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**CAVA**

CAVA - ATTLEBORO  
287 WASHINGTON STREET  
ATTLEBORO, MA 02703  
FOR CAVA  
14 Ridge Square NW #500, WASHINGTON, DC 20016

PROJECT NUMBER:  
240072

ISSUE	DATE
PERMIT SET	MAY 16, 2025

GENERAL INFORMATION  
MECHANICAL

SHEET:

**M000**

**GENERAL NOTES:**

- A. ALL WORK TO BE PERFORMED TO MEET ALL STATE, CITY & LOCAL CODE REQUIREMENTS.
- B. ALL WALL PATCHING TO BE BY GC.
- C. MC IS TO COORDINATE WITH OTHER TRADES BEFORE INSTALLING DUCTWORK. IF THE MC FAILS TO COORDINATE WITH OTHER TRADES AND THE WORK MUST BE ALTERED THE MC WILL CHANGE IT AT HIS OWN EXPENSE.
- D. COORDINATE THE EXACT LOCATION OF ALL GRILLES, REGISTERS & DIFFUSER WITH ARCHITECTURAL REFLECTED CEILING PLAN.
- E. MECHANICAL CONTRACTOR IS TO VISIT THE SITE PRIOR TO SUBMITTING A BID & INCLUDE IN THE BID ANY ITEMS NECESSARY FOR A COMPLETE & OPERATIONAL SYSTEM.
- F. DRAWINGS ARE SCHEMATIC IN NATURE & MC IS TO INCLUDE ANY ITEMS REQUIRED FOR A COMPLETE & OPERATIONAL SYSTEM WHETHER SHOWN OR NOT SHOWN ON THE DRAWINGS.
- G. MC TO FURNISH ALL PERMITS REQUIRED FOR HIS PORTION OF THE WORK.
- H. MC TO COORDINATE WITH ELECTRICAL CONTRACTOR CONCERNING ELECTRICAL REQUIREMENTS BEFORE ORDERING ANY EQUIPMENT.
- I. CONTRACTOR IS RESPONSIBLE FOR ADHERING TO THE ENTIRETY OF THIS DRAWING SET, INCLUDING BUT NOT LIMITED TO: PLANS, ELEVATIONS, DETAILS, SCHEDULES, AND SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL DRAWINGS OF OTHER TRADES, INCLUDING BUT NOT LIMITED TO, ARCHITECTURAL, PLUMBING, ELECTRICAL, CIVIL, AND STRUCTURAL.
- J. ALL CUTTING AND PATCHING OF ROOF IS TO BE BY GC, WHERE REQUIRED, THE GC SHALL UTILIZE THE LANDLORD'S ROOFING CONTRACTOR AT THE GC'S EXPENSE.

**SEQUENCE OF OPERATION**

- A. PROVIDE STAND ALONE OR APPLICATION SPECIFIC CONTROLLERS AS REQUIRED TO PERFORM THE FOLLOWING SEQUENCES OF OPERATIONS.
- B. **PACKAGED ROOFTOP UNITS**
  - 1. UNIT SHALL CONSIST OF SUPPLY AIR FAN, FILTERS, DX COOLING COIL, GAS-FIRED HEAT SECTION, AND A 7-DAY PROGRAMMABLE THERMOSTAT.
  - 2. PROVIDE AN OVERRIDE SWITCH TO OPERATE THE UNIT DURING UNOCCUPIED HOURS. THIS SWITCH SHALL BE PART OF THE PROGRAMMABLE THERMOSTAT. OVERRIDE SWITCH ALLOWS THE UNIT TO OPERATE FOR TWO HOURS (ADJUSTABLE).
  - 3. OCCUPIED MODE: BASED ON THE ROOFTOP UNITS HOURS OF OCCUPANCY, START THE UNIT AT THE BEGINNING OF OCCUPANCY AND SHUT DOWN THE UNIT AT THE END OF OCCUPANCY (NOTE: OUTSIDE AIR DAMPER WITHIN THE RTU SHALL OPEN AND THEN THE RTU SHALL START). THE UNIT SHALL START EARLIER AS DETERMINED BY THE PROGRAM FOR EARLY WARM-UP OR COOL DOWN. ON A SYSTEM STARTUP, THE RTU FAN SHALL START AND RUN CONTINUOUSLY AND THE INTERNAL FACTORY CONTROLS SHALL BE ENABLED. BASED ON THE SPACE TEMPERATURE SENSOR, THE UNIT SHALL CYCLE THE HEATING/COOLING TO MAINTAIN THE SPACE TEMPERATURE SETPOINT (COOLING 75 DEGREE F, HEATING 70 DEGREE F)
    - 3.1. ECONOMIZER MODE: WHEN ENTHALPY OF OA IS BELOW 28 BTU/LB, ECONOMIZER MODE SHALL BE ENABLED. ECONOMIZER MODE SHALL LINEARLY MODULATE OUTDOOR AIR CFM FROM MINIMUM OA CFM TO 100% BASED ON ENTHALPY READINGS.
    - 3.2. HUMIDITY CONTROL (WHEN NEEDED BASED ON CLIMATE); UPON DETECTION OF RELATIVE HUMIDITY ABOVE 55%, THE UNIT SHALL CYCLE INTO DEHUMIDIFICATION MODE IF NOT ALREADY IN COOLING.
  - 4. UNOCCUPIED MODE: THE RTU INTERNAL OA DAMPERS SHALL REMAINED CLOSED WHEN THE BUILDING IS NOT OCCUPIED. THE RTU SHALL STOP HEATING/COOLING AND THE FAN SHALL STOP. IF THE SPACE TEMPERATURE FALLS BELOW 54 DEGREE F (ADJUSTABLE), THE UNIT SHALL START AND HEAT UNTIL THE SPACE TEMPERATURE IS 60 DEGREE F (ADJUSTABLE) AND THEN SHUTDOWN. IF THE SPACE TEMPERATURE RISES ABOVE 85 DEGREE F (ADJUSTABLE), THE UNIT SHALL START AND COOL UNTIL THE SPACE TEMPERATURE IS 80 DEGREE F (ADJUSTABLE) AND THEN SHUTDOWN.
  - 5. UPON DETECTION OF SMOKE BY UNIT SMOKE DETECTOR BOTH RTUS SHALL SHUT DOWN AND AN ALARM SHALL BE SENT TO THE FIRE ALARM CONTROL PANEL (WHERE APPLICABLE). LOCAL REMOTE ANNUNCIATORS SHALL ALSO BE ACTIVATED.
- C. **KITCHEN HOOD EXHAUST FAN (KEF-1)**
  - 1. THE KITCHEN HOOD EXHAUST FAN SHALL BE ENABLED WHEN ANY COOKING APPLIANCE LOCATED UNDER ITS RESPECTIVE HOOD, IS IN USE.
- D. **MAKE UP AIR UNIT**
  - 1. THE MAKE UP AIR UNIT SHALL BE ENABLED WHEN THE KITCHEN HOOD EXHAUST FAN (KEF-1) IS ENERGIZED. THE INTERNAL MOTORIZED DAMPER WITHIN WITH MAU-1 SHALL OPEN AND THE FAN SHALL RUN. IF OA IS LESS THAN 65° (ADJ.), THE MAU-1 GAS-FIRED HEAT SECTION SHALL BE ENABLED TO MAINTAIN A MINIMUM OF 65°.
  - 2. WHEN KEF-1 IS OFF, MAU-1 SHALL BE DE-ENERGIZED AND THE INTERNAL MOTORIZED DAMPED SHALL CLOSE.
- E. **HOOD FIRE PROTECTION ACTIVATION**
  - 1. UPON ACTIVATION OF HOOD FIRE SUPPRESSION SYSTEM, SHUT DOWN MAU-1, RTU-1 AND RTU-2. PROVIDE RELAYS CONTACTS, INTERLOCKS, TRANSFORMERS AND ALL ASSOCIATED WIRING TO ACCOMPLISH SEQUENCE. MAU-1 IS ALREADY PREWIRED TO SHUT DOWN IN HOOD CONTROL PANEL. MECHANICAL CONTRACTOR SHALL INTERLOCK RTU-1 AND RTU-2 TO ALSO SHUT DOWN.

**ABBREVIATIONS**

(A)	EXISTING TO BE ABANDONED	GC	GENERAL TRADES CONTRACTOR
(D)	EXISTING TO BE DEMOLISHED	ID	INNER DIAMETER
(E)	EXISTING TO REMAIN	KEC	KITCHEN EQUIPMENT CONTRACTOR
(F)	FUTURE	LAT	LEAVING AIR TEMPERATURE
(R)	EXISTING TO BE RELOCATED	LWT	LEAVING WATER TEMPERATURE
AAV	AUTOMATIC AIR VENT	MAU	MAKEUP AIR UNIT
AFF	ABOVE FINISHED FLOOR	MC	MECHANICAL CONTRACTOR
AHJ	AUTHORITY HAVING JURISDICTION	MFR	MANUFACTURER
AMB	AMBIENT	N/A	NOT APPLICABLE
APD	AIR PRESSURE DROP	NC	NORMALLY CLOSED
BAS	BUILDING AUTOMATIC SYSTEM	NO	NORMALLY OPEN
BFP	BACKFLOW PREVENTER	NTS	NOT TO SCALE
BLDG	BUILDING	OA	OUTSIDE AIR
BOB	BOTTOM OF BEAM	OD	OUTSIDE DIAMETER
BOD	BOTTOM OF DUCT	PD	PRESSURE DROP
BOP	BOTTOM OF PIPE	PRV	PRESSURE REDUCING VALVE
BOS	BOTTOM OF STRUCTURE	RA	RETURN AIR
CL	CENTER LINE	REL	RELIEF AIR
DB	DRY BULB	RTU	ROOFTOP UNIT
DIA	DIAMETER	SA	SUPPLY AIR
DN	DOWN	SCC	SENSIBLE COOLING CAPACITY
EA	EXHAUST AIR	SP	STATIC PRESSURE
EAT	ENTERING AIR TEMPERATURE	TCP	TEMPERATURE CONTROL PANEL
EC	ELECTRICAL CONTRACTOR	TSP	TOTAL STATIC PRESSURE
EF	EXHAUST FAN	TYP	TYPICAL
EFF	EFFICIENCY	UNO	UNLESS NOTED OTHERWISE
EG	ETHYLENE GLYCOL	VFD	VARIABLE FREQUENCY DRIVE
ESP	EXTERNAL STATIC PRESSURE	WB	WET BULB
EWT	ENTERING WATER TEMPERATURE	WG	WATER GAUGE
EXH	EXHAUST	WIC	WALK IN COOLER
FPI	FINS PER INCH	WPD	WATER PRESSURE DROP

**MECHANICAL LEGEND**

	SUPPLY DUCT UP		PIPING DOWN
	SUPPLY DUCT DOWN		PIPING UP
	RETURN DUCT UP		TURNING VANES
	RETURN DUCT DOWN		VOLUME DAMPER
	FIRE DAMPER		CONDENSATE DRAIN
	SMOKE DAMPER		MOTORIZED DAMPER
	COMB. FIRE/SMOKE DAMPER		REMOTE ANNUNCIATOR
	BACKDRAFT DAMPER		REMOTE TEMP. SENSOR
	SMOKE DETECTOR		THERMOSTAT
	SPIN-IN WITH VOLUME DAMPER		HUMIDISTAT
	45° RETURN DUCT TAP WITH VOL. DAMPER		FLEX DUCT
	DIFFUSER		LINEAR DIFFUSER WITH FLEX CONNECTION
	DIFFUSER WITH FLEX CONNECTION		ROUND DUCT UP
	GRILLE/REGISTER		ROUND DUCT DOWN
	SIDEWALL GRILLE/ REGISTER/ DIFFUSER		REDUCER

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MECHANICAL PLAN

SHEET:

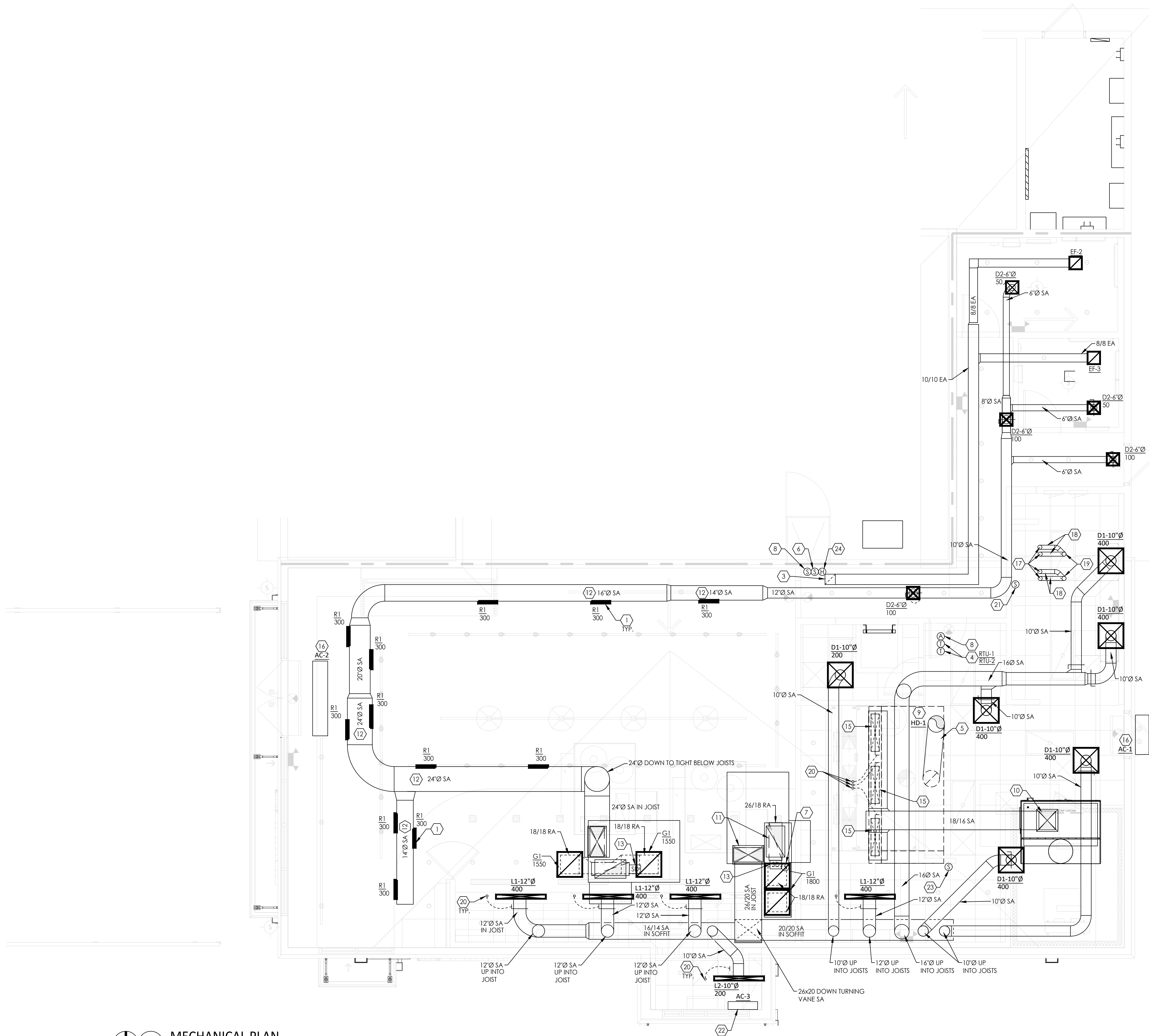
**M101**

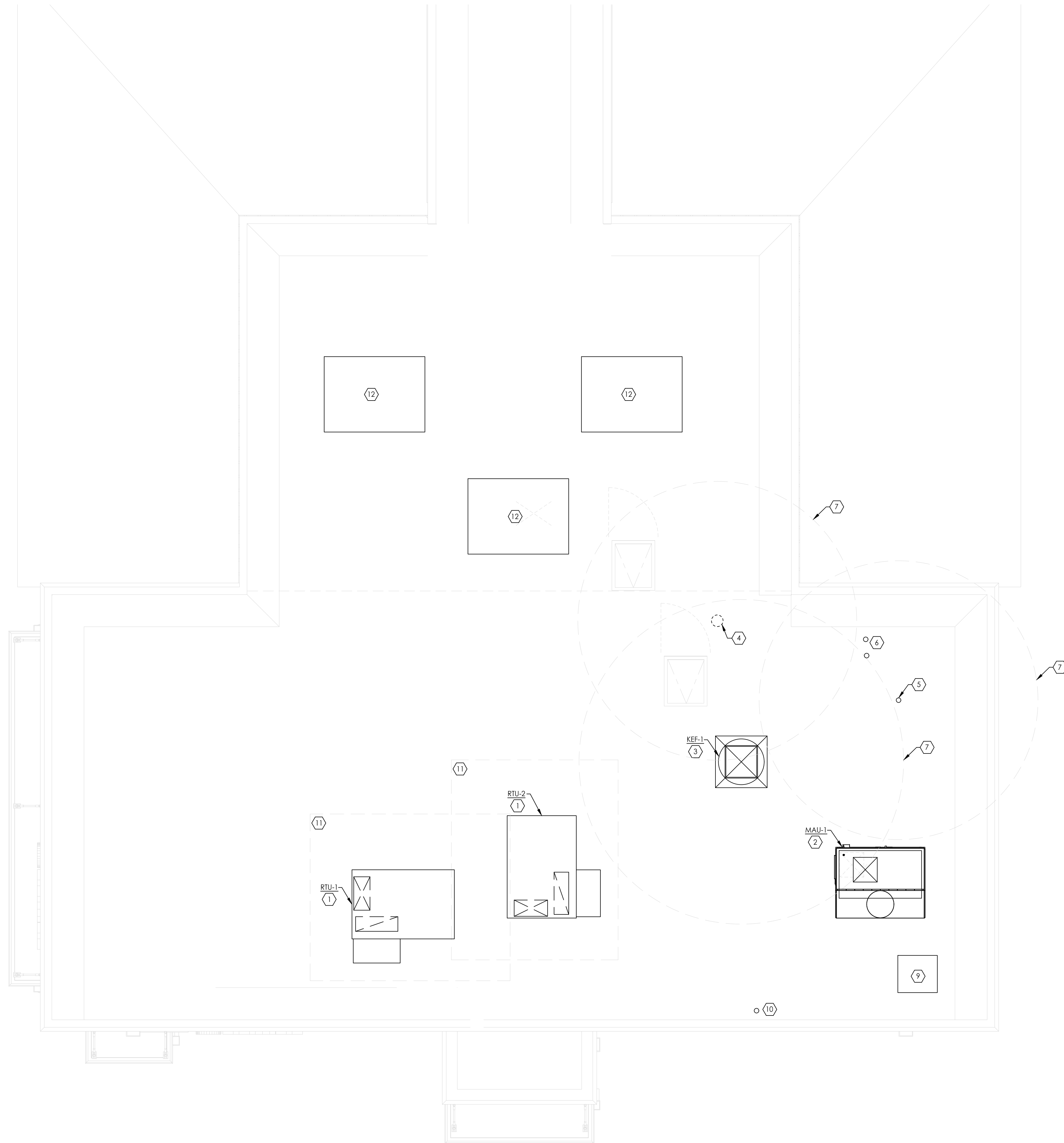
**GENERAL NOTES:**

- DO NOT PENETRATE KITCHEN EXHAUST HOODS OR DUCTWORK WITH ANY TYPE OF FASTENING ASSEMBLY (I.E. SCREWS, RIVETS).
- IF NOT PAINTED, ALL DUCTWORK SHALL HAVE GASKET A SEAL.
- EXPOSED DUCTWORK IN THE DINING AREA SHALL BE MADE OF ELECTRO-GALVANIZED STEEL (PAINTLOCK). SEE MECHANICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- GC TO PROVIDE ACCESS PANELS IN HARD LID CEILINGS FOR ACCESS TO DUCT MOUNTED SMOKE DETECTORS, SENSOR, BALANCING DAMPERS, ETC. LOCATION OF ACCESS PANEL TO BE CENTERED IN LINE WITH LIGHT FIXTURES AND DIFFUSERS. COORDINATE ACCESS PANEL LOCATIONS WITH ARCHITECTURAL SHEETS.

**CODED NOTES:** (#)

- MOUNT REGISTER AT 15° ANGLE ON SIDE OF DUCT. ADJUST DIFFUSER BLADES TO 45° PATTERN. BALANCE AIR SCOOP TO CFM INDICATED.
- MOUNT RETURN GRILLE (G2) TIGHT TO BOTTOM OF STRUCTURE. INSTALL WITH LOUVERS FACING UP SO THE INTERIOR OF THE DUCTWORK IS NOT VISIBLE.
- ROUTE 10"x10" EXHAUST DUCT UP THROUGH ROOF ABOVE. REFER TO DETAIL 6 SHEET M401 FOR CONTINUATION. SEAL WEATHER TIGHT.
- INSTALL LED TOUCHSCREEN 24/7 PROGRAMMABLE THERMOSTAT (WITH CONTROLS LOCKED BY CODE) MOUNTED AT 48" AFF. COORDINATE EXACT LOCATION WITH OWNER.
- ROUTE 16" Ø CUSTOM FABRICATED TYPE 1 KITCHEN EXHAUST DUCT FROM EXHAUST HOOD, UP THROUGH ROOF ABOVE AND CONNECT TO KITCHEN EXHAUST FAN. REFER TO SHEET M201 FOR CONTINUATION. COORDINATE WITH KES AND CAPTIVE AIRE DRAWINGS. SEAL WEATHER TIGHT. CONTRACTOR SHALL PROVIDE CLEANOUT EVERY 20' AND AT EVERY CHANGE OF DIRECTION IN TYPE 1 EXHAUST DUCT.
- REMOTE TEMPERATURE AVERAGING SENSOR MOUNTED AT 48" AFF FOR RTU-2. WIRE BACK TO THERMOSTAT AT MANAGERS DESK.
- REMOTE TEMPERATURE SENSOR MOUNTED WITHIN RETURN DUCT FOR RTU-1. WIRE BACK TO THERMOSTAT AT MANAGERS DESK.
- PROVIDE AUDIO/VISUAL REMOTE SMOKE DETECTOR ANNUNCIATOR WITH REMOTE KEY OPERATED RESET FOR SMOKE DETECTOR MOUNTED AT 48" AFF. ALIGN ANNUNCIATOR WITH THERMOSTAT SENSOR WHERE APPLICABLE.
- TYPE 1 GREASE EXHAUST HOOD. REFER TO KES AND CAPTIVE AIRE DRAWINGS FOR ADDITIONAL INFORMATION.
- ROUTE 18"x14" MAKE UP AIR DUCT UP THROUGH ROOF ABOVE AND CONNECT TO MAKE UP AIR UNIT. REFER TO SHEET M201 FOR CONTINUATION. COORDINATE WITH KES AND CAPTIVE AIRE DRAWINGS. SEAL WEATHER TIGHT.
- ROUTE SUPPLY AND RETURN AIR DUCT UP THROUGH ROOF ABOVE AND CONNECT TO ROOF TOP UNIT. REFER TO SHEET M201 FOR CONTINUATION. SEAL WEATHER TIGHT.
- MOUNT SPIRAL DUCT TIGHT TO BOTTOM OF STRUCTURE.
- PROVIDE DUCT MOUNTED SMOKE DETECTOR IN RETURN AIR DUCT. UPON DETECTION OF SMOKE UNIT SHALL DE-ENERGIZE.
- ROUTE 26"x8" SUPPLY AIR DUCT DOWN FROM CEILING SPACE AND CONNECT TO SUPPLY AIR PLENUM ON HOOD. PROVIDE BALANCING DAMPER AND BALANCE TO 420 CFM. REFER TO KES AND CAPTIVE AIRE DRAWINGS FOR ADDITIONAL INFORMATION.
- ROUTE 36"x8" MAKEUP AIR DUCT DOWN FROM CEILING SPACE AND CONNECT TO MAKE UP AIR PLENUM ON HOOD. PROVIDE BALANCING DAMPER AND BALANCE TO 618 CFM. REFER TO KES AND CAPTIVE AIRE DRAWINGS FOR ADDITIONAL INFORMATION.
- PROVIDE AIR CURTAIN ABOVE ENTRANCE DOOR. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- ROUTE 3" COMBUSTION AIR AND FLUE DOWN FROM CEILING SPACE AND CONNECT TO WATER HEATER. INSTALLATION SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
- EXTEND 3" COMBUSTION AIR AND FLUE IN CEILING SPACE. FIELD VERIFY EXACT ROUTING.
- EXTEND 3" COMBUSTION AIR AND FLUE UP TO CONCENTRIC VENT THROUGH ROOF ABOVE. REFER TO SHEET M201 FOR ADDITIONAL INFORMATION.
- REMOTE BALANCING DAMPER, TYPICAL FOR BALANCING DAMPERS IN HARD CEILING APPLICATIONS.
- PROVIDE CO2 MEASUREMENT SPECIALISTS RAD-0102-4 REMOTE CO2 STORAGE SAFETY ALARM (OR EQUAL). INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE BERNER DTU03-2026A AIR CURTAIN ABOVE OPENING IN DRIVER THROUGH WINDOW. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. VERIFY EXACT LOCATION WITH GC AND OWNER.
- PROVIDE REMOTE TEMPERATURE SENSOR FOR THE HOOD HD-1 AT THIS LOCATION AT 5'-0" AFF. PROVIDE CABLING TO THE HOOD CONTROL PANEL AS NOTED IN THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- PROVIDE REMOTE HUMIDISTAT FOR THE HVAC EQUIPMENT AS NOTED AT THIS LOCATION IMMEDIATELY ABOVE THE TEMPERATURE SENSOR. COORDINATE LOCATION WITH EQUIPMENT AND WALL-MOUNTED FIXTURES AS REQUIRED SUCH THAT THE SENSOR IS NOT BLOCKED. ADJUST THE SENSOR FOR A DEADBAND TO ENERGIZE HOT GAS REHEAT WHEN HUMIDITY EXCEEDS 60% RELATIVE HUMIDITY AND TO DE-ENERGIZE WHEN THE HUMIDITY DROPS BELOW 50%.





**GENERAL NOTES:**

- A. DO NOT PENETRATE KITCHEN EXHAUST HOODS OR DUCTWORK WITH ANY TYPE OF FASTENING ASSEMBLY (I.E. SCREWS, RIVETS).
- B. IF NOT PAINTED, ALL DUCTWORK SHALL HAVE GASKET A SEAL.
- C. EXPOSED DUCTWORK IN THE DINING AREA SHALL BE MADE OF ELECTRO-GALVANIZED STEEL (PAINTLOCK). SEE MECHANICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.

**CODED NOTES:** (#)

1. EXISTING ROOFTOP UNIT (PROVIDED BY LANDLORD UNDER A SEPARATE PERMIT) TO REMAIN. FIELD-VERIFY EXACT LOCATION, MAKE AND MODEL.
2. INSTALL MAKE-UP AIR UNIT ON MANUFACTURERS ROOF CURB. CONTRACTOR SHALL CUT, PATCH, FLASH, AND AND COUNTER FLASH AROUND ROOF CURB TO MAINTAIN ANY APPLICABLE ROOF WARRANTY.
3. INSTALL HOOD EXHAUST FAN ON MANUFACTURERS ROOF CURB. ENSURE LOCATION IS A MINIMUM OF 10' - 0" FROM ANY OUTSIDE AIR INTAKES. CONTRACTOR SHALL CUT, PATCH, FLASH, AND AND COUNTER FLASH AROUND ROOF CURB TO MAINTAIN ANY APPLICABLE ROOF WARRANTY.
4. INSTALL 10"x10" EXHAUST DUCT WITH GOOSENECK AND BIRDSCREEN. ENSURE LOCATION IS A MINIMUM OF 10' - 0" FROM ANY OUTSIDE AIR INTAKES. CONTRACTOR SHALL CUT, PATCH, FLASH, AND AND COUNTER FLASH AROUND ROOF PENETRATION TO MAINTAIN ANY APPLICABLE ROOF WARRANTY.
5. 4" VENT THROUGH ROOF. CONTRACTOR SHALL ENSURE LOCATION IS A MINIMUM OF 10' - 0" FROM ANY OUTSIDE AIR INTAKES.
6. COMBINATION AIR INTAKE AND FLUE EXHAUST FOR WATER HEATER. INSTALL PER MANUFACTURERS RECOMMENDATIONS. CONTRACTOR SHALL ENSURE LOCATION IS A MINIMUM OF 10' - 0" FROM ANY OUTSIDE AIR INTAKES.
7. ENSURE TO MAINTAIN 10'-0" CLEARANCE TO OUTSIDE AIR INTAKES.
8. ROUTE 4" STORM AND 4" OVERFLOW DOWN FROM ROOF AND OVER FLOW DRAIN. REFER TO SHEET P101 FOR CONTINUATION.
9. GC TO INSTALL WALK-IN COOLER CONDENSER ON ROOF PER MANUFACTURER'S RECOMMENDATIONS.
10. EXISTING 3" VENT THROUGH ROOF FOR GRAVITY GREASE INTERCEPTOR (PROVIDED BY LANDLORD UNDER A SEPARATE PERMIT).
11. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCE ZONES. NO DUCTWORK, PIPING, CONDUIT OR OTHER SYSTEMS SHALL BE PERMITTED IN THIS AREA. COORDINATE WITH SITE CONDITIONS AND WORK OF OTHER TRADES AS REQUIRED. TYPICAL.
12. EXISTING ROOFTOP EQUIPMENT. NOT IN CONTRACT.



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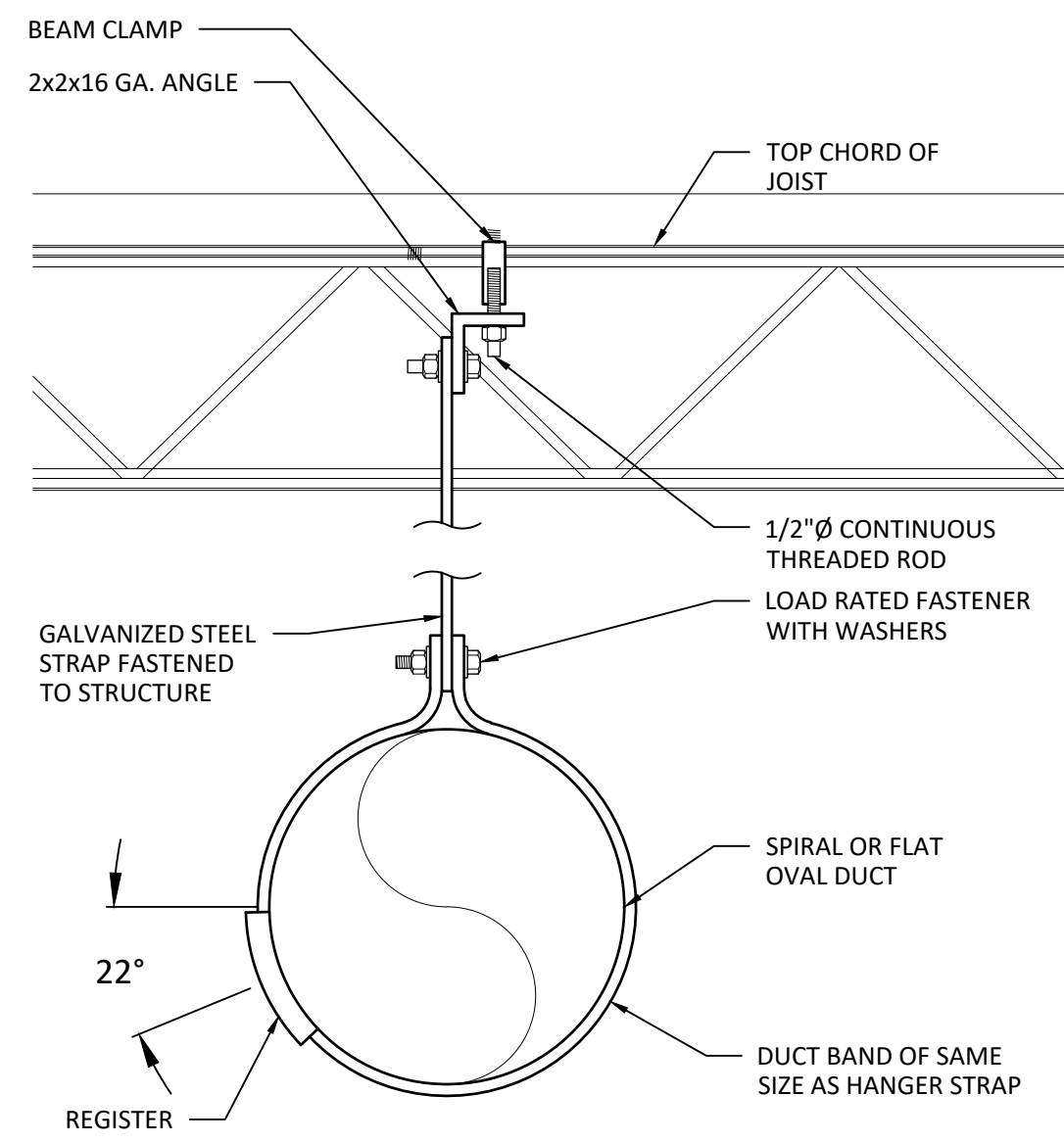
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MECHANICAL ROOF PLAN

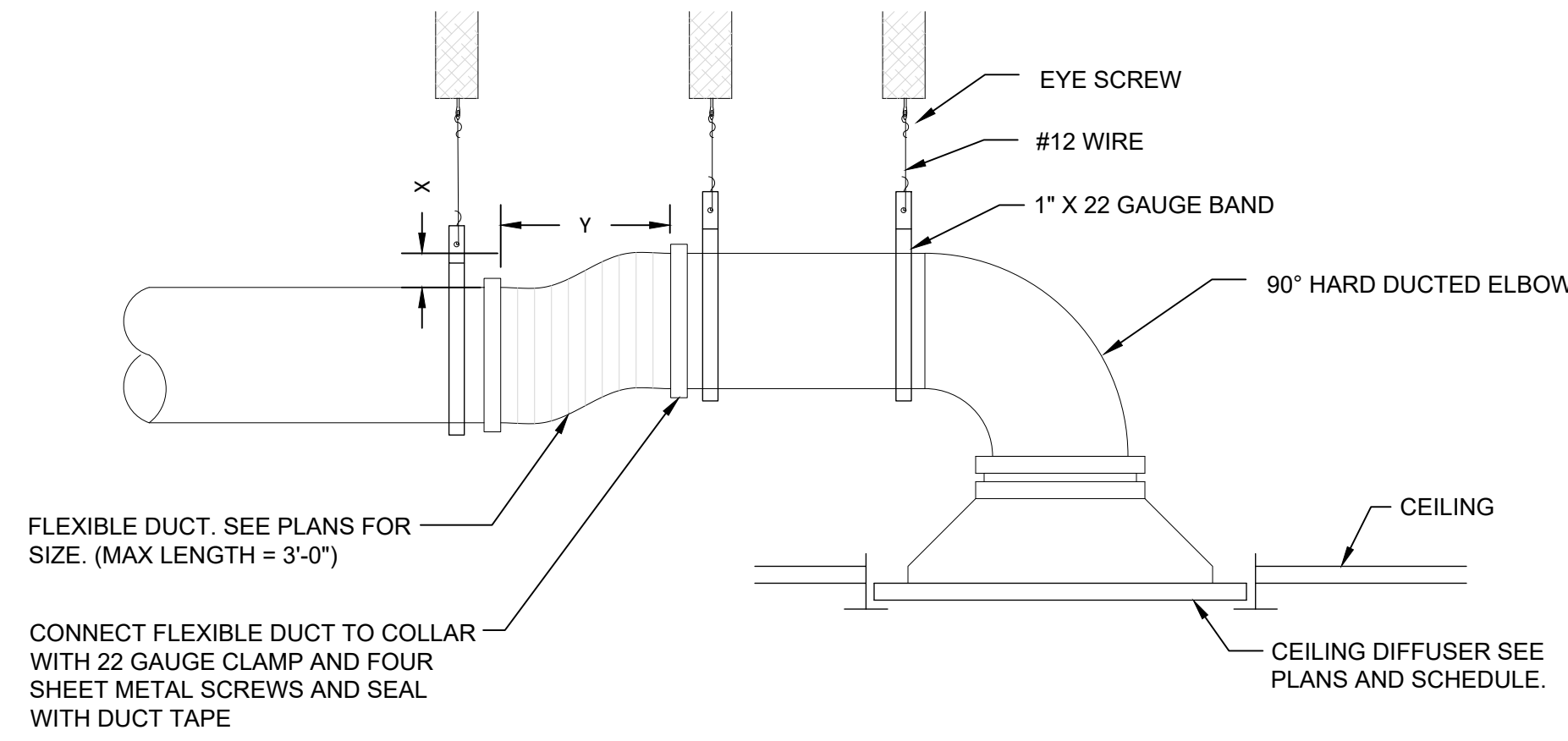
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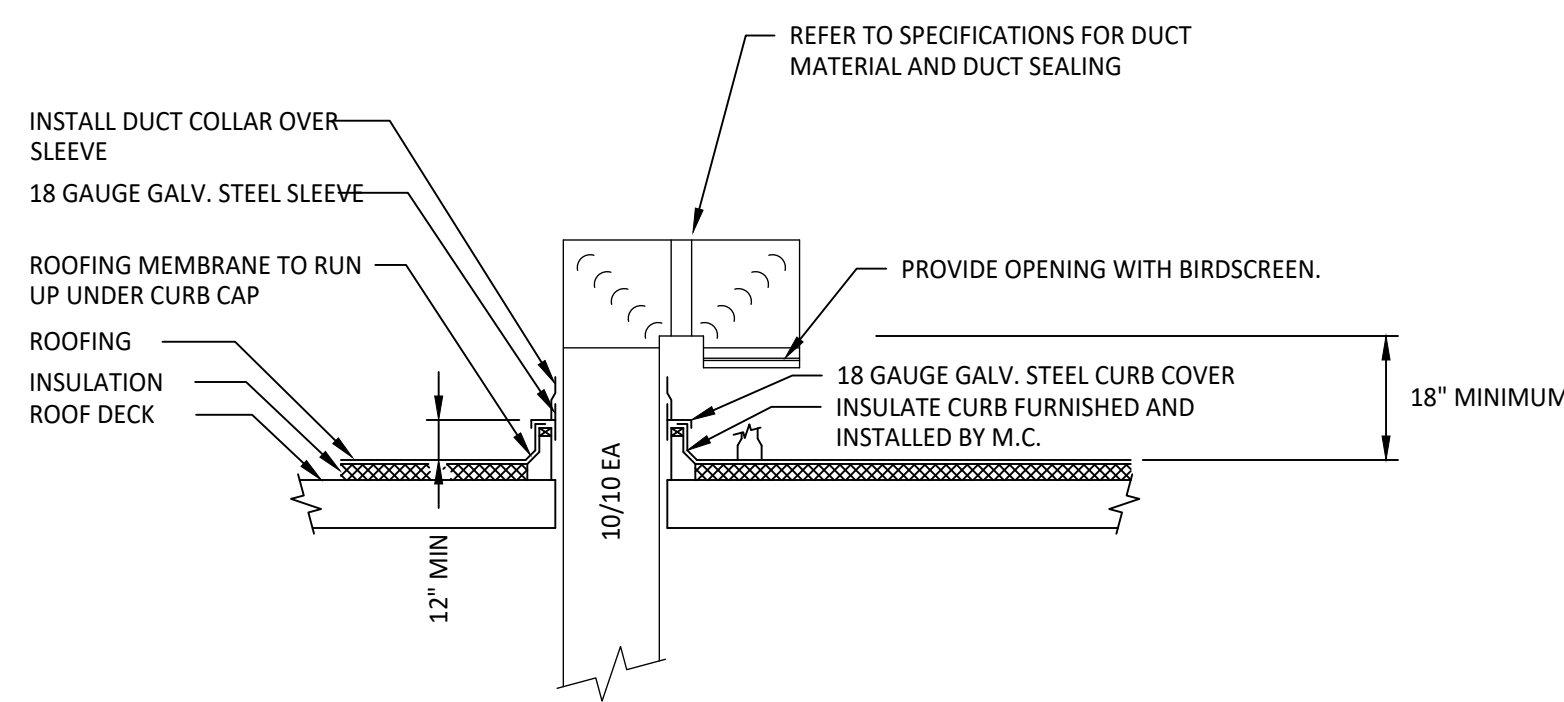
**1** MECHANICAL ROOF PLAN  
 1/4" = 1'-0"



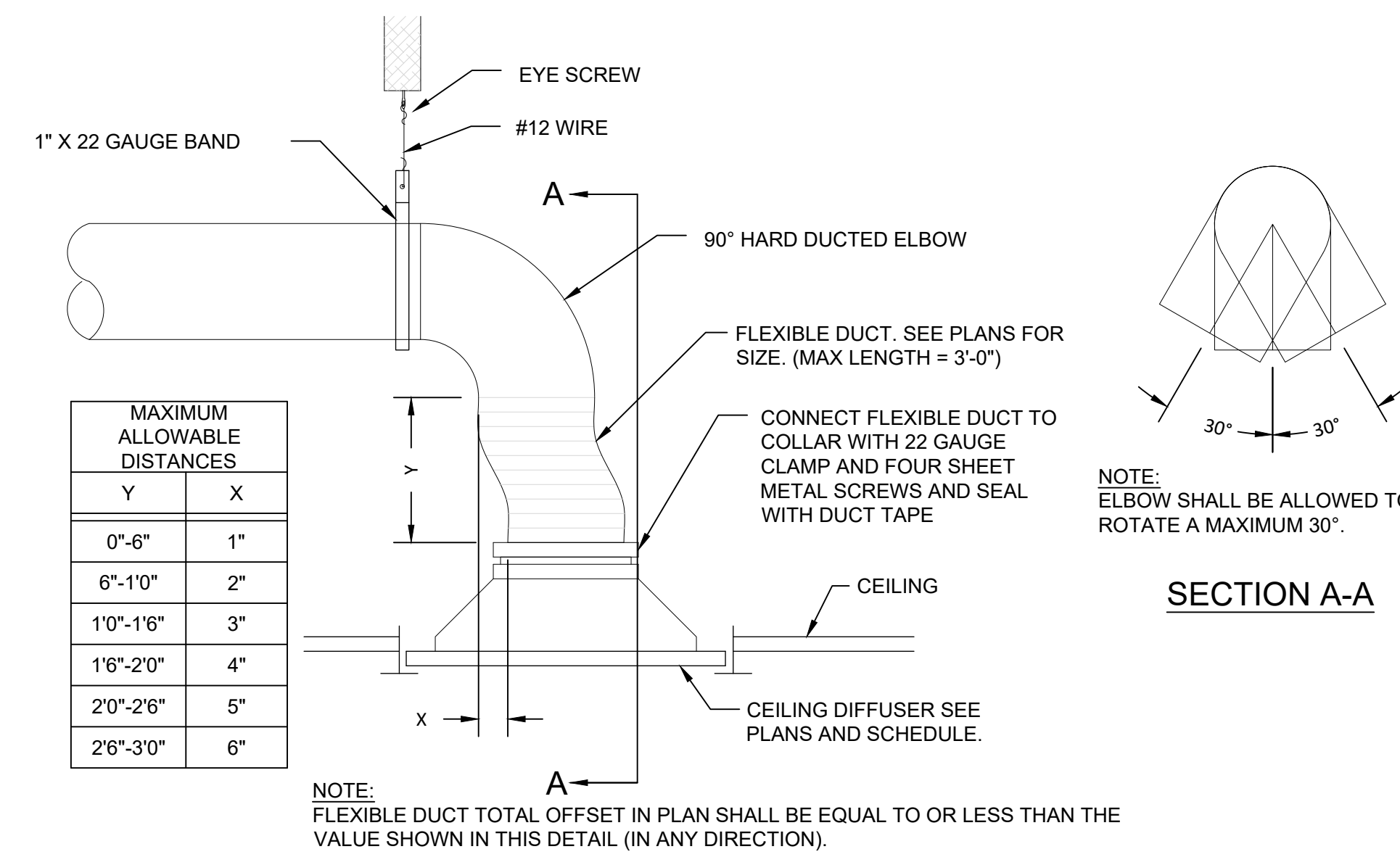
**7** SPIRAL DUCT SUPPORT DETAIL  
N.T.S.



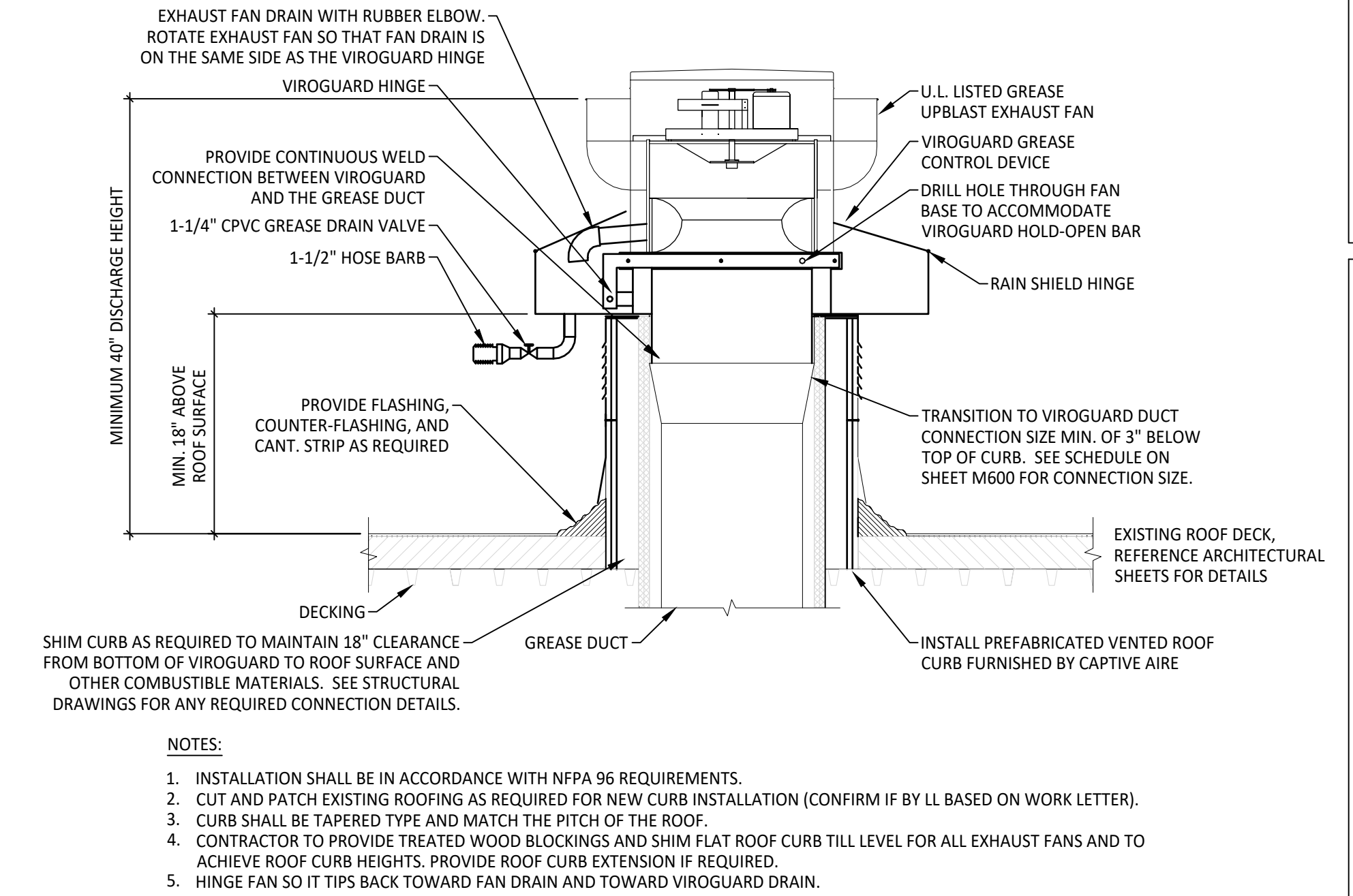
**8** DUCT MOUNTED REGISTER  
N.T.S.



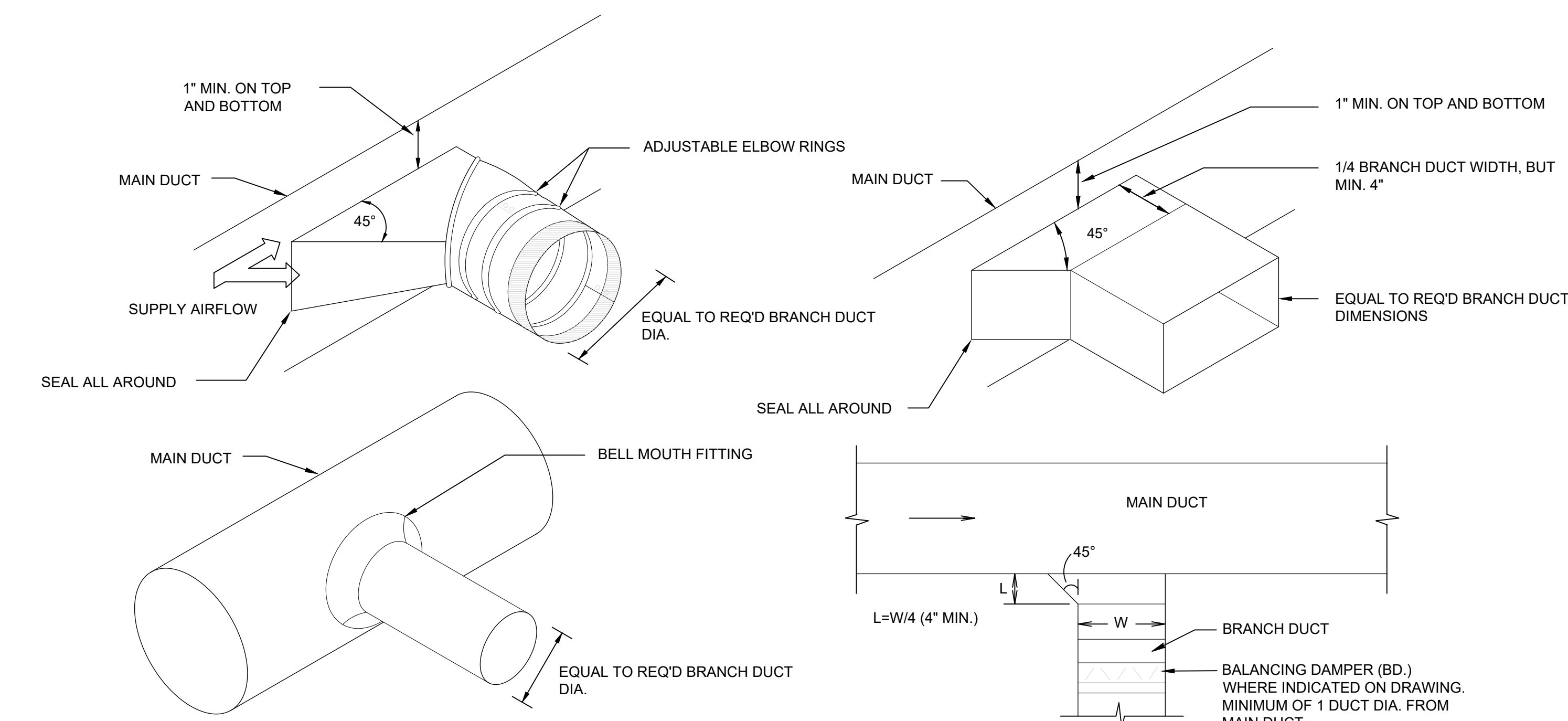
**6** DUCTWORK ROOF PENETRATION DETAIL  
N.T.S.



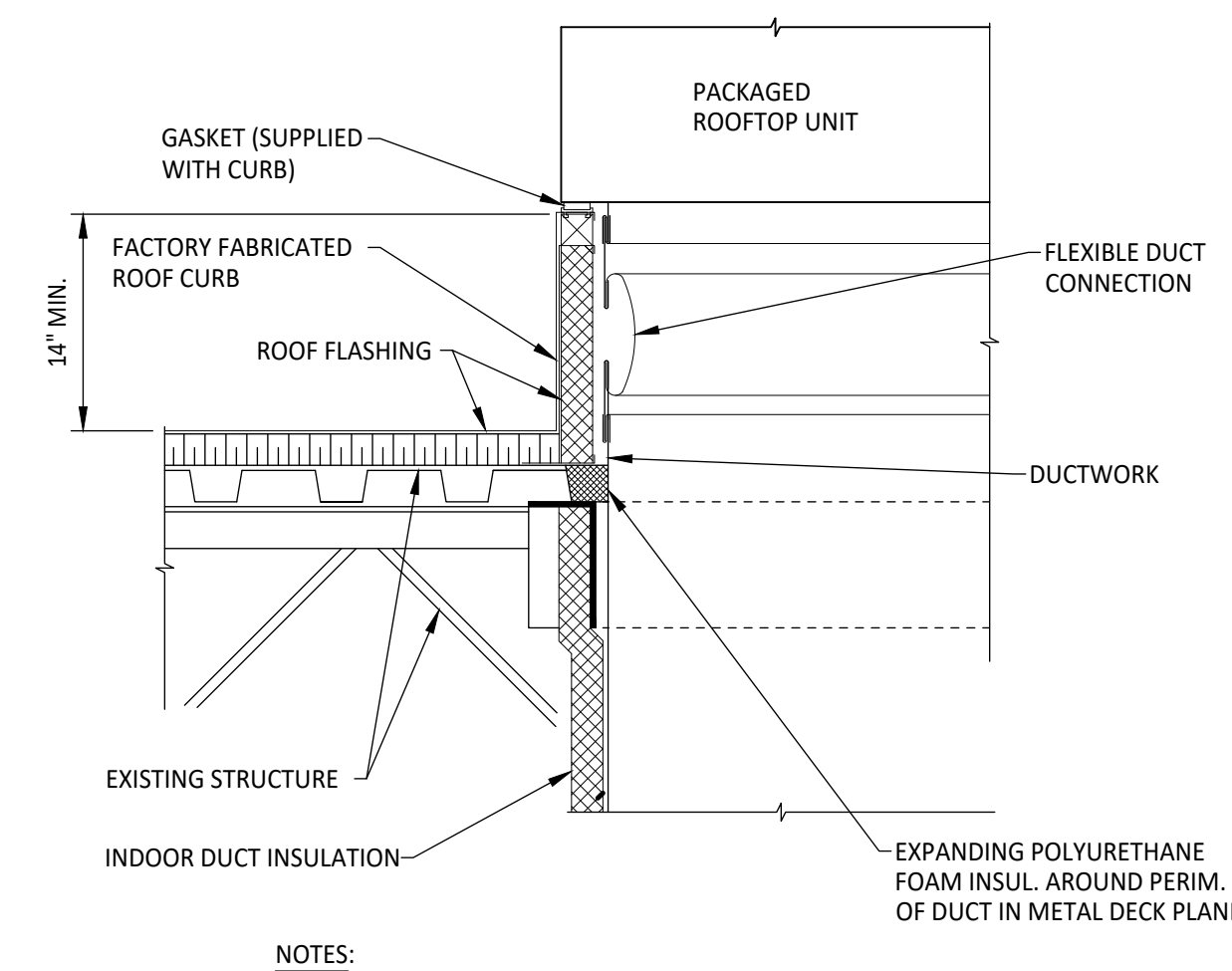
**5** CEILING DIFFUSER DETAIL  
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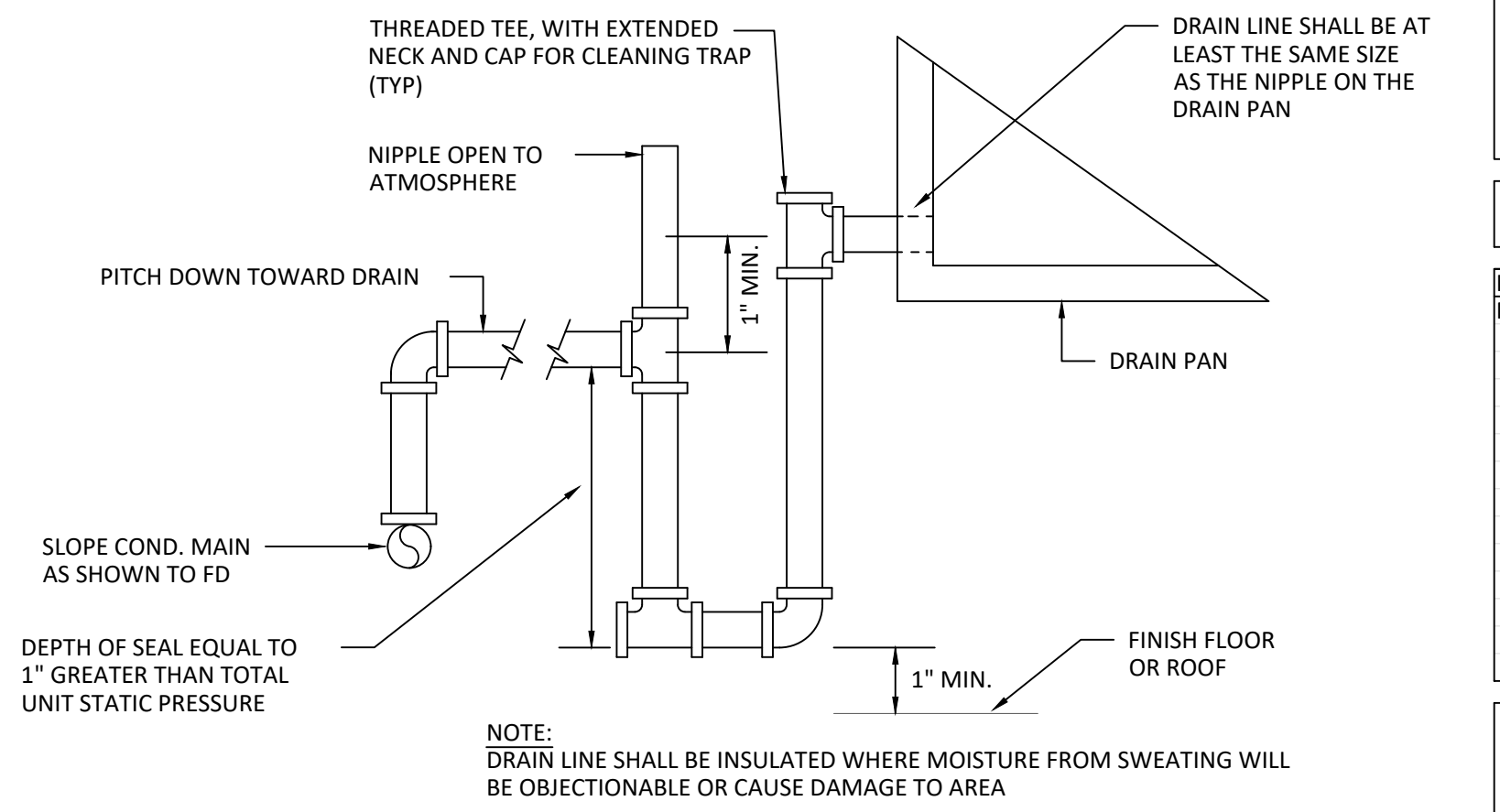
**4** GREASE EXHAUST FAN DETAIL  
N.T.S.



**3** DUCT BRANCH DETAIL  
N.T.S.



**2** PACKAGED ROOFTOP UNIT DETAIL  
N.T.S.



**1** CONDENSATE DRAIN DETAIL  
N.T.S.

MAXIMUM ALLOWABLE DISTANCES	
Y	X
0'-6"	1"
6'-10"	2"
1'0"-1'6"	3"
1'6"-2'0"	4"
2'0"-2'6"	5"
2'6"-3'0"	6"

NOTE:  
FLEXIBLE DUCT TOTAL OFFSET IN PLAN SHALL BE EQUAL TO OR LESS THAN THE VALUE SHOWN IN THIS DETAIL (IN ANY DIRECTION).

MATERIAL SCHEDULE		
CATEGORY	APPLICATION	ALLOWABLE MATERIAL
DUCT	CONCEALED SUPPLY	RECTANGULAR OR ROUND. INSULATED
	CONCEALED RETURN	RECTANGULAR OR ROUND. INSULATED
	CONCEALED GENERAL EXHAUST	RECTANGULAR OR ROUND. INSULATED
	CONCEALED, TYPE I HOOD EXHAUST	FACTORY-BUILT, COMMERCIAL KITCHEN, DOUBLE-WALL GREASE DUCT WITH 0" CLEARANCE TO COMBUSTIBLES. LISTED AND LABELED IN ACCORDANCE WITH UL1978/UL2221 AND INSTALLED IN ACCORDANCE WITH THE MECHANICAL CODE AND THE MANUFACTURER'S UL LISTING OR WELDED RECTANGULAR 16 GAUGE STEEL WITH ZERO CLEARANCE TO COMBUSTIBLE DUCT WRAP.
	EXPOSED SUPPLY	DOUBLE-WALL INSULATED ROUND OR OVAL AS NOTED

VENTILATION SCHEDULE									
BASED ON IMC 2015 (TABLE 403.3.1.1)									
CATEGORY	ROOM NUMBER	AREA	OCCUPANT DENSITY (PPL / 1000 SF)	OCCUPANT LOAD (PEOPLE)	AIR RATE		EFFECTIVENESS	VENTILATION REQUIRED (CFM)	VENTILATION PROVIDED (CFM)
					CFM / PERSON	CFM / SF			
RTU-2									
DINING	100-103	1,005	70	74	7.50	0.18	0.8	919.9	920
HALL	109	195	0	0	0.00	0.06	0.8	14.6	15
RESTROOM	110-111	1,169	0	0	0.00	0.00	0.8	0.0	0
TOTAL:								934.5	935
RTU-1									
BACK OF HOUSE	108	518	20	10	7.50	0.12	0.8	171.4	175
OFFICE	107	57	5	1	5.00	0.06	0.8	10.5	10
KITCHEN	104-106	431	20	9	7.50	0.12	0.8	145.5	145
TOTAL:								327.4	330

ROOFTOP UNIT SCHEDULE																						
OUTSIDE AIR CONDITIONS - SUMMER DB/WB: 90.5/76.6°F, WINTER DB: 16.6°F																						
UNIT TAG	MANUFACTURER	MODEL	TONS	AIRFLOW				HEATING (MBH)				GROSS COOLING (MBH)			COOLING DESIGN AMBIENT (95°F)	ELECTRICAL			WEIGHT (LBS)	FURNISHED BY	INSTALLED BY	NOTES
				CFM	OA MIN.	ESP.	MOTOR HP	INPUT	OUTPUT	STAGES	AFUE%	TOTAL	SENS.	EER/SEER		MCA	MOCp	V/P/H				
RTU-1	CARRIER	48FEFN12	10	4,000	935	1.00	0.80	250 / 200	205 / 164	2	82	129.1	97.19	11.0 / 15.0	89.0 DB / 79.3 WB	58	70	208/3/60	1,350	LL	LL	1,2,3
RTU-2	CARRIER	48FEFN12	10	4,000	330	1.00	0.80	250 / 200	205 / 164	2	82	129.1	97.19	11.0 / 15.0	89.0 DB / 79.3 WB	58	70	208/3/60	1,350	LL	LL	1,2,3

- NOTES:
- PROVIDE WITH 14" CURB. FIELD VERIFY EXACT REQUIREMENTS.
  - INCLUDE WITH ENTHALPY CONTROLLED 100% MODULATING ECONOMIZER, HUMIDIZER.
  - PROVIDE WITH HONEYWELL VISIONPRO 8000 TOUCHSTREEN PROGRAMMABLE THERMOSTAT, MODEL TH8320. INTERLOCK WITH REMOTE TEMPERATURE SENSOR.

MAKEUP AIR UNIT SCHEDULE																					
THIS EQUIPMENT HAS BEEN SELECTED AND APPROVED BY CAPTIVEAIRE. ALL INFORMATION PERTINENT TO THIS UNIT SHALL BE THE SOLE RESPONSIBILITY OF CAPTIVEAIRE.																					
UNIT TAG	MODEL	TONS	AIRFLOW				HEATING (MBH)				COOLING (MBH)			COOLING DESIGN AMBIENT (95°F)	ELECTRICAL			WEIGHT (LBS)	FURNISHED BY	INSTALLED BY	NOTES
			CFM	OA MIN.	ESP.	MOTOR HP	INPUT	OUTPUT	AFUE%	TOTAL	SENS.	IEER	MCA		MOCp	V/P/H					
MAU-1	EARTU1-1200-15-5T-MPU	5.0	1,854	1,854	0.80	2.00	197.7	160.1	80	64.0	29.6	17.9	80DB / 67WB	28.4	30	208/3/60	1,300	OWNER	GC	1	

- NOTES:
- REFER TO KES AND CAPTIVEAIRE DRAWINGS FOR ADDITIONAL INFORMATION.

KITCHEN HOOD SCHEDULE												
THIS EQUIPMENT HAS BEEN SELECTED AND APPROVED BY CAPTIVEAIRE. ALL INFORMATION PERTINENT TO THIS UNIT SHALL BE THE SOLE RESPONSIBILITY OF CAPTIVEAIRE.												
UNIT TAG	MODEL	HOOD LENGTH	MAX. COOKING TEMP.	EXHAUST CFM	MAU CFM	QTY.	LIGHTS	MISC.		FURNISHED BY	INSTALLED BY	NOTES
								FIRE SUPP. SYSTEM	HANGING WEIGHT (LBS.)			
H-1	6030 ND-2-PSP-F	11'-7"	600°	2,317	1,854	6	RECESSED ROUND	YES	1209	OWNER	GC	1

- NOTES:
- REFER TO KES AND CAPTIVEAIRE DRAWINGS FOR ADDITIONAL INFORMATION.

EXHAUST FAN SCHEDULE														
BASED ON GREENHECK, UNO.														
UNIT TAG	MODEL	FUNCTION	PERFORMANCE DATA			MOTOR DATA						FURNISHED BY	INSTALLED BY	NOTES
			FAN TYPE	CFM	ESP.	DAMPER	BELT OR DIRECT	SONES RATING	HP	VOLT	PH			
KEF-1	DU85HFA	HOOD EXHAUST	UPBLAST	2,317	1.00	--	DIRECT	16.7	1.0	120	1	OWNER	GC	1,2
EF-2	SP-A290	RESTROOM EXHAUST	CEILING	125	0.30	BDD	DIRECT	5.3	0.03	120	1	GC	GC	3
EF-3	SP-A290	RESTROOM EXHAUST	CEILING	125	0.30	BDD	DIRECT	5.3	0.03	120	1	GC	GC	3

- NOTES:
- FAN SHALL BE INTERLOCKED WITH HOOD CONTROLS, REFER TO KES AND CAPTIVEAIR DRAWINGS FOR ADDITIONAL INFORMATION.
  - PROVIDE FAN WITH ENVIROMATIC VIROGUARD HOOD EXHAUST FAN ROOFTOP CONTAINMENT SYSTEM.
  - FAN SHALL OPERATE ON RESTROOM OCCUPANCY SENSOR, FAN SHALL TURN OFF 1 MINUTE AFTER RESTROOM IS UNOCCUPIED.

GRILLES, REGISTERS, AND DIFFUSERS SCHEDULE											
BASED ON TITUS, UNO. D = DIFFUSER G = GRILLE R = REGISTER											
UNIT TAG	FUNCTION	MODEL	FACE SIZE	PERFORMANCE DATA					FURNISHED BY	INSTALLED BY	NOTES
				FRAME TYPE	MATERIAL	FINISH	BALANCE DAMPER	MAX N.C.			
D1	SUPPLY	PAS	24"x24"	LAY-IN	STEEL	WHITE	--	25	GC	GC	1,2
D2	SUPPLY	OMNI	12"x12"	SURFACE	STEEL	WHITE	--	25	GC	GC	1,4
R1	SUPPLY	S300FS	20"x6"	DUCT	ALUMINUM	WHITE	AIR SCOOP	25	GC	GC	DUCT SIZE 18"x6", NOTE 3
L1	SUPPLY	FL-20-22	48"x4.75"	SURFACE	ALUMINUM	WHITE	--	25	GC	GC	1 SLOT, 2" SLOT WIDTH, PROVIDE WITH INSULATED PLENUM AND BALANCING DAMPER
G1	RETURN	350RL	24"x24"	SURFACE	ALUMINUM	WHITE	--	25	GC	GC	

- NOTES:
- SUPPLY DIFFUSERS TO BE INSULATED VIA FACTORY SYSTEM.
  - WITH NO INTERNAL DEFLECTOR.
  - COORDINATE PAIN COLOR (PT-106) WITH ARCHITECTURAL SHEETS.
  - INCLUDE WITH BALANCING DAMPER IN NECK.

AIR BALANCE SCHEDULE					
COMPONENT	SUPPLY CFM	RETURN CFM	OUTDOOR AIR CFM	EXHAUST CFM	SUBTOTAL CFM
RTU-1	4000	3065	935	0	935
RTU-2	4000	3670	330	0	330
MAU-1	1854	0	1854	0	1854
KEF-1	0	0	0	2317	-2317
EF-2	0	0	0	125	-125
EF-3	0	0	0	125	-125
NET PRESSURE (CFM):					552

HEATED AIR CURTAIN SCHEDULE														
TAG	DESCRIPTION	NOZZLE WIDTH (INCHES)	AIRFLOW			ELECTRICAL				FURNISHED BY	INSTALLED BY	BASIS FOR DESIGN		REMARKS
			MAX VELOCITY (FPM)	AVERAGE VELOCITY (FPM)	AIRFLOW (CFM)	HEATER KW	MOCp (A)	MCA (A)	V/P/H			MANUFACTURER	MODEL	
AC-1	PRIMARY DINING ROOM DOOR	84.00	2,317	1,728	2,268	15	60	46.6	208/3/60	GC	GC	BERNER	AE08-E-2084E	FURNISH WITH MAGNETIC DOOR SWITCH INTERLOCKED WITH DOOR. INTEGRAL DISCONNECT SWITCH. WALL MOUNTING BRACKET. COORDINATE COLOR WITH ARCHITECT.
AC-2	REAR DOOR AIR CURTAIN	42.00	2,317	1,728	1,134	5.6	25	18	208/3/60	GC	GC	BERNER	AE08-E-1042E	FURNISH WITH MAGNETIC DOOR SWITCH INTERLOCKED WITH DOOR. INTEGRAL DISCONNECT SWITCH. WALL MOUNTING BRACKET. COORDINATE COLOR WITH ARCHITECT.

- NOTES:
- PROVIDE WITH INTEGRAL DISCONNECT SWITCH AND WALL MOUNTING BRACKET.
  - FINISH TO MATCH STOREFRONT.



NOT FOR CONSTRUCTION REVIEW SET ONLY

CAVA

CAVA - ATTLEBORO  
287 WASHINGTON STREET  
ATTLEBORO, MA 02703  
FOR CAVA  
14 Ridge Square NW #500, WASHINGTON, DC 20016

PROJECT NUMBER:  
240072

ISSUE DATE  
PERMIT SET MAY 16, 2025

MECHANICAL SCHEDULES

SHEET:

M501

# SPECIFICATIONS - DIVISION 23 - HVAC

## SECTION 230500 - GENERAL MECHANICAL REQUIREMENTS:

HVAC SUBCONTRACTOR SHALL PROVIDE AT BID TIME A BID TO PROVIDE PREVENTATIVE MAINTENANCE SERVICES FOR ONE YEAR.

FURNISH TO THE OWNER ALL OPERATING & MAINTENANCE MANUALS, RECORD DRAWINGS, TEST & BALANCE REPORT. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER REPRESENTATIVES FOR EMPLOYEE TRAINING REQUIREMENTS FOR ALL EQUIPMENT.

MECHANICAL CONTRACTOR SHALL SUBMIT COMPLIANCE CHECKLIST TO BUILDING OFFICIAL UPON SUBSTANTIAL COMPLETION OF PROJECT. PROVIDE EQUIPMENT INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM.

### DEFINITIONS:

FURNISH MEANS TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR INSTALLATION.

INSTALL MEANS TO PLACE IN POSITION AND MAKE CONNECTIONS FOR SERVICE OR USE.

PROVIDE MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.

### WARRANTY:

PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT THE OWNER'S OPTION. CONTRACTOR SHALL INCLUDE ONE YEAR WARRANTY ON OWNER FURNISHED EQUIPMENT. CONTRACTOR SHALL INCLUDE COSTS FOR RECEIVING, HANDLING, STORAGE, AND HOISTING OF OWNER FURNISHED EQUIPMENT.

### COORDINATION:

COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE.

### DUCT DIMENSIONS:

UNLESS OTHERWISE NOTED, DUCT DIMENSIONS ON THE DRAWINGS ARE INSIDE CLEAR DIMENSIONS.

### MAKE-UP AIR UNIT:

UNIT SHALL HAVE AN INTEGRAL DISCHARGE THERMOSTAT LINKED TO THE INTERNAL CONTROLS. THE HEATER SHALL BE SET TO MAINTAIN DUCT SUPPLY TEMPERATURE AT NO LESS THAN 65 DEG. F. (ADJ.).

HIGH LIMIT SWITCH SET TO 180 DEG. F.

INTAKE AIR SENSOR SET TO 10 DEG. F. (ADJ.) LOWER THAN DISCHARGE AIR SENSOR.

### TEMPERATURE CONTROLS:

PROVIDE PROGRAMMABLE THERMOSTATS WITH REMOTE TEMPERATURE SENSORS AND REMOTE HUMIDISTATS COMPATIBLE WITH ROOFTOP UNIT. CONTROL WIRING SHALL BE INSTALLED IN CONDUIT. THERMOSTAT SHALL MEET SETPOINT ADJUSTMENT FOR UNO CURVED MODE: HEATING DOWN TO 55 DEGREES AND COOLING UP TO 85 DEGREES. PROVIDE INTERLOCK CONTROL WIRING BETWEEN HOOD EXHAUST FANS AND ROOFTOP UNITS.

### END OF SECTION

## SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

### PART 1 - GENERAL

#### 1.1 SECTION REQUIREMENTS

##### A. SUBMITTALS:

1. CERTIFIED TAB REPORTS.
2. TAB FIRM QUALIFICATIONS: NBC CERTIFIED.
3. TAB REPORT FORMS: STANDARD TAB CONTRACTOR'S FORMS APPROVED BY ARCHITECT.

##### PART 2 - PRODUCTS (NOT USED)

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

1. EXAMINE THE CONTRACT DOCUMENTS TO BECOME FAMILIAR WITH PROJECT REQUIREMENTS AND TO DISCOVER CONDITIONS IN SYSTEMS' DESIGNS THAT MAY PRECLUDE PROPER TAB OF SYSTEMS AND EQUIPMENT.
2. EXAMINE THE APPROVED SUBMITTALS FOR HVAC SYSTEMS AND EQUIPMENT.
3. EXAMINE SYSTEMS FOR INSTALLED BALANCING DEVICES, SUCH AS TEST PORTS, GAGE COCKS, THERMOMETER WELLS, FLOW-CONTROL DEVICES, BALANCING VALVES AND FITTINGS, AND MANUAL VOLUME DAMPERS. VERIFY THAT LOCATIONS OF THESE BALANCING DEVICES ARE ACCESSIBLE.
4. EXAMINE SYSTEM AND EQUIPMENT INSTALLATIONS AND VERIFY THAT FIELD QUALITY-CONTROL TESTING, CLEANING, AND ADJUSTING SPECIFIED IN INDIVIDUAL SECTIONS HAVE BEEN PERFORMED.
5. EXAMINE HVAC EQUIPMENT AND FILTERS AND VERIFY THAT BEARINGS ARE GREASED, BELTS ARE ALIGNED AND TIGHT, AND EQUIPMENT WITH FUNCTIONING CONTROLS IS READY FOR OPERATION.
6. EXAMINE TERMINAL UNITS, SUCH AS VARIABLE-AIR-VOLUME BOXES, AND VERIFY THAT THEY ARE ACCESSIBLE AND THEIR CONTROLS ARE CONNECTED AND FUNCTIONING.
7. EXAMINE AUTOMATIC TEMPERATURE SYSTEM COMPONENTS TO VERIFY THE FOLLOWING:
  1. DAMPERS, VALVES, AND OTHER CONTROLLED DEVICES ARE OPERATED BY THE INTENDED CONTROLLER.
  2. DAMPERS AND VALVES ARE IN THE POSITION INDICATED BY THE CONTROLLER.
  3. INTEGRITY OF DAMPERS AND VALVES FOR FREE AND FULL OPERATION AND FOR TIGHTNESS OF FULLY CLOSED AND FULLY OPEN POSITIONS. THIS INCLUDES DAMPERS IN MULTIZONE UNITS, MIXING BOXES, AND VARIABLE-AIR-VOLUME TERMINALS.
  4. AUTOMATIC MODULATING AND SHUTOFF VALVES, INCLUDING TWO-WAY VALVES AND THREE-WAY MIXING AND DIVERTING VALVES, ARE PROPERLY CONNECTED.
  5. THERMOSTATS AND HUMIDISTATS ARE LOCATED TO AVOID ADVERSE EFFECTS OF SUNLIGHT, DRAFTS, AND COLD WALLS.
  6. SENSORS ARE LOCATED TO SENSE ONLY THE INTENDED CONDITIONS.
  7. SEQUENCE OF OPERATION FOR CONTROL MODES IS ACCORDING TO THE CONTRACT DOCUMENTS.
  8. CONTROLLER SET POINTS ARE SET AT INDICATED VALUES.
  9. INTERLOCKED SYSTEMS ARE OPERATING.
  10. CHANGEOVER FROM HEATING TO COOLING MODE OCCURS ACCORDING TO INDICATED VALUES.
8. REPORT DEFICIENCIES DISCOVERED BEFORE AND DURING PERFORMANCE OF TEST AND BALANCE PROCEDURES.

#### 3.2 GENERAL PROCEDURES FOR TESTING AND BALANCING

1. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN AABC'S "NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE", NBC, ASHRAE 111, NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS" OR SMACNA'S "HVAC SYSTEMS - TESTING, ADJUSTING, AND BALANCING" AND IN THIS SECTION.
2. CUT INSULATION, DUCTS, PIPES, AND EQUIPMENT CABINETS FOR INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY FOR TAB PROCEDURES. AFTER TESTING AND BALANCING, PATCH PROBE HOLES IN DUCTS WITH SAME MATERIAL AND THICKNESS AS USED TO CONSTRUCT DUCTS. INSTALL AND JOIN NEW INSULATION THAT MATCHES REMOVED MATERIALS. RESTORE INSULATION, COVERINGS, VAPOR BARRIER, AND FINISH.
3. MARK EQUIPMENT AND BALANCING DEVICES, INCLUDING DAMPER-CONTROL POSITIONS, VALVE POSITION INDICATORS, FAN-SPEED-CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, WITH PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIAL TO SHOW FINAL SETTINGS.
- 3.3 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS
  1. PREPARE SCHEMATIC DIAGRAMS OF SYSTEMS "AS-BUILT" DUCT LAYOUTS.
  2. FOR VARIABLE-AIR-VOLUME SYSTEMS, DEVELOP A PLAN TO SIMULATE DIVERSITY.
  3. DETERMINE THE BEST LOCATIONS IN MAIN AND BRANCH DUCTS FOR ACCURATE DUCT AIRFLOW MEASUREMENTS.
  4. VERIFY THAT MOTOR STARTERS ARE EQUIPPED WITH PROPERLY SIZED THERMAL PROTECTION.
  5. CHECK FOR AIRFLOW BLOCKAGES.

- F. CHECK CONDENSATE DRAINS FOR PROPER CONNECTIONS AND FUNCTIONING.
- G. CHECK FOR PROPER SEALING OF AIR-HANDLING UNIT COMPONENTS.
- H. CHECK FOR PROPER SEALING OF AIR DUCT SYSTEM.

#### 3.4 TOLERANCES

- A. SET HVAC SYSTEM AIRFLOW AND WATER FLOW RATES WITHIN THE FOLLOWING TOLERANCES:
  1. SUPPLY, RETURN, AND EXHAUST FANS AND EQUIPMENT WITH FANS: PLUS OR MINUS 5 PERCENT.
  2. AIR OUTLETS AND INLETS: PLUS OR MINUS 10 PERCENT.

### END OF SECTION

## SECTION 230700 - HVAC INSULATION

### PART 1 - GENERAL

#### 1.1 SECTION REQUIREMENTS

- A. QUALITY ASSURANCE: LABELED WITH MAXIMUM FLAME-SPREAD INDEX OF 25 AND MAXIMUM SMOKE-DEVELOPED INDEX OF 50 ACCORDING TO ASTM E 84.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. SURFACE-BURNING CHARACTERISTICS:
  1. INDOOR INSULATION AND RELATED MATERIALS: TO BE FACTORY LABELED DESIGNATING MAXIMUM FLAME-SPREAD INDEX OF 25 OR LESS, AND SMOKE-DEVELOPED INDEX OF 50 OR LESS ACCORDING TO ASTM E 84.
2. INSULATION MATERIALS
  - A. FLEXIBLE ELASTOMERIC: CLOSED-CELL SPONGE-OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE I FOR TUBULAR MATERIALS AND TYPE II FOR SHEET MATERIALS.
  - B. MINERAL-FIBER BLANKET INSULATION: COMPLY WITH ASTM C 553, TYPE II AND ASTM C 1290, TYPE I.
    1. FSK JACKET: ALUMINUM-FOIL, FIBERGLASS-REINFORCED SCRIM WITH KRAFT-PAPER BACKING; COMPLYING WITH ASTM C 1136, TYPE II.
    2. FSK TAPE: FOIL-FACE, VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH ACRYLIC ADHESIVE; COMPLYING WITH ASTM C 1136.
  - C. MINERAL-FIBER, PIPE AND TANK INSULATION: COMPLYING WITH ASTM C 1393, TYPE II OR TYPE IIIA CATEGORY 2, OR WITH PROPERTIES SIMILAR TO ASTM C 612, TYPE IB; AND HAVING FACTORY-APPLIED ASJ JACKET, NOMINAL DENSITY IS 2.5 LB/CU. FT. OR MORE. THERMAL CONDUCTIVITY [K-VALUE] AT 100 DEG F IS 0.29 BTU IN./H X SQ. FT. X DEG F OR LESS.
    1. ASJ: WHITE, KRAFT-PAPER, FIBERGLASS-REINFORCED SCRIM WITH ALUMINUM-FOIL BACKING; COMPLYING WITH ASTM C 1136, TYPE I.
    2. ASJ TAPE: WHITE VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH ACRYLIC ADHESIVE, COMPLYING WITH ASTM C 1136.
  - D. FLEXIBLE ELASTOMERIC ADHESIVE: COMPLY WITH MIL-A-24179A, TYPE II, CLASS I.
  - E. MINERAL-FIBER ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2, GRADE A.
  - F. VAPOR-BARRIER MASTIC: WATER BASED; SUITABLE FOR INDOOR AND OUTDOOR USE ON BELOW AMBIENT SERVICES; COMPLY WITH MIL-PRF-19565C, TYPE II.

### PART 3 - EXECUTION

#### 3.1 INSULATION INSTALLATION

- A. COMPLY WITH REQUIREMENTS OF THE MIDWEST INSULATION CONTRACTORS ASSOCIATION'S "NATIONAL COMMERCIAL & INDUSTRIAL INSULATION STANDARDS" FOR INSULATION INSTALLATION ON PIPES AND EQUIPMENT.
- B. INSULATION INSTALLATION AT INTERIOR WALL AND PARTITION PENETRATIONS (THAT ARE NOT FIRE RATED): INSTALL INSULATION CONTINUOUSLY THROUGH WALLS AND PARTITIONS.
- C. INSULATION INSTALLATION AT FIRE-RATED WALL, PARTITION, AND FLOOR PENETRATIONS: INSTALL INSULATION CONTINUOUSLY THROUGH PENETRATIONS. SEAL PENETRATIONS. COMPLY WITH REQUIREMENTS IN SECTION 078400.
- D. FLEXIBLE ELASTOMERIC INSULATION INSTALLATION:
  1. SEAL LONGITUDINAL SEAMS AND END JOINTS WITH ADHESIVE TO ELIMINATE OPENINGS IN INSULATION THAT ALLOW PASSAGE OF AIR TO SURFACE BEING INSULATED.
  2. INSULATION INSTALLATION ON PIPE FITTINGS AND ELBOWS: INSTALL MITERED SECTIONS OF PIPE INSULATION. SECURE INSULATION MATERIALS AND SEAL SEAMS WITH ADHESIVE TO ELIMINATE OPENINGS IN INSULATION THAT ALLOW PASSAGE OF AIR TO SURFACE BEING INSULATED.
- E. MINERAL-FIBER INSULATION INSTALLATION:
  1. INSULATION INSTALLATION ON STRAIGHT PIPES AND TUBES: WHERE VAPOR BARRIERS ARE INDICATED, SEAL LONGITUDINAL SEAMS, END JOINTS, AND PROTRUSIONS WITH VAPOR-BARRIER MASTIC AND JOINT SEALANT.
  2. FOR INSULATION WITH FACTORY-APPLIED JACKETS ON ABOVE AMBIENT SURFACES, SECURE LAPS WITH OUTWARD CLINCHED STAPLES AT 6 INCHES O.C.
  3. FOR INSULATION WITH FACTORY-APPLIED JACKETS ON BELOW AMBIENT SURFACES, DO NOT STAPLE LONGITUDINAL TABS BUT SECURE TABS WITH ADDITIONAL ADHESIVE AS RECOMMENDED BY INSULATION MATERIAL MANUFACTURER AND SEAL WITH VAPOR-BARRIER MASTIC AND FLASHING SEALANT.
  4. BLANKET INSULATION INSTALLATION ON DUCTS AND PLENUMS: SECURE WITH ADHESIVE AND INSULATION PINS.
  5. FOR DUCTS AND PLENUMS WITH SURFACE TEMPERATURES BELOW AMBIENT, INSTALL A CONTINUOUS UNBROKEN VAPOR BARRIER.
- F. PLENUMS AND DUCTS REQUIRING INSULATION:
  1. CONCEALED SUPPLY AIR.
  2. CONCEALED AND EXPOSED OUTDOOR AIR.
  3. CONCEALED AND EXPOSED RETURN AIR LOCATED IN NONCONDITIONED SPACE.

#### 3.2 DUCT AND PLENUM INSULATION SCHEDULE

RETAIN "ONE OF" OPTION IN PARAGRAPHS IN THIS ARTICLE TO ALLOW CONTRACTOR TO SELECT PIPING MATERIALS FROM THOSE RETAINED.

- A. CONCEALED DUCT INSULATION SHALL BE 1-1/2" THICK MINERAL-FIBER BLANKET WITH A 1.5-LB/CU. FT. NOMINAL DENSITY.

#### 3.3 HVAC PIPING INSULATION SCHEDULE

- A. CONDENSATE PIPING: INSULATION SHALL BE 1" THICK FLEXIBLE ELASTOMERIC.
- B. REFRIGERANT PIPING: INSULATION SHALL BE 1" THICK FLEXIBLE ELASTOMERIC.

### END OF SECTION

## SECTION 232300 - REFRIGERANT PIPING

### PART 2 - PRODUCTS

#### 2.1 TUBES AND FITTINGS

- A. COPPER TUBE: ASTM B 88, TYPE K OR TYPE L, ANNEALED OR DRAWN-TEMPER TUBING AND WROUGHT-COPPER FITTINGS WITH BRAZED OR SOLDERED JOINTS.
  - B. WROUGHT-COPPER FITTINGS AND UNIONS: ASME B16.22.
  - C. SOLDER FILLER METALS: ASTM B 32. USE 95-5 TIN ANTIMONY OR ALLOY HB SOLDER TO JOIN COPPER SOCKET FITTINGS ON COPPER PIPE.
  - D. BRAZING FILLER METALS: AWS A5.8.
- #### 2.2 VALVES AND SPECIALTIES
- A. AS REQUIRED BY THE KITCHEN EQUIPMENT MANUFACTURER.

### PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. INSTALL REFRIGERANT PIPING AND CHARGE WITH REFRIGERANT ACCORDING TO ASHRAE 1.5.
- B. INSTALL REFRIGERANT PIPING AS REQUIRED BY THE KITCHEN EQUIPMENT MANUFACTURER.

### END OF SECTION

## SECTION 233100 - HVAC DUCTS AND CASINGS

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
  - B. STRUCTURAL PERFORMANCE: DUCT HANGERS AND SUPPORTS SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS DESCRIBED IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
  - C. COMPLY WITH NFPA 96 FOR DUCTS CONNECTED TO COMMERCIAL KITCHEN HOODS.
- #### 2.2 DUCTS
- A. ELECTROGALVANIZED-STEEL SHEET: ASTM A 879
    1. PAINTLOK/PAINTLOCK OR EQUAL.
  - B. GENERAL DUCTWORK SHALL BE GALVANIZED STEEL, ASTM A453/A435M, CONSTRUCTED TO THE GAUGE AND CORRESPONDING REINFORCING SCHEDULE AS INDICATED IN THE LATEST EDITION OF SMACNA.
    - C. TYPE 1 KITCHEN EXHAUST DUCTWORK
      1. FACTORY-BUILT COMMERCIAL KITCHEN GREASE DUCT:
        - a. INSTALL REDUCED CLEARANCE, ROUND, DOUBLE-WALL DRAUSE DUCT AS SPECIFIED MEETING UL 1978 REQUIREMENTS, REFER TO KITCHEN EQUIPMENT SUPPLIER DRAWINGS FOR REQUIREMENTS.
        - b. DUCTWORK AND FITTINGS FURNISHED BY OWNER FOR INSTALLATION BY THIS CONTRACTOR.
        - c. NO FIRE WRAP SHALL BE REQUIRED FOR THIS INSTALLATION.
    - D. TYPE 2 KITCHEN EXHAUST DUCTWORK: 18 GAUGE ALUMINUM OR STAINLESS STEEL. SEAMS SHALL BE CONTINUOUSLY WELDED LIQUID TIGHT.
    - E. JOINT AND SEAM TAPE, AND SEALANT: COMPLY WITH UL 181A. PROVIDE POLYMERIC RUBBER TYPE SEALANT FOR USE ON BOTH INTERIOR LOCATED DUCTWORK AND DUCTWORK EXPOSED TO OUTDOOR CONDITIONS. SEALER SHALL HAVE HIGH BONDING STRENGTH FOR SURE, FIRST TIME SEALING OF JOINTS IN LOW, MEDIUM, AND HIGH PRESSURE DUCT SYSTEMS. SEALER SHALL BE HIGH IN SOLID CONTENT, PROVIDE A TWO PART TAPE SEALING SYSTEM, CONSISTING OF WOVEN FIBER TAPE IMPREGNATED WITH A GYPSUM MINERAL COMPOUND, AND A MODIFIED ACRYLIC/SILOXANE ACTIVATOR THAT REACTS EXOTHERMICALLY WITH THE TAPE. TWO PART TAPE SEALING SYSTEM MUST BE RATED FOR BOTH INDOOR AND OUTDOOR APPLICATION. TAPE SHALL NOT CONTAIN ASBESTOS.
  - F. METAL DUCT FABRICATION: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

#### 2.3 ACCESSORIES

- A. VOLUME DAMPERS AND CONTROL DAMPERS: SINGLE-BLADE AND MULTIPLE OPPOSED-BLADE DAMPERS, STANDARD LEAKAGE RATING, HEAVY DUTY, AND SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS; FACTORY FABRICATED AND COMPLETE WITH REQUIRED HARDWARE AND ACCESSORIES.
  2. ROUND VOLUME DAMPERS: PROVIDE MINIMUM 20 GAUGE GALVANIZED STEEL FRAME AND BLADES, MINIMUM 3/8" SQUARE STEEL AXLE, MOLDED SYNTHETIC BEARINGS, WITH LOCKING POSITION REGULATOR. REGULATOR SHALL BE POSITIONED WITH SHEET METAL BRACKET BEYOND DUCT COVERING, WHERE POSITIONING REGULATOR IS NOT ACCESSIBLE. PROVIDE COUPLING AND EXTENSION ROD WITH REGULATOR FOR CEILING OR WALL INSTALLATION, AS REQUIRED.
  3. RECTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM 16 GAUGE GALVANIZED STEEL CHANNEL FRAME, 16 GAUGE GALVANIZED STEEL BLADES, MINIMUM 1/2" HEXAGONAL AXLE, BOLDED SYNTHETIC BEARINGS, WITH 3/8" SQUARE PLATED STEEL CONTROL SHAFT. LINKAGES SHALL BE CONCEALED IN THE FRAME. OPERATING SHAFT SHALL EXTEND BEYOND FRAME AND DUCT TO A LOCKING QUADRANT WITH ADJUSTABLE LEVER. MAXIMUM BLADE WIDTH SHALL NOT EXCEED 6".
- B. FLEXIBLE DUCT CONNECTORS: FLAME-RETARDED OR NONCOMBUSTIBLE FABRICS, COATINGS, AND ADHESIVES COMPLYING WITH UL 181, CLASS 1, CONNECTOR TO BE 30 OUNCE, NEOPRENE COATED, FIBERGLASS FABRIC.
- C. FLEXIBLE DUCTS: FACTORY ASSEMBLED, UL 181, CLASS 1, WITH 1-1/2-INCH THICK (R-5 MIN.), 1 PCF FIBERGLASS INSULATION AND REINFORCED OUTER PROTECTIVE COVER/VAPOR BARRIER. FLEXIBLE DUCT SHALL MEET NFPA 90A WITH FLAME SPREAD UNDER 25, SMOKE DEVELOPED UNDER 50, AND SHALL BE RATED FOR MINIMUM 2-INCH WG PRESSURE AND 0 TO 250°F TEMPERATURE. PROVIDE SCREW-OPERATED METAL ADJUSTABLE CLAMPING DEVICES, USE TWIST-LOCK CONICAL TAP COLLARS AT CONNECTIONS INTO SHEET METAL DUCTWORK, MAXIMUM EXTENDED LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FEET.
- D. TURNING VANES: PROVIDE FABRICATED TURNING VANES AND VANE RUNNERS, CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS". PROVIDE TURNING VANES CONSTRUCTED OF CURVED BLADES, SUPPORTED WITH BARS PERPENDICULAR TO BLADES, AND SET INTO SIDE STRIPS SUITABLE FOR MOUNTING IN DUCTWORK. FOLLOW SMACNA GUIDELINES FOR SPACING SUPPORT, AND CONSTRUCTION. ALL BLADES SHALL BE DOUBLE THICKNESS AIRFOIL TYPE.
- E. BIRD SCREENS AND FRAMES: PROVIDE BIRD SCREENS THAT CONFORM TO ASTM E 2016, NO. 2 MESH, ALUMINUM OR STAINLESS STEEL. PROVIDE "MEDIUM-LIGHT" RATED ALUMINUM SCREENS. PROVIDE "LIGHT" RATES STAINLESS STEEL SCREENS.
- F. DUCT-MOUNTED ACCESS DOORS: FABRICATE ACCESS PANELS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE"; FIGURES 2-10, "DUCT ACCESS DOORS AND PANELS," AND 2-11, "ACCESS PANELS - ROUND DUCT."

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. INSTALL DUCTWORK, ACCESSORIES, AND SUPPORTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" UNLESS OTHERWISE INDICATED.
  - B. SEAL DUCTS TO THE FOLLOWING SEAL CLASSES ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE": 1-INCH WG, SEAL CLASS A.
  - C. AVOID PASSING THROUGH OR ABOVE ELECTRICAL EQUIPMENT SPACES AND ENCLOSURES.
  - D. CLEAN DUCT SYSTEMS BEFORE TESTING, ADJUSTING, AND BALANCING.
- #### 3.2 DUCTWORK SCHEDULE
- A. EXPOSED DUCTWORK IN ARCHITECTURALLY FINISHED SPACES- ELECTRO-GALVANIZED STEEL SHEET.
  - B. CONCEALED DUCTWORK AND DUCTWORK IN UNFINISHED ARCHITECTURAL SPACES- GALVANIZED STEEL.

### END OF SECTION

## SECTION 233423 - HVAC EXHAUST FANS

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. PRODUCTS SHALL BE LICENSED TO USE THE AMCA-CERTIFIED RATINGS SEAL.
  - B. EXHAUST FANS SHALL COMPLY WITH UL 705, TYPE 1 FANS SHALL ALSO COMPLY WITH UL 742.
  - C. TYPE 1 FANS TO BE DESIGNED FOR HIGH HEAT OPERATION AT 300°F.
  - D. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
- #### 2.2 CENTRIFUGAL VENTILATORS
- A. HOUSING: REMOVABLE, SPUN-ALUMINUM, DOME TOP AND OUTLET BAFFLE; SQUARE, ONE-PIECE, ALUMINUM BASE WITH VENTURI INLET CONE.
    1. UPBLAST UNITS: ALUMINUM DISCHARGE BAFFLE TO DIRECT DISCHARGE AIR UPWARD, WITH RAIN AND SNOW DRAINS.
  - B. FAN WHEELS: ALUMINUM HUB AND WHEEL WITH BACKWARD-INCLINED BLADES.

### C. BELT-DRIVEN DRIVE ASSEMBLY: RESILIENTLY MOUNTED TO HOUSING.

1. FAN SHAFT: TURNED, GROUND, AND POLISHED STEEL; KEYED TO WHEEL HUB.
  2. SHAFT BEARINGS: PERMANENTLY LUBRICATED, PERMANENTLY SEALED, SELF-ALIGNING BALL BEARINGS.
  3. PULLEYS: CAST-IRON, ADJUSTABLE-PITCH MOTOR PULLEY.
  4. FAN AND MOTOR ISOLATED FROM EXHAUST AIRSTREAM.
- #### D. ACCESSORIES:
1. DISCONNECT SWITCH: NON-FUSIBLE TYPE, WITH THERMAL-OVERLOAD PROTECTION, FACTORY WIRED THROUGH AN INTERNAL ALUMINUM CONDUIT.
  2. BIRD SCREENS: REMOVABLE, 1/2-INCH MESH, ALUMINUM OR BRASS WIRE.
  3. DAMPERS: COUNTERBALANCED, PARALLEL-BLADE, BACKDRAFT DAMPERS MOUNTED IN CURB BASE; FACTORY SET TO CLOSE WHEN FAN STOPS.
  4. MOTORIZED DAMPERS: PARALLEL-BLADE DAMPERS MOUNTED IN CURB BASE WITH ELECTRIC ACTUATOR; WIRED TO CLOSE WHEN FAN STOPS.
- #### E. ROOF CURBS: 20 GAUGE GALVANIZED STEEL; MITERED AND WELDED CORNERS; 1-1/2-INCH THICK, RIGID, FIBERGLASS INSULATION ADHERED TO INSIDE WALLS; AND 1-1/2-INCH WOOD NAILER. SIZE AS REQUIRED TO SUIT ROOF OPENING AND FAN BASE.
1. CONFIGURATION: SELF-FLASHING WITHOUT A CANT STRIP, WITH MOUNTING FLANGE.
  2. OVERALL HEIGHT: 12 INCHES FOR GENERAL EXHAUST FANS; 20 INCHES FOR KITCHEN EXHAUST FANS.
  3. PITCH MOUNTING: MANUFACTURE CURB FOR ROOF SLOPE.
  4. MOUNTING PEDESTAL: GALVANIZED STEEL WITH REMOVABLE ACCESS PANEL.
  5. TYPE 1 ROOF CURBS TO BE VENTED TYPE.
  6. TYPE 1 AND TYPE 2 ROOF CURBS TO BE HINGED TYPE.
- #### F. CAPACITIES AND CHARACTERISTICS:
1. SEE SCHEDULE.
- #### G. MOTORS
- A.A. COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND EFFICIENCY REQUIREMENTS FOR MOTORS.
    - 1.1. MOTOR SIZES: MINIMUM SIZE AS INDICATED. IF NOT INDICATED, LARGE ENOUGH SO DRIVEN LOAD WILL NOT REQUIRE MOTOR TO OPERATE IN SERVICE FACTOR RANGE ABOVE 1.0.
  - A.B. ENCLOSURE TYPE: TOTALLY ENCLOSED, FAN COOLED.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. INSTALL UNITS WITH CLEARANCES FOR SERVICE AND MAINTENANCE.
- B. ROOF-MOUNTED UNITS: INSTALL ROOF CURB ON ROOF STRUCTURE, ACCORDING TO ARI GUIDELINE B. INSTALL AND SECURE ROOF-MOUNTED FANS ON CURBS, AND COORDINATE ROOF PENETRATIONS AND FLASHING WITH ROOF CONSTRUCTION.

### END OF SECTION

## SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

### PART 1 - GENERAL

#### PART 2 - PRODUCTS

##### 2.1 DIFFUSERS, REGISTERS, AND GRILLES:

- A. REFER TO SCHEDULES FOR FINISH TYPE, COLOR, MATERIAL, AND MOUNTING.

##### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. INSTALL DIFFUSERS, REGISTERS, AND GRILLES LEVEL AND PLUMB.
- B. CEILING-MOUNTED OUTLETS AND INLETS: DRAWINGS INDICATE GENERAL ARRANGEMENT OF DUCTS, FITTINGS, AND ACCESSORIES. MAKE FINAL LOCATIONS WHERE INDICATED, AS MUCH AS PRACTICAL. FOR UNITS INSTALLED IN LAY-IN CEILING PANELS, LOCATE UNITS IN THE CENTER OF PANEL UNLESS OTHERWISE INDICATED. WHERE ARCHITECTURAL FEATURES OR OTHER ITEMS CONFLICT WITH INSTALLATION, NOTIFY ARCHITECT FOR A DETERMINATION OF FINAL LOCATION.
- C. AFTER INSTALLATION, ADJUST DIFFUSERS, REGISTERS, AND GRILLES TO AIR PATTERNS INDICATED, OR AS DIRECTED, BEFORE STARTING AIR BALANCING.

#### 2. END OF SECTION



NOT FOR CONSTRUCTION REVIEW SET ONLY

CAVA

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