS OF FULLY DESCRIPTIVE SHOP DRAWINGS OF EQUIPMENT PRIOR TO PURCHASE FOR APPROVAL INCLUDING, BUT NOT LIMITED TO: AC EQUIPMENT, FANS, VAV BOXES AND AIR DISTRIBUTION. IF EQUIPMENT PROVIDED IS EQUAL TO SPECIFIED PLEASE DO NOT PROVIDE SHOP DRAWINGS.
- AT COMPLETION OF JOB THE HVAC CONTRACTOR SHALL GIVE THE OWNER AN AS BUILT OF REPRODUCIBLE SEPIAS SHOWING THE EXACT INSTALLATION. (THIS IS NOT INCLUDED ON ENGINEERING SCOPE OF WORK.)
- AIR CONDITIONING SYSTEM SHALL BE TESTED, ADJUSTED AND BALANCED BY AN INDEPENDENT TEST AND BALANCE COMPANY OR INDIVIDUAL HOLDING A CURRENT CERTIFICATION FROM A RECOGNIZED TESTING AND BALANCE AGENCY
- AIR BALANCE SHALL BE ACCOMPLISHED IN A MANNER TO FIRST MINIMIZE THROTTLING LOSSES, ADJUST FLOW DESIGN CONDITION WITHIN 10% OF THOSE INDICATED ON THE DRAWINGS. OBTAIN TOTAL AND EXTERNAL STATIC PRESSURE, PRESSURE DROP ACROSS THE FILTER, FULL LOAD AMPS AND RPM READING FOR ALL MOTORS AT BALANCED COND. RECORD D/W/B TEMP. IN/OUT THE COIL AND OUTSIDE D/W/B TEMP. BALANCING PROCEDURE SHALL BE IN ACCORDANCE WITH (NEBB), (AABC).
- SUBMIT ALL TEST AND BALANCE REPORTS TO ENGINEER FOR APPROVAL (PROVIDE LOCATION IDENTIFICATION FOR ALL AIR DISTRIBUTION DEVICES ON REPORT) SUBMIT ALL TEST AND BALANCE REPORTS TO ARCHITECT OR ENGINEER FOR APPROVAL.
- ALL DUCT SIZES ARE CLEAR INSIDE DIMENSIONS.
- THE HVAC CONTRACTOR SHALL WARRANT ALL WORKMANSHIP AND MATERIALS FOR ONE YEAR FROM THE DATE OF FINAL WORK ACCEPTANCE BY OWNER. ANY BREAKDOWN OCCURRING IN FIRST YEAR SHALL BE REPAIRED AT NO EXPENSE TO THE OWNER. THE COMPRESSOR(S) SHALL HAVE A FIVE YEAR QUARANTY.
- MOUNT ALL EQUIPMENT FOR WIND LOADS AND MOUNTING HEIGHTS AS REQUIRED BY LOCAL CODES. (EXISTING, PROVIDED UNDER SHELL PERMIT)
- ALL SHEET METAL DUCTWORK TO BE CONSTRUCTED IN ACCORDANCE WITH SMACNA'S STANDARDS FOR LOW PRESSURE DUCTS. ALL JOINTS AND SEAMS OF INTERIOR DUCTS TO BE SEALED WITH 4" TAPE (PERMACELL #991AF) APPLIED WITH ADHESIVE TO MAKE JOINTS AIRTIGHT.
- ALL SHEET METAL A/C DUCTWORK SHALL BE COVERED WITH 1 1/2 OWENS-CORNING TYPE 150-1 1/2 POUNDS DENSITY, BLANKET INSULATION WITH U.L. RATED F.R.K FOIL REINFORCED KRAFT FACING. APPLY INSULATION USING WELDED PINS OR STICK CLIPS PROVIDE 2" SPACING OVERLAP AT JOINTS AND SEAMS. STAPLE ON 2" CENTERS AND COVER WITH FIRE RESISTANCE MASTIC AND 4" GASS-FAB-TAPE. R=6.0
- ALL EXTERIOR DUCTWORK TO HAVE INTERIOR INSULATION, 1" OWENS-CORNING DUCT LINER BOARD APPLIED IN ACCORDANCE WITH SMACNA'S STANDARDS. SOLDER ALL DUCT JOINTS AND SEAMS. R=6.0
- AT OWNER'S OPTION, INTERIOR LOW PRESSURE DUCTWORK TO BE CONSTRUCTED WITH O.C. FIBERGLASS DUCT BOARD TYPE FR (HD) 1 1/2 INCH THICK WITH GLASS SCRIM REINFORCED FOIL FACING, FOLLOWING SMACNA'S FIBROUS GLASS DUCT CONSTRUCTION STANDARDS AND MANUFACTURER'S FABRICATION AND INSTALLATION MANUAL. ALL JOINTS AND SEAMS SHALL BE CLOSED USING FLARE STAPLES 2" O.C. AND O.C. FIBERGLASS DUCT SYSTEM CLASS 1 RATED MASTIC, AND GLASS REINFORCING TAPE. R=6.0 PROVIDE ALTERNATIVE BID FOR FIBERGLASS DUCT SYSTEM.
- FLEXIBLE DUCTWORK SHALL BE CLASS 1 AIR DUCT, U.L. LISTED AS MANUFACTURED BY ATCO FLEXARE OR APPROVED EQUAL AND R=6.0. INSTALL PER LATEST S.M.A.C.N.A. STANDARDS AND MANUFACTURER'S RECOMMENDATIONS. DUCTWORK SHALL NOT BE COMPRESSED TO OVER 20% OF ITS CROSS SECTIONAL AREA. MAX LENGTH = 6 FT
- EXHAUST DUCTWORK SHALL BE FLEX ALUMINIUM DUCT IN ACCORDANCE WITH S.M.A.C.N.A. STANDARDS FOR LOW PRESSURE DUCTS OR RIGID GALVANIZED DUCT.
- OUTSIDE AIR INTAKE DUCTWORK SHALL BE FLEX ALUMINIUM DUCT IN ACCORDANCE WITH S.M.A.C.N.A. STANDARDS FOR LOW PRESSURE DUCTS OR RIGID GALVANIZED DUCT.
- ALL AIR DEVICES SHALL BE OF ALUMINIUM CONSTRUCTION TITUS, OR APPROVED EQUAL.
- PROVIDE METAL STARTING COLLARS WITH DAMPER FOR ALL FLEXIBLE SUPPLY DUCTS W/ ACCESSIBLE EXTERIOR FOR OPERATOR.
- FILTER SHALL BE DISPOSABLE TYPE AND HAVE CLEAN PRESSURE DROP 0.15" PROVIDE TWO SETS, ONE DURING CONSTRUCTION AND ONE FOR AFTER OCCUPANCY.
- ALL 90 DEGREE SQUARE THROAT, SQUARE HEEL ELBOWS OTHER THAN THOSE IN TRANSFER AIR DUCTS SHALL HAVE TURNING VANES. ELBOWS WITH MOLDED FIBROUS GLASS VANES MUST HAVE THE ROD OR CHANNEL REINFORCEMENT ON CHEEKS TO PREVENT WALL DEFLECTION. PROVIDE APPROVED DOUBLE THICK TURNING VANES.
- BRANCH TAKEOFFS MUST BE PROVIDED WITH APPROVED, ADJUSTABLE AND ACCESSIBLE VOLUME MANUAL DAMPERS.
- TEMPERATURE CONTROL FOR AC OR VAV SHALL BE AS INDICATED ON DRAWINGS BY APPROVED MANUFACTURER. FAN COILS THERMOSTAT WITH SUB-BASE OFF-ON COOL AND FAN SWITCHES.
- FURNISH SMOKE DETECTORS, FIRESTATS AS REQUIRED BY N.F.P.A.
- THIS CONTRACTOR SHALL FURNISH ALL MOTOR STARTERS REQUIRED FOR ALL EQUIP. FURNISHED UNDER THIS CONTRACT AND SHALL BE INSTALLED BY THE ELECTRICAL CONTRACTOR.
- VIBRATION ISOLATION : ALL EQUIPMENT AS PER MANUFACTURER RECOMMENDATIONS TO ELIMINATE ANY EQUIPMENT NOISE FROM BEING HEARD.
- PROVIDE ALL NECESSARY CONTROLS FOR THE OPERATION OF THE AC SYSTEM.
- DUCT TRANSITION ELEMENTS ANGLE SHOULD NOT BE GREATER THAN 15' FOR CONVERGING ELEMENTS NOT GREATER THAN 7' FOR DIVERGING ELEMENTS. SEE AMCA STANDARD 201-90 EQUIPMENT BY MANUFACTURERS OTHER THAN THOSE SPECIFIED MAY BE ACCEPTABLE. HOWEVER, THE COORDINATION WITH ALL TRADES FOR INSTALLING ACCEPTABLE ALTERNATIVE INCLUDING AUXILIARY EQUIPMENT (I.E. CONTROLS, STARTERS, SPACE AVAILABILITY, INTERFERENCE WITH OTHER TRADES ETC.) SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR PROVIDE SHOP DRAWINGS FOR ALL TRADES INVOLVED IN THE ALTERNATIVE. (ADDITIONALLY SEE PARAGRAPH 12.) SEND ALTERNATIVES TO THE ARCHITECT / ENGINEER IN AMPLE TIME TO PERMIT REVIEW.
- PROVIDE CONDENSATE DRAIN PIPING TO CONDENSATE DRAINAGE SYSTEM. PIPING SHALL BE DWY TYPE COPPER WITH DRAINAGE FITTINGS AND REMOVABLE CLEAN OUTS AT EACH ELBOW. CONDENSATE LINES WITHIN BUILDING ENVELOPE MUST BE SHEETED IN 1" INSULATION.
- ALL REFRIGERATION PIPING TO BE COPPER TYPE "K" HARD DRAWN WITH SWEAT END WROUGHT COPPER FITTINGS AND SIZED PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE LONG RADIUS ELBOWS.
- SUCTION REFRIGERATION LINES SHALL BE INSULATED WITH 3/4" ARMAFLEX.
- ELECTRIC HEATERS BLAST COIL TYPE, NICKEL CHROMIUM WIRE, INSULATING BUSHINGS, FACTORY WIRE AND MOUNTED CONTROL PANEL INCLUDING CONTRACTORS, HEAT LIMITERS, HIGH LIMIT SWITCHES IN ACCORDANCE WITH N.E.C. HEATERS TO HAVE TWO SEPARATE CIRCUITS.
- ALL RFI OR SIMILAR TO ENGINEER OFFICE TO BE SUBMITTED ON WRITING THROUGH ARCHITECT OFFICE.
- IF SPACE ABOVE CEILING IS USED AS RETURN AIR PLENUM, PVC OR ANY OTHER EXPOSED COMBUSTIBLE MATERIAL WILL NOT BE ALLOWED TO USE ABOVE CEILING.

LANDLORD COORDINATION NOTES:
 1.- THE CONTRACTOR SHALL COORDINATE ALL WORK WITH THE BUILDING MANAGEMENT COMPANY. (LANDLORD)
 2.- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND BECOME FAMILIAR WITH LANDLORD GUIDELINES, PROCEDURES METHODS, APPROVE PRODUCTS PRIOR TO PURCHASING DETAILS PRIOR TO PERFORMED WORK. IF DISCREPANCIES BETWEEN SAME AND WORK SHOWN ON PLANS AREA FOUND THE CONTRACTOR SHALL REPORT THEM IN WRITING TO THE ARCHITECT / ENGINEER WITH AMPLE TO MAKE REVISIONS TO DRAWINGS.
 3.- ALL WORK SHALL BE SCHEDULED WITH THE LANDLORD, INFORM LANDLORD WITH NOT LESS THAN 24 HR. NOTICE WHEN SHUT DOWN, INTERRUPTION OR CONNECTION TO ANY BUILDING SYSTEM IS REQUIRED. MAKE ANY AND ALL NECESSARY ARRANGEMENTS TO MAINTAIN BUILDING SYSTEMS ACTIVE, PARTICULARLY LIFE SAFETY SYSTEMS.

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE PROCEEDING WITH WORK. IF ANY DISCREPANCIES, ERRORS OR OMISSIONS SHOULD BE ENCOUNTERED ON PLANS, CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE ANY PART OF THE WORK IS STARTED, SO THAT PROPER CORRECTIONS SHALL BE MADE. IF THE ENGINEER IS NOT NOTIFIED PRIOR TO COMMENCING THE WORK, THE CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR ANY DISCREPANCIES, ERRORS OR OMISSIONS.

GENERAL CONTRACTOR SHALL COORDINATE ALL REQUIRED OPENING ON STRUCTURE TO ALLOW FOR HVAC SYSTEM PENETRATIONS AND ROUTING.

SUPPLY FLEX DUCT SIZING TABLE:

0 CFM TO 30 CFM = 4"
31 CFM TO 50 CFM = 5"
51 CFM TO 75 CFM = 6"
76 CFM TO 110 CFM = 7"
111 CFM TO 160 CFM = 8"
161 CFM TO 225 CFM = 9"
226 CFM TO 300 CFM = 10"
301 CFM TO 480 CFM = 12"
481 CFM TO 700 CFM = 14"
701 CFM TO 1,000 CFM = 16"
1,001 CFM TO 1,300 CFM = 18"
1,301 CFM TO 1,700 CFM = 20"
1,701 CFM TO 2,300 CFM = 22"

NOTE:
 IF DUCT EXCEEDS 25 FT, OR HAS EXCESSIVE BENDS, INCREASE TO THE NEXT SIZE.

HVAC DESIGN REQUIRES:	YES	NO
DUCT SMOKE DETECTOR	X	
FIRE DAMPER(S)		X
SMOKE DAMPER(S)		X
FIRE RATED ENCLOSURE		X
FIRE RATED ROOF/FLOOR CEILING ASSEMBLY		X
FIRE STOPPING		X
SMOKE CONTROL		X

MANDATORY SHOP DRAWING SUBMITTALS

- ROOF TOP UNITS AND MINI SPUT UNITS
- AIR DISTRIBUTION DEVICES, CEILING DIFFUSERS, RETURNS GRILLES, TRANSFER GRILLES.
- EXHAUST FANS