MECHANICAL GENERAL NOTES

1. PROVIDE AND INSTALL ALL LABOR, MATERIALS AND EQUIPMENT AS REQUIRED FOR A COMPLETE OPERABLE MECHANICAL SYSTEM AS REQUIRED.
2. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH AND CONFORM IN ALL ASPECTS TO THE LATEST ADOPTED EDITION OF ALL LOCAL, STATE, AND NATIONAL BUILDING CODES.
3. THE CONTRACTOR IS RESPONSIBLE FOR UNDERSTANDING AND FOLLOWING ALL CLIENTS/OWNERS' STANDARDS PRIOR TO BIDDING.
4. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
5. DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY PROJECT SCOPE AND GENERAL ARRANGEMENT. THE CONTRACTOR SHALL COORDINATE WITH ALL TRADES AND BE RESPONSIBLE FOR COORDINATION AND ACTUAL INSTALLATION LOCATIONS.
6. THE CONTRACTOR SHALL SUBMIT INSTALLATION SHOP DRAWINGS THAT INCLUDE ANY CONFLICTS WITH RECOMMENDATIONS THAT CORRECT THE CONFLICT. ALL SHOP DRAWINGS SHALL BE APPROVED BY THE ENGINEER PRIOR TO ANY INSTALLATIONS.
7. ALL HVAC SYSTEMS MOVING 2,000 CFM OR MORE, SHALL BE PROVIDED WITH DUCT-MOUNTED SMOKE DETECTORS IN THE SUPPLY AND RETURN AIR STREAMS. THE MECHANICAL CONTRACTOR SHALL INSTALL ALL SMOKE DETECTORS AND THE ELECTRICAL CONTRACTOR SHALL FURNISH AND WIRE ALL SMOKE DETECTORS. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR FOR ANY/ALL WIRING REQUIREMENTS TO SHUT DOWN AIRFLOW AND ACTIVATE THE CENTRAL FIRE ALARM SYSTEM UPON SENSING SMOKE. PROVIDE ANY/ALL ELECTRICAL CONTACTS AS NEEDED.
8. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION.
9. ALL INSTALLED EQUIPMENT, PIPING, DUCTWORK, ETC. SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 7'-6" THROUGHOUT ACCESS ROUTES.
10. ALL EQUIPMENT, DUCTWORK, PIPING ETC. SHALL BE TESTED PRIOR TO INSTALLATION OF INSULATION.
11. LOCATE ALL TEMPERATURE, PRESSURE AND FLOW MEASURING DEVICES IN AN ACCESSIBLE LOCATION AND INSTALLED PER MANUFACTURER RECOMMENDATIONS.
12. TESTING AND BALANCING SHALL BE PERFORMED BY A MEMBER OF THE ASSOCIATED AIR BALANCING COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). ALL WORK SHALL BE IN ACCORDANCE WITH THE AABC STANDARDS.
13. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCTS SHALL BE PROVIDED BY THE SAME MANUFACTURER.
14. ALL ELECTRICAL WIRING AND CONDUITS SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE.
15. PROVIDE ANY MISCELLANEOUS STEEL REQUIRED FOR PROPER INSTALLATION OF ALL EQUIPMENT, DUCTWORK, PIPING ETC..., AS REQUIRED.
16. DO NOT PROVIDE OR INSTALL ANY COMBUSTIBLE MATERIAL IN RETURN AIR PLENUMS. ALL MATERIALS SHALL MEET FLAME SPREAD AND SMOKE DEVELOPED RATING REQUIREMENTS OF ASTM E 84.
17. INSTALLATIONS SHALL PROVIDE NECESSARY ACCESS AND CLEARANCES AS REQUIRED BY THE MANUFACTURER, MAINTENANCE AND REQUIRED BY CODE.
18. PROVIDE ANY/ALL ACCESS DOORS REQUIRING ACCESS TO DAMPERS, CONTROLS, VALVES, ETC. ANY ACCESS DOORS LOCATED IN A RATED ASSEMBLY SHALL MEET THE RATING REQUIREMENTS.
19. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL SEISMIC RESTRAINTS REQUIRED BY CODE FOR ALL DUCTWORK, PIPING, EQUIPMENT ETC.
20. UNLESS OTHERWISE NOTED, ALL DUCTWORK DIMENSIONS SHOWN ON THE DRAWINGS ARE INTERNAL FREE AREA DIMENSIONS. SHEET METAL SIZE SHALL BE INCREASED AS REQUIRED FOR INTERNALLY LINED DUCTS.
21. ALL PIPING AND DUCTWORK OVERHEAD ARE INSTALLED TIGHT TO THE UNDERSIDE OF STRUCTURE. ELEVATIONS SHOWN ON DRAWINGS ARE AS FOLLOWS UNLESS NOTED OTHERWISE:
    A. PRESSURE PIPING – CENTER OF PIPE.
    B. GRAVITY PIPING – INVERT
    C. DUCTWORK – BOTTOM ON DUCT (BOD).
22. MOUNT ALL TEMPERATURE, HUMIDITY, CARBON DIOXIDE SENSORS ETC. PER MANUFACTURERS RECOMMENDATIONS AND ANSI REQUIREMENTS.
23. PROVIDE FLEXIBLE/EXPANSION JOINTS AT ALL BUILDING EXPANSION/SEISMIC LOCATIONS. FLEXIBLE/EXPANSION JOINTS SHALL ALLOW FOR A MINIMUM OF 2" MOVEMENT OR MATCH/EXCEED THE BUILDING MOVEMENT.
24. PROVIDE GALVANIZED SCH 40 PIPE SLEEVES AT ALL FLOOR AND WALL PENETRATIONS. ALL SLEEVES AT SLAB ON GRADE OR BELOW SHALL BE WATERPROOF.
25. PROVIDE FIRE SEALS AT ALL PENETRATIONS THROUGH FIRE RATED ASSEMBLIES. INSTALL IN ACCORDANCE WITH U.L. REQUIREMENTS.
26. PROVIDE HANGERS FOR DUCTWORK, PIPING, EQUIPMENT, TRANSFORMERS ETC... HANGERS SHALL BE GALV. THREADED STEEL RODS, GALV. STEEL ANGLES, GALV. CHANNELS, OR SIMILAR DEVICES MEETING MSS STANDARDS AND SECURELY ATTACHED TO THE BUILDING STRUCTURAL STEEL COMPONENTS. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. ALL CONNECTIONS SHALL BE COORDINATED WITH GENERAL CONTRACTOR. WELDING TO STRUCTURAL COMPONENTS SHALL NOT BE PERMITTED. IT IS NOT INTENDED FOR HANGERS TO BE PRIMARILY SUPPORTED FROM THE FLOOR DECKING. WHERE UNAVOIDABLE, REFER TO STEEL DECKING SPECIFICATIONS FOR REQUIREMENTS PERTAINING TO HANGERS SUPPORTED BY THE FLOOR DECK. DO NOT INSTALL ANY HANGERS DIRECTLY TO THE ROOF DECK.

MECANICAL ABBREVIATIONS

(NOT ALL SYMBOLS MAY APPEAR ON DRAWINGS)

A	
A	AMPS, AMPERE
ABC	ABOVE COUNTER
ABV	ABOVE
AC	AIR CONDITIONING UNIT
AC	ALTERNATING CURRENT
ACS PNL	ACCESS PANEL
ACU	AIR-COOLED CONDENSING UNIT
ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFR	ABOVE FINISHED ROOF
AHU	AIR HANDLING UNIT
AL	ACOUSTIC LINING
AMB	AMBIENT
AUX	AUXILIARY, AUXILIARIES
AV	AUDIO VISUAL
B	
BDD	BACKDRAFT DAMPER
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
C	
CAT	CATALOGUE
CD	CONDENSATE DRAIN
CF	CIRCULATION FAN
CFH	CUBID FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CI	CAST IRON
CKT	CIRCUIT
CLG	CEILING
CO	CLEAN OUT, CARBON MONOXIDE
CO2	CARBON DIOXIDE
COD	CABLE OPERATED VOLUME DAMPER
COL	COLUMN
COMM	COMMUNICATION
CONC	CONCRETE
CONN	CONNECT
CONST	CONSTRUCTION
CONT	CONTINUOUS
COP	COEFFICIENT OF PERFORMANCE
CRAC	COMPUTER ROOM AIR CONDITIONING UNIT
CT	COOLING TOWER
CU	CONDENSING UNIT
CVO	COLD WATER VALVED OPENING
CW	COLD WATER
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
D	
D	DEPTH
DB	DRY BULB
DCV	DEMAND CONTROLLED VENTILATION
DEMARC	TELECOMMUNICATION DEMARCATION BOARD
DIA	DIAMETER
DIFF	DIFFUSER
DN	DOWN
DOAS	DEDICATED OUTSIDE AIR SYSTEM
DTL	DETAIL
DTL	DETAIL
DWG	DRAWING
E	
EA	EACH
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECH	ELECTRIC CEILING HEATER
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EMER	EMERGENCY
EQUIP	EQUIPMENT
ER	EXISTING TO BE REMOVED
ERV	ENERGY RECOVERY VENTILATOR
ESP	EXTERNAL STATIC PRESSURE
ETR	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
EWH	ELECTRIC WALL HEATER
EWT	ENTERING WATER TEMPEARTURE
EXH	EXHAUST
EXIST, EXG	EXISTING
EXP	EXPANSION
F	
F	DEGREES FAHRENHEIT
F/A	FROM ABOVE
F/B	FROM BELOW
FA	FREE AREA
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FPB	FAN POWERED VAV TERMINAL UNIT
FPM	FEET PER MINUTE
FSD	COMBINATION FIRE/SMOKE DAMPER
FT	FEET
G	
G	GROUND
GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
H	
H	HEIGHT, HYDROGEN
HD	HEAD
HORIZ	HORIZONTAL
HP	HORSEPOWER
HTG	HEATING
HUM	HUMIDITY
HVAC	HEATING, VENTILATION & AIR CONDITIONING
HVLS	HIGH VOLUME LOW SPEED
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
I	
IDF	INDIVIDUAL DISTRIBUTION FRAME - DATA
IN	INCHES
IN WC	INCHES WATER COLUMN
K	
KVA	KILOVOLT AMPERES
KW	KILOWATT
KWH	KILOWATT - HOUR
L	
L	LENGTH
LAT	LEAVING AIR TEMPERATURE
LAT	LATENT (BTU)
LB	POUNDS (WEIGHT)
LD	LINEAR DIFFUSER
LIN FT	LINEAR FOOT
LPR	LOW PRESSURE STEAM RETURN
LPS	LOW PRESSURE STEAM SUPPLY
LTG	LIGHTING
LWT	LEAVING WATER TEMPERATURE
M	
mA	MILI AMPS
MAX	MAXIMUM
MBH	THOUSAND BRITISH THERMAL UNIT PER HOUR
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDF	MAIN DISTRIBUTION FRAME - DATA
MECH	MECHANICAL
MH	METHANE
MIN	MINIMUM
MISC	MISCELLANEOUS
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MTR	MOTOR
MTRZD	MOTORIZED
N	
#	NUMBER
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NO2	NITROGEN DIOXIDE
O	
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OCC	OCCUPANCY
OD	OUTSIDE DIAMETER
OED	OPEN-ENDED DUCT
OZ	OUNCE
P	
PD	PRESSURE DROP
PD	PUMPED DISCHARGE
PE	PHOTO-ELECTRIC
PERF	PERFORATED
PF	POWER FACTOR
PH	PHASE
PLBG	PLUMBING
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
PSIG	POUNDS PER SQUARE INCH - GAUGE
PVC	POLYVINYL CHLORIDE
PWR	POWER
R	
RA	RETURN AIR
RCP	REFLECTED CEILING PLAN
REC	RECEPTACLE
REF	REFERENCE
REFR	REFRIGERATOR
REQ	REQUIRED
RGD	REGISTERS, GRILLES & DIFFUSERS
RH	RELATIVE HUMIDITY
RLA	RUNNING LOAD AMPS
RLFA	RELIEF AIR
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RQ	REQUIREMENT
RT	RAINTIGHT
RTU	ROOFTOP UNIT
S	
SA	SUPPLY AIR
SD	SMOKE DETECTOR
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SEF	SMOKE EXHAUST FAN
SENS	SENSIBLE (BTU)
SHT	SHEET
SHT MTL	SHEET METAL
SP	STATIC PRESSURE
SPECS	SPECIFICATIONS
SPEF	SMOKE PURGE EXHAUST FAN
SPKR	SPEAKER
SQ	SQUARE
SQFT, SF	SQUARE FEET
STD	STANDARD
SURF	SURFACE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRICAL
T	
T-STAT	THERMOSTAT
TC	TIMECLOCK
TELE	TELEPHONE
TOT	TOTAL (BTU)
TYP	TYPICAL
U	
UF	UNDERFLOOR
UON	UNLESS OTHERWISE NOTED
V	
V	VOLT
VA	VALVE
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VERT	VERTICAL
VT	VENT
VTL	VENTILATION
VV	VARIABLE VOLUME TERMINAL UNIT
W	
W	WATTS
W	WIDTH
WB	WET BULB
WH	WATER HEATER
WMS	WIRE MESH SCREEN
WP	WEATHERPROOF
WT	WEIGHT

MECHANICAL PIPING LEGEND

(NOT ALL SYMBOLS MAY APPEAR ON DRAWINGS)

SYMBOL	DESCRIPTION
CD	CONDENSATE PIPING
PD	PUMPED DISCHARGE PIPING
HWS	HOT WATER SUPPLY PIPING
HWR	HOT WATER RETURN PIPING
CHWS	CHILLED WATER SUPPLY PIPING
CHWR	CHILLED WATER RETURN PIPING
CWS	CONDENSER WATER SUPPLY PIPING
CWR	CONDENSER WATER RETURN PIPING
DTWS	DUAL TEMPERATURE WATER SUPPLY
DTWR	DUAL TEMPERATURE WATER RETURN
LPS	LOW PRESSURE STEAM SUPPLY
LPR	LOW PRESSURE STEAM RETURN
	GATE VALVE
	BALL VALVE
	CHECK VALVE
	T&P SAFETY RELIEF VALVE
	BUTTERFLY VALVE
	UNION
	2-WAYCONTROL VALVE
	3-WAYCONTROL VALVE
	CONCENTRIC REDUCER

HVAC DESIGN CONDITIONS

JOB LOCATION: DAYTONA BEACH, FL

ELEVATION: 26
CLIMATE ZONE 2A

DESIGN CONDITIONS (BASIS OF DESIGN):

35.7°F WINTER DRY BULB - ASHRAE 99.6%
89.5°F DRY BULB AND 77.2°F WET BULB SUMMER DESIGN - ASHRAE 2%

60°F WINTER INDOOR DESIGN DRY BULB - OCCUPIED HEATING
55°F WINTER INDOOR DESIGN DRY BULB - UNOCCUPIED HEATING
80°F DRY BULB AND 50%RH SUMMER INDOOR DESIGN - OCCUPIED COOLING
85°F DRY BULB AND 50%RH SUMMER INDOOR DESIGN - UNOCCUPIED COOLING

CALCULATIONS BASED ON ASHRAE DESIGN CRITERIA AND CALCULATION METHODOLOGY.

MECHANICAL DRAWING LIST

SHEET NO.	SHEET TITLE
M001	MECHANICAL NOTES, SYMBOL LEGEND, & ABBREVIATIONS
M002	LOAD CALCULATIONS AND ENERGY COMPLIANCE
M101	FIRST FLOOR MECHANICAL PLAN
M401	ENLARGED VIEWS
M501	MECHANICAL DETAILS
M601	MECHANICAL SCHEDULES
M701	MECHANICAL GAS DETECTION CONTROL DIAGRAMS

MECHANICAL LEGEND

(NOT ALL SYMBOLS MAY APPEAR ON DRAWINGS)

SYMBOL	DESCRIPTION
	90° ELBOW DOWN
	90° ELBOW UP
	ROUND RADIUS ELBOW
	45° ELBOW
	90° ELBOW DOWN
	90° ELBOW UP
	RECTANGULAR RADIUS ELBOW
	RECTANGULAR ELBOW WITH TURNING VANES
	BRANCH TAKE-OFF WITH ANGLED TAP & VOLUME DAMPER
	REDUCER, ECCENTRIC
	REDUCER, CONCENTRIC
	INTERNAL ACOUSTICALLY LINED DUCTWORK
	INSULATED DUCTWORK
	SUPPLY DUCT
	RETURN DUCT
	EXHAUST DUCT
	ROUND DUCT
	FLEXIBLE DUCT CONNECTION
	EXISTING DUCT TO REMAIN
	EXISTING DUCT TO BE REMOVED
	NEW DUCT
	SUPPLY AIR DIFFUSER
	RETURN GRILLE
	EXHAUST GRILLE
	MANUAL VOLUME DAMPER
M	MOTORIZED DAMPER
BD	BACKDRAFT DAMPER
FD	FIRE DAMPER
SD	SMOKE DAMPER
FSD	COMBINATION FIRE-SMOKE DAMPER
NO2 CO	SPACE COMBINATION NITROGEN DIOXIDE AND CARBON MONOXIDE SENSOR
FCP	FAN CONTROL PANEL
TH	COMBINATION TEMPERATURE AND RELATIVE HUMIDITY SENSOR
SD	DUCT SMOKE DETECTOR
CO2	SPACE OR DUCT CARBON DIOXIDE SENSOR
CO	SPACE CARBON MONOXIDE SENSOR
H	SPACE HYDROGEN SENSOR
T	SPACE OR DUCT TEMPERATURE THERMOSTAT
RH	SPACE OR DUCT RELATIVE HUMIDITY SENSOR
NO2	SPACE NITROGEN DIOXIDE SENSOR
OCC	SPACE OCCUPANCY SENSOR
1/2"	UNDERCUT DOOR - NUMBER DENOTES DOOR UNDERCUT
	RETURN / EXHAUST AIRFLOW DIRECTION
	SUPPLY AIRFLOW DIRECTION
	WATER FLOW DIRECTION
	PIPING GUIDE
	PIPING ANCHOR
	DISCONNECTION POINT
	CONNECTION POINT
#	KEYNOTE

Architecture
Engineering
Environmental
Land Surveying
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Meriden, CT 06405
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(203) 630-2615 Fax

JESSE E. VOSE LICENSE No. 82504 STATE OF FLORIDA PROFESSIONAL ENGINEER

Jesse E Vose, PE

This item has been digitally signed and sealed by Jesse E. Vose on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

DMO4 - CANOPY ENCLOSURE

2400 MASON AVE
DAYTONA BEACH FL 32114

NO	DATE	DESCRIPTION

REVISIONS

DESIGNED:	RV
DRAWN:	RV
REVIEWED:	JV
PROJECT NO.:	2501635
DATE:	1/12/2026
ISSUED FOR:	PERMIT SET

TITLE:

MECHANICAL NOTES, SYMBOL LEGEND, & ABBREVIATIONS

SHEET NUMBER

M001

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1/8/2026 12:53:15 PM

Air System Sizing Summary for Canopy 1
(In Alternative: Default Alternative)

Project: 2501635 - DMO4 Canopies — 07/15/2025
Prepared by: BL Companies — 1:12 PM

Air System Information

Air System Name	Canopy 1	Number of zones	1	
Equipment Class	PKG ROOF	Floor Area	21968.7	sqft
Air System Type	SZCAV	Location	Daytona Beach Intl, FL, USA	

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	40.1	Tons	Peak coil load occurs at	July 13:00	
Total coil load	481.7	MBH	OA DB / WB	90.7 / 76.7	F
Sensible coil load	285.6	MBH	Entering DB / WB	74.5 / 63.9	F
Coil CFM at peak load	6271	CFM	Leaving DB / WB	32.7 / 32.7	F
Sum of peak zone CFM	6271	CFM	Resulting RH	51	%
Sensible heat ratio	0.593		Design supply temp.	58.0	F
CFM/Ton	156.2		Zone T-stat Check	1 of 1	OK
sqft/Ton	547.2		Max zone temperature deviation	0.0	F
BTU/(hr sqft)	21.9				
Water flow @ 10.0 F rise	N/A				

Central Heating Coil Sizing Data

Max coil load	145.0	MBH	Load occurs at	Design Heating	
Coil CFM at Design Heating	6271	CFM	BTU/(hr sqft)	6.6	
Max coil CFM	6271	CFM	Ent. DB / Lvg DB	54.7 / 76.0	F
Water flow @ 20.0 F drop	N/A				

Dehumidification Reheat Coil Sizing Data

Max coil load	132.7	MBH	Load occurs at	June 6:00	
Coil CFM at June 6:00	6271	CFM	BTU/(hr sqft)	6.0	
Max coil CFM	6271	CFM	Ent. DB / Lvg DB	36.4 / 55.9	F
Water flow @ 20.0 F drop	N/A				

Supply Fan Sizing Data

Design CFM	6271	CFM	Fan motor BHP	3.43	BHP
Design CFM/sqft	0.29	CFM/sqft	Fan motor kW	2.72	kW
			Fan total static	2.00	in wg

Outdoor Ventilation Air Data

Design airflow CFM	2197	CFM	CFM/person	50.00	CFM/person
CFM/sqft	0.10	CFM/sqft			

Zone Sizing Summary for Canopy 1
(In Alternative: Default Alternative)

Project: 2501635 - DMO4 Canopies — 07/15/2025
Prepared by: BL Companies — 1:12 PM

Air System Information

Air System Name	Canopy 1	Number of zones	1	
Equipment Class	PKG ROOF	Floor Area	21968.7	sqft
Air System Type	SZCAV	Location	Daytona Beach Intl, FL, USA	

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/sqft	Reheat Coil Capacity (MBH)	Reheat Coil Water gpm @ 20.0 F	Zone Htg Unit Coil Capacity (MBH)	Zone Htg Unit Water gpm @ 20.0 F	Mixing Box Fan Airflow (CFM)
Zone 1	6271	6271	0.29	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (sqft)
Zone 1	115.0	August 15:00	83.3	21968.7

Space Loads and Airflows

Zone Name / Space Name	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (sqft)	Space CFM/sqft
Zone 1						
Canopy 1	115.0	August 15:00	6271	83.3	21968.7	0.29

Air System Heat Balance Summary for Canopy 1
(In Alternative: Default Alternative)

Project: 2501635 - DMO4 Canopies — 07/15/2025
Prepared by: BL Companies — 1:12 PM

Table 1. System Loads

	DESIGN COOLING - JULY 13:00 OA DB / WB 90.7 F / 76.7 F			DESIGN HEATING OA DB / WB 35.7 F / 29.9 F		
COMPONENT LOADS	Details	Sensible [BTU/hr]	Latent [BTU/hr]	Details	Sensible [BTU/hr]	Latent [BTU/hr]
Zone Conditioning	-	164800	85690	-	84432	0
Plenum Load	-	0	0	-	0	0
Return Fan Load	6271 CFM	0	-	6271 CFM	0	-
Ventilation Load	2197 CFM	59689	102949	2197 CFM	69440	0
Supply Fan Load	6271 CFM	9298	-	6271 CFM	-9298	-
Zone Fan Coil Fans Load	-	0	-	-	0	-
>> Total System Loads	-	233786	188639	-	144575	0
Central Cooling Coil	-	285606	196122	-	0	0
Central Heating Coil	-	0	-	-	144994	-
Dehumidification Reheat Coil	-	-61516	-	-	0	-
>> Total Conditioning	-	224091	196122	-	144994	0
Key:	Positive values are cooling loads Negative values are heating loads			Positive values are heating loads Negative values are cooling loads		

Table 2. Zone Heat Balance Loads

	DESIGN COOLING - JULY 13:00 OA DB / WB 90.7 F / 76.7 F			DESIGN HEATING OA DB / WB 35.7 F / 29.9 F		
Zone Heat Balance Component	Details	Sensible [BTU/hr]	Latent [BTU/hr]	Details	Sensible [BTU/hr]	Latent [BTU/hr]
Exterior Wall Convection	6085 sqft	12994	-	6085 sqft	8692	-
Roof Convection	21969 sqft	35171	-	21969 sqft	20210	-
Window Convection	0 sqft	0	-	0 sqft	0	-
Skylight Convection	0 sqft	0	-	0 sqft	0	-
Door Convection	762 sqft	2263	-	762 sqft	2123	-
Floor Convection	21969 sqft	16156	-	21969 sqft	21229	-
Interior Wall Convection	4329 sqft	3022	-	4329 sqft	1838	-
Ceiling Convection	0 sqft	0	-	0 sqft	0	-
Overhead Lighting Convection	15158 W	21879	-	0 W	0	-
Task Lighting Convection	0 W	0	-	0 W	0	-
Electric Equipment Convection	0 W	0	-	0 W	0	-
People Convection	44	3888	19992	0	0	0
Infiltration	808 CFM	14194	29468	919 CFM	29224	0
Miscellaneous Equipment	-	0	0	-	0	0
Air Internal Energy Change	-	0		-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	109568	49459	-	83315	0
Key:	Positive values are cooling loads Negative values are heating loads			Positive values are heating loads Negative values are cooling loads		

Note 1: Surface convection line items show the combined effects of conductive heat gain to the surface and radiative heat gains absorbed at the surface which are then convected to room air.

Note 2: Lighting, equipment, and people line items include only the direct convective heat gain from the heat source to the room air. The radiative portion of the heat gain is first absorbed by surfaces in the room and then later convected from the surface to the air. Therefore the effect of the radiative portion of the heat gain is found in the surface convection line items.

Note 3: Solar heat gain is absorbed by surfaces in the room, re-radiated to other surfaces, and finally convected from the surfaces to room air. Therefore, the effect of solar heat gain is found in the surface convection line items.

System Psychrometrics for Canopy 1
(In Alternative: Default Alternative)

Project: 2501635 - DMO4 Canopies — 07/15/2025
Prepared by: BL Companies — 1:12 PM

DESIGN COOLING DAY AT JULY 13:00

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)
Ventilation Air	Inlet	90.8	0.01665	2197	400	59689	102949
Vent - Return Mixing	Outlet	74.5	0.01022	6271	579	-	-
Central Cooling Coil	Outlet	32.7	0.00388	6271	579	285606	196122
Central Heating Coil	Outlet	32.7	0.00388	6271	579	61516	-
Supply Fan	Outlet	34.1	0.00388	6271	579	9298	-
Dehumid. Reheat Coil	Outlet	43.1	0.00388	6271	579	61516	-
Cold Supply Duct	Outlet	43.1	0.00388	6271	579	-	-
Zone Air	-	65.3	0.00668	6271	677	164800	85690
Return Air	Outlet	65.6	0.00676	6271	675	-	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.080; At site altitude = 1.079 BTU/(hr-CFM-F)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 4746.6; At site altitude = 4741.3 BTU/(hr-CFM)
Site Altitude = 31.0 ft

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (BTU/hr)	T-stat Mode	Zone Cond (BTU/hr)	Zone Temp (F)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Unit (BTU/hr)
Zone 1	0	Deadband	152386	65.3	6271	677	0	0

System Psychrometrics for Canopy 1
(In Alternative: Default Alternative)

Project: 2501635 - DMO4 Canopies — 07/15/2025
Prepared by: BL Companies — 1:12 PM

WINTER DESIGN HEATING

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)
Ventilation Air	Inlet	35.7	0.00199	2197	400	-69440	0
Vent - Return Mixing	Outlet	54.7	0.00199	6271	400	-	-
Central Cooling Coil	Outlet	54.7	0.00199	6271	400	0	0
Central Heating Coil	Outlet	76.0	0.00199	6271	400	144994	-
Supply Fan	Outlet	77.4	0.00199	6271	400	9298	-
Dehumid. Reheat Coil	Outlet	77.4	0.00199	6271	400	0	-
Cold Supply Duct	Outlet	77.4	0.00199	6271	400	-	-
Zone Air	-	65.0	0.00199	6271	400	-84432	0
Return Air	Outlet	65.0	0.00199	6271	400	-	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.080; At site altitude = 1.079 BTU/(hr-CFM-F)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 4746.6; At site altitude = 4741.3 BTU/(hr-CFM)
Site Altitude = 31.0 ft

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (BTU/hr)	T-stat Mode	Zone Cond (BTU/hr)	Zone Temp (F)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Unit (BTU/hr)
Zone 1	-84432	Heating	-84432	65.0	6271	400	0	0

Air System Sizing Summary for Canopy 2
(In Alternative: Default Alternative)

Project: 2501635 - DMO4 Canopies — 07/15/2025
Prepared by: BL Companies — 1:12 PM

Air System Information

Air System Name	Canopy 2	Number of zones	1	
Equipment Class	PKG ROOF	Floor Area	21631.5	sqft
Air System Type	SZCAV	Location	Daytona Beach Intl, FL, USA	

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	39.9	Tons	Peak coil load occurs at	June 15:00	
Total coil load	478.7	MBH	OA DB / WB	91.6 / 77.2	F
Sensible coil load	283.7	MBH	Entering DB / WB	74.7 / 64.0	F
Coil CFM at peak load	6266	CFM	Leaving DB / WB	33.1 / 33.1	F
Sum of peak zone CFM	6266	CFM	Resulting RH	51	%
Sensible heat ratio	0.593		Design supply temp.	58.0	F
CFM/Ton	157.1		Zone T-stat Check	1 of 1	OK
sqft/Ton	542.3		Max zone temperature deviation	0.0	F
BTU/(hr sqft)	22.1				
Water flow @ 10.0 F rise	N/A				

Central Heating Coil Sizing Data

Max coil load	146.4	MBH	Load occurs at	Design Heating	
Coil CFM at Design Heating	6266	CFM	BTU/(hr sqft)	6.8	
Max coil CFM	6266	CFM	Ent. DB / Lvg DB	54.9 / 76.4	F
Water flow @ 20.0 F drop	N/A				

Dehumidification Reheat Coil Sizing Data

Max coil load	128.1	MBH	Load occurs at	November 10:00	
Coil CFM at November 10:00	6266	CFM	BTU/(hr sqft)	5.9	
Max coil CFM	6266	CFM	Ent. DB / Lvg DB	35.2 / 54.1	F
Water flow @ 20.0 F drop	N/A				

Supply Fan Sizing Data

Design CFM	6266	CFM	Fan motor BHP	3.43	BHP
Design CFM/sqft	0.29	CFM/sqft	Fan motor kW	2.72	kW
			Fan total static	2.00	in wg

Outdoor Ventilation Air Data

Design airflow CFM	2163	CFM	CFM/person	50.00	CFM/person
CFM/sqft	0.10	CFM/sqft			

Zone Sizing Summary for Canopy 2
(In Alternative: Default Alternative)

Project: 2501635 - DMO4 Canopies — 07/15/2025
Prepared by: BL Companies — 1:12 PM

Air System Information

Air System Name	Canopy 2	Number of zones	1	
Equipment Class	PKG ROOF	Floor Area	21631.5	sqft
Air System Type	SZCAV	Location	Daytona Beach Intl, FL, USA	

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/sqft	Reheat Coil Capacity (MBH)	Reheat Coil Water gpm @ 20.0 F	Zone Htg Unit Coil Capacity (MBH)	Zone Htg Unit Water gpm @ 20.0 F	Mixing Box Fan Airflow (CFM)
Zone 2	6266	6266	0.29	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (sqft)
Zone 2	114.9	July 16:00	85.6	21631.5

Space Loads and Airflows

Zone Name / Space Name	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (sqft)	Space CFM/sqft
Zone 2						
Canopy 2	114.9	July 16:00	6266	85.6	21631.5	0.29

Air System Heat Balance Summary for Canopy 2
(In Alternative: Default Alternative)

Project: 2501635 - DMO4 Canopies — 07/15/2025
Prepared by: BL Companies — 1:12 PM

Table 1. System Loads

	DESIGN COOLING - JUNE 15:00 OA DB / WB 91.6 F / 77.2 F			DESIGN HEATING OA DB / WB 35.7 F / 29.9 F		
COMPONENT LOADS	Details	Sensible [BTU/hr]	Latent [BTU/hr]	Details	Sensible [BTU/hr]	Latent [BTU/hr]
Zone Conditioning	-	167963	83797	-	86865	0
Plenum Load	-	0	0	-	0	0
Return Fan Load	6266 CFM	0	-	6266 CFM	0	-
Ventilation Load	2163 CFM	60469	103684	2163 CFM	68374	0
Supply Fan Load	6266 CFM	9290	-	6266 CFM	-9290	-
Zone Fan Coil Fans Load	-	0	-	-	0	-
>> Total System Loads	-	237721	187481	-	145949	0
Central Cooling Coil	-	283725	194931	-	0	0
Central Heating Coil	-	0	-	-	146362	-
Dehumidification Reheat Coil	-	-55839	-	-	0	-
>> Total Conditioning	-	227886	194931	-	146362	0
Key:	Positive values are cooling loads Negative values are heating loads			Positive values are heating loads Negative values are cooling loads		

Table 2. Zone Heat Balance Loads

	DESIGN COOLING - JUNE 15:00 OA DB / WB 91.6 F / 77.2 F			DESIGN HEATING OA DB / WB 35.7 F / 29.9 F		
Zone Heat Balance Component	Details	Sensible [BTU/hr]	Latent [BTU/hr]	Details	Sensible [BTU/hr]	Latent [BTU/hr]
Exterior Wall Convection	6963 sqft	10737	-	6963 sqft	10078	-
Roof Convection	21632 sqft	37941	-	21632 sqft	20438	-
Window Convection	0 sqft	0	-	0 sqft	0	-
Skylight Convection	0 sqft	0	-	0 sqft	0	-
Door Convection	762 sqft	2676	-	762 sqft	2147	-
Floor Convection	21632 sqft	17332	-	21632 sqft	22719	-
Interior Wall Convection	3337 sqft	2432	-	3337 sqft	1472	-
Ceiling Convection	0 sqft	0	-	0 sqft	0	-
Overhead Lighting Convection	14926 W	21543	-	0 W	0	-
Task Lighting Convection	0 W	0	-	0 W	0	-
Electric Equipment Convection	0 W	0	-	0 W	0	-
People Convection	43	3829	19685	0	0	0
Infiltration	794 CFM	14634	29863	905 CFM	28775	0
Miscellaneous Equipment	-	0	0	-	0	0
Air Internal Energy Change	-	0		-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	111125	49547	-	85629	0
Key:	Positive values are cooling loads Negative values are heating loads			Positive values are heating loads Negative values are cooling loads		

Note 1: Surface convection line items show the combined effects of conductive heat gain to the surface and radiative heat gains absorbed at the surface which are then convected to room air.

Note 2: Lighting, equipment, and people line items include only the direct convective heat gain from the heat source to the room air. The radiative portion of the heat gain is first absorbed by surfaces in the room and then later convected from the surface to the air. Therefore the effect of the radiative portion of the heat gain is found in the surface convection line items.

Note 3: Solar heat gain is absorbed by surfaces in the room, re-radiated to other surfaces, and finally convected from the surfaces to room air. Therefore, the effect of solar heat gain is found in the surface convection line items.

System Psychrometrics for Canopy 2
(In Alternative: Default Alternative)

Project: 2501635 - DMO4 Canopies — 07/15/2025
Prepared by: BL Companies — 1:12 PM

DESIGN COOLING DAY AT JUNE 15:00

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)
Ventilation Air	Inlet	91.5	0.01687	2163	400	60469	103684
Vent - Return Mixing	Outlet	74.7	0.01026	6266	586	-	-
Central Cooling Coil	Outlet	33.1	0.00394	6266	586	283725	194931
Central Heating Coil	Outlet	33.1	0.00394	6266	586	55839	-
Supply Fan	Outlet	34.5	0.00394	6266	586	9290	-
Dehumid. Reheat Coil	Outlet	42.6	0.00394	6266	586	55839	-
Cold Supply Duct	Outlet	42.6	0.00394	6266	586	-	-
Zone Air	-	65.3	0.00669	6266	685	167963	83797
Return Air	Outlet	65.6	0.00677	6266	685	-	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.080; At site altitude = 1.079 BTU/(hr-CFM-F)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 4746.6; At site altitude = 4741.3 BTU/(hr-CFM)
Site Altitude = 31.0 ft

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (BTU/hr)	T-stat Mode	Zone Cond (BTU/hr)	Zone Temp (F)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Unit (BTU/hr)
Zone 2	0	Deadband	155278	65.3	6266	685	0	0

System Psychrometrics for Canopy 2
(In Alternative: Default Alternative)

Project: 2501635 - DMO4 Canopies — 07/15/2025
Prepared by: BL Companies — 1:12 PM

WINTER DESIGN HEATING

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)
Ventilation Air	Inlet	35.7	0.00199	2163	400	-68374	0
Vent - Return Mixing	Outlet	54.9	0.00199	6266	400	-	-
Central Cooling Coil	Outlet	54.9	0.00199	6266	400	0	0
Central Heating Coil	Outlet	76.4	0.00199	6266	400	146362	-
Supply Fan	Outlet	77.8	0.00199	6266	400	9290	-
Dehumid. Reheat Coil	Outlet	77.8	0.00199	6266	400	0	-
Cold Supply Duct	Outlet	77.8	0.00199	6266	400	-	-
Zone Air	-	65.0	0.00199	6266	400	-86865	0
Return Air	Outlet	65.0	0.00199	6266	400	-	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.080; At site altitude = 1.079 BTU/(hr-CFM-F)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 4746.6; At site altitude = 4741.3 BTU/(hr-CFM)
Site Altitude = 31.0 ft

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (BTU/hr)	T-stat Mode	Zone Cond (BTU/hr)	Zone Temp (F)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Unit (BTU/hr)
Zone 2	-86865	Heating	-86865	65.0	6266	400	0	0

COM*check* Software Version COMcheckWeb
Mechanical Compliance Certificate

Project Information

Energy Code:	90.1 (2019) Standard
Project Title:	2501635 - DMO4
Location:	Daytona Beach, Florida
Climate Zone:	2a
Project Type:	Alteration

Construction Site:	Owner/Agent:	Designer/Contractor:
2400 MASON AVE DAYTONA BEACH, Florida 32114	AMAZON	REBECCA VILLANUEVA BL COMPANIES 355RESEARCH PKWY MERIDEN, Connecticut 06450

Efficiency Packages

Description	Credit

Mechanical Systems List

Quantity System Type & Description

1 RTU-1
Split System Heat Pump
Heating Mode: Capacity = 206 kBtu/h,
Proposed Efficiency = 3.40 COP, Required Efficiency = 3.20 COP
Cooling Mode: Capacity = 254 kBtu/h, , Air Economizer
Proposed Efficiency = 10.10 EER, Required Efficiency = 9.50 EER
Proposed Part Load Efficiency = 16.00 IEER, Required Part Load Efficiency = 12.50 IEER
Fan System: FAN | CANOPY -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
S Supply, Single-Zone VAV, 8000 CFM, 4.2 motor nameplate hp, 1.00 fan energy index , fan exception: Fan array <= 5 total HP or <= 4.1 kW

SYSTEM VERIFICATION REQUIRED.

1 RTU-2
Split System Heat Pump
Heating Mode: Capacity = 206 kBtu/h,
Proposed Efficiency = 3.40 COP, Required Efficiency = 3.20 COP
Cooling Mode: Capacity = 254 kBtu/h, , Air Economizer
Proposed Efficiency = 10.10 EER, Required Efficiency = 9.50 EER
Proposed Part Load Efficiency = 16.00 IEER, Required Part Load Efficiency = 12.50 IEER
Fan System: FAN | CANOPY -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
S Supply, Single-Zone VAV, 8000 CFM, 4.2 motor nameplate hp, 1.00 fan energy index , fan exception: Fan array <= 5 total HP or <= 4.1 kW

SYSTEM VERIFICATION REQUIRED.

1 RTU-3
Split System Heat Pump
Heating Mode: Capacity = 206 kBtu/h,
Proposed Efficiency = 3.40 COP, Required Efficiency = 3.20 COP
Cooling Mode: Capacity = 254 kBtu/h, , Air Economizer
Proposed Efficiency = 10.10 EER, Required Efficiency = 9.50 EER
Proposed Part Load Efficiency = 16.00 IEER, Required Part Load Efficiency = 12.50 IEER
Fan System: FAN | CANOPY -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Quantity System Type & Description

Fans:
S Supply, Single-Zone VAV, 8000 CFM, 4.2 motor nameplate hp, 1.00 fan energy index , fan exception: Fan array <= 5 total HP or <= 4.1 kW

SYSTEM VERIFICATION REQUIRED.

1 RTU-4
Split System Heat Pump
Heating Mode: Capacity = 206 kBtu/h,
Proposed Efficiency = 3.40 COP, Required Efficiency = 3.20 COP
Cooling Mode: Capacity = 254 kBtu/h, , Air Economizer
Proposed Efficiency = 10.10 EER, Required Efficiency = 9.50 EER
Proposed Part Load Efficiency = 16.00 IEER, Required Part Load Efficiency = 12.50 IEER
Fan System: FAN | CANOPY -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
S Supply, Single-Zone VAV, 8000 CFM, 4.2 motor nameplate hp, 1.00 fan energy index , fan exception: Fan array <= 5 total HP or <= 4.1 kW

SYSTEM VERIFICATION REQUIRED.

Mechanical Compliance Statement

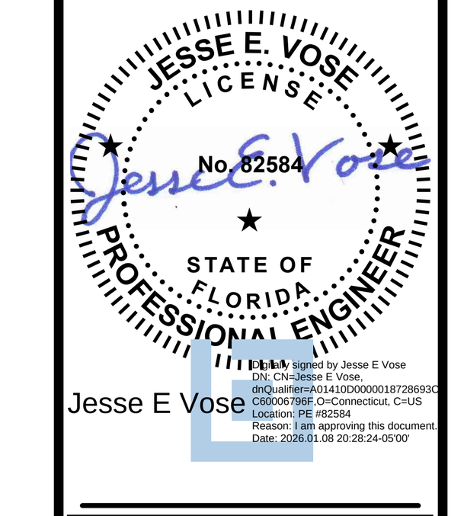
Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 90.1 (2019) Standard requirements in COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

REBECCA VILLANUEVA - ENGINEER	REBECCA VILLANUEVA	08-01-2025
Name - Title	Signature	Date

Architecture
Engineering
Environmental
Land Surveying

BL Companies

355 Research Parkway
Meriden , CT 06405
(203) 630-1406
(203) 630-2615 Fax



Jesse E Vose
Digitally signed by Jesse E Vose
DN: CN=Jesse E Vose, dnQualifier=A01410D0000018728693C C60006796F,O=Connecticut, C=US
Location: PE #82584
Reason: I am approving this document.
Date: 2026.01.08 20:28:24-05'00'

This item has been digitally signed and sealed by Jesse E. Vose on the date adjacent to the seal.

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DMO4 - CANOPY ENCLOSURE
2400 MASON AVE
DAYTONA BEACH FL 32114

REVISIONS		
NO	DATE	DESCRIPTION

DESIGNED:	RV
DRAWN:	RV
REVIEWED:	JV
PROJECT NO.:	2501635
DATE:	1/12/2026
ISSUED FOR:	PERMIT SET

TITLE:
LOAD CALCULATIONS AND ENERGY COMPLIANCE

SHEET NUMBER
M002

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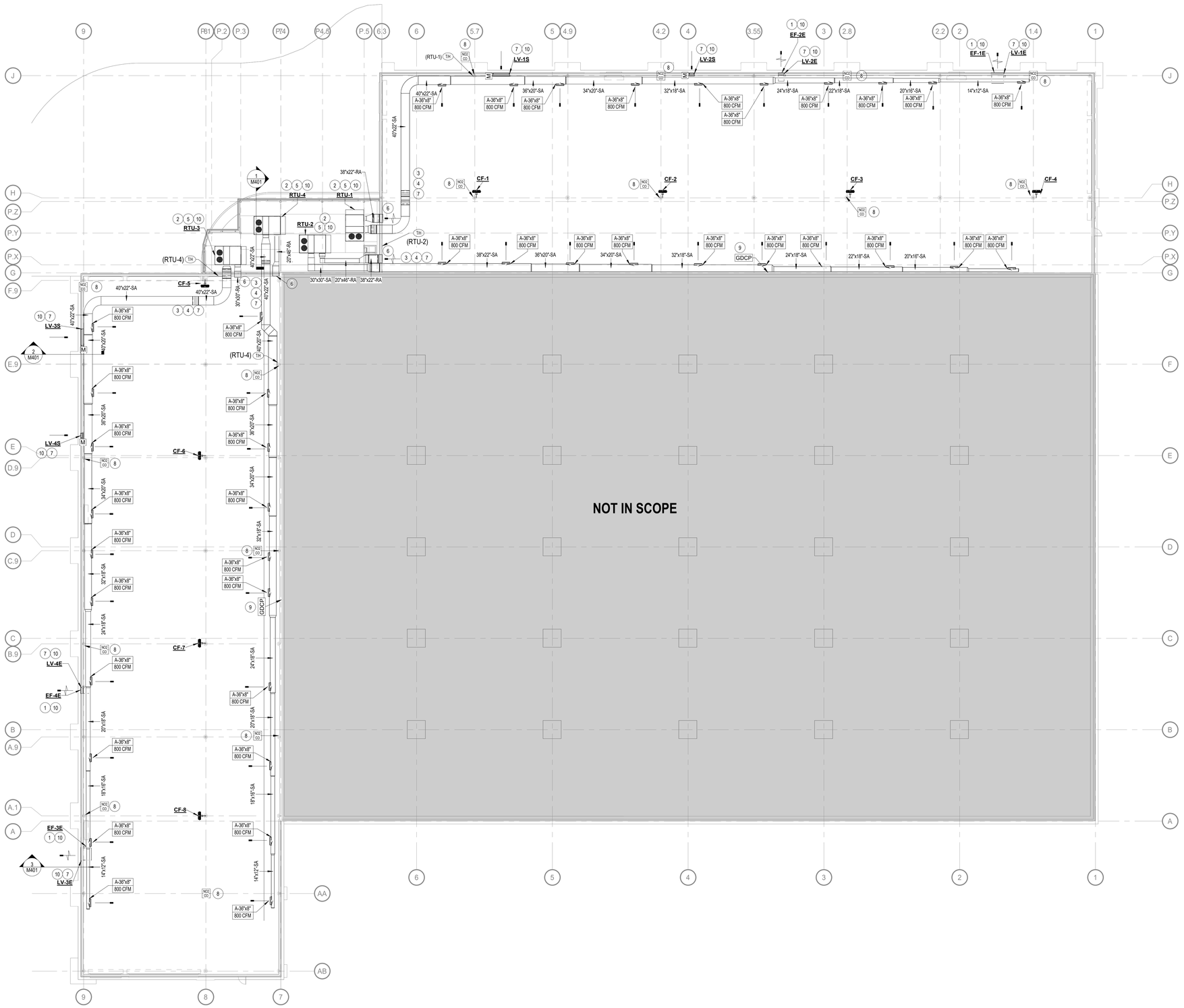


1 FIRST FLOOR DUCTWORK PLAN
1/16" = 1'-0"

MECHANICAL GENERAL NOTES:

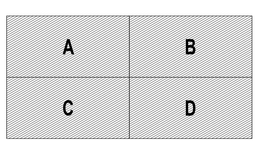
1. PROVIDE NECESSARY LOW VOLTAGE WIRING, POWER SUPPLIES TO CONTROLLER, & TRANSFORMERS TO SUPPLY POWER TO THE REMOTE SENSORS AS REQUIRED BY MANUFACTURER.
2. ALL DUCTWORK SHALL BE RUN BELOW STRUCTURAL BEAMS. COORDINATE ALL DUCTWORK WITH THE PIPING OF DIV. 21 & DIV. 22 AND THE ELEC. CONDUITS OF DIV. 26.
3. LOCATE SENSORS AND THERMOSTATS SUCH THAT THEY ARE ACCESSIBLE, PROTECTED, AND IN AN AREA OF UNOBSTRUCTED AIR CIRCULATION. PROVIDE EACH DEVICE WITH A WIRE IMPACT GUARD ASSEMBLY.
4. ALL WALL PENETRATIONS SHALL BE WEATHERTIGHT. PROVIDE FRAMING AS REQUIRED AT WALL OPENING.
5. MAINTAIN A MINIMUM DISTANCE OF 10'-0" BETWEEN EXHAUST AIR AND MECHANICAL AIR INTAKES AND ALL PLUMBING VENTS.
6. ALL NEW DUCTWORK ELBOWS SHALL HAVE DOUBLE THICKNESS TURNING VANES.

MECHANICAL KEY NOTES:

(NOT ALL KEY NOTES APPEAR ON ALL SHEETS)

1. ALL MECHANICAL EQUIPMENT SUPPORTS SHALL BE SECURELY CONNECTED TO THE NEW CFMF CANOPY PERIMETER WALLS (INCLUDING VIBRATION MITIGATION). PROVIDE ADDITIONAL MISC GALV STEEL SUPPORTS TO ACCOMMODATE INSTALLATION AS REQUIRED. COORDINATE WITH CFMF CONTRACTOR.
2. NOT USED.
3. INSTALL BOTTOM OF SUPPLY AIR DUCTWORK A MINIMUM 12'-0" ABOVE FINISHED FLOOR AND AS HIGH AS POSSIBLE. COORDINATE FINAL LOCATION WITH EXISTING SPRINKLER, LIGHTING, STRUCTURAL, PIPING. DUCTWORK SHALL BE ABOVE ALL LIGHTING.
4. ROUTE SUPPLY AND RETURN DUCTWORK AS CLOSE TO THE WALL AS POSSIBLE. PROVIDE ALL NECESSARY GALV. STRUCTURAL SUPPORTS, BRACING AND FRAMING FOR ALL DUCTWORK PENETRATING EXTERIOR WALL. SEAL WALL WEATHERTIGHT.
5. PACKAGED ROOFTOP UNITS TO BE MOUNTED TO WITHSTAND WIND LOADS AS ADOPTED BY THE LOCAL AUTHORITY. PROVIDE RESTRAINED SPRING VIBRATION ISOLTION AS REQUIRED. PROVIDE SHOP DRAWING SUBMITTAL FOR ROOFTOP UNIT SUPPORTS AND MOUNTING DESIGNED AND SEALED BY A FLORIDA PROFESSIONAL ENGINEER WITH VIBRATION ISOLATORS DESIGNED FOR LOCATION SPECIFIC WIND LOADS. MAINTAIN THE MINIMUM CLEARANCES AROUND THE UNIT FOR SERVICING AND MAINTENANCE PER THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. REFER TO DETAILS ON M500 SERIES AND STRUCTURAL DRAWINGS FOR MORE INFORMATION. INSTALL UNIT IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. OPEN-ENDED, ACOUSTICALLY LINED, RETURN DUCT THROUGH WALL WITH 1/2"x1/2" WIRE MESH SCREEN AT OPENING. COORDINATE DUCT LOCATION AROUND EXISTING PLUMBING AND FIRE PROTECTION PIPES/EQUIPMENT IN FIELD.
7. COORDINATE IN FIELD AND WITH ARCHITECTURAL DRAWINGS FOR FINAL WALL PENETRATIONS. ADJUST DUCTWORK PENETRATING EXTERIOR WALL AND RTU LOCATION AS NECESSARY TO AVOID CONFLICT WITH EXISTING STRUCTURAL COLUMNS, BRACING, AND BEAMS WHILE MAINTAINING MINIMUM UNIT CLEARANCE REQUIREMENTS.
8. PROVIDE CONSPEC OPTIO PGM REMOTE CARBON MONOXIDE AND NITROGEN DIOXIDE (CO, NO2) GAS SENSORS AND 24V WIRES. CO DETECTORS TO BE INSTALLED 3' TO 5' ABOVE FLOOR LEVEL AND NO2 DETECTOR TO BE INSTALLED 1' BELOW CANOPY CEILING, BOTH TO BE INTERLOCKED WITH GAS CONTROL PANEL. LABEL EACH SENSOR WITH ITS RESPECTIVE LABEL IN THE GAS CONTROL PANEL. PROTECT EACH SENSOR WITH A TAMPERPROOF COVER. REFER TO SEQUENCE OF OPERATIONS FOR MORE INFORMATION.
9. PROVIDE CONSPEC PRIMUS V GAS DETECTION CONTROL PANEL MOUNTED ON WALL 60" ABOVE FLOOR, WITH MANUAL OVERRIDE SWITCH. INTERLOCK PANEL WITH REMOTE GAS SENSORS AND 24V WIRES, GRAVITY VENTILATOR DAMPERS, AND EXHAUST FANS . REFER TO GAS DETECTION SEQUENCE OF OPERATIONS.
10. SHOP DRAWING SUBMITTALS FOR ROOFTOP UNITS, LOUVERS, AND EXHAUST FANS MUST INCLUDE DOCUMENTATION SEALED BY A FLORIDA PROFESSIONAL ENGINEER THAT EQUIPMENT CONSTRUCTION IS DESIGNED TO WITHSTAND SPECIFIC LOCAL REQUIREMENTS FOR WIND LOADS.

KEYPLAN



TRUE NORTH

Architecture
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Land Surveying
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(203) 630-2615 Fax

JESSE E. VOSE LICENSE No. 82504 STATE OF FLORIDA PROFESSIONAL ENGINEER
Jesse E Vose

This item has been digitally signed and sealed by Jesse E. Vose on the date adjacent to the seal.

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DMO4 - CANOPY ENCLOSURE
2400 MASON AVE
DAYTONA BEACH FL 32114

NO	DESCRIPTION	DATE

REVISIONS

DESIGNED:	RV
DRAWN:	RV
REVIEWED:	JV
PROJECT NO.:	2501635
DATE:	1/12/2026
ISSUED FOR:	PERMIT SET

TITLE:
FIRST FLOOR MECHANICAL PLAN

SHEET NUMBER
M101

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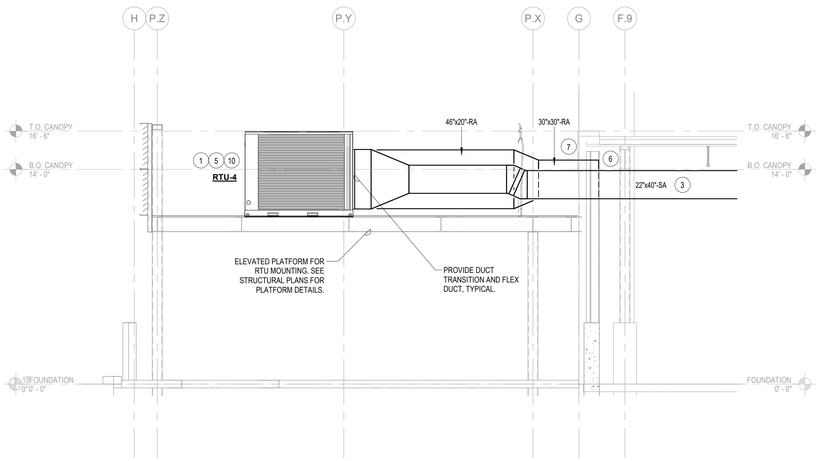
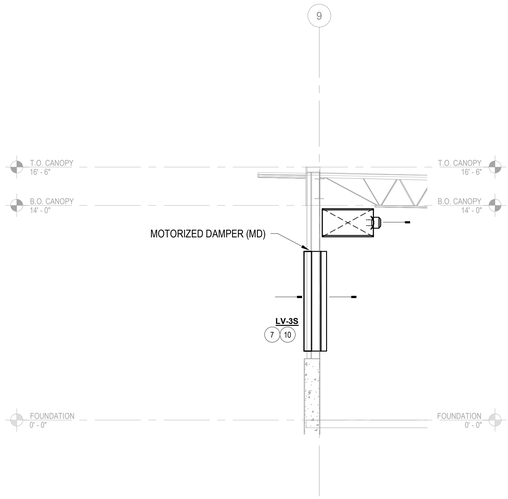
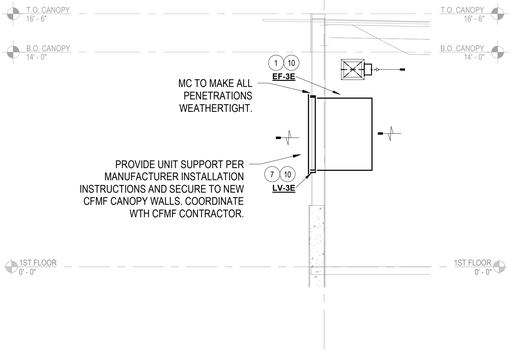


1 RTU SECTION, TYPICAL
1/4" = 1'-0"



2 INTAKE LOUVER SECTION, TYPICAL
1/4" = 1'-0"



3 EXHAUST ASSEMBLY SECTION, TYPICAL
1/4" = 1'-0"

MECHANICAL GENERAL NOTES:

1. PROVIDE NECESSARY LOW VOLTAGE WIRING, POWER SUPPLIES TO CONTROLLER, & TRANSFORMERS TO SUPPLY POWER TO THE REMOTE SENSORS AS REQUIRED BY MANUFACTURER.
2. ALL DUCTWORK SHALL BE RUN BELOW STRUCTURAL BEAMS. COORDINATE ALL DUCTWORK WITH THE PIPING OF DIV. 21 & DIV. 22 AND THE ELEC. CONDUITS OF DIV. 26.
3. LOCATE SENSORS AND THERMOSTATS SUCH THAT THEY ARE ACCESSIBLE, PROTECTED, AND IN AN AREA OF UNOBSTRUCTED AIR CIRCULATION. PROVIDE EACH DEVICE WITH A WIRE IMPACT GUARD ASSEMBLY.
4. ALL WALL PENETRATIONS SHALL BE WEATHERTIGHT. PROVIDE FRAMING AS REQUIRED AT WALL OPENING.
5. MAINTAIN A MINIMUM DISTANCE OF 10'-0" BETWEEN EXHAUST AIR AND MECHANICAL AIR INTAKES AND ALL PLUMBING VENTS.
6. ALL NEW DUCTWORK ELBOWS SHALL HAVE DOUBLE THICKNESS TURNING VANES.

MECHANICAL KEY NOTES:

(NOT ALL KEY NOTES APPEAR ON ALL SHEETS)

1. ALL MECHANICAL EQUIPMENT SUPPORTS SHALL BE SECURELY CONNECTED TO THE NEW CFMF CANOPY PERIMETER WALLS (INCLUDING VIBRATION MITIGATION). PROVIDE ADDITIONAL MISC GALV STEEL SUPPORTS TO ACCOMMODATE INSTALLATION AS REQUIRED. COORDINATE WITH CFMF CONTRACTOR.
2. NOT USED.
3. INSTALL BOTTOM OF SUPPLY AIR DUCTWORK A MINIMUM 12'-0" ABOVE FINISHED FLOOR AND AS HIGH AS POSSIBLE. COORDINATE FINAL LOCATION WITH EXISTING SPRINKLER, LIGHTING, STRUCTURAL, PIPING. DUCTWORK SHALL BE ABOVE ALL LIGHTING.
4. ROUTE SUPPLY AND RETURN DUCTWORK AS CLOSE TO THE WALL AS POSSIBLE. PROVIDE ALL NECESSARY GALV. STRUCTURAL SUPPORTS, BRACING AND FRAMING FOR ALL DUCTWORK PENETRATING EXTERIOR WALL. SEAL WALL WEATHERTIGHT.
5. PACKAGED ROOFTOP UNITS TO BE MOUNTED TO WITHSTAND WIND LOADS AS ADOPTED BY THE LOCAL AUTHORITY. PROVIDE RESTRAINED SPRING VIBRATION ISOLTION AS REQUIRED. PROVIDE SHOP DRAWING SUBMITTAL FOR ROOFTOP UNIT SUPPORTS AND MOUNTING DESIGNED AND SEALED BY A FLORIDA PROFESSIONAL ENGINEER WITH VIBRATION ISOLATORS DESIGNED FOR LOCATION SPECIFIC WIND LOADS. MAINTAIN THE MINIMUM CLEARANCES AROUND THE UNIT FOR SERVICING AND MAINTENANCE PER THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. REFER TO DETAILS ON M500 SERIES AND STRUCTURAL DRAWINGS FOR MORE INFORMATION. INSTALL UNIT IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. OPEN-ENDED, ACOUSTICALLY LINED, RETURN DUCT THROUGH WALL WITH 1/2"x1/2" WIRE MESH SCREEN AT OPENING. COORDINATE DUCT LOCATION AROUND EXISTING PLUMBING AND FIRE PROTECTION PIPES/EQUIPMENT IN FIELD.
7. COORDINATE IN FIELD AND WITH ARCHITECTURAL DRAWINGS FOR FINAL WALL PENETRATIONS. ADJUST DUCTWORK PENETRATING EXTERIOR WALL AND RTU LOCATION AS NECESSARY TO AVOID CONFLICT WITH EXISTING STRUCTURAL COLUMNS, BRACING, AND BEAMS WHILE MAINTAINING MINIMUM UNIT CLEARANCE REQUIREMENTS.
8. PROVIDE CONSPEC OPTIO PGM REMOTE CARBON MONOXIDE AND NITROGEN DIOXIDE (CO, NO2) GAS SENSORS AND 24V WIRES. CO DETECTORS TO BE INSTALLED 3' TO 5' ABOVE FLOOR LEVEL AND NO2 DETECTOR TO BE INSTALLED 1' BELOW CANOPY CEILING, BOTH TO BE INTERLOCKED WITH GAS CONTROL PANEL. LABEL EACH SENSOR WITH ITS RESPECTIVE LABEL IN THE GAS CONTROL PANEL. PROTECT EACH SENSOR WITH A TAMPERPROOF COVER. REFER TO SEQUENCE OF OPERATIONS FOR MORE INFORMATION.
9. PROVIDE CONSPEC PRIMUS V GAS DETECTION CONTROL PANEL MOUNTED ON WALL 60" ABOVE FLOOR, WITH MANUAL OVERRIDE SWITCH. INTERLOCK PANEL WITH REMOTE GAS SENSORS AND 24V WIRES, GRAVITY VENTILATOR DAMPERS, AND EXHAUST FANS . REFER TO GAS DETECTION SEQUENCE OF OPERATIONS.
10. SHOP DRAWING SUBMITTALS FOR ROOFTOP UNITS, LOUVERS, AND EXHAUST FANS MUST INCLUDE DOCUMENTATION SEALED BY A FLORIDA PROFESSIONAL ENGINEER THAT EQUIPMENT CONSTRUCTION IS DESIGNED TO WITHSTAND SPECIFIC LOCAL REQUIREMENTS FOR WIND LOADS.

TRUE NORTH

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JESSE E. VOSE LICENSE No. 82504 STATE OF FLORIDA PROFESSIONAL ENGINEER
Jesse E Vose

This item has been digitally signed and sealed by Jesse E. Vose on the date adjacent to the seal.

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DMO4 - CANOPY ENCLOSURE
2400 MASON AVE
DAYTONA BEACH FL 32114

REVISIONS

NO	DATE	DESCRIPTION

DESIGNED:	RV
DRAWN:	RV
REVIEWED:	JV
PROJECT NO.:	2501635
DATE:	1/12/2026
ISSUED FOR:	PERMIT SET

TITLE:
ENLARGED VIEWS

SHEET NUMBER
M401

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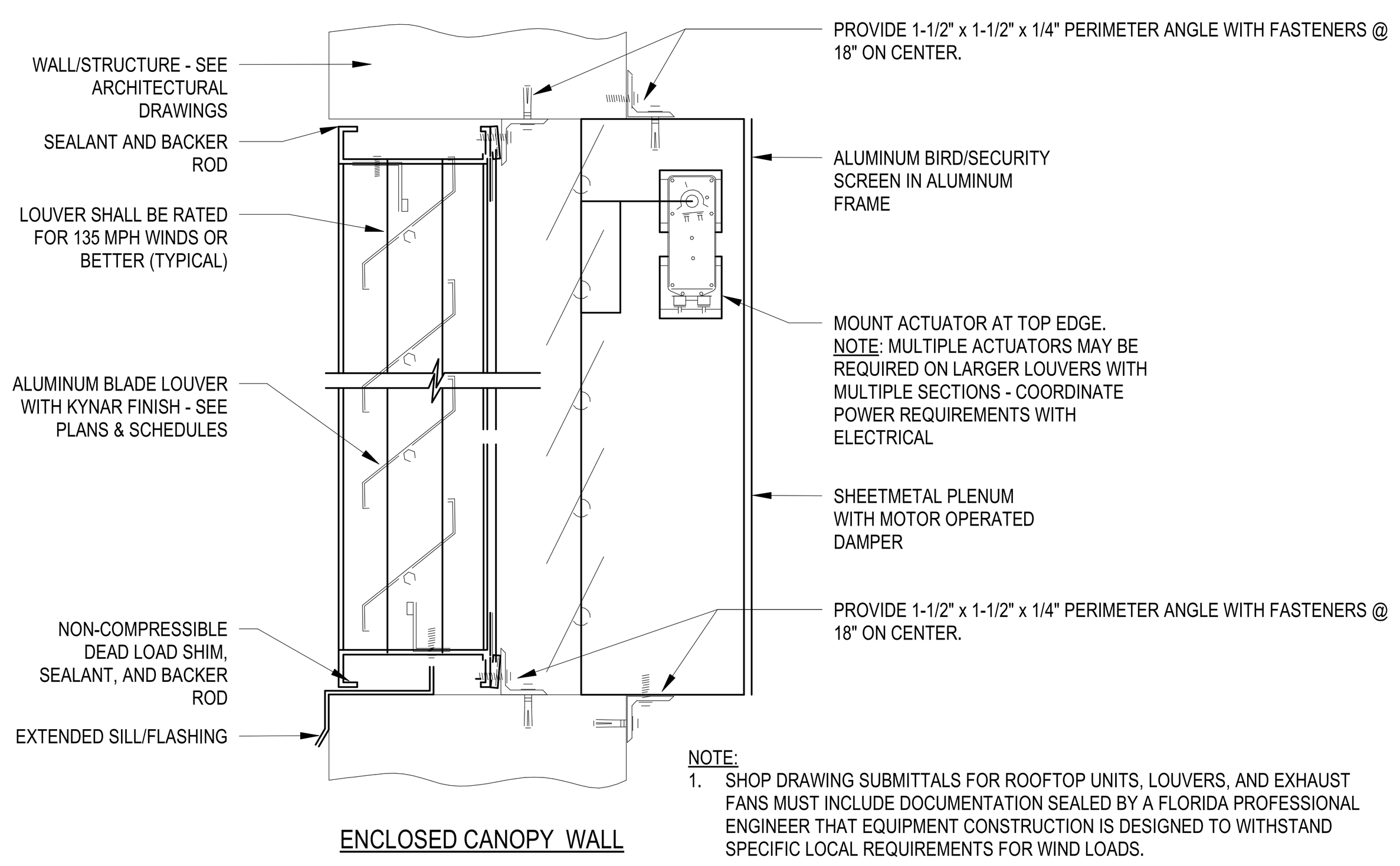
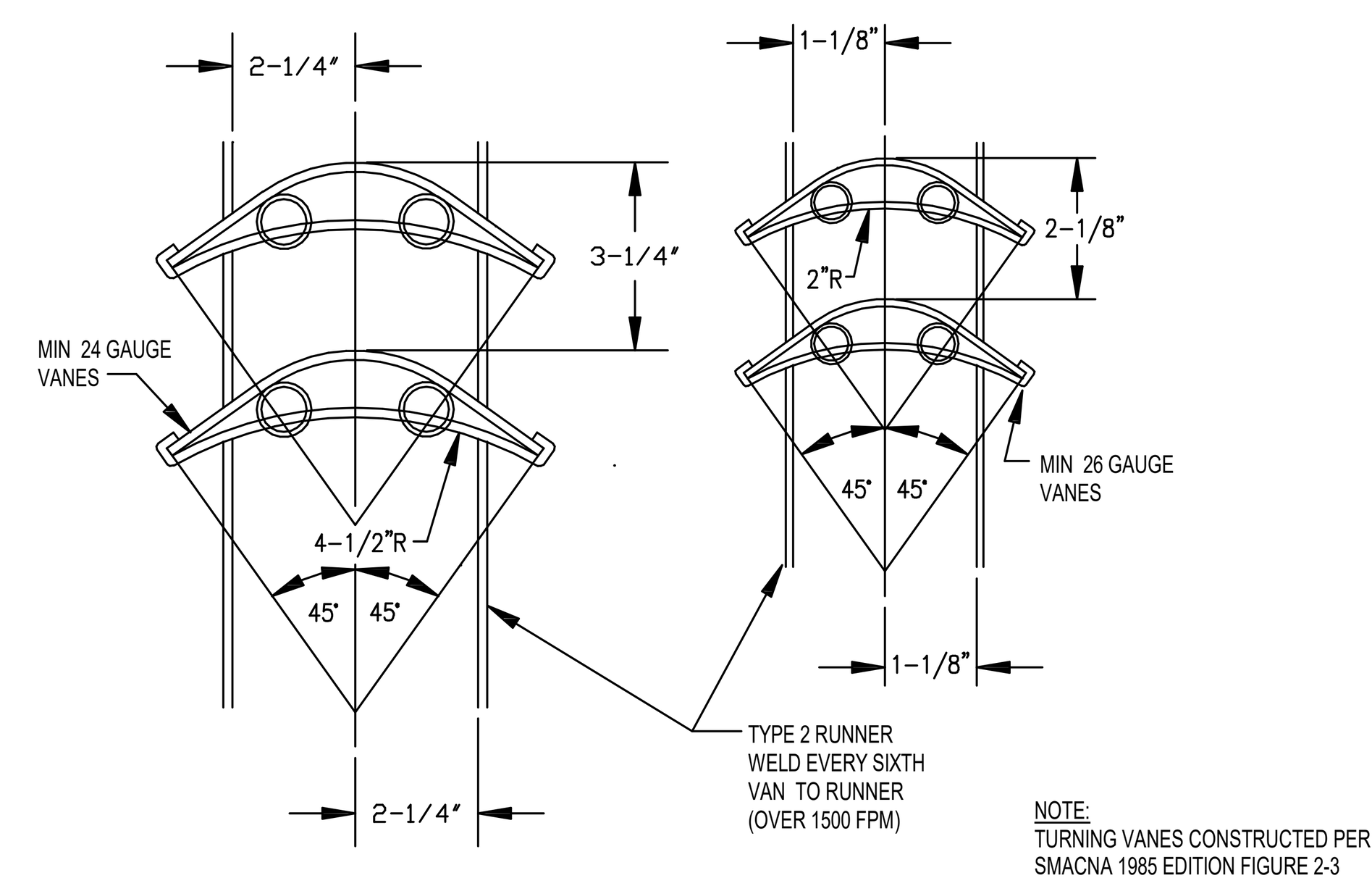


NOTE:
1. SHOP DRAWING SUBMITTALS FOR ROOFTOP UNITS, LOUVERS, AND EXHAUST FANS MUST INCLUDE DOCUMENTATION SEALED BY A FLORIDA PROFESSIONAL ENGINEER THAT EQUIPMENT CONSTRUCTION IS DESIGNED TO WITHSTAND SPECIFIC LOCAL REQUIREMENTS FOR WIND LOADS.

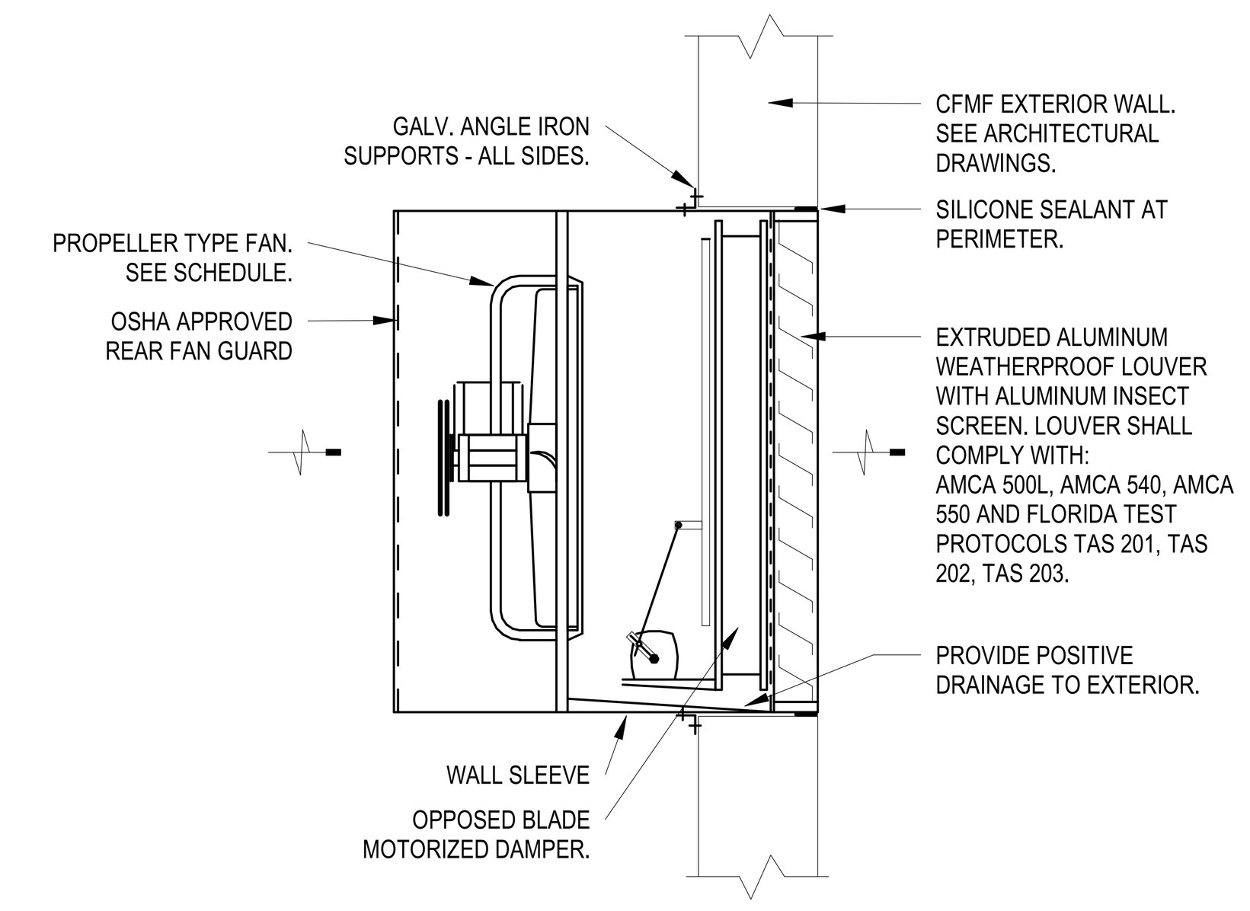
1 INTAKE LOUVER DETAIL
NOT TO SCALE



NOTE: TURNING VANES CONSTRUCTED PER SMACNA 1985 EDITION FIGURE 2-3

NOTE: ALL SQUARE ELBOWS SHALL BE PROVIDED WITH TURNING VANES.

2 TURNING VANE DETAIL
NOT TO SCALE



NOTE:
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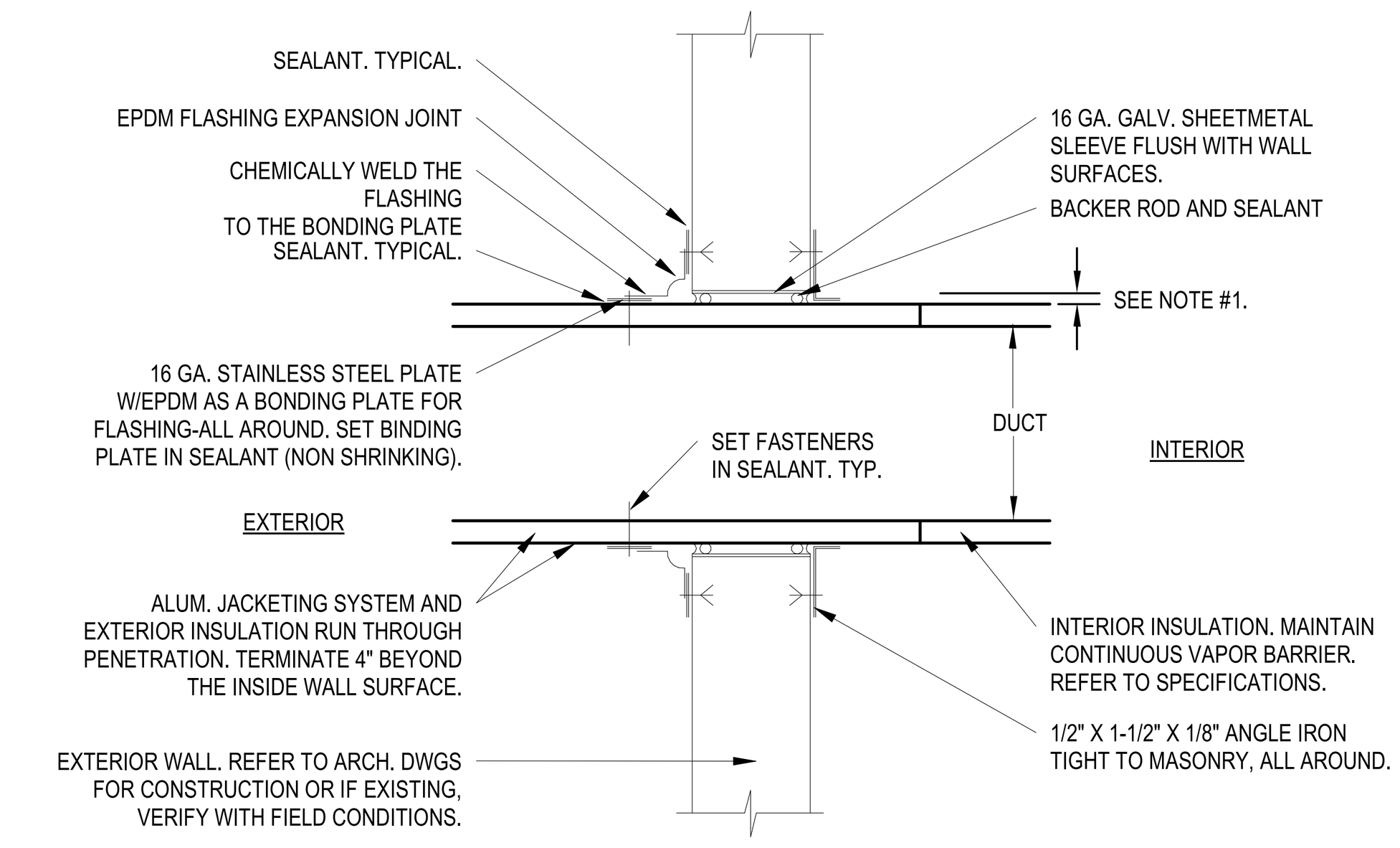
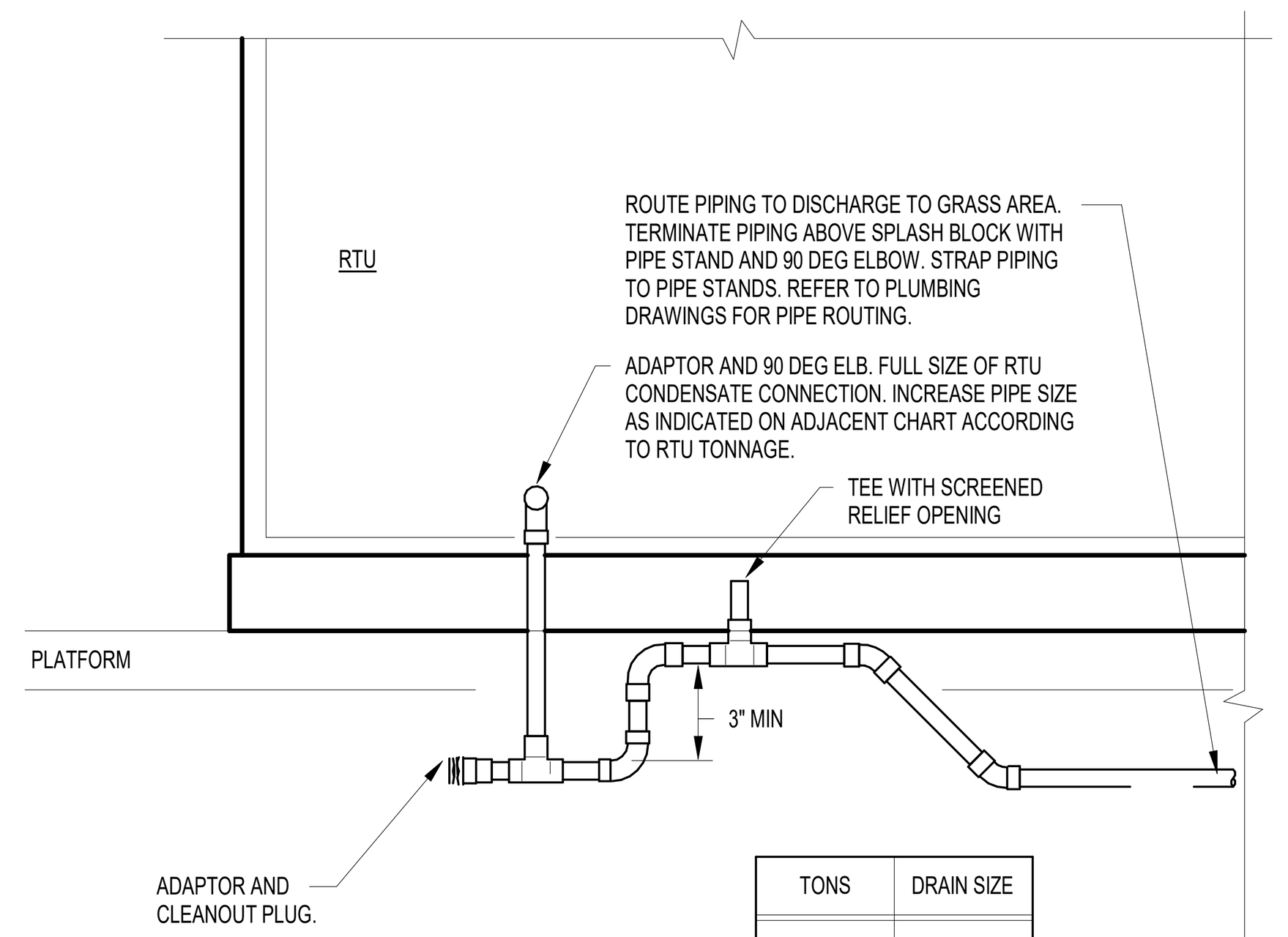
3 WALL MOUNTED FAN WITH MD & LOUVER DETAIL
NOT TO SCALE



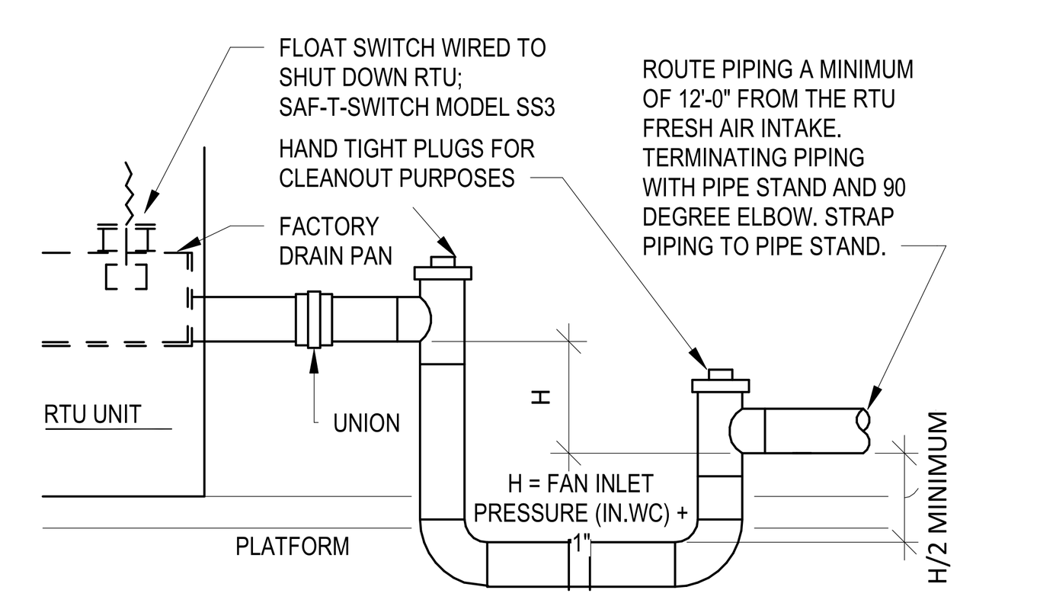
NOTES:
1. WALL OPENING TO BE 1/2" (1" MAX.) LARGER THAN THE INSULATED DUCT - ALL AROUND.
2. THE DUCT SHALL BE SUPPORTED INDEPENDENTLY FROM THE EXTERIOR WALL PENETRATION. SUPPORT THE DUCT, INDOORS & OUTDOORS, FROM THE BUILDING STRUCTURE WITHIN A MAX. OF 12" OF THE PENETRATION.

4 DUCT PENETRATIONS AT EXTERIOR WALL DETAIL
NOT TO SCALE



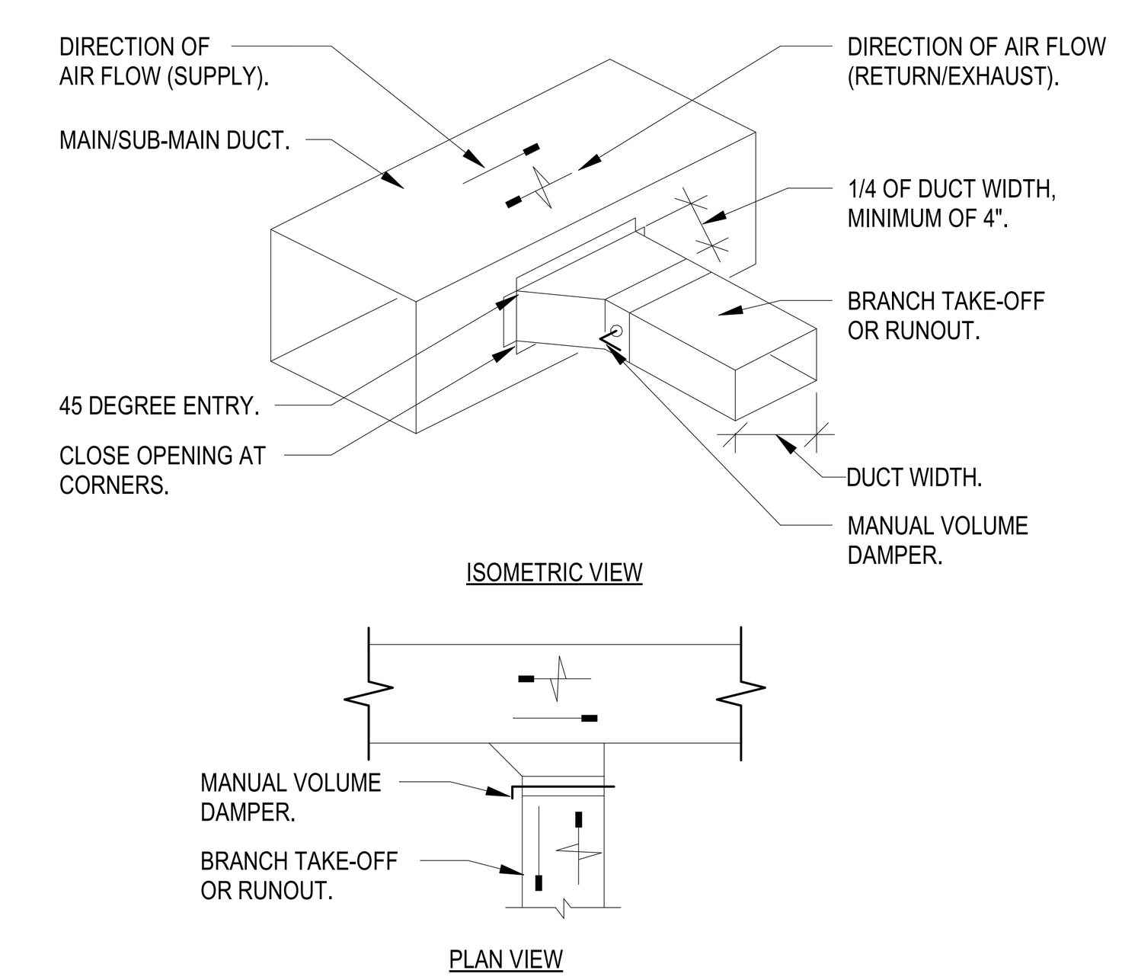
TONS	DRAIN SIZE
UP TO 20	3/4"
20 TO 40	1"
40 TO 90	1-1/4"
90 TO 125	1-1/2"
125 TO 250	2"

5 RTU CONDENSATE DETAIL
NOT TO SCALE



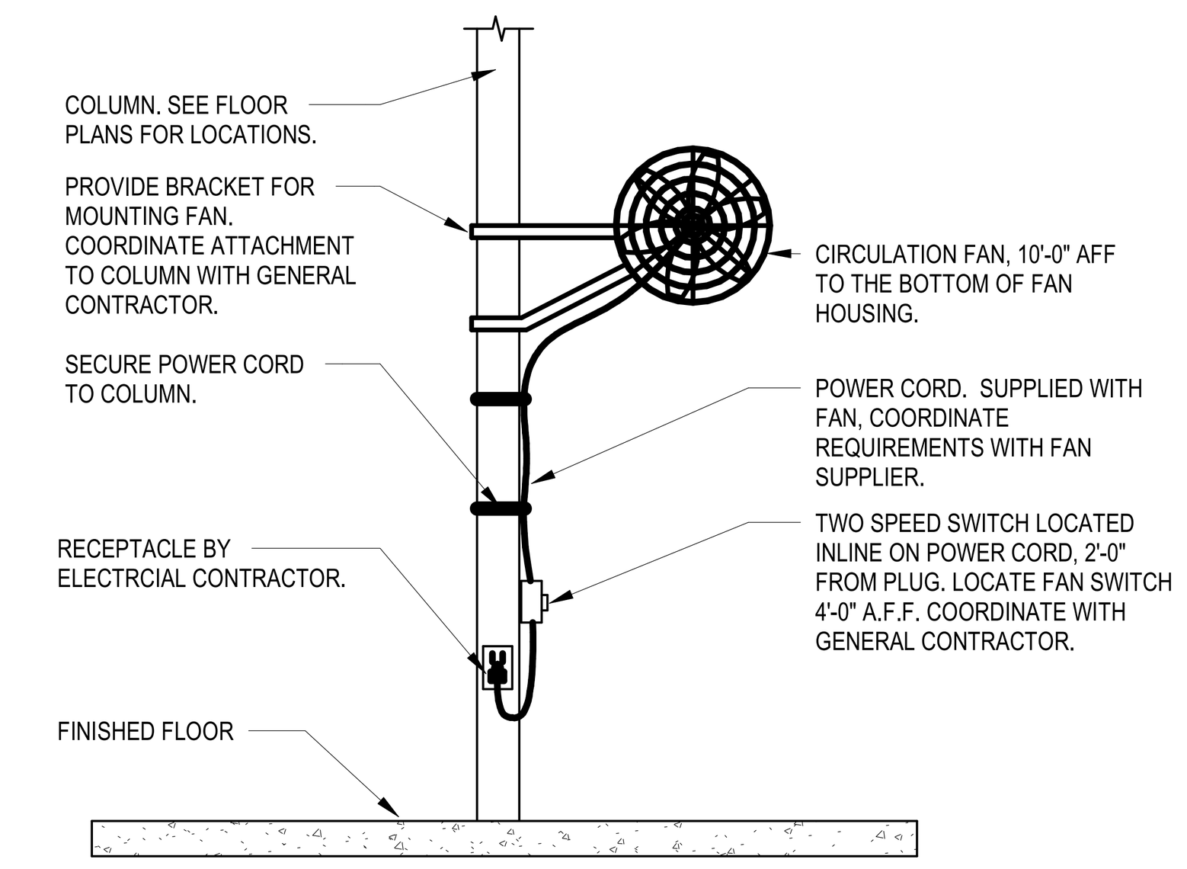
NOTES:
1. SLOPE PIPING DOWN TOWARDS GRASS AT 1/8" PER FOOT.
2. RUNNING TRAPS ARE NOT ALLOWED.
3. TEST THE FLOAT SWITCH IN THE DRAIN PAN FOR PROPER OPERATION AT LEAST ONCE A YEAR.
4. PVC PIPING EXPOSED TO WEATHER SHALL BE PAINTED WITH A LIGHT COLORED ACRYLIC OR LATEX ULTRAVIOLET (UV) AND OZONE INHIBITOR PAINT THAT IS CHEMICALLY COMPATIBLE WITH PVC.

6 RTU CONDENSATE DRAIN DETAIL
NOT TO SCALE

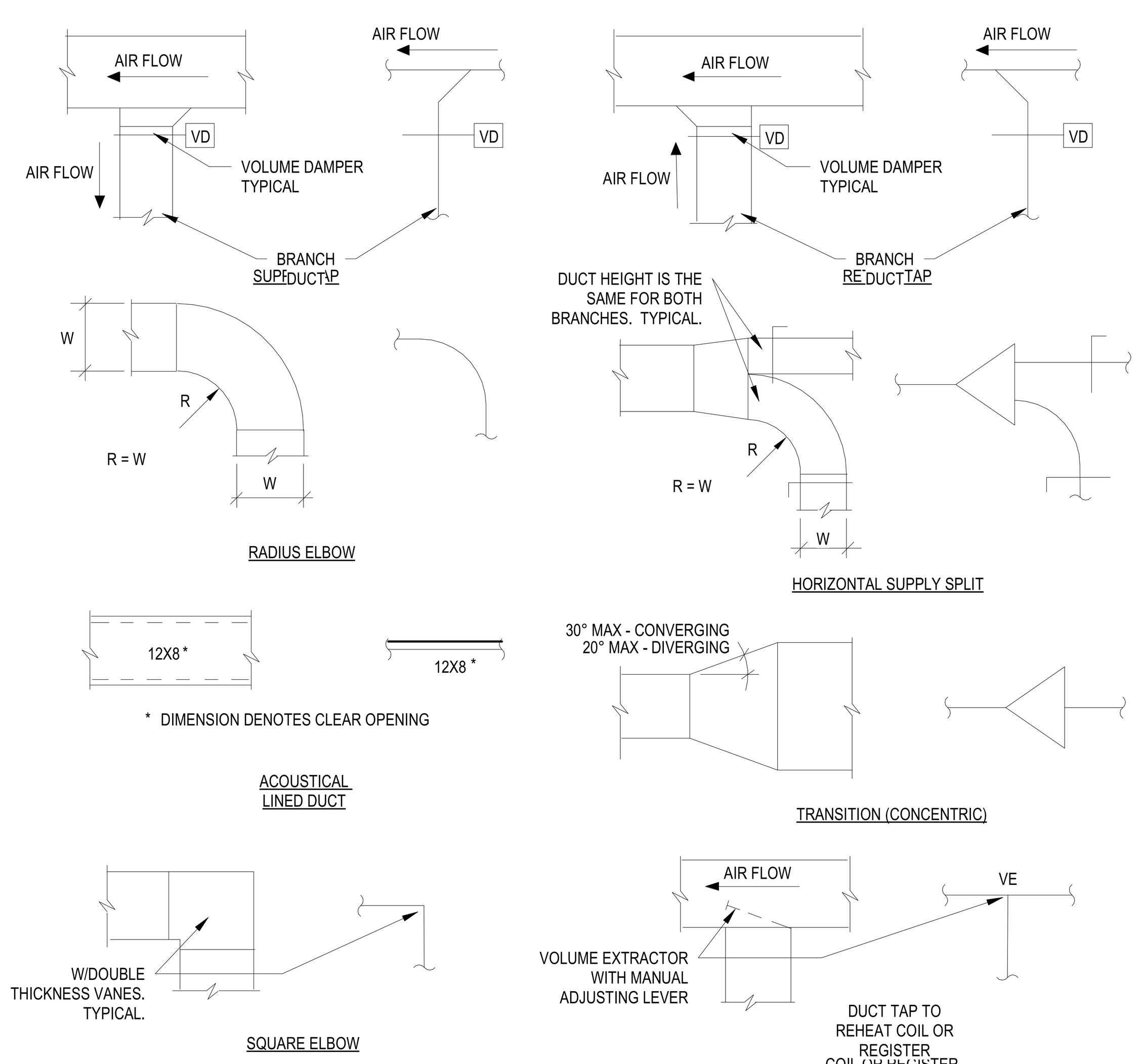


NOTE:
ALL INSULATED SUPPLY AND RETURN DUCTWORK SHALL BE FURNISHED AND INSTALLED WITH STAND-OFF MOUNTING BRACKETS FOR VOLUME/BALANCING DAMPER OPERATORS. ALLOW CLEARANCE BETWEEN DUCT AND OPERATOR OF NOT LESS THAN INSULATION THICKNESS.

7 DUCT TAKE OFF
NOT TO SCALE

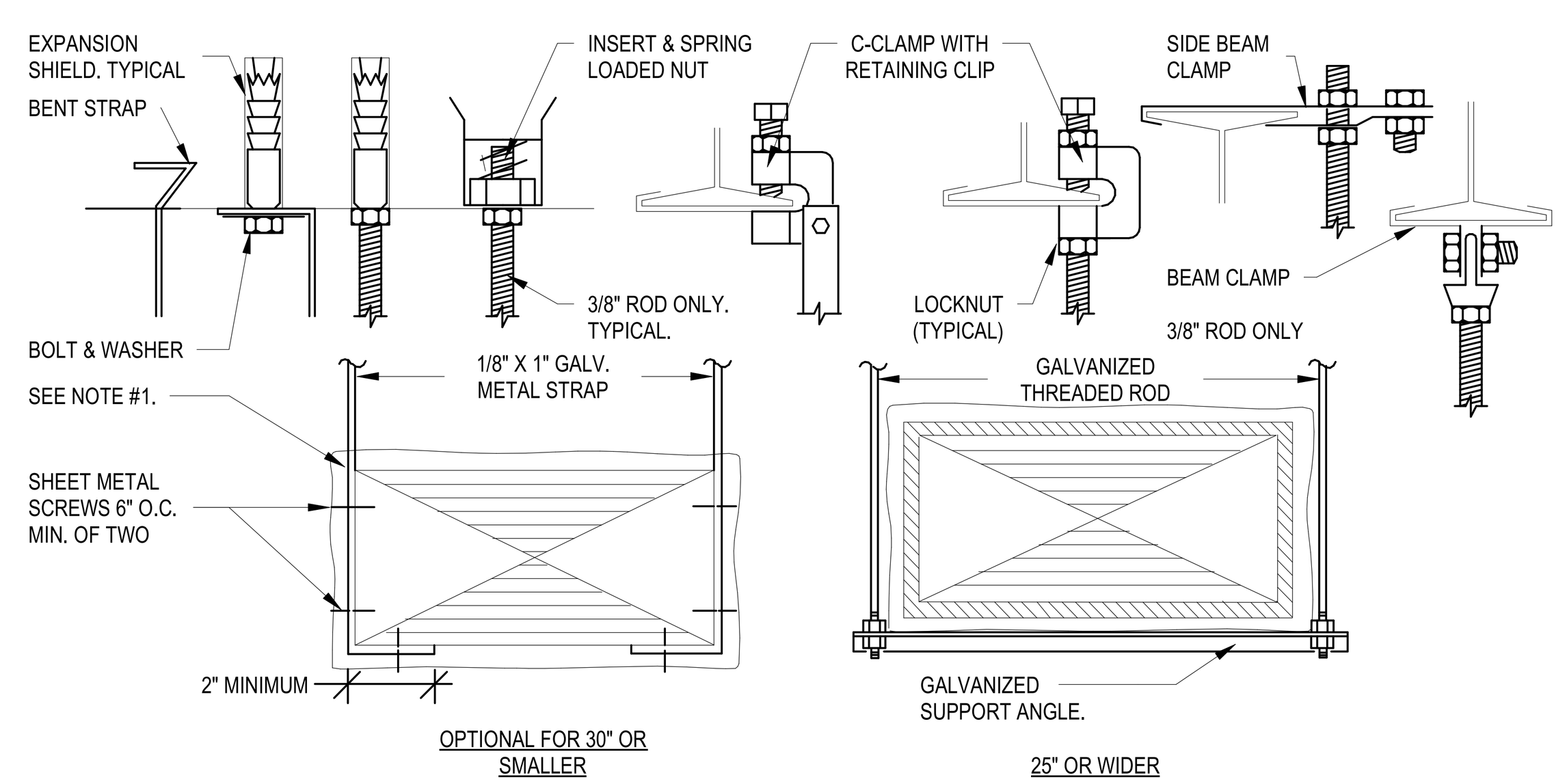


8 CIRCULATION (CAGE) FAN INSTALLATION
NOT TO SCALE



NOTES:
1. SPECIFICATIONS EXCEED SMACNA STANDARDS IN SOME INSTANCES.
2. SMACNA SHALL BE CONSIDERED THE MINIMUM STANDARD UNLESS OTHERWISE INDICATED.

9 DUCT CONSTRUCTION DETAIL
NOT TO SCALE

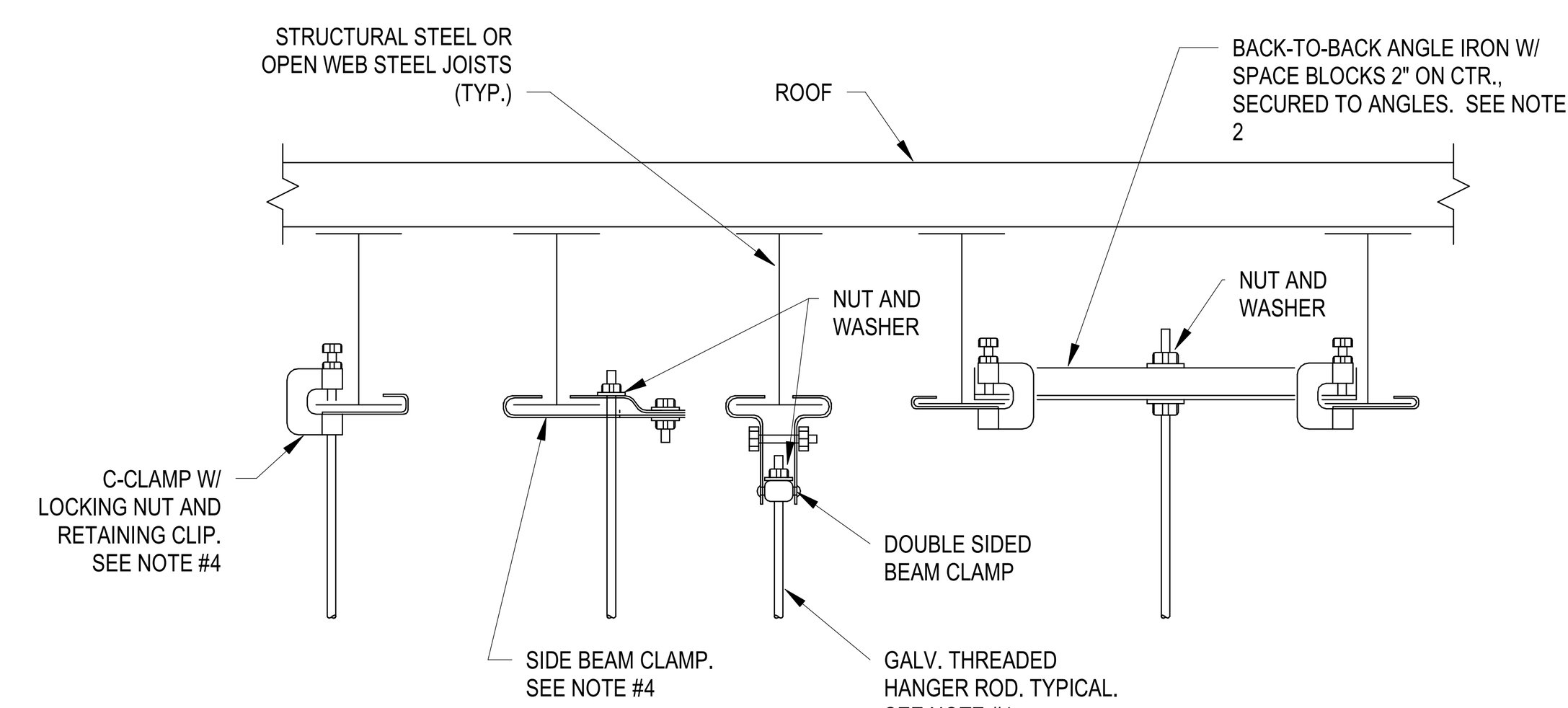


DUCT WIDTH	ROD DIA.	SUPPORT ANGLE OR EQUIV. CHANNEL	MAXIMUM SPACING	MAXIMUM AREA *
UP TO 30"	3/8"	1 1/2" X 1 1/2" X 1/8"	8'-0" O.C.	4 SQ. FT.
31" TO 42"	3/8"	1 1/2" X 1 1/2" X 1/8"	6'-0" O.C.	10 SQ. FT.
43" TO 60"	1/2"	1 1/2" X 1 1/2" X 1/8"	6'-0" O.C.	10 SQ. FT.
61" TO 84"	1/2"	2" X 2" X 1/4"	4'-0" O.C.	----
85" AND UP	1/2"	2" X 2" X 1/4"	4'-0" O.C.	----

* REDUCE SPACING TO NEXT SMALLER INTERVAL IF DUCT AREA EXCEEDS MAXIMUM.

NOTES:
1. HANGERS MUST NOT DEFORM DUCT SHAPE.
2. STRAPS AND RODS SHALL BE GALV. STEEL.
3. WHERE HANGERS ARE INSTALLED UNDER THE INSULATION AND PENETRATE THROUGH THE INSULATION, SEAL ALL PENETRATIONS WITH APPROVED SEALING MASTIC. BUILD-UP MASTIC AT BASE (PENETRATION) AND EXTEND AND TAPER BEYOND PENETRATION TO A MIN. OF 6".

10 RECTANGULAR DUCT SUPPORT
NOT TO SCALE



NOTES:
1. FOR CEILING SUSPENDED EQUIPMENT PROVIDE MIN. 3/8" DIA. HANGER ROD (REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS).
2. FOR PIPES UNDER 2" USE A SINGLE 1-1/2"x1-1/2"x1/4" ANGLE IRON WITH C-CLAMP. FOR PIPES 2-1/2" AND LARGER USE 3"x3"x1/4" ANGLE IRON BACK TO BACK AS SHOWN.
3. REPAIR OF FIREPROOFING IN ORDER TO FACILITATE THE INSTALLATION OF HANGER RODS IN EXISTING CONSTRUCTION SHALL BE BY THE G.C.
4. USE OF C-CLAMPS AND SIDE BEAM CLAMPS IS LIMITED TO PIPING 2-1/2" AND UNDER.

11 TYPICAL METHOD OF SECURING HANGER RODS TO STRUCTURAL STEEL
NOT TO SCALE

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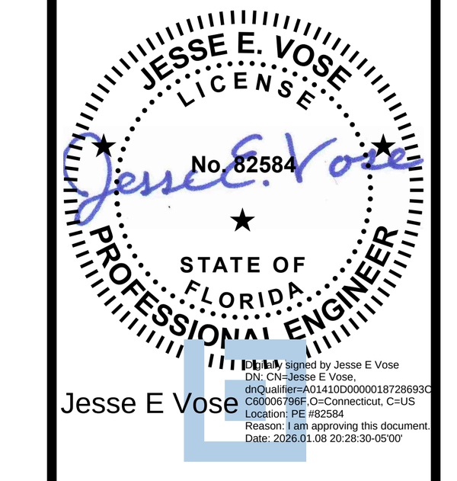

Jesse E Vose

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DMO4 - CANOPY ENCLOSURE
2400 MASON AVE
DAYTONA BEACH FL 32114

REVISIONS

NO	DATE	DESCRIPTION

DESIGNED: RV
DRAWN: RV
REVIEWED: JV
PROJECT NO.: 2501635
DATE: 1/12/2026
ISSUED FOR: PERMIT SET

TITLE: MECHANICAL DETAILS

SHEET NUMBER
M501

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HEAT PUMP UNITS

MARK	MANUFACTURER	MODEL	AREA SERVED	REFRIG. TYPE	NOMINAL TONS	ESP (IN WC)	AIRFLOW DATA (CFM)		COOLING DATA				COOLING EFFICIENCY EER / IEER	HEATING DATA			UNIT ELEC DATA				WEIGHT (LBS)	REMARKS
							SUPPLY	OUTSIDE	AMBIENT TEMP. (°F)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	STAGES		AMBIENT TEMP. (°F)	CAPACITY (MBH)	COP @ 47	VOLTS	PHASE	MCA	MOP		
RTU-1	TRANE	WHK300A4S00	PLAN NORTH CANOPY	R-454B	20	1	8,000	1,100	92.6	253.88	174.59	4	10.10 / 16.00	35.7	205.98	3.40	480	3	64	80	2358	ALL
RTU-2	TRANE	WHK300A4S00	PLAN NORTH CANOPY	R-454B	20	1	8,000	1,100	92.6	253.88	174.59	4	10.10 / 16.00	35.7	205.98	3.40	480	3	64	80	2358	ALL
RTU-3	TRANE	WHK300A4S00	PLAN WEST CANOPY	R-454B	20	1	8,000	1,100	92.6	253.88	174.59	4	10.10 / 16.00	35.7	205.98	3.40	480	3	64	80	2358	ALL
RTU-4	TRANE	WHK300A4S00	PLAN WEST CANOPY	R-454B	20	1	8,000	1,100	92.6	253.88	174.59	4	10.10 / 16.00	35.7	205.98	3.40	480	3	64	80	2358	ALL

REMARKS:
1. MAINTAIN THE MINIMUM CLEARANCES AROUND THE UNIT FOR SERVICING AND MAINTENANCE PER THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. REFER TO DETAILS ON M500 SERIES AND STRUCTURAL DRAWINGS FOR MORE INFORMATION. INSTALL UNIT IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. PACKAGED ROOFTOP UNITS TO BE MOUNTED TO WITHSTAND WIND LOADS AS ADOPTED BY THE LOCAL AUTHORITY. PROVIDE RESTRAINED SPRING VIBRATION ISOLTION AS REQUIRED. PROVIDE SHOP DRAWING SUBMITTAL FOR ROOFTOP UNIT SUPPORTS AND MOUNTING DESIGNED AND SEALED BY A FLORIDA PROFESSIONAL ENGINEER WITH VIBRATION ISOLATORS DESIGNED FOR LOCATION SPECIFIC WIND LOADS.
3. SHOP DRAWING SUBMITTALS FOR ROOFTOP UNITS MUST INCLUDE DOCUMENTATION SEALED BY A FLORIDA PROFESSIONAL ENGINEER THAT EQUIPMENT CONSTRUCTION IS DESIGNED TO WITHSTAND SPECIFIC LOCAL REQUIREMENTS FOR WIND LOADS.
4. PROVIDE FACTORY, MOUNTED & WIRED, BACNET PROTOCOL CONTROLS W/ INTERFACE FOR FULL MONITORING & CONTROL BY THE CENTRAL BMS. REFER TO SEQUENCE OF OPERATIONS.
5. SYSTEM SHALL OPERATE AS A SINGLE ZONE, VARIABLE AIR VOLUME UNIT. UNIT SHALL BE A HORIZONTAL DISCHARGE CONFIGURATION.
6. PROVIDE FIELD INSTALLED, DUAL ENTHALPY, LOW LEAK ECONOMIZER WITH POWERED EXHAUST.
7. PROVIDE WITH DEMAND CONTROL VENTILATION, INCLUDING SPACE OR DUCT MOUNTED CO2 SENSORS. SEE PLANS. REFER TO SEQUENCE OF OPERATIONS.
8. PROVIDE WITH COMPRESSOR ANTI-RECYCLE CONTROLS.
9. PROVIDE SINGLE POINT POWER CONNECTION.
10. PROVIDE DEHUMIDIFICATION CONTROLS, INCLUDING SPACE OR DUCT MOUNTED RH SENSORS. SEE PLANS. REFER TO SEQUENCE OF OPERATIONS.
11. PROVIDE NON-FUSED DISCONNECT AND NON-POWERED GFCI CONVENIENCE OUTLET.
12. BALANCE REPORT TO BE PROVIDED TO INSPECTOR.
13. UNITS SHALL BE ULTRA HIGH EFFICIENCY WITH VARIABLE SPEED COMPRESSOR AND MODULATING HOT-GAS REHEAT.
14. DIRECT DRIVE PLENUM FANS WITH ECM MOTORS. PLENUM FAN SHALL BE BACKWARD-CURVED FAN WHEEL ALONG WITH AN EXTERNAL ROTOR DIRECT DRIVE VARIABLE SPEED INDOOR MOTOR.
15. MECHANICAL CONTRACTOR SHALL INSTALL DUCT MOUNTED SMOKE DETECTORS FOR SA AND RA. SMOKE DETECTORS WITH AUXILIARY CONTACTS FOR FIRE ALARM MONITORING AND GLOBAL SYSTEM SHUTDOWN SHALL BE SUPPLIED BY ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL WIRE SMOKE DETECTOR TO FIRE ALARM. COORDINATE WITH FIRE ALARM AND ELECTRICAL CONTRACTORS.
16. PROVIDE 2-INCH MERV 8 FILTERS.
17. SELECTIONS SCHEDULED ARE BASIS OF DESIGN, APPROVED EQUAL PRODUCTS BY CARRIER, LENNOX, OR JOHNSON CONTROLS, PROVIDED THEY MEET OR EXCEED THE BASIS OF DESIGN PERFORMANCE AND SPECIFICATIONS.

SEQUENCE OF OPERATIONS:

THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ALL CONTROLS, CONTROL WIRING AND CONTROL DESIGN. REFER TO BOOK SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR SPECIFIED SEQUENCE OF OPERATIONS.

SEQUENCE OF OPERATIONS
1. IT IS THE INTENT OF THIS AND OTHER DIV. 23 SPECIFICATIONS TO HAVE ALL HVAC EQUIPMENT CONTROLLED USING FACTORY MOUNTED AND WIRED IN THE FACTORY AND AS PROVIDED FOR FIELD INSTALLATION. WHERE THERE ARE ANY PORTION(S) OF THE SEQUENCES OF OPERATION DESCRIBED HEREIN AND IN OTHER DIV. 23 SPECIFICATIONS THAT CANNOT BE FULFILLED OR THEIR REQUIREMENTS MET BY THE FACTORY PROVIDED CONTROLS, THE AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL COORDINATE WITH THE EQUIPMENT MANUFACTURER TO PROVIDE ALL NECESSARY COMPONENTS (IE: SOFTWARE, HARDWARE, PROGRAMMING, WIRING, END DEVICES, ETC...) TO FULFIL THOSE PORTIONS OF THE SEQUENCES FOR SEAMLESS OPERATION AND TO ALLOW FOR "FORWARDS AND BACKWARDS" COMMUNICATIONS FOR REMOTE MONITORING AND CONTROL.
2. ROOFTOP UNITS (RTU):
   - A. GENERAL:
     1. THE RTU SHALL BE OPERATED THROUGH ITS RESPECTIVE REMOTE PROGRAMMABLE CONTROLLER. THE CONTROLLER SHALL BE CAPABLE OF SCHEDULING OPERATION WITH 2-HOUR OCCUPANT OVERRIDE, AND 10-HOUR BACKUP. THE CONTROLLER SHALL BE LOCATED AS DIRECTED BY THE CLIENT'S REPRESENTATIVE.
     2. THE RTU SHALL OPERATE IN SEQUENCE PROVIDING ALL SYSTEM SAFETIES ARE SATISFIED.
     3. THE RTU SHALL OPERATE IN A SINGLE ZONE VAV MODE OF OPERATION (SZVAV).
     4. ALL SEQUENCES HEREIN APPLY TO ALL RTU'S UNLESS SPECIFICALLY INDICATED FOR A SZVAV OPERATION.
     5. DURING ANY PERIOD WHILE THE RTU IS IN OCCUPIED MODE THE UNIT MINIMUM OA VENTILATION QUANTITY SHALL BE MAINTAINED, EXCEPT WHEN THE SYSTEM IS INDEXED INTO DEMAND CONTROLLED VENTILATION (DCV) MODE (SEE BELOW).
     6. ALL SETPOINTS SHALL BE MONITORED AND ADJUSTABLE.
     7. ALL DATA POINTS WILL HAVE ABILITY TO BE TRENDED.
     8. ALL DATA POINTS MAY BE ALARMED.
     9. ALL ALARMS SHALL BE VISIBLE AND AUDIBLE.
   - B. UNIT SAFETIES:
     1. EMERGENCY SHUTDOWN: THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL..
     2. SUPPLY OR RETURN AIR SMOKE DETECTION: THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SMOKE DETECTOR STATUS.
   - C. RUN CONDITIONS - SCHEDULED: THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:
     1. UNOCCUPIED MODE (NIGHT SETPOINT):
        - a. SUMMER (SETUP) – 85 DEGREES F (ADJ.)
        - b. WINTER (SETBACK) – 55 DEGREES F (ADJ.)
     2. OCCUPIED MODE:
        - a. SUMMER – 80 DEGREES F, 50%RH (ADJ.)
        - b. WINTER – 60 DEGREES F (ADJ.)
     3. THE SPACE TEMPERATURE SET POINT CAN BE ADJUSTED:
        - a. LOCALLY AT THE CONTROLLER,
        - b. REMOTELY AT THE ROOM SENSOR
   - D. UNOCCUPIED MODE: THE SUPPLY FAN(S) SHALL BE OFF, THE REFRIGERATION SYSTEM AND/OR HEATING SYSTEM SHALL BE DEENERGIZED, THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL BE CLOSED, AND THE RETURN AIR DAMPER SHALL BE OPEN. UNIT SAFETIES SHALL BE ACTIVE AT ALL TIMES.
     1. DURING THIS MODE, THE UNIT SHALL BE INDEXED TO RUN TO MAINTAIN THE ZONES AT THEIR UNOCCUPIED TEMPERATURE SETPOINTS. REFER TO THE SEQUENCES BELOW FOR ADDITIONAL INFORMATION REGARDING UNIT COMPONENT OPERATIONS.
   - E. RTU OPTIMAL START: THE UNIT SHALL START PRIOR TO SCHEDULED OCCUPANCY BASED ON THE TIME NECESSARY FOR THE ZONES TO REACH THEIR OCCUPIED SETPOINTS, UNLESS SHUTDOWN ON SAFETIES.
     1. THE START TIME SHALL AUTOMATICALLY ADJUST BASED ON CHANGES IN OUTSIDE AIR TEMPERATURE AND ZONE TEMPERATURES.
     2. DURING OPTIMAL START, THE OUTSIDE AIR DAMPER SHALL BE FULLY CLOSED.
     3. WHEN THE ZONE TEMPERATURES REACH OCCUPIED SETPOINTS, THE UNIT SHALL BE AUTOMATICALLY INDEXED TO OCCUPIED MODE AND THE OUTSIDE AND RETURN AIR DAMPER SHALL BE MODULATED IN SEQUENCE TO MAINTAIN THE OUTSIDE AIR VENTILATION AIRFLOW (SEE SCHEDULE).
   - F. OUTSIDE AIR VENTILATION:
     1. WHEN IN THE OCCUPIED MODE, THE CONTROLLER SHALL MEASURE THE OUTSIDE AIRFLOW AND MODULATE THE OUTSIDE AND RETURN AIR DAMPERS IN SEQUENCE TO MAINTAIN THE OUTSIDE AIR VENTILATION AIRFLOW.
        - a. THE OA VENTILATION AIRFLOW SHALL BE MAINTAINED IN ACCORDANCE WITH THE DEMAND CONTROLLED VENTILATION ADJUSTMENT (SEE BELOW).
   - G. OCCUPIED MODE:
     1. WHEN THE RTU IS INDEXED INTO "OCCUPIED MODE", UNLESS SHUTDOWN ON SAFETIES, THE SUPPLY FAN SHALL BE ENABLED AND RUN CONTINUOUSLY. THE OA AND RETURN AIR DAMPERS SHALL BE POSITIONED TO PROVIDE THE MINIMUM OUTSIDE AIR VENTILATION. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.
        - a. RTU: (SZVAV)
          1. THE SUPPLY FAN(S) SHALL BE MODULATED IN SEQUENCE TO MAINTAIN THE OCCUPIED SPACE TEMPERATURE SETPOINT. THE AIRFLOW SHALL VARY BETWEEN THE MIN. & MAX. THE MINIMUM SETPOINT SHALL BE 30% (ADJ.) OF THE SUPPLY AIRFLOW.
     2. THE CONTROLLER SHALL MODULATE THE OA & RA AIR DAMPERS TO ASSURE THE MINIMUM OA VENTILATION IS MAINTAINED AS THE SUPPLY FAN MODULATES BETWEEN ITS MIN. AND MAX. AIRFLOW SETPOINTS VIA AIRFLOW MEASURING STATIONS (AFMS) LOCATED IN THE OUTSIDE AIR INTAKE OF THE RTU'S. AFMS FURNISHED BY THE MC AND INSTALLATED BY THE BMS CONTRACTOR. COORDINATE WITH THE RTU AND AFMS MANUFACTURERS FOR INSTALLATION INSTRUCTIONS.
     3. ALARMS SHALL BE PROVIDED AS FOLLOWS:
        - a. FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
        - b. FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
        - c. FAN VFD FAULT.
   - H. SUPPLY AIR TEMPERATURE SETPOINT (OPTIMIZED):
     1. RTU: (SZVAV)
        - a. THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE AND SHALL MAINTAIN A SUPPLY AIR TEMPERATURE SETPOINT RESET BASED ON ZONE COOLING AND HEATING REQUIREMENTS.
          1. THE SUPPLY AIR TEMPERATURE SETPOINT SHALL BE RESET BASED ON ZONE REQUIREMENTS AS FOLLOWS:
             - A. FOR COOLING
               1. THE INITIAL SUPPLY AIR TEMPERATURE SETPOINT SHALL BE 55°F (ADJ.).
               2. AS COOLING DEMAND INCREASES, THE SETPOINT SHALL INCREMENTALLY RESET DOWN TO A MINIMUM OF 53°F (ADJ.).
               3. AS COOLING DEMAND DECREASES, THE SETPOINT SHALL INCREMENTALLY RESET UP TO A MAXIMUM OF 65° F (ADJ.).
             - B. FOR HEATING
               1. THE INITIAL SUPPLY AIR TEMPERATURE SETPOINT SHALL BE 82°F (ADJ.).
               2. AS HEATING DEMAND INCREASES, THE SETPOINT SHALL INCREMENTALLY RESET UP TO A MAXIMUM OF 85° F (ADJ.).
             - C. AS HEATING DEMAND DECREASES, THE SETPOINT SHALL INCREMENTALLY RESET DOWN TO A MINIMUM OF 72° F (ADJ.).
   - I. DX COOLING: THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND STAGE OR MODULATE THE PACKAGED REFRIGERATION SYSTEM TO MAINTAIN ITS SPACE COOLING SETPOINT. RTU UNITS SHALL BE EQUIPPED WITH AN INTEGRATED DIFFERENTIAL ENTHALPY ECONOMIZER, WHERE THE ECONOMIZER IS THE FIRST STAGE OF COOLING AND MECHANICAL COOLING ENGAGES TO SUPPLEMENT THE ECONOMIZER. TO PREVENT SHORT CYCLING, THE STAGE SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.
     1. THE COOLING SHALL BE ENABLED WHENEVER:
        - a. OUTSIDE AIR TEMPERATURE IS GREATER THAN 60°F (ADJ.).
        - b. AND THE ECONOMIZER (IF PRESENT) IS DISABLED OR FULLY OPEN.
        - c. AND THE SUPPLY FAN STATUS IS ON.
        - d. AND THE HEATING IS NOT ACTIVE.
     2. ALARMS SHALL BE PROVIDED AS FOLLOWS:
        - a. HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5°F (ADJ.) GREATER THAN SETPOINT.
     3. DEHUMIDIFICATION: THE CONTROLLER SHALL MEASURE THE RETURN AIR HUMIDITY AND OVERRIDE THE COOLING SEQUENCE TO MAINTAIN RETURN AIR HUMIDITY AT OR BELOW 50% RH (ADJ.). DEHUMIDIFICATION SHALL BE ENABLED WHENEVER THE SUPPLY FAN STATUS IS ON.
   - K. ECONOMIZER MODE: THE UNIT'S PROGRAMMABLE CONTROLLER SHALL MONITOR THE RETURN AIR & OUTSIDE AIR ENTHALPY. WHEN THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY, THE SYSTEM SHALL OPERATE AS FOLLOWS:
     1. THE CONTROLLER SHALL MODULATE THE ECONOMIZER DAMPERS (RETURN & OA DAMPERS) IN SEQUENCE. WHENEVER THE SYSTEM IS IN OCCUPIED MODE, THE OA DAMPER SHALL MODULATE BETWEEN THE MIN. OA VENT AIRFLOW AND 100% SUPPLY AIR. THE OUTSIDE AIR DAMPER SHALL NEVER PROVIDE LESS THAN THE OA VENT AIRFLOW.
        - A. RTU (SZVAV): THE DAMPERS SHALL MODULATE TO MAINTAIN THE OCCUPIED SPACE TEMPERATURE SETPOINT.
     2. THE ECONOMIZER SHALL BE ENABLED WHENEVER:
        - a. OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
        - b. AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE.
        - c. AND THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY.
        - d. AND THE SUPPLY FAN STATUS IS ON.
     3. THE ECONOMIZER SHALL BE DISABLED WHENEVER:
        - a. MIXED AIR TEMPERATURE DROPS TO 35°F (ADJ.).
        - b. OR THE OA ENTHALPY EXCEEDS RA ENTHALPY.
        - c. OR ON LOSS OF SUPPLY FAN STATUS.
        - d. OR FREEZESTAT (IF PRESENT) IS ON.
   - L. DEMAND CONTROL VENTILATION (DCV) ADJUSTMENT:
     1. DCV SHALL NOT BE AVAILABLE DURING UNOCCUPIED, ECONOMIZER OR MORNING WARM UP/COOL DOWN MODES.
     2. THE BMS CONTRACTOR SHALL PROVIDE A COMMON OUTDOOR AIR CO_2 TRANSMITTER LOCATED ON THE EXTERIOR OF THE BUILDING.
     3. THE OUTDOOR & SPACE CO_2 TRANSMITTER(S) SHALL BE CONTINUOUSLY MONITORED.
        - a. THE INDOOR CO_2 SETPOINT SHALL BE EQUAL TO THE OUTDOOR AIR LEVEL PLUS 350 PPM (ADJ.).
     4. WHEN THE INDOOR CO_2 LEVELS ARE BELOW SETPOINT, THE OA AND RA DAMPERS SHALL BE MODULATED IN SEQUENCE TO DECREASE THE OA VENTILATION AIRFLOW.
        - a. THE OA VENTILATION AIRFLOW SHALL BE TEMPORARILY RESET TO 10% (ADJ.) OF THE SCHEDULED OA VENTILATION AIRFLOW.
     5. WHEN THE INDOOR CO_2 LEVELS ARE ABOVE SETPOINT, THE SCHEDULED OA VENTILATION AIRFLOW SHALL BE MAINTAINED.
   - M. THE UNITS ARE SUBJECT TO SYSTEM SAFETIES:
     1. FILTER DIFFERENTIAL PRESSURE MONITOR: THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FINAL FILTERS.
        - a. ALARMS SHALL BE PROVIDED AS FOLLOWS:
          1. FILTER CHANGE REQUIRED: FINAL FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).
     2. MIXED AIR TEMPERATURE: THE CONTROLLER SHALL MONITOR THE MIXED AIR TEMPERATURE AND USE AS REQUIRED FOR ECONOMIZER CONTROL (IF PRESENT) OR PREHEATING CONTROL (IF PRESENT)
        - a. ALARMS SHALL BE PROVIDED AS FOLLOWS:
          1. HIGH MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS GREATER THAN 90°F (ADJ.).
          2. LOW MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).
     3. RETURN AIR HUMIDITY: THE CONTROLLER SHALL MONITOR THE RETURN AIR HUMIDITY AND USE AS REQUIRED FOR ECONOMIZER CONTROL (IF PRESENT) OR HUMIDITY CONTROL (IF PRESENT).
        - a. ALARMS SHALL BE PROVIDED AS FOLLOWS:
          1. HIGH RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS GREATER THAN 70% (ADJ.).
          2. LOW RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS LESS THAN 30% (ADJ.).
     4. RETURN AIR CARBON DIOXIDE (CO2) CONCENTRATION MONITORING: THE CONTROLLER SHALL MEASURE THE RETURN AIR CO2 CONCENTRATION.
        - a. ALARMS SHALL BE PROVIDED AS FOLLOWS:
          1. HIGH RETURN AIR CARBON DIOXIDE CONCENTRATION: IF THE RETURN AIR CO2 CONCENTRATION IS GREATER THAN 1000 PPM (ADJ.) WHEN IN THE UNIT IS RUNNING.
     5. RETURN AIR TEMPERATURE: THE CONTROLLER SHALL MONITOR THE RETURN AIR TEMPERATURE AND USE AS REQUIRED FOR SETPOINT CONTROL OR ECONOMIZER CONTROL (IF PRESENT).
        - a. ALARMS SHALL BE PROVIDED AS FOLLOWS:
          1. HIGH RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS GREATER THAN 90°F (ADJ.).
          2. LOW RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).
     6. SUPPLY AIR TEMPERATURE: THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.
        - a. ALARMS SHALL BE PROVIDED AS FOLLOWS:
          1. HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
          2. LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F (ADJ.)
     7. DUCT SMOKE DETECTORS: IF PRODUCTS OF COMBUSTION ARE PRESENT WITHIN THE SUPPLY AND/OR RETURN DUCTS. THE SUPPLY FAN(S) SHALL BE DISABLED AND THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL CLOSE.
        - a. ALARMS SHALL BE PROVIDED AS FOLLOWS:
          1. UNIT SHUTDOWN: IF PRODUCTS OF COMBUSTION ARE PRESENT WITHIN THE SUPPLY AND/OR RETURN DUCTS.
     8. CURRENT SENSORS INSTALLED AT THE SUPPLY FAN(S) SHALL MONITOR THEIR RESPECTIVE STATUS. IF THE DEVICE STATUS SHOULD DIFFER FROM THE COMMAND, AN ALARM SHALL ACTIVATE.
3. EXHAUST FANS (EFs):
   - A. GENERAL: THE CONTROLLER SHALL MONITOR THE FAN STATUS. ALL FANS WILL BE MONITORED FOR RUN STATUS AT THE CENTRAL BMS OWS.
   - B. THE FAN SHALL BE CONTROLLED BY THE GAS DETECTION SYSTEM. SEE GDS SEQUENCE OF OPERATIONS FOR ADDITIONAL INFORMATION.
   - C. WHEN THE FAN IS COMMANDED ON, THE FAN SHALL BE ENABLED AND RUN CONTINUOUSLY. WHEN THE FAN IS COMMANDED OFF, THE FAN SHALL BE DEENERGIZED.
4. CIRCULATION FANS (CFs):
   - A. GENERAL: THE CONTROLLER SHALL MONITOR THE FAN STATUS. ALL FANS WILL BE MONITORED FOR RUN STATUS AT THE CENTRAL BMS OWS.
   - B. ALL FANS SHALL BE CONTROLLED BY THEIR RESPECTIVE CORD MOUNTED, INLINE, MULTI-SPEED SWITCH CONTROLLER.
   - C. FANS SHALL BE INTERLOCKED WITH THE CENTRAL FIRE ALARM SYSTEM.

CONTROLS ACCOUNT VENDOR CONTACT AND GENERAL SCOPE OVERVIEW 23 0900 INSTRUMENTATION AND CONTROL FOR HVAC V4.3:

ACCOUNT OVERVIEW (REFERENCE SPECIFICATIONS 23 0900 SECTION 1.3):

A. CLIENT HAS STANDARDIZED ON ASHRAE STANDARD 135-2010, BACNET/IP AND BACNET MS/TP CONTROL SYSTEM ARCHITECTURE AS THE PREFERRED COMMUNICATION METHOD FOR THE BMS. THE DIVISION OF WORK FOR THIS PROJECT IS SEGMENTED BETWEEN DIVISION 23 (CONTROLS) AND DIVISION 25 (SYSTEMS INTEGRATION). DIVISIONS 23 AND 25 SHALL BE SUPPORTED BY A PRESELECTED CONTROLS CONTRACTOR AND SYSTEMS INTEGRATOR (SI). THE SI IS RESPONSIBLE FOR COORDINATING THE CONSISTENCY OF THE LOCAL OPERATOR WORKSTATION SYSTEM GRAPHICS, PROVIDING NETWORK AREA CONTROLLERS (NACS), GLOBAL LOGIC/SEQUENCES. DIVISION 23 SHALL BE THE PRESELECTED CONTROLS CONTRACTOR. DIVISION 25 SYSTEMS INTEGRATOR (SI) SHALL BE CBRE/ESI.

B. THE GENERAL CONTRACTOR SHALL DIRECTLY HIRE CBRE|ESI FOR SYSTEM INTEGRATION (SI).

HVAC CONTROLS AND MONITORING SYSTEMS:

1. INTEGRATE RTU CONTROLS TO EXISTING CENTRALIZED CONTROL PLATFORM AND INTERFACE FOR FULL MONITORING & CONTROL OF EQUIPMENT.
2. INTEGRATE THE FOLLOWING HVAC EQUIPMENT INTO THE EXISTING BUILDING AUTOMATION SYSTEM (BAS):
   - A. ROOFTOP UNITS (RTU-1, RTU-2, RTU-3 AND RTU-4)
   - B. COORDINATE INTEGRATION WITH THE OWNER'S REPRESENTATIVE AND REFER TO THE SEQUENCE OF OPERATIONS FOR DETAILED REQUIREMENTS.
3. INSTALLATION SHALL BE COORDINATED WITH THE TENANT'S IT SYSTEMS FOR INTERNET ACCESS. LOCAL BMS SHALL BE CAPABLE OF INTEGRATING UNIT CONTROLLERS WITHIN A WEB-BASED NETWORK INTERFACE. THE SYSTEM INTERFACE SHALL DEPICT EACH MECHANICAL SYSTEM ON THE BUILDING FLOORPLAN WITH POINT-AND-CLICK GRAPHICAL INTERFACE. DESIGNS SHALL BE BASED ON TELETROL, LIGHTSTAT, EMME OR AN APPROVED EQUIVALENT. THE SYSTEM SHALL PROVIDE CONNECTION TO THE OWNER'S VIRTUAL PRIVATE NETWORK (VPN) FOR REMOTE ACCESS TO DATA.

HVAC CODE COMPLIANCE NOTES:

1. COOLING TO EACH ZONE IS CONTROLLED BY A THERMOSTAT CONTROL. MINIMUM ONE HUMIDITY CONTROL DEVICE PER INSTALLED HUMIDIFICATION / DEHUMIDIFICATION SYSTEM.
2. ALL HVAC SYSTEMS TO INCLUDE OPTIMUM START CONTROLS.
3. INSULATE ALL PIPING EXPOSED TO WEATHER. INSULATION TO PROTECT FROM DAMAGE DUE TO SUN, MOISTURE, WIND, ETC.
4. THERMOSTATIC CONTROLS TO HAVE A 5°F DEADBAND.
5. TEMPERATURE CONTROLS TO HAVE SETPOINT OVERLAP RESTRICTIONS.
6. EQUIP EACH ZONE WITH SETBACK CONTROLS USING PROGRAMMABLE CONTROL SYSTEM.
7. AUTOMATIC CONTROLS; SETBACK TO 55 °F (HEAT) AND 85 °F (COOL), 7-DAY CLOCK, 2-HOUR OCCUPANT OVERRIDE, 10-HOUR BACKUP.

REFER TO BOOK SPECIFICATIONS FOR MORE INFORMATION.

EXHAUST FANS

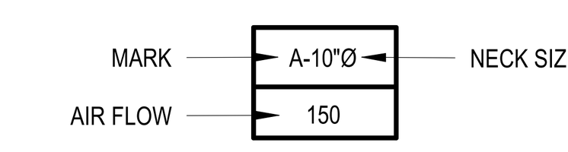
MARK	MANUFACTURER	MODEL	TYPE	DRIVE TYPE	AIRFLOW (CFM)	ESP (IN WC)	FAN RPM	ELEC DATA			SONES	WEIGHT (LBS)	REMARKS
								HP	VOLTS	PHASE			
EF-1E	GREENHECK	BAER-48	SIDEWALL	BELT	15,500	0.437	793	2	480	3	45	521	ALL
EF-2E	GREENHECK	AER-20-VG	SIDEWALL	DIRECT	1,100	0.489	1262	1/2	480	1	13.4	145	ALL
EF-3E	GREENHECK	BAER-48	SIDEWALL	BELT	15,500	0.437	793	2	480	3	45	521	ALL
EF-4E	GREENHECK	AER-20-VG	SIDEWALL	DIRECT	1,100	0.489	1262	1/2	480	1	13.4	145	ALL

REMARKS:
1. INSTALL IN ACCORDANCE WITH MANUF. INSTALLATION INSTRUCTIONS.
2. INSTALL ALL SHIPPED LOOSE ITEMS IN ACCORDANCE WITH MANUF. INSTALLATION INSTRUCTIONS.
3. PROVIDE THE FOLLOWING: EC MOTOR W/ SPEED CONTROL FOR BALANCING - DIAL ON MOTOR, UL-705, NEMA-1 TOGGLE TYPE DISCONNECT SWITCH, JUNCTION BOX MOUNTED & WIRED, SHORT WALL HSG, FLUSH EXTERIOR, W/ OSHA GRD, MOTOR ACCESS: FROM INT. OF BLDG, CLOSURE ANGLES, WEATHERHOOD, GALVANIZED 45 DEG. WITH BIRD SCREEN, WIRING PIGTAIL, INTERNAL, & MOTORIZED DAMPER.
4. SHOP DRAWING SUBMITTALS FOR ROOFTOP UNITS, LOUVERS, AND EXHAUST FANS MUST INCLUDE DOCUMENTATION SEALED BY A FLORIDA PROFESSIONAL ENGINEER THAT EQUIPMENT CONSTRUCTION IS DESIGNED TO WITHSTAND SPECIFIC LOCAL REQUIREMENTS FOR WIND LOADS.
5. SELECTION BASED ON GREENHECK. EQUAL MANUFACTURER BY COOK, PENN OR PRIOR APPROVED EQUALS.

AIR DEVICE

MARK	MANUFACTURER	MODEL	SERVICE	MATERIAL	MOUNTING TYPE	MAX NC LEVEL	COLOR	SIZE		DAMPER	REMARKS
								FACE	NECK		
A	TITUS	DL	SUPPLY	ALUMINUM	SURFACE - DUCT	30	WHITE	SEE TAG	-	AIR SCOOP	ALL

REMARKS:
1. SELECTIONS SCHEDULED ARE BASED ON PRODUCTS BY TITUS. EQUAL PRODUCTS, SUBJECT TO COMPLIANCE WITH ALL CRITERIA, BY PRICE OR METALAIRE.



LOUVERS

MARK	MANUFACTURER	MODEL	SIZE		SERVICE	AIRFLOW (CFM)	MIN FREE AREA (SF)	MAX PRESSURE DROP (IN WC)	OPERATOR	INTERLOCK	REMARKS
			WIDTH	HEIGHT							
LV-1E	GREENHECK	EVH-501D	5' - 0"	5' - 0"	EXHAUST	15500	14.0	0.21	120 V	EF-1	ALL
LV-1S	GREENHECK	EVH-660D	6' - 6"	6' - 6"	INTAKE	15500	18.8	0.11	120 V	EF-1	ALL
LV-2E	GREENHECK	EVH-501D	2' - 2"	2' - 2"	EXHAUST	1100	2.0	0.05	120 V	EF-2	ALL
LV-2S	GREENHECK	EVH-660D	2' - 0"	2' - 0"	INTAKE	1100	1.3	0.12	120 V	EF-2	ALL
LV-3E	GREENHECK	EVH-501D	5' - 0"	5' - 0"	EXHAUST	15500	14.0	0.21	120 V	EF-3	ALL
LV-3S	GREENHECK	EVH-660D	6' - 6"	6' - 6"	INTAKE	15500	18.8	0.11	120 V	EF-3	ALL
LV-4E	GREENHECK	EVH-501D	2' - 2"	2' - 2"	EXHAUST	1100	2.0	0.05	120 V	EF-4	ALL
LV-4S	GREENHECK	EVH-660D	2' - 0"	2' - 0"	INTAKE	1100	1.3	0.12	120 V	EF-4	ALL

REMARKS:
1. THE MOTORIZED DAMPER SHALL BE NORMALLY CLOSED. DAMPER ACTUATOR: FAIL OPEN, TWO-POSITION WITH AUX. SWITCH.
2. DAMPER AND LOUVER SHALL BE BY THE SAME MANUFACTURER.
3. THE LOUVER SHALL BE A SINGLE SECTION - MAXIMUM SECTION SIZE PER MANUFACTURER'S PRODUCT DATA. WHERE MULTIPLE SECTION LOUVERS ARE REQUIRED, PROVIDE CORROSION RESISTANT STRUCTURAL REINFORCING MEMBERS ALONG WITH ANY ASSOCIATED INSTALLATION HARDWARE. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
4. SHOP DRAWING SUBMITTALS FOR ROOFTOP UNITS, LOUVERS, AND EXHAUST FANS MUST INCLUDE DOCUMENTATION SEALED BY A FLORIDA PROFESSIONAL ENGINEER THAT EQUIPMENT CONSTRUCTION IS DESIGNED TO WITHSTAND SPECIFIC LOCAL REQUIREMENTS FOR WIND LOADS.
5. PROVIDE WITH EXTENDED SILL, SECURITY BARS, ALUMINUM BIRD AND INSECT SCREEN IN REMOVABLE FRAME, MOUNTING CLIP ANGLES AND FASTENERS.
6. COLOR TO MATCH EXTERIOR WALL USING THE MANUFACTURER'S STANDARD COLORS - FINISH TYPE: 2-COAT 70% KYNAR.
7. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION AND ELEVATION.
8. LOUVER SHALL COMPLY WITH AMCA 500L, 550 AND 540 COMPLIANT; ASTM E330, E1886 AND E1996; AND FLORIDA TEST PROTOCOLS TAS 201, TAS 202 AND TAS 203.
9. SELECTIONS SCHEDULED ARE BASIS OF DESIGN. APPROVED EQUAL PRODUCTS BY LOREN COOK OR RUSKIN, PROVIDED THEY MEET OR EXCEED THE BASIS OF DESIGN PERFORMANCE AND SPECIFICATIONS.

CIRCULATION FANS

MARK	MANUFACTURER	MODEL	MOUNTING TYPE	DRIVE TYPE	DIAMETER (IN)	ELEC DATA			WEIGHT (LBS)	REMARKS
						VOLTS	PHASE	AMPS		
CF-1	BIG ASS FANS	F-AE1-2001	WALL MOUNT / I-BEAM	DIRECT	36"	120	1	3.5	32	ALL
CF-2	BIG ASS FANS	F-AE1-2001	WALL MOUNT / I-BEAM	DIRECT	36"	120	1	3.5	32	ALL
CF-3	BIG ASS FANS	F-AE1-2001	WALL MOUNT / I-BEAM	DIRECT	36"	120	1	3.5	32	ALL
CF-4	BIG ASS FANS	F-AE1-2001	WALL MOUNT / I-BEAM	DIRECT	36"	120	1	3.5	32	ALL
CF-5	BIG ASS FANS	F-AE1-2001	WALL MOUNT / I-BEAM	DIRECT	36"	120	1	3.5	32	ALL
CF-6	BIG ASS FANS	F-AE1-2001	WALL MOUNT / I-BEAM	DIRECT	36"	120	1	3.5	32	ALL
CF-7	BIG ASS FANS	F-AE1-2001	WALL MOUNT / I-BEAM	DIRECT	36"	120	1	3.5	32	ALL
CF-8	BIG ASS FANS	F-AE1-2001	WALL MOUNT / I-BEAM	DIRECT	36"	120	1	3.5	32	ALL

REMARKS:
1. PROVIDE A COLUMN/WALL MOUNTING BRACKET AND MOUNT FAN AT APPROX 10' AFF.
2. FAN IS PROVIDED WITH AUTOMATION AND MULTI-FAN KIT, POWER CORD W/ PLUG, AND FACTORY MOUNTED INLINE 2-SPEED SWITCH. THE 2-SPEED SWITCH SHALL BE MOUNTED 4'-0" AFF. A RECEPTACLE SHALL BE PROVIDED BY THE EC BELOW EACH RESPECTIVE FAN. COORDINATE WITH THE EC. REFER TO DETAIL.
3. PROVIDE A FIRE ALARM FAN SHUTDOWN CONTROL MODULE. COORDINATE WITH THE EC.
4. SELECTIONS SCHEDULED ARE BASED ON PRODUCTS BY BIG ASS FANS. EQUAL PRODUCTS, SUBJECT TO COMPLIANCE WITH ALL CRITERIA, BY PATTERSON AND GREENHECK.

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No. 82584
STATE OF FLORIDA
PROFESSIONAL ENGINEER

Jesse E Vose

Digitally signed by Jesse E Vose
Date: 2026.01.08 20:28:33-05'00'

This item has been digitally signed and sealed by Jesse E. Vose on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

DMO4 - CANOPY ENCLOSURE
2400 MASON AVE
DAYTONA BEACH FL 32114

REVISIONS

NO	DATE	DESCRIPTION

DESIGNED: RV
DRAWN: RV
REVIEWED: JV
PROJECT NO.: 2501635
DATE: 1/12/2026
ISSUED FOR:
PERMIT SET

TITLE:
MECHANICAL SCHEDULES

SHEET NUMBER
M601

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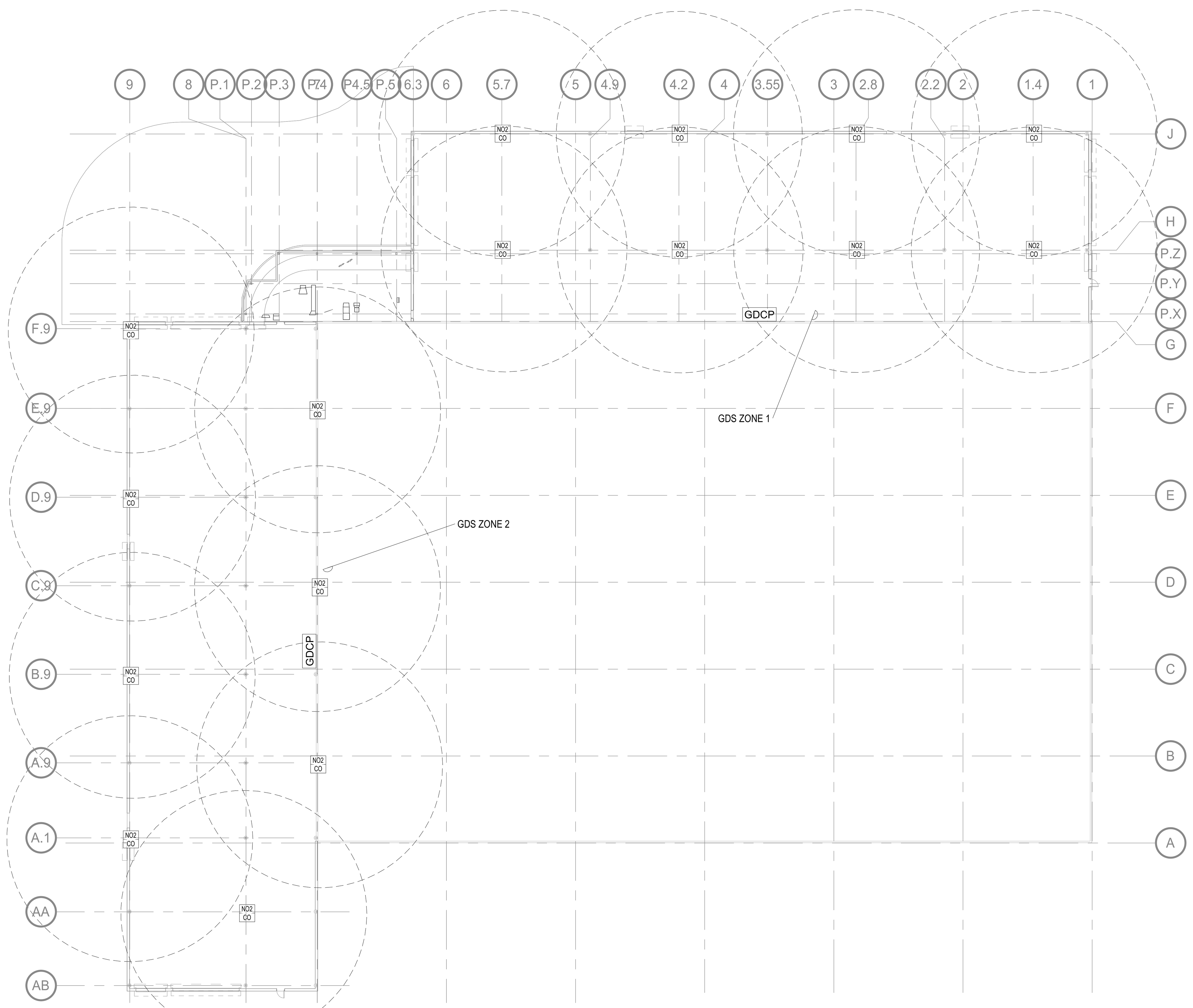
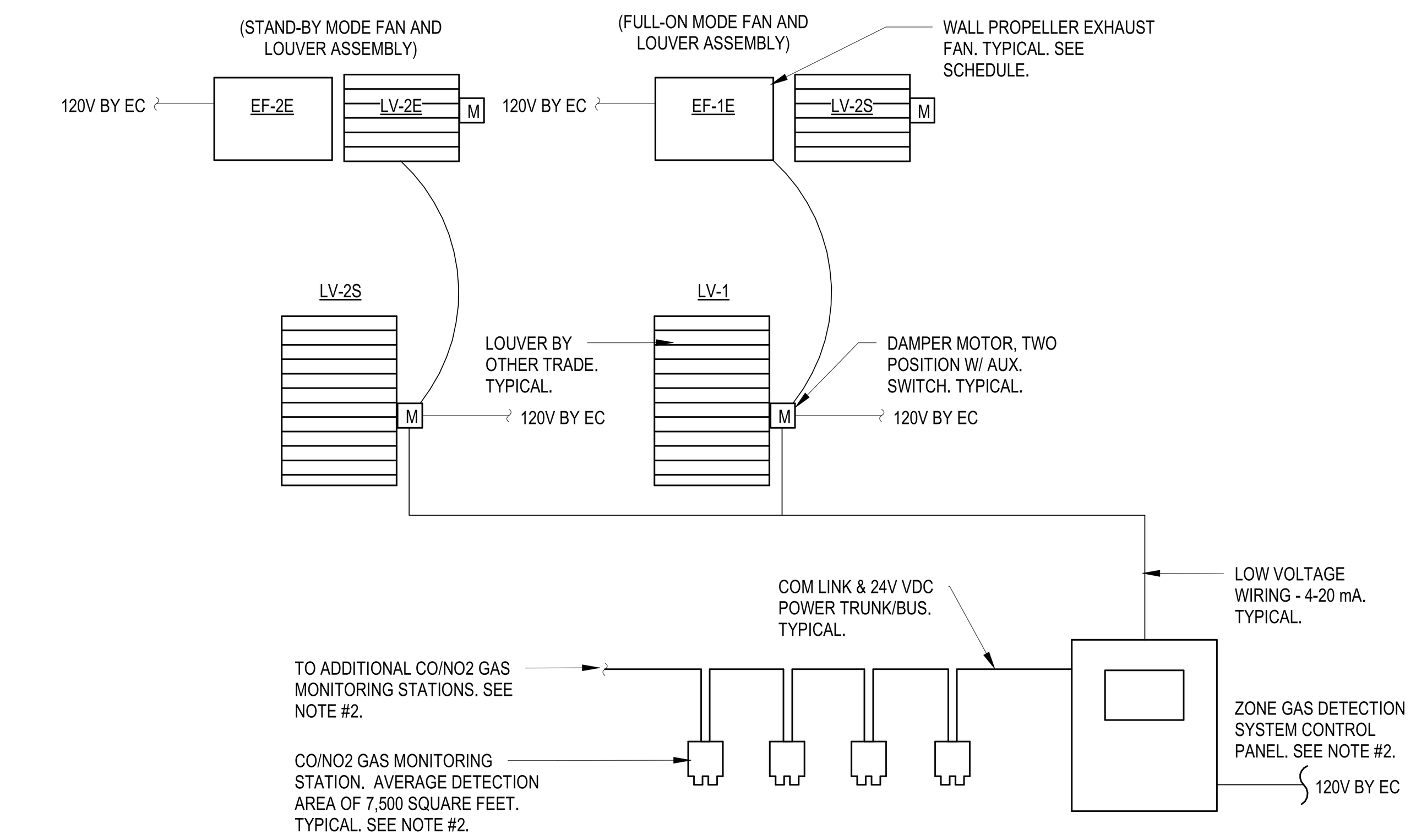


3 ENCLOSED CANOPY - GDS ZONE KEYPLAN
1/32" = 1'-0"



NOTES:
1. GAS DETECTION SYSTEM (GDS) SHALL CONTINUOUSLY MONITOR CO AND NO2 GAS LEVELS IN ALL GARAGE AREAS. INITIAL TOXIC GAS CONCENTRATION SETPOINTS SHALL BE AS INDICATED IN THE GDS SEQUENCE OF OPERATIONS. REFER TO GAS DETECTION SYSTEM SEQUENCE OF OPERATION FOR ADDITIONAL INFORMATION.
2. REFER TO FLOOR PLANS FOR LOCATIONS OF GAS DETECTION SYSTEM CONTROL PANEL, LOUVERS, AND GAS MONITORING STATIONS.
3. PROVIDE ALL NECESSARY COMPONENTS: CONTROLLERS, EXPANSION MODULES, DIGITAL SENSORS, REMOTE RELAYS, REPEATER/POWER BOOSTERS, TRANSFORMERS, COMMUNICATIONS/POWER CABLING & WIRING, ETC. FOR A COMPLETE AND FUNCTIONING SYSTEM.
4. INSTALL IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS. COORDINATE INSTALLATION WITH GENERAL CONTRACTOR AND ELECTRICAL CONTRACTOR.
5. DESIGN BASIS: INTEC DGC6.

1 CO/NO2 GAS DETECTION SYSTEM DETAIL
1/8" = 1'-0"

GAS DETECTION SYSTEM (GDS) SEQUENCE OF OPERATIONS:

THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ALL CONTROLS, CONTROL WIRING AND CONTROL DESIGN.

1. GENERAL:
   A. THE GAS DETECTION SYSTEM (GDS) SHALL BE ZONED. SEE GDS ZONE KEY PLAN. THE GAS DETECTION SYSTEM SHALL HAVE A CENTRAL CONTROL PANEL WITH AUDIBLE ALARM AND EACH ZONE SHALL CONSIST OF, BUT NOT LIMITED TO: COMBINATION CO/NO2 SENSORS (OR SEPARATE SENSORS MOUNTED NEXT TO EACH OTHER), TWO AUDIO/VISUAL ALARMS PER ZONE, COMBINATION LOUVER/DAMPERS, AND EXHAUST FANS. THE GDS AND ALL APPURTENANCES THEREOF SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND WRITTEN INSTALLATION INSTRUCTIONS.
   B. COMBINATION CARBON MONOXIDE (CO) AND NITROGEN DIOXIDE (NO2) SENSORS, AND AUTOMATIC CONTROLS TO BE UL 2075 COMPLIANT.
   C. PROVIDE TESTING & CALIBRATION SCHEDULE FOR CO/NO2 SENSORS TO END USER, TENANT OR OWNER.
   D. THE GDS SHALL BE CONFIGURED TO STAGE THE COMBINATION LOUVER/DAMPER(S) AND FAN(S) AS INDICATED HEREIN.
   E. APPROVED MANUFACTURERS: ARMSTRONG MONITORING, INTEC CONTROLS, TOX ALERT, HONEYWELL.
2. SEQUENCE OF OPERATION:
   A. GENERAL: THE GDS VENTILATION SYSTEM SHALL BE CYCLED BETWEEN TWO (2) MODES OF OPERATION: “FULL-ON” & “STANDBY”. ALL GDS ZONES SHALL BE INDEXED INTO “STANDBY MODE” WHEN THE BUILDING IS “OCCUPIED” AND REMAIN IN THIS MODE UNLESS THE BUILDING IS EITHER, “UNOCCUPIED” OR WHEN GAS CONCENTRATIONS EXCEED THEIR SETPOINTS.
   B. THE GDS CONTROL UNIT SHALL BE PROVIDED WITH RELAY CONTACTS / 4-20MA ANALOG OUTPUTS AND EXPANSION MODULES, AS NEEDED.
      1. STANDBY MODE:
         a. THE ASSOCIATED EQUIPMENT (SEE TABLE 2) SHALL BE CONTROLLED AS FOLLOWS: MOTORIZED DAMPER SHALL “OPEN” AND VIA THE DAMPER END SWITCH(ES), ENERGIZE THE STAND-BY EXHAUST FAN AND RUN CONTINUOUSLY.
         b. IF GAS CONCENTRATIONS EXCEED THEIR SETPOINTS (SEE TABLE 1), THE GDS SHALL BE INDEXED TO THE "FULL-ON MODE".
      2. FULL-ON MODE:
         a. THE ASSOCIATED EQUIPMENT (SEE TABLE 2) SHALL BE CONTROLLED AS FOLLOWS:
            1. WHEN GAS CONCENTRATIONS EXCEED THEIR SETPOINTS (SEE TABLE 1), THE GDS CONTROL UNIT SHALL DEENERGIZE THE STAND-BY EXHAUST FAN(S) AND CLOSE ITS RESPECTIVE MOTORIZED DAMPER, “OPEN” THE FULL-ON MOTORIZED DAMPER(S) AND VIA THE DAMPER END SWITCH(ES), SHALL ENERGIZE THE FULL-ON EXHAUST FAN(S) AND RUN CONTINUOUSLY.
            2. WHEN GAS CONCENTRATIONS DROP BELOW THEIR SETPOINTS,THE GDS SHALL DEENERGIZE THE FULL-ON EXHAUST FAN AND CLOSE ITS RESPECTIVE MOTORIZED DAMPER AND RESET BACK INTO STANDBY MODE.
      3. DAMPER(S) & FAN(S) SHALL BE MONITORED AND ALARMED. AN AUDIBLE & VISUAL ALARM SHALL BE SENT TO AN ALARM STATION WHEN A DEVICE STATUS DIFFERS FROM ITS COMMAND. ALARMS SHALL BE MANUALLY RESET. AN ALARM STATION SHALL BE LOCATED AS INSTRUCTED BY THE BUILDING OWNER’S REPRESENTATIVE.
         a. FAN STATUS – OFF, WHEN COMMANDED “ON”,
         b. DAMPER STATUS – CLOSED, WHEN COMMANDED “OPEN”.
3. PURGE CYCLE:
   A. THE GDS SYSTEM SHALL HAVE A PURGE CYCLE TO MANUALLY ENABLE THE SYSTEM WHEN DESIRED. A MUSHROOM TYPE PUSH BUTTON SWITCH WITH PROTECTIVE CLEAR FLIP-UP COVER SHALL BE PROVIDED WITH EACH GDS CONTROL UNIT AND LOCATED AT THE GDS CONTROL UNIT. PROVIDE A PLAQUE TO INDICATE “CO/NO2 PURGE”.
      1. WHEN THE SWITCH IS ENGAGED, THE LOUVER/DAMPERS AND FANS SHALL OPERATE IN FULL-ON SEQUENCE AS INDICATED ABOVE.
      2. THE PURGE CYCLE SHALL BE ENABLED FOR A TIMED PERIOD - 5 MINS. (ADJ.).
4. ALARMS:
   A. FIRST ALARM: THE GDS SHALL CONTROL THE LOUVER/DAMPER(S) AND ENERGIZE THE EXHAUST FAN(S), IN SEQUENCE, WHEN A SENSOR(S) DETECT CO/NO2 LEVELS THAT EXCEED SETPOINT (SEE TABLE 1).
   B. SECOND ALARM: AFTER A 1 MINUTE TIMED DELAY (ADJ.) AT THE CO/NO2 LEVEL SETPOINT (SEE TABLE 1), A COMBINATION AUDIO/VISUAL ALARM PROVIDED WITH THE GDS CONTROL UNIT SHALL BE ACTIVATED.
      1. ALARM RESET:
         a. ALARM SHALL SILENCE WHEN ANY OF THE GDS CONTROL UNIT KEYPAD BUTTONS ARE PUSHED, OR
         b. THE LEVEL HAS DROPPED DOWN TO FIRST ALARM SETPOINT.
         c. THE FAN(S) AND LOUVER/DAMPER(S) SHALL CONTINUE TO OPERATE AND REMAIN OPEN.

TABLE 1: TOXIC GAS CONCENTRATION SETPOINTS

TOXIC GAS	FIRST ALARM:	SECOND ALARM:	SENSOR CELL	RADIUS OF COVERAGE
CARBON MONOXIDE (CO)	25 PPM	200 PPM	5' ABOVE FLOOR	APPROX. 50 FEET
NITROGEN DIOXIDE (NO_2)	0.7 PPM	2 PPM	5' ABOVE FLOOR	APPROX. 50 FEET

TABLE 2: ASSOCIATED EQUIPMENT

SYSTEM MODE	GDS ZONE	ASSOCIATED EXHAUST FANS	ASSOCIATED LOUVER MDs	REMARKS
FULL-ON	1	EF-1E	LV-1E, LV-1S	1
STANDBY	1	EF-2E	LV-2E, LV-2S	1
FULL-ON	2	EF-3E	LV-3E, LV-3S	1
STANDBY	2	EF-4E	LV-4E, LV-4S	1

REMARKS:
1. ALL FANS SHALL OPERATE PER THE GDS SEQUENCE OF OPERATIONS.

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