

H:\DRAWINGS\TILE - THE LEARNING EXPERIENCE\TILE - WISCONSIN\TILEW22-099 - TLE PEWAUKEE WI 2021 MEADOW LANE\CD\STILEW22-099-HVAC.DWG LNICOLAE PLOTTED: 03/24/2023

GENERAL ABBREVIATIONS

A		I	
A	Air or Compressed Air	ID	Inside Diameter
AC	Air Conditioning	IN	Inches
ACD	Automatic Control Damper	K	Kilowatt
AD	Access Door	L	
AF	Air Foil	LAT	Leaving Air Temperature
AHU	Air Handling Unit	LB	Pound
AMP	Ampere	LF	Linear Feet
AP	Access Panel	LD	Linear Diffuser
APD	Air Pressure Drop	LP	Low Point
AS	Air Stream	LPS	Low Pressure Steam
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers	LRA	Locked Rotor Amps
ATC	Automatic Temperature Control	LUVR	Louver
ATM	Atmosphere	LVDOR	Louvered Door
AHJ	Authority Having Jurisdiction	LVG	Leaving
		LWT	Leaving Water Temperature
B		M	
BDD	Back-Draft Damper	MAX	Maximum
BHP	Brake Horsepower	MBH	1000 BTUH
BI	Backwards Inclined	MCA	Minimum Circuit Amps
BOD	Bottom of Duct	MD	Motorized Damper
BTU	British Thermal Unit	MECH	Mechanical
BTUH	BTU per Hour	MIN	Minimum
		MJ	Make-Up Water
		MJA	Make-Up Air
C		N	
CENT	Center or Centrifugal	NC	Noise Criteria or Normally Closed
CF	Cubic Feet	NO	Normally Open
CFM	Cubic Feet per Minute	NOM	Nominal
CH	Chilled or Chiller		
CHW	Chilled Water	O	
CHWR	Chilled Water Return	OA	Outside Air
CHWS	Chilled Water Supply	OAI	Outside Air Intake
CO	Carbon Monoxide	OC	On Center
CONN	Connection	OD	Outside Diameter
CT	Cooling Tower	ODP	Open Drip Proof
CTBD	Cooling Tower Blow Down	OV	Outlet Velocity
CUH	Cabinet Unit Heater		
CWR	Condenser Water Return	P	
CWS	Condenser Water Supply	PCF	Pounds per Cubic Foot
		PD	Pressure Drop
		PH	Phase
		PRV	Pressure Reducing Valve
		PSI	Pounds per Square Inch
		PSIA	Pounds per Square Inch - Absolute
		PSID	Pounds per Square Inch - Differential
		PSIG	Pounds per Square Inch - Gauge
		PVC	Polyvinyl Chloride
D		R	
D	Drain	R	Radius
DB	Dry Bulb (Temperature)	RA	Return Air
DEG	Degree	RET	Return
DDC	Direct Digital Control	RH	Relative Humidity
DIA	Diameter	RLA	Running Load Amps
DIM	Dimension	RLF	Relief
DP	Differential Pressure	RPM	Revolutions per Minute
		RTU	Roof-Top Unit
E		S	
EA	Each or Exhaust Air	SA	Supply Air
EAHU	Exhaust Air Handling Unit	SCR	Screen
EAT	Entering Air Temperature	SDT	Saturated Condensing Temperature
EF	Exhaust Fan	SD	Smoke Detector or Smoke Damper
EMER	Emergency	SE	Smoke Exhaust
EMS	Energy Management System	SEN	Sensible
ESP	External Static Pressure	SFD	Combination Smoke / Fire Damper
ET	Expansion Tank	SHC	Sensible Heat Capacity
EUH	Electrical Unit Heater	SMACNA	Sheet metal and Air Conditioning Contractor's National Association
EWT	Entering Water Temperature	SP	Static Pressure
EXH	Exhaust	SF	Square Feet
EXT	External	SS	Stainless Steel
EXP	Expansion	SUP	Supply
F		T	
F	Fahrenheit	T	Temperature
FA	Free Area or Fire Alarm	TEFC	Totally Enclosed Fan Cooled
FC	Flexible Connection	TEMP	Temperature
FCU	Fan Coil Unit	TON	12,000 BTUH (Cooling Capacity)
FD	Fire Damper, or Fire Department	TSP	Total Static Pressure
FLA	Full Load Amps	TSTAT	Thermostat
FLEX	Flexible	TYP	Typical
FLDR	Floor Drain		
FPM	Feet per Minute	U	
FPS	Feet per Second	UC	Undercut (Door)
FRP	Fiberglass Reinforced Plastic		
FS	Flow Switch	V	
FT	Feet	V	Volts
FTR	Fin Tube Radiation	VAV	Variable Air Volume
		VD	Volume Damper
		VEL	Velocity
		VFD	Variable Frequency Drive
G		W	
G	Gas	WB	Wet Bulb Temperature
GA	Gauge	WC	Water Column
GAL	Gallons	WG	Water Gauge
GALV	Galvanized	WPD	Water Pressure Drop
GFU	Glycol Feed Unit	WTD	Water Temperature Difference
GPH	Gallons per Hour		
GPM	Gallons per Minute		
GR	Grade		
H			
HB	Hose Bib (Connection)		
HD	Head		
HP	Horsepower or High Point		
HR	Hour		
HRU	Heat Recovery Unit		
HTG	Heating		
HTHW	High Temperature Hot Water		
HWR	Hot Water Return		
HWS	Hot Water Supply		
HZ	Hertz (Cycles per Second)		

HVAC SPECIFICATIONS

THE FOLLOWING STANDARDS SHALL GOVERN THE CHARACTER OF THE WORK TO BE PERFORMED: ASTM, NFPA, SMACNA, UL, AND LOCAL AGENCIES HAVING JURISDICTION.

1. LOW PRESSURE - RECTANGULAR DUCTWORK GALVANIZED SHEET METAL GAUGE (ALL FOUR SIDES),

DIMENSION LONGEST SIDE, INCHES	GALV STEEL GAUGE	ALUMINUM THICKNESS INCHES	COPPER OZ. PER SQ. FT.	TRANSVERSE REINFORCING AT JOINTS AND BETWEEN JOINTS
UP THRU 12	26	0.020	16	1" POCKET LOCK 24 GAUGE, STANDING SEAM JOINT 24 GAUGE, 1" STANDING S SLIP 24 GAUGE, JOINT MAX ON 8 FT. CENTERS.
13 THRU 18	24	0.025	24	SAME AS FOR UP THRU 12.
19 THRU 54	24	0.025	24	1" POCKET LOCK 22 GAUGE, JOINTS MAX. ON 8 FT. CENTERS.

- WITH 1 X 1 X 1/8 IN.
 1. FLAT AREAS OF DUCT OVER 18 IN. WIDE SHALL BE STIFFENED BY CROSS BREAKING OF BEADING.
 2. ALL JOINTS TO HAVE CORNER CLOSURES.
 3. ALL JOINTS SHALL BE SEALED WITH 3M EC-800 MASTIC.
2. DUCT INSTALLATION:
 DUCTS SHALL BE SUPPORTED WITH APPROVED HANGERS AT INTERVALS NOT EXCEEDING 5 FEET.

3. DUCTWORK INSULATION QUALITY ASSURANCE:
 A. FLAME SPREAD/SMOKE DEVELOPED RATING OF 25/50 IN ACCORDANCE WITH ASTM E84

- PRODUCT: GLASS FIBER, FLEXIBLE
 A. MANUFACTURERS:
 1. SCHULLER
 2. OWENS CORNING
 3. KNAUF
- B. INSULATION: ASTM C553 C812; FLEXIBLE, NONCOMBUSTIBLE
 1. "K" (KSI) VALUE: ASTM C518, 0.29 AT 75 DEGREES F.
 2. MAXIMUM SERVICE TEMPERATURE: 250 DEGREES F.
 3. SECURE WITH PRESSURE SENSITIVE TAPE.
- C. VAPOR BARRIER JACKET
 1. KRAFT PAPER REINFORCED WITH GLASS FIBER YARN AND BONDED TO
 2. MOISTURE VAPOR TRANSMISSION: ASTM E96, 0.04 PERM.
 3. SECURE WITH PRESSURE SENSITIVE TAPE.
- D. VAPOR BARRIER TAPE
 1. KRAFT PAPER REINFORCED WITH GLASS FIBER YARN AND BONDED TO ALUMINIZED FILM, WITH PRESSURE SENSITIVE RUBBER BASED ADHESIVE.
- E. TIE WIRE: ANNEALED STEEL, 16 GAGE.

DUCTWORK INSULATION NOTES:
 ALL SUPPLY AND RETURN DUCTS AND PLENUM INSTALLED AS PART OF AN HVAC AIR DISTRIBUTION SYSTEM MUST BE THERMALLY INSULATED WITH MINIMUM REQUIREMENTS AS FOLLOWS:

R-8 SUPPLY AND RETURN AIR DUCT INSULATION IN UNCONDITIONED SPACES

R-8 SUPPLY AND RETURN AIR DUCT INSULATION OUTSIDE THE BUILDING

R-8 INSULATION BETWEEN DUCTS AND THE BUILDING EXTERIOR WHEN DUCTS ARE PART OF A BUILDING ASSEMBLY

ALL ABOVE MENTIONED INSULATION VALUES SHALL BE CHECKED BY CONTRACTOR AND ADAPTED TO REFLECT REQUIREMENTS OF APPLICABLE ENERGY CODE

EQUIPMENT SYMBOLS AND CALL OUTS

	VD	MANUAL BALANCING VOLUME DAMPER
	Ⓣ	WIRED WALL ROOM THERMOSTAT
	Ⓢ	WIRED REMOTE WALL MOUNTED AVERAGING TEMPERATURE SENSOR CAPABILITY
	Ⓜ	RETURN DUCT MOUNTED HUMIDISTAT
		NEW RETURN/EXHAUST DIFFUSER
		NEW SUPPLY DIFFUSER
	ECH-1	ELECTRIC CEILING HEATER
	EF-1	EXHAUST FAN ROOF MOUNTED, MUSHROOM DOWNBLAST TYPE
	A1/2(325)	AIR OUTLET TAG
		CONDENSATE DRAIN PIPE
		NEW RIGID DUCT
		NEW FLEXIBLE DUCT
		PACKAGED ROOFTOP UNIT
	D/S	SMOKE DETECTOR - DUCT MOUNTED

DUCTWORK SYMBOLS

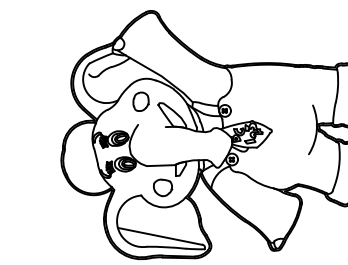
DESCRIPTION	DOUBLE LINE DUCT
SUPPLY DUCT UP	
SUPPLY DUCT DOWN	
ROUND DUCT UP SUPPLY/RETURN/EXHAUST	
ROUND DUCT DOWN SUPPLY/RETURN/EXHAUST	
STANDARD RADIUS ELBOW (R = W) SUPPLY/RETURN/EXHAUST	
MITERED ELBOWS W/ VANES	
BULLHEAD SPLIT SUPPLY	
TAKEOFF TO DIFF/GRILLE	
RETURN DUCT UP	
RETURN DUCT DN	
EXHAUST DUCT UP	
EXHAUST DUCT DN	
HORIZONTAL OFFSET SUPPLY/RETURN/EXHAUST	
RISE OR DROP SUPPLY/RETURN/EXHAUST	
45° TAP TAKE-OFF RECTANGULAR / ROUND (Ø) - OVAL ()	
90° TAP TAKE-OFF RECTANGULAR / ROUND (Ø) - OVAL ()	
BULLHEAD CONVERGE RETURN/EXHAUST RECTANGULAR / ROUND (Ø) - OVAL ()	

- CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE CONTRACTOR'S BEST SKILL AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE AND HAVE CONTROL OVER CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCE, AND JOB SITE SAFETY
- GC MUST PROVIDE & INSTALL ALL PRODUCTS PER PLANS. ONLY SUBSTITUTED PRODUCTS NEED TO BE SUBMITTED TO THE ARCHITECT FOR APPROVAL. UNAPPROVED SUBSTITUTIONS WILL BE REPLACED AT THE EXPENSE OF THE GC.
- VERBAL REPRESENTATION HAS NO VALUE AND ALL REQUESTS TO CHANGE ANY PRODUCTS OR SPECIFICATIONS PER PLANS, MUST BE SUBMITTED IN WRITING TO THE ARCHITECT & TLE FOR APPROVAL.



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ISSUE

NO.	DATE	DESCRIPTION	INT.
1	03-24-23	FOR TLE REVIEW	MBJ

REVISION

NO.	DATE	DESCRIPTION	INT.
1	12/6/22	REVISED AS NOTED	MBJ

PROFESSIONAL CERTIFICATION

NAME OF LICENSEE:
 MATTHEW B. JARMEL
 LICENSE NUMBER: 12809-5

Project Number: TLEW22-099	Scale: AS NOTED
Drawn By: LN	Approved By: MBJ

Drawing Name:
**HVAC ABBREVIATIONS
 SPECIFICATIONS
 AND SYMBOL LIST**

Drawing Number:
M-101

H:\DRAWINGS\TILE- THE LEARNING EXPERIENCE\TILE- WISCONSIN\TILEW12-099 - TILE PEWAUKEE WI 2021 MEADOW LANE\CDSTILEW12-099-HVAC.DWG LNICOLAE PLOTTED: 03/24/2023

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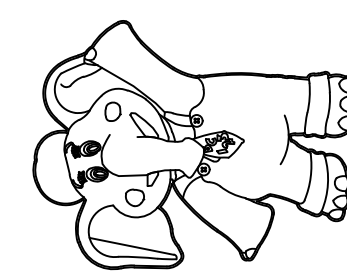
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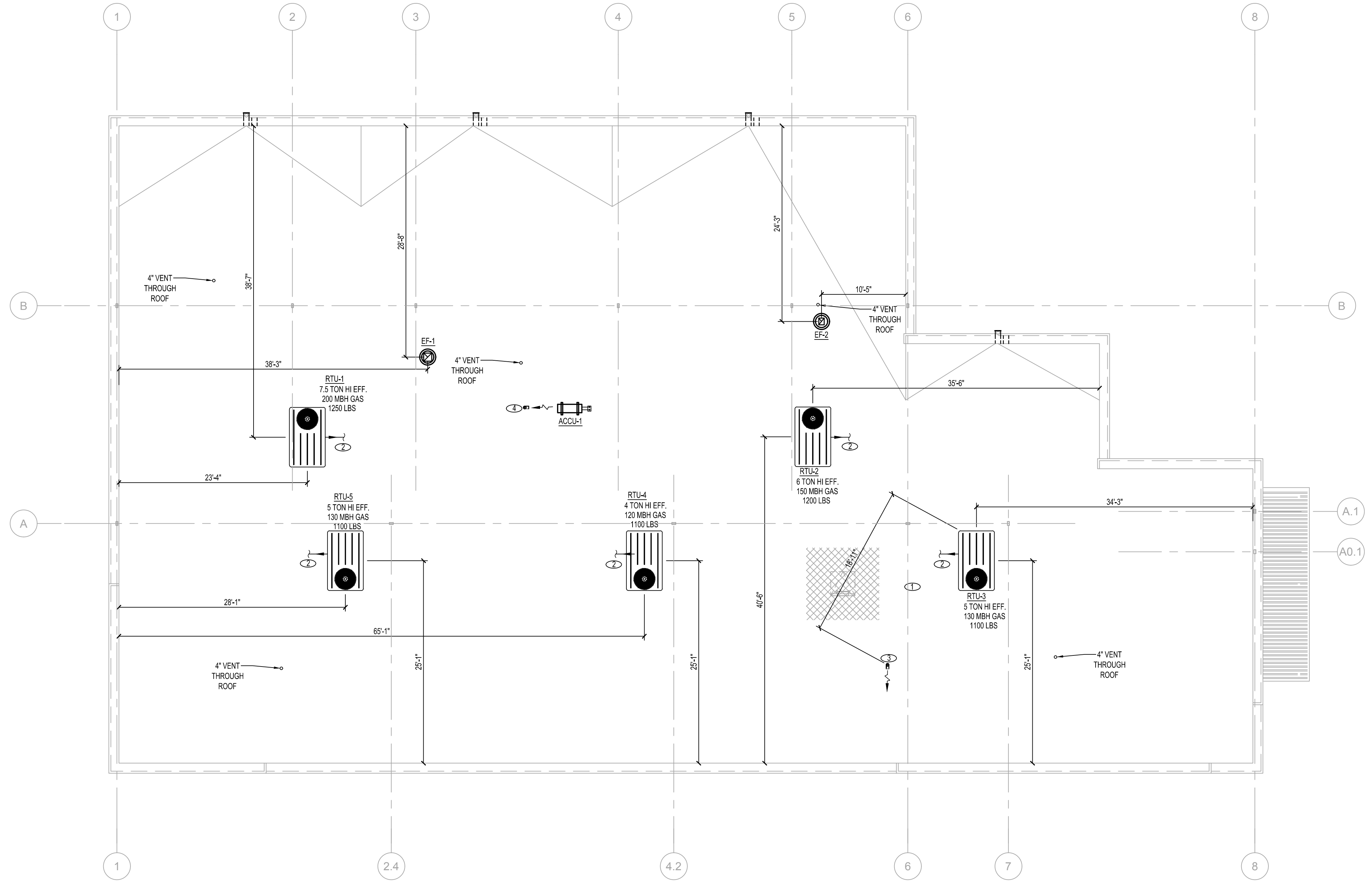
KEY NOTES:

- ① THE HORIZONTAL DISTANCE FROM DRYER EXHAUST OUTLET TO CLOSEST ROOFTOP UNIT OUTSIDE AIR INTAKE SHALL BE MORE THAN 10 FEET
- ② PROVIDE CONDENSATE DRAIN PIPE SIZED PER MANUFACTURER'S REQUIREMENTS FOR EACH ROOFTOP UNIT WITH CONDENSATE TRAP. CONDENSATE TO BE DISCHARGED TO THE ROOF TOWARD ROOF DRAIN. MINIMUM PIPE LENGTH FIVE (5) FEET AWAY FROM RTU INLET TO PROVIDE POSITIVE DRAINAGE. PROVIDE P-TRAP WITH MINIMUM 2" DIFFERENCE BETWEEN INLET AND DISCHARGE. ALLOW PVC PIPE (SIZE TO MATCH THE RTU CONDENSATE DISCHARGE) FROM P-TRAP TO ROOF DRAIN WITH VENT. THE PVC DRAIN LINE SHALL BE INSTALLED THAT NO AIR BLOCK WILL OCCUR.
- ③ 4" DRYER EXHAUST DUCT, TERMINATE WITH GOOSENECK MIN. 3' ABOVE ROOF LINE
- ④ 4" O.A. DUCT FOR PANTRY CASSETTE. TERMINATE WITH MIN. 3' ABOVE ROOF LINE

SHEET NOTES:

- 1. FOR GAS PIPE LAYOUT REFER TO PLUMBING DRAWINGS
- 2. CENTRAL EXHAUST FANS FOR TOILET EXHAUST TO OPERATE ON A TIMER. THE TIMER HAS TWO (2) EXHAUST FANS RUNNING FROM 6:00 AM TO 8:00 PM, SEVEN DAYS A WEEK. THEY SHOULD NOT BE CONNECTED TO THE LIGHT SWITCH OR BE INDIVIDUAL FAN UNITS.
- 3. CONTRACTOR SHALL COORDINATE EXACT LOCATION OF ALL EQUIPMENT ON ROOF WITH STRUCTURAL DWGS. ALL SERVICEABLE EQUIPMENT MUST BE LOCATED A MINIMUM OF 10 FEET FROM ROOF EDGE OR OPENINGS. CONTRACTOR TO COORDINATE AND PROVIDE SAFETY RAILS IF UNITS ARE WITHIN 10 FEET OF ROOF EDGE OR OPENINGS.

ROOF EXHAUST SYSTEM NOTES
ALL EXHAUST DISCHARGE AND VENTS TO BE LOCATED AT A MINIMUM DISTANCE OF 10 FT. FROM ANY RTU'S O/A INTAKES



1 HVAC ROOF PLAN
SCALE: 1/8" = 1'-0"
NORTH

ISSUE

NO.	DATE	DESCRIPTION	INT.
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NAME OF LICENSEE:
MATTHEW B. JARMEL
LICENSE NUMBER: 12809-5

Project Number: TLEW12-099 Scale: AS NOTED
Drawn By: LN Approved By: MBJ

Drawing Name:
HVAC ROOF PLAN

Drawing Number:
M-300

DRAWINGS: TLE - THE LEARNING EXPERIENCE: TLE - WISCONSIN: TLEW12-099 - TLE PEWAUKEE WI 2021 MEADOW LANE: DCSD: TLEW12-099 - TLE PEWAUKEE WI 2021 MEADOW LANE: DCSD: TLEW12-099 - HVAC: DWG - LINCOLN - PLOTTED: 03/24/2023

ROOFTOP AIR HANDLING UNIT SCHEDULE

TAG	LOCATION	MANUF	MANUF MODEL	TOTAL CFM	MAX. O.A. CFM	COOLING TONS	DX COOLING COIL DATA						GAS HEATING COIL DATA				MOTOR/ELECTRICAL DATA						NOTES						
							NET TOTAL CAPACITY MBH	NET SENSIBLE CAPACITY MBH	LATENT CAPACITY MBH	COIL EAT DB °F	COIL EAT WB °F	UNIT LAT DB °F	UNIT LAT WB °F	COOLING DESIGN OUTDOOR AMBIENT TEMP DB/WB °F	TYPE OF HEAT	INPUT CAPACITY MBH	OUTPUT CAPACITY MBH	COIL EAT DB °F	UNIT LAT DB °F	HEATING DESIGN OUTDOOR AMBIENT TEMP DB °F	UNIT VOLTAGE	EXT. SP IN W.C.		SUPPLY FAN MOTOR HP	SUPPLY FAN MOTOR TYPE	EER	MCA	MOP	MAX. OPERATING UNIT WEIGHT LBS
RTU-1	ROOF	TRANE	YHJ090A3S0H	2900	400	7.5 TON	84.40	64.95	19.45	74.96	63.26	54.91	53.42	87 / 73	HIGH	200	162	62.08	113.80	-5	208/60/3	0.8	3.1	MULTISPEED	12.1	42	50	1250	SEE NOTES
RTU-2	ROOF	TRANE	YHJ072A3S0H	2300	350	6 TON	68.38	51.76	16.62	75.10	63.39	54.86	53.29	87 / 73	HIGH	150	121.50	61.30	110.21	-5	208/60/3	0.8	3.1	MULTISPEED	12.1	38	50	1200	SEE NOTES
RTU-3	ROOF	TRANE	YHC060E3	1900	300	5 TON	55.83	42.08	13.75	75.24	63.07	55.22	52.97	87 / 73	HIGH	130	104	60.52	111.42	-5	208/60/3	0.7	1	STANDARD	11.9	26	40	1100	SEE NOTES
RTU-4	ROOF	TRANE	YHC048E3	1400	300	4 TON	43.71	31.32	12.39	75.94	63.73	55.70	53.06	87 / 73	HIGH	120	96	56.62	120.22	-5	208/60/3	0.7	1	STANDARD	11.6	24	35	1100	SEE NOTES
RTU-5	ROOF	TRANE	YHC060E3	2000	300	5 TON	46.07	43.24	2.83	75.10	62.94	55.55	53.32	87 / 73	HIGH	130	104	61.30	109.70	-5	208/60/3	0.7	1	STANDARD	11.9	26	40	1100	SEE NOTES

- NOTES:
- ALL UNITS SHALL HAVE DOWNFLOW DUCTS ARRANGEMENT
 - PROVIDE ECONOMIZER WITH COMPARATIVE ENTHALPY FOR ALL RTUS. PROVIDE RETURN DUCT SMOKE DETECTOR FOR ALL RTUS
 - PROVIDE FACTORY INSTALLED BAROMETRIC RELIEF DAMPERS WITH HOOD
 - PROVIDE FACTORY INSTALLED 2 IN MERV8 FILTER
 - PROVIDE FACTORY INSTALLED UNPOWERED GFCI
 - PROVIDE FACTORY INSTALLED HINGED ACCESS DOORS
 - PROVIDE MINIMUM 14" TALL MANUFACTURER'S ROOFCURBS FOR EACH UNIT.
 - PROVIDE STANDARD MOTOR AIR VOLUME
 - PROVIDE FACTORY INSTALLED HOT GAS REHEAT (DEHUMIDIFICATION) FOR ALL RTUS
 - PROVIDE FACTORY INSTALLED WEATHERPROOF DISCONNECT
 - PROVIDE CONDENSATE DRAIN OVERFLOW SWITCH, DIRTY FILTER SWITCH AN FAN FAILURE SWITCH
 - THE CONTRACTOR SHALL VERIFY AND COORDINATE REQUIRED ROOF ASSEMBLY OPENING LOCATIONS AND EQUIPMENT WEIGHT(S) WITH THE ARCHITECTS PRIOR TO ORDERING HVAC EQUIPMENT AND REVIEW OF FRAMING SHOP DRAWINGS.
 - FOR EACH UNIT PROVIDE THERMOSTAT HONEYWELL TC500 AND WHEN THE UNIT SUPPLIES MORE THAN (1) ROOM, PROVIDE AVERAGING SENSORS HONEYWELL MODEL TR40 FOR LOCATIONS AND QUANTITIES SEE DWG M-200

EXHAUST FAN SCHEDULE

TAG	LOCATION	MANUF	MANUF MODEL	CFM	DRIVE	RPM	ESP. IN. W.C.	SONES	ROOF OPENING	WEIGHT LBS	HP	VOLTS	MOTOR TYPE	REMARKS
EF-1	ROOF	CARNES	VEDK10	820	DIRECT	1134	0.4	8.5	13x13	35	1/2	120/1	P2	SEE NOTES 1
EF-2	ROOF	CARNES	VEDK06	350	DIRECT	1303	0.3	5.4	11x11	30	1/8	120/1	J2	SEE NOTES 2

- NOTES:
- PROVIDE DISCONNECT SWITCH, BACKDRAFT DAMPER ALUMINUM INSECT SCREEN AND PREFABRICATED FLAT ROOF CURB BY FAN MANUFACTURER FAN TO RUN ON TIMECLOCK PARAGON MODEL 7000 SERIES AS SHOWN IN ELECTRICAL DWGS

DRYER EXHAUST

TAG	MODEL NO.	REMARKS
IF-1	FANTECH DBF-4XL INLINE FAN FOR DRYER EXHAUST	<p>DRYERBOOSTER FAN SCHEDULE 160 CFM TO ROOF PROVIDE BACKDRAFT DAMPER. DO NOT INSTALL BIRDSCREEN. IF FAN IS NOT INSTALLED ON THE SAME ROOM THAN CLOTHES DRYER IS, A PERMANENT LABEL ON THE WALL WHERE THE DUCT ENTERS SHALL BEAR THE WORDS: "THIS DRYER EXHAUST SYSTEM IS EQUIPPED WITH A REMOTELY LOCATED BOOSTER FAN" FAN TO BE INTERLOCKED WITH DRYER ON/OFF SWITCH. PROVIDE FIVE MINUTES DELAY AFTER DRYER IS TURNED OFF. CHECK MECHANICAL NOTE BELOW.</p>

CONTRACTOR TO FIELD VERIFY THE TOTAL LENGTH OF CLOTHES DRYER EXHAUST DUCT BEFORE INSTALLING BOOSTER FAN. MAXIMUM EQUIVALENT LENGTH SHALL NOT EXCEED 90 FT. FOR DRYER EXHAUST DUCT WITH ONE (1) 90 DEGREE BEND MAXIMUM EQUIVALENT LENGTH SHALL NOT EXCEED 60 FT. FOR DUCT WITH TWO (2) 90 DEGREE BENDS MAXIMUM EQUIVALENT LENGTH SHALL NOT EXCEED 45 FT. FOR DUCT WITH THREE (3) 90 DEGREE BENDS MAXIMUM EQUIVALENT LENGTH SHALL NOT EXCEED 35 FT. FOR DUCT WITH FOUR (4) 90 DEGREE BENDS MAXIMUM EQUIVALENT LENGTH SHALL NOT EXCEED 25 FT. IF CONTRACTOR VERIFIES THESE CODE REQUIREMENTS ARE MET, OR THE DRYER INSTALLED INSTALLATION MANUAL SPECIFIES THE ALLOWABLE DEVELOPED LENGTH, NO BOOSTER FAN SHALL BE NECESSARY AND A CREDIT SHALL BE PROVIDED

DIFFUSER AND REGISTER SCHEDULE

TAG	MANUF	MANUF MODEL	CFM RANGE	SERVICE	NECK SIZE Ø IN.	FACE PANEL SIZE IN.	REMARKS
A1	CARNES	SJTB	0-100	SUPPLY	6	24x24	SEE NOTES
A2	CARNES	SJTB	101-230	SUPPLY	8	24x24	SEE NOTES
A3	CARNES	SJTB	231-380	SUPPLY	10	24x24	SEE NOTES
A4	CARNES	SJTB	381-460	SUPPLY	12	24x24	SEE NOTES
A5	CARNES	SJTB	461-600	SUPPLY	14	24x24	SEE NOTES
B1	CARNES	SPRB	0-100	RETURN	6	24x24	SEE NOTES
B2	CARNES	SPRB	101-230	RETURN	8	24x24	SEE NOTES
B3	CARNES	SPRB	231-380	RETURN	10	24x24	SEE NOTES
B4	CARNES	SPRB	381-450	RETURN	12	24x24	SEE NOTES
B5	CARNES	SPRB	451-600	RETURN	14	24x24	SEE NOTES
B6	CARNES	SPRB	601-1000	RETURN	16	24x24	SEE NOTES
C1	CARNES	SPRB	70	EXHAUST	6	12x12	SEE NOTES
C2	CARNES	SPRB	150	PANTRY EXHAUST	8	12x12	SEE NOTES

- NOTES:
- CFM SHALL BE AS INDICATED IN DRAWINGS.
 - EXHAUST GRILLES SHALL BE FACE MOUNTED ON THE 24x24 CEILING TILE

SUBMITTALS FOR HVAC EQUIPMENT AND COMPONENTS SHALL BE PROVIDED TO THE ARCHITECT AND TO THE LEARNING EXPERIENCE PRIOR TO ORDERING EQUIPMENT. ALL SUBSTITUTION OF EQUIPMENT SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY TLE

START UP OF UNITS
MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR STARTUP OF ALL UNITS. CONTRACTOR SHALL COORDINATE WITH TRANE REP. TO SCHEDULE SITE VISITS TO VERIFY INSTALLATION IS AS PER MANUFACTURER'S SPECIFICATIONS. THE STARTUP ACTIVITIES MUST BE DOCUMENTED AND MADE PART OF THE CLOSE-OUT PACKAGE PROVIDED BY THE GENERAL CONTRACTOR TO THE OWNER AND TENANT ON THE PROJECT.

TRANE NATIONAL ACCOUNTS EQUIPMENT PACKAGE

FOR MORE INFORMATION OF EQUIPMENT CONTACT TRANE NATIONAL ACCOUNTS: TLE@TRANE.COM
THE INSTALLING CONTRACTOR ACCEPTS ALL COSTS RELATED TO EQUIPMENT SUBSTITUTIONS CONDENSER STANDS PROVIDED BY OTHERS
ORDERING PROCEDURES:
TRANE NATIONAL ACCOUNTS DEPARTMENT WILL ORDER EQUIPMENT AND COORDINATE SHIPMENT WITH THE SUCCESSFUL HVAC CONTRACTOR. THE HVAC CONTRACTOR WILL BE RESPONSIBLE FOR EQUIPMENT WARRANTY, DELIVERY COORDINATION, RECEIVING AND INSTALLATION AS DESCRIBED IN THE SPECIFICATIONS.
START UP AND COMMISSIONING REQUIREMENTS:
INSTALLING CONTRACTOR IS RESPONSIBLE FOR INITIAL STARTUP, CERTIFIED TEST & BALANCE, RUNNING THE UNITS & MAINTAINING THE AIR FILTERS DURING THE CONSTRUCTION PHASE. TWO WEEKS PRIOR TO THE BUILDING TRAINING, THE CONTRACTOR WILL COORDINATE THE EQUIPMENT UNIT VERIFICATION WITH MANUFACTURER. UPON COMPLETION, CONTRACTOR SHALL FURNISH A WRITTEN REPORT TO THE LEARNING EXPERIENCE AND AHJ AS REQUIRED BY AHJ.

MECH ROOM ELECTRIC UNIT HEATER SCHEDULE

TAG	LOCATION	MANUF	MANUF MODEL	KW	BTUH	CFM	THROW FT.	MIN. MOUNTING HEIGHT FT.	MCA	CONTROL CIRCUIT & FAN MOTOR VOLTS	WEIGHT LBS	REMARKS
UH-1	MECH. RM.	QMARK	MWUH5004	1.87	6396	270	16	6	11.3	208/160	24	SEE NOTE 1

- NOTES:
- HEATER TO BE WALL MOUNTED. PROVIDE DISCONNECT SWITCH. BUILT IN THERMOSTAT TO BE SET AT 65° F

GLOBAL PLASMA AIR DUCT TUBE SCHEDULE

TAG	MANUFACTURER	MODEL	SERVING	ELEC. VOLTAGE	WEIGHT	QUANTITY PER UNIT
GP-1	GLOBAL PLASMA SOLUTIONS	FC48-AC	ONE FOR EACH RTU	24 VOLTS	4 LBS	1

ALL TUBES SHALL BE MOUNTED INSIDE CORRESPONDING ROOFTOP UNIT CABINET

ELECTRIC CEILING HEATER SCHEDULE

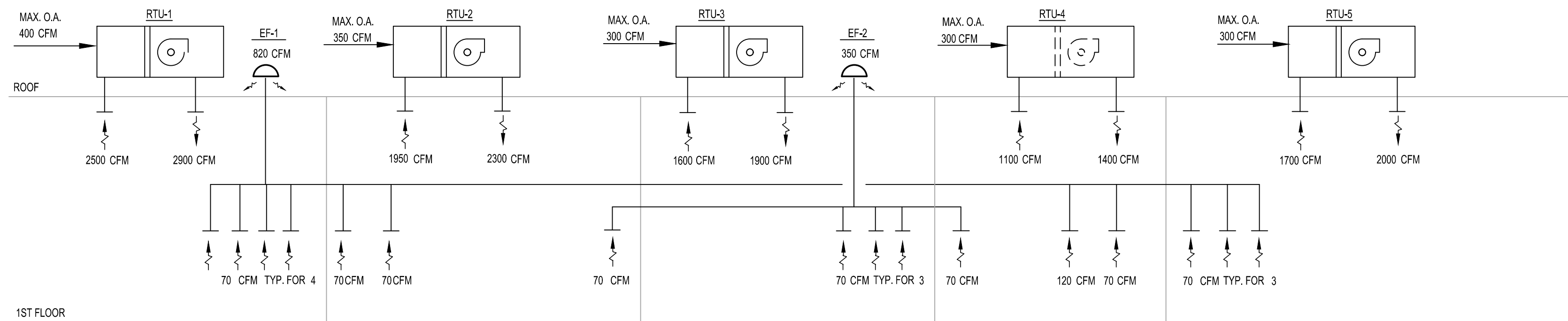
TAG	MANUFACTURER	MODEL	KW	ELEC. VOLTAGE	WEIGHT	REMARKS
ECH-1	QMARK	EFF SERIES 1500	1.5	120/160	22	SEE NOTE 1
ECH-2	QMARK	EFF SERIES 1500	1.5	120/160	22	SEE NOTE 1

- NOTES:
- HEATER TO BE CEILING MOUNTED. PROVIDE T-BAR MOUNTING KIT, DISCONNECT SWITCH. PROVIDE WALL REMOTE THERMOSTAT (120V WITH CONTACTS RATED AT 20AMPS OR GREATER). THERMOSTAT TO BE SET AT 74° F.

PANTRY SPLIT SYSTEM UNIT SCHEDULE

INDOOR UNIT										OUTDOOR UNIT									
TAG	LOCATION	MANUF	MANUF MODEL	CFM	COOLING CAPACITY AT 95° F (BTU/H)	HEATING CAPACITY AT 47° F / 17° F (BTU/H)	MCA	UNIT WEIGHT (LBS)	TAG	LOCATION	MANUF	MANUF MODEL	CFM	VOLTAGE	MCA	MOP	REFRIGERANT TYPE	UNIT WEIGHT (LBS)	
AC-1	PANTRY CEILING	mitsubishi	TPLA0A0241EA70A	530-640/710-810	24,000	26,000 / 26,000	1.0	56	ACCU-1	ROOF	mitsubishi	TRUZH0241HA10NA	1940	208/1	17.0	27	R410A	190	

- NOTES:
- UNIT SHALL BE CONTROLLED BY A MITSUBISHI WIRED THERMOSTAT MODEL TAR-40MAAU, LOCATED IN PANTRY AS PER PLAN.
 - PROVIDE BLUE DIAMOND (MEGABLU ADVANCED) CONDENSATE PUMP W/ RESERVOIR & SENSOR, OUTSIDE AIR KIT, DISCONNECT SWITCH CONDENSATE TO DISCHARGE INDIRECTLY TO JANITOR SINK. ROUTING SHALL BE COORDINATED IN FIELD.



AIR FLOW DIAGRAM

N.T.S.

1. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE CONTRACTOR'S BEST SKILL AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE AND HAVE CONTROL OVER CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCE, AND JOB SITE SAFETY
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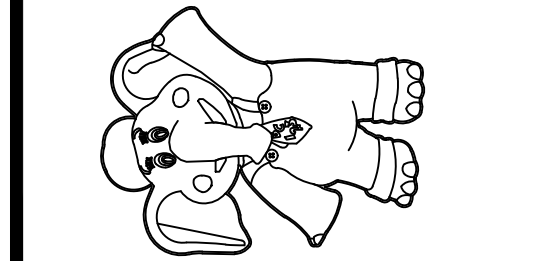


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NO.	DATE	DESCRIPTION	INT.
1	03-24-23	FOR TLE REVIEW	MBJ

REVISION

NO.	DATE	DESCRIPTION	INT.
1	9/13/22	REVISED AS NOTED	MBJ
2	12/6/22	REVISED AS NOTED	MBJ

PROFESSIONAL CERTIFICATION
NAME OF LICENSEE:
MATTHEW B. JARMEL
LICENSE NUMBER: 12809-5

Project Number: TLEW122-099 Scale: AS NOTED
Drawn By: LN Approved By: MBJ

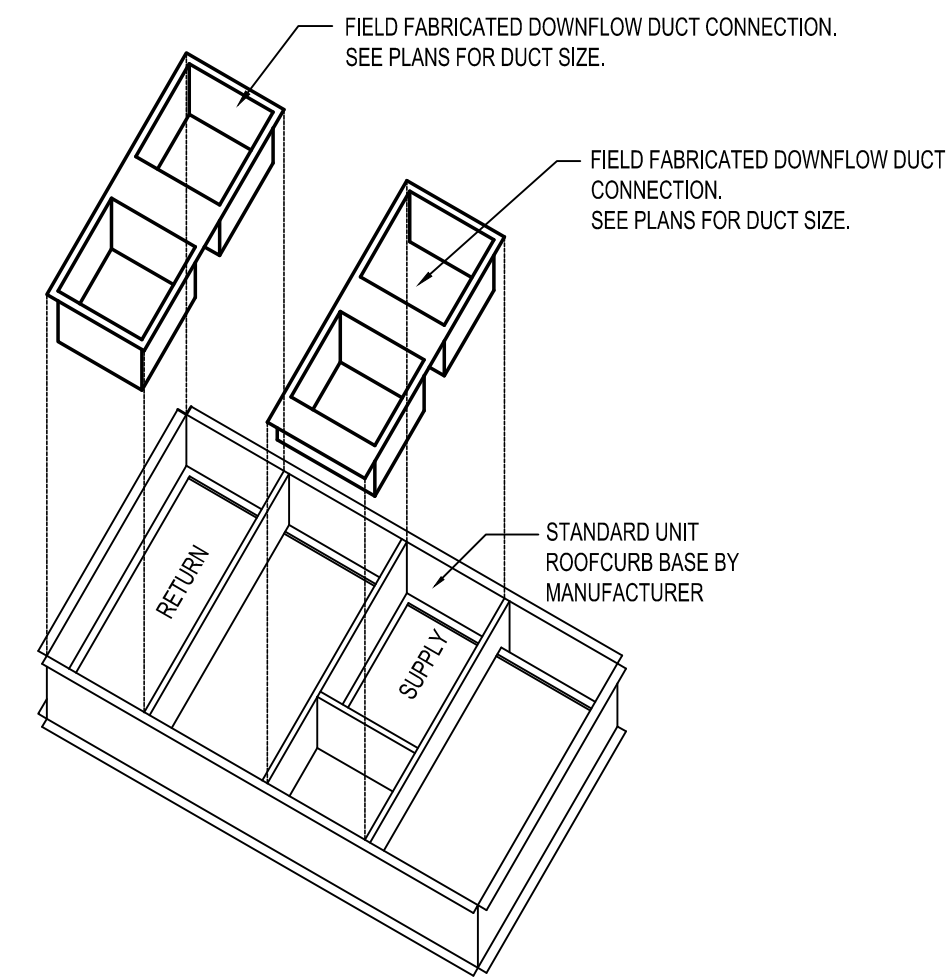
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HVAC SCHEDULES & AIR RISER DIAGRAM

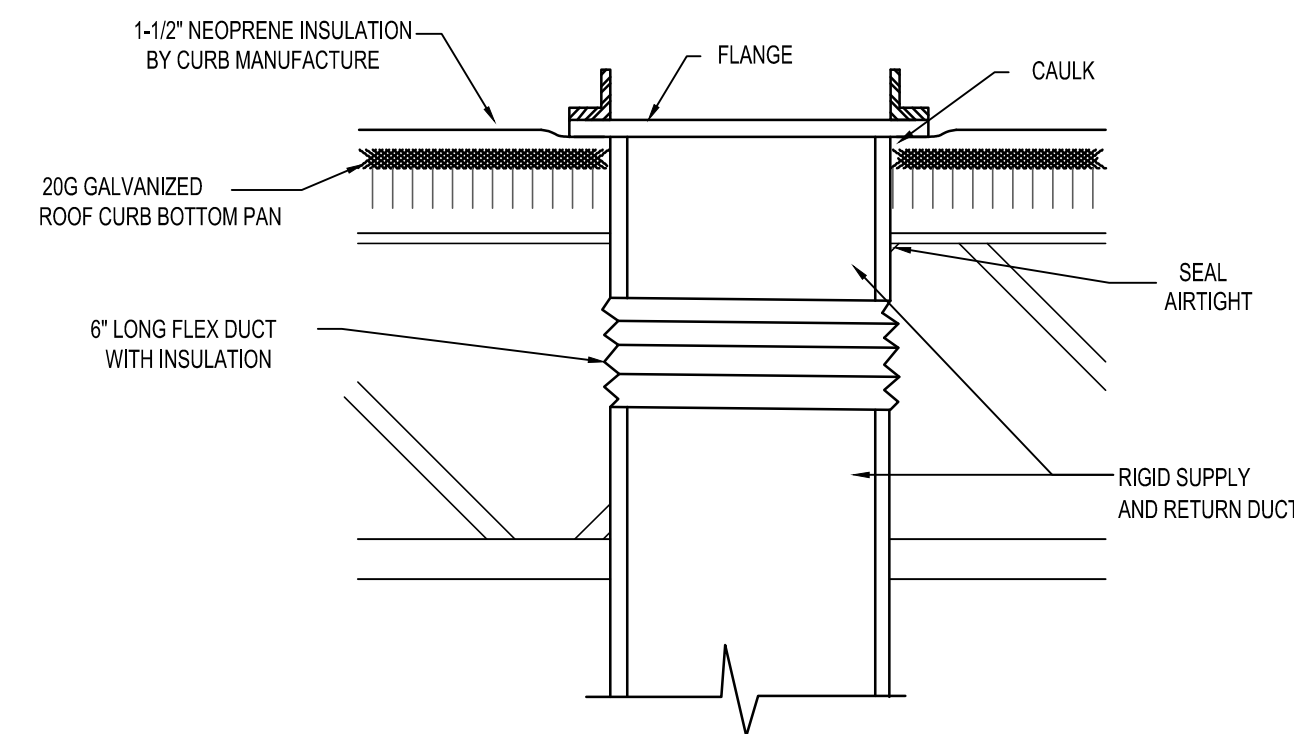
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M-400

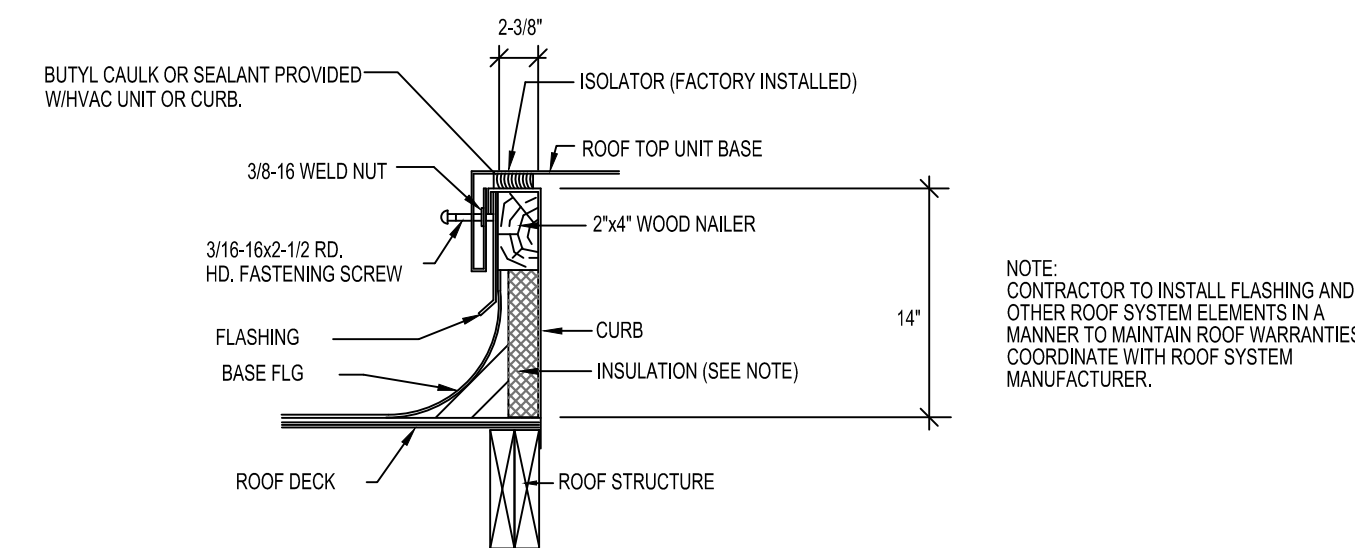
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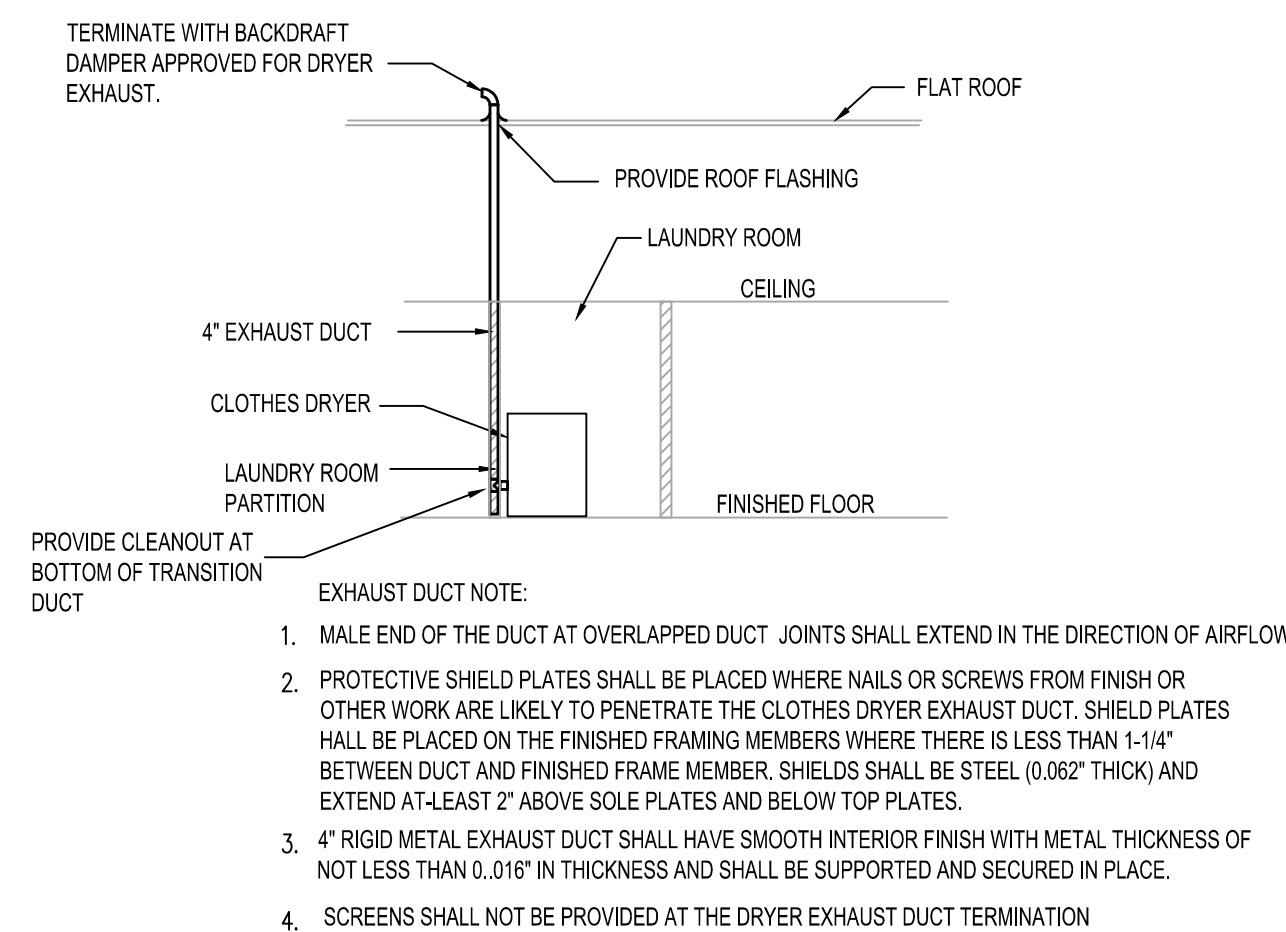
12 DUCTWORK CONNECTION TO ROOFCURB
SCALE: N.T.S.



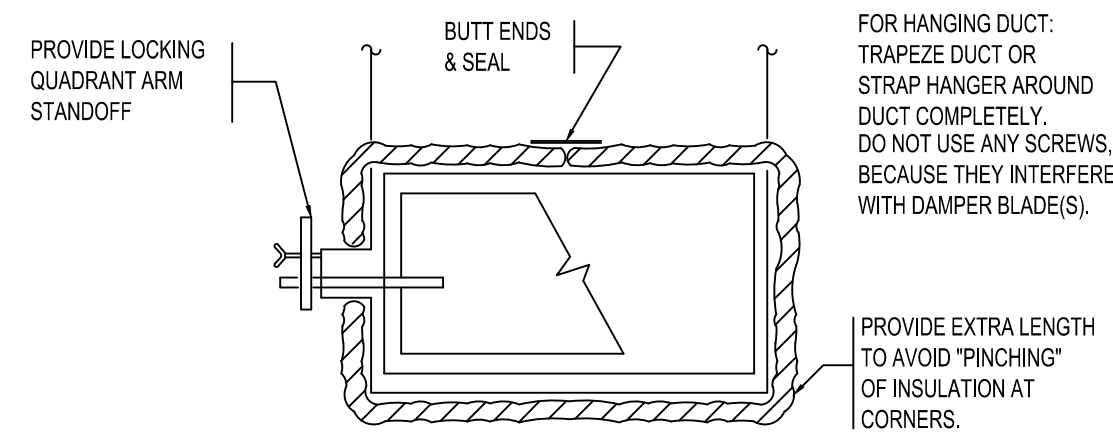
11 DUCT PENETRATION THROUGH ROOF
SCALE: N.T.S.



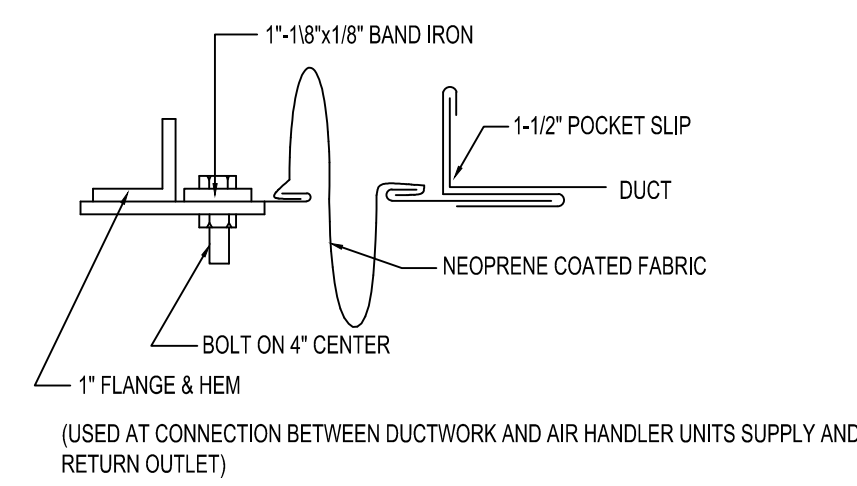
10 TYPICAL HVAC UNIT ROOFTOP CURB
SCALE: 1" = 1'-0"



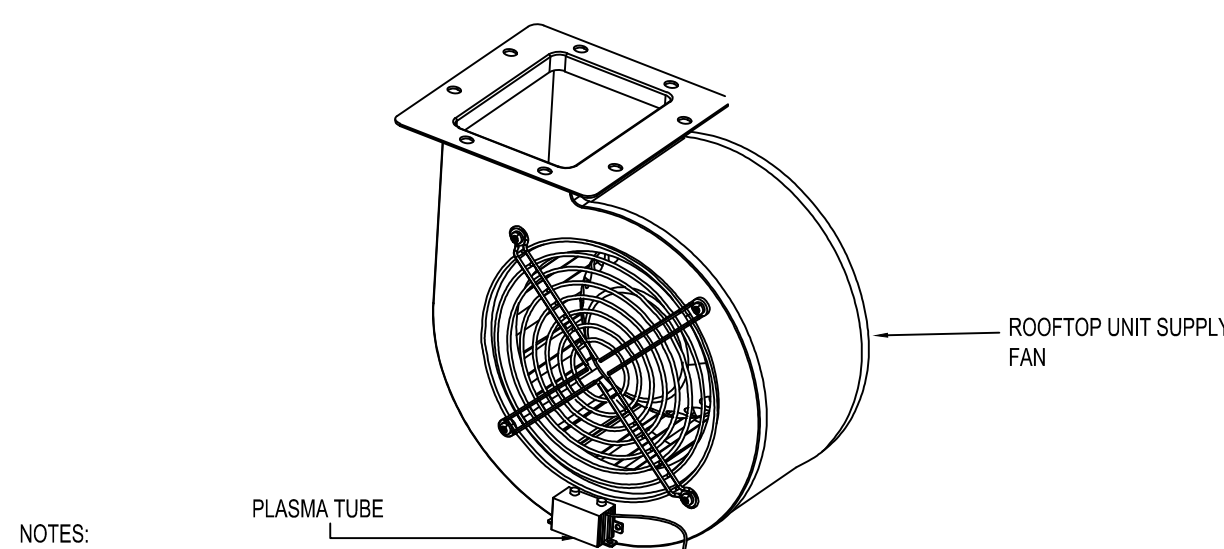
9 CLOTHES DRYER EXHAUST DIAGRAM
SCALE: N.T.S.



5 DUCT INSULATION DIAGRAM
SCALE: N.T.S.

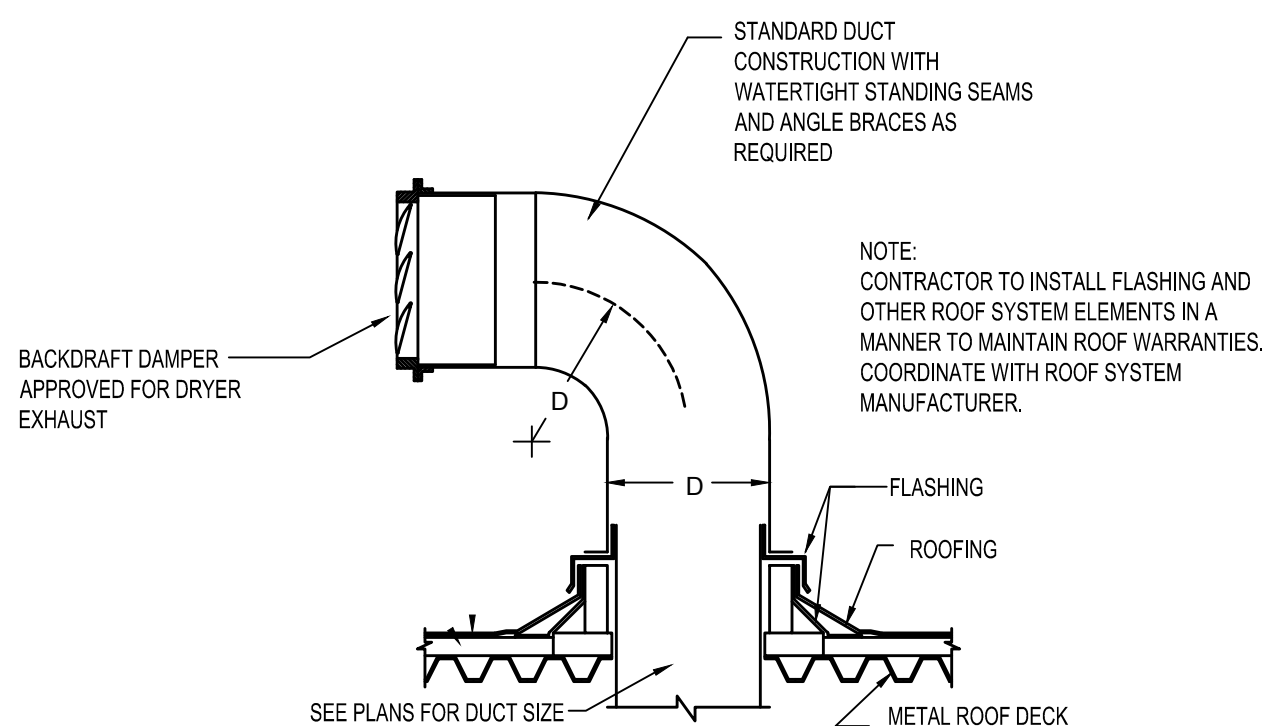


6 FLEX CONNECTOR DIAGRAM
SCALE: N.T.S.

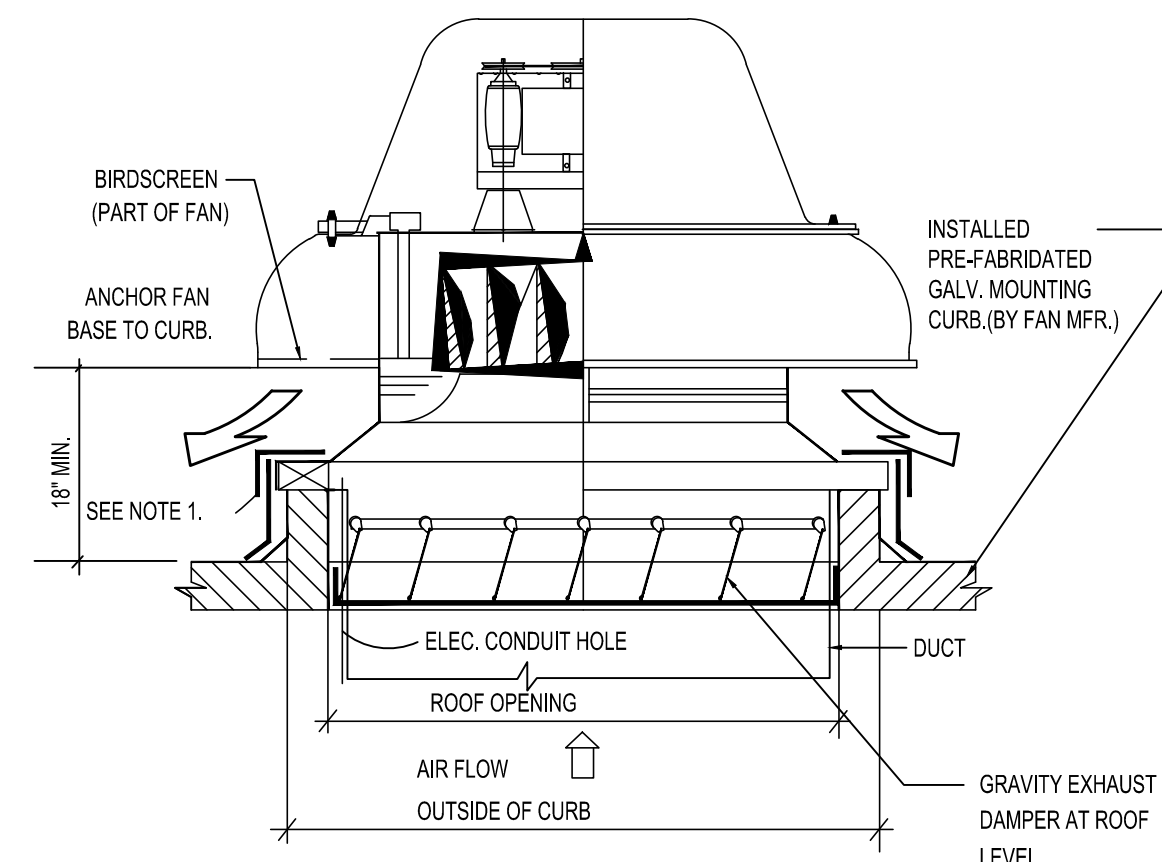


7 GPS-FC-48-AC MOUNTING DIAGRAM
SCALE: N.T.S.

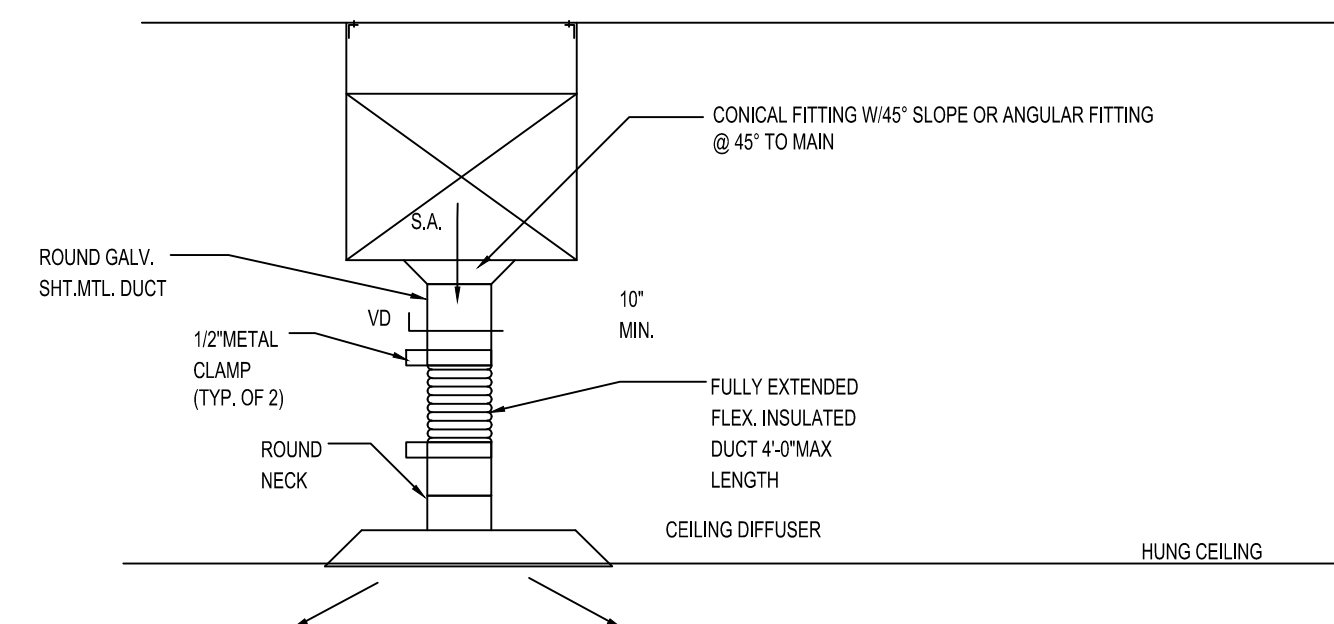
8 DRYER GOOSENECK DIAGRAM
SCALE: N.T.S.



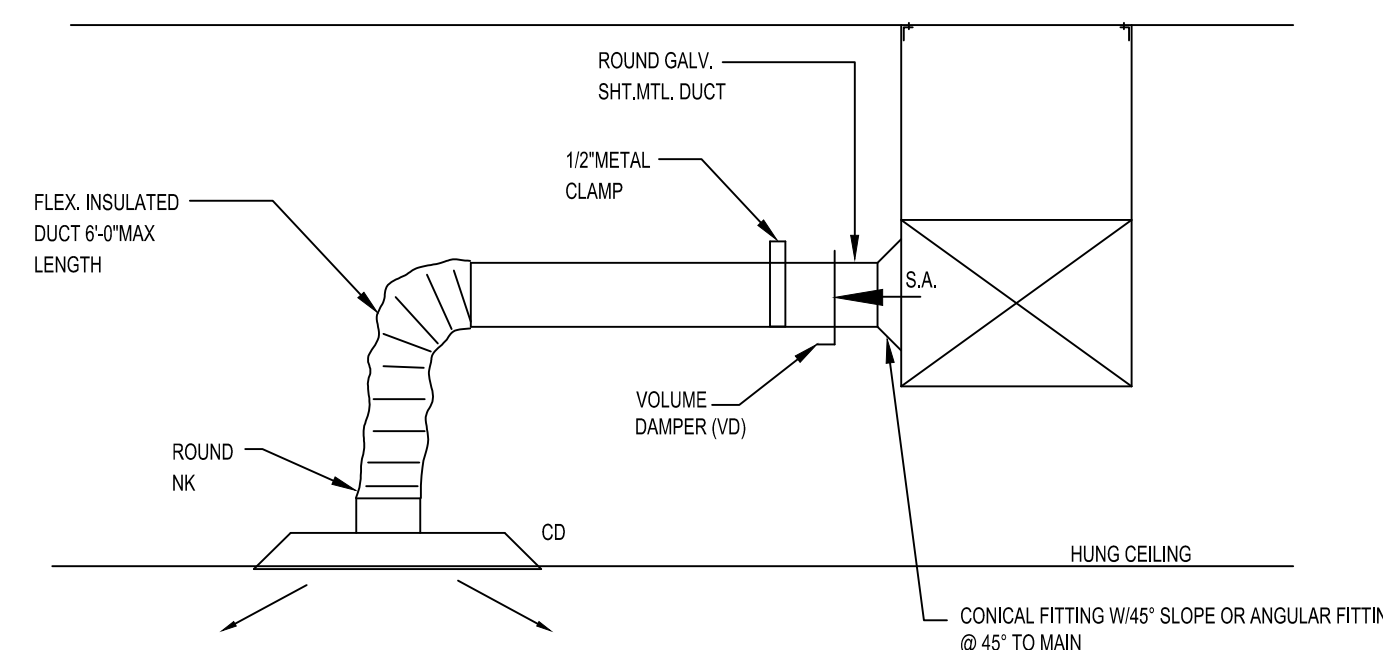
8 DRYER GOOSENECK DIAGRAM
SCALE: N.T.S.



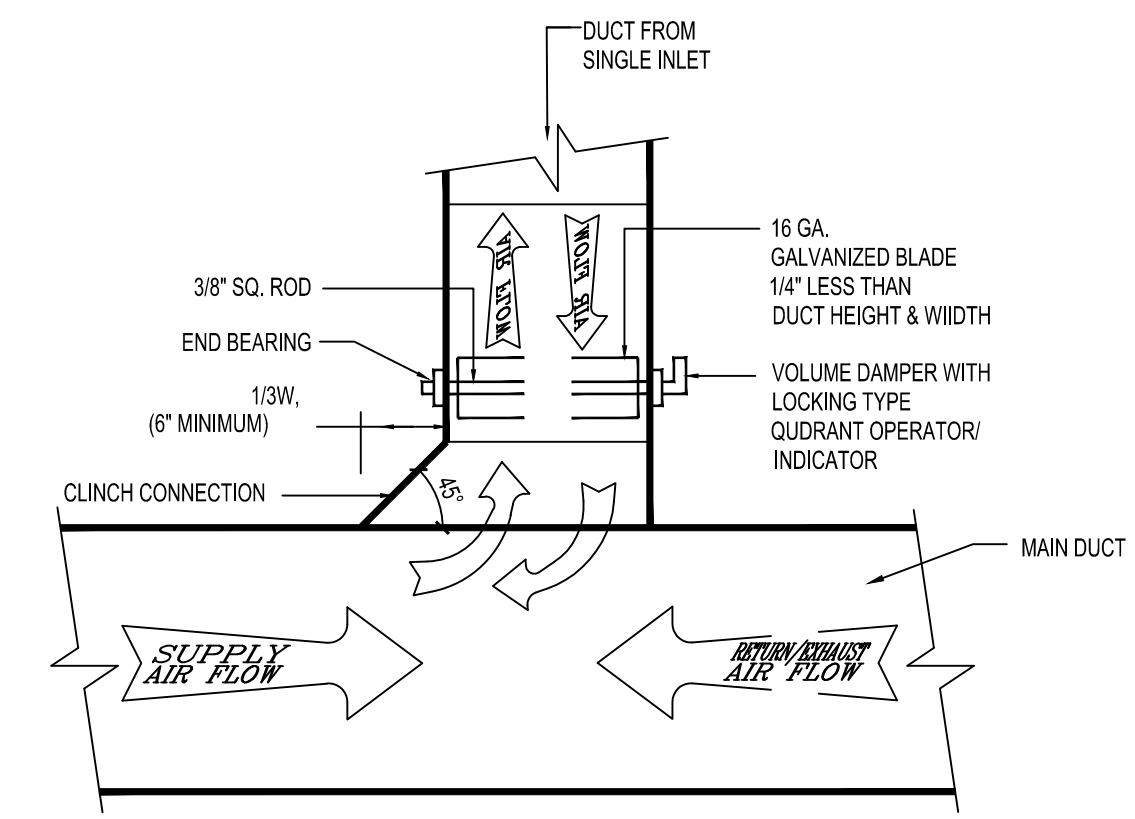
4 ROOF EXHAUST FAN DIAGRAM
SCALE: N.T.S.



3 BOTTOM DUCT DIFFUSER CONNECTION
SCALE: 1/2" = 1'-0"



2 SUPPLY DIFFUSER CONNECTION
SCALE: 1/2" = 1'-0"



1 SUPPLY/RETURN (EXHAUST) DUCT TAP
SCALE: N.T.S.

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PROFESSIONAL CERTIFICATION
NAME OF LICENSEE:
MATTHEW B. JARMEL
LICENSE NUMBER: 12809-5

Project Number: TLEW22-099
Scale: AS NOTED
Drawn By: LN
Approved By: MBJ

Drawing Name:
**HVAC
DETAILS/DIAGRAMS**
Drawing Number:
M-500

DRAWINGS/STILE - THE LEARNING EXPERIENCE/ITL - WISCONSIN/LEW122-099 - TLE PEWAUKEE WI 2021 MEADOW LANE/COSTIT/LEW122-099 - HVAC/DWG - LINCOLAIE - PLOTTED: 03/24/2023

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MATTHEW B. JARME
LICENSE NUMBER: 12809-5

Project Number: LEW122-099
Scale: AS NOTED
Drawn By: LN
Approved By: MBJ

Drawing Name:
HVAC VENTILATION CALCULATIONS

Drawing Number:
M-600

GPS Air 3101 Yorkmont Rd Suite 400 Charlotte, NC 28208
VERSION 2.2 naming ASHRAE 62.1-2016

Zone Type	Facility Type	Zone Use	Zone Floor Area (square ft)	Zone Max Occupancy	Table 6.1 OA per Occupant (cfm)	Table 6.1 OA per Sq Ft (cfm/sq ft)	Pz * Rp	Az * Ra	Table 6.2 Ventilation Effectiveness (E _v)	Outdoor Air to Zone (CFM) with E _v correction (V _{OA})
RTU-1	Educational Facilities	Daycare through age 4	2,097.0	82.0	62.0	0.29	200	246	0.8	537

Indoor Contaminants table with columns: Contaminant, Maximum Threshold Value, Generation Rate, Filtration Effectiveness, etc.

Building materials and furnishings assumed to have no VOCs and off-gassing is complete.

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IMC 2006 & later allows for ASHRAE 62 IAQP through the engineered exception found in Section 403.2 Exhaust flow rates may differ from Table 6.5 based on ASHRAE 62 IAQP via Section 6.5.2

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RTU-2	Educational Facilities	Daycare through age 4	1,871.0	46.0	46.0	0.18	460	301	0.8	351

Indoor Contaminants table with columns: Contaminant, Maximum Threshold Value, Generation Rate, Filtration Effectiveness, etc.

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RTU-3	Educational Facilities	Daycare through age 4	1,956.0	26.0	26.0	0.13	260	250	0.8	210

Indoor Contaminants table with columns: Contaminant, Maximum Threshold Value, Generation Rate, Filtration Effectiveness, etc.

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BASED ON VENTILATION RATES PRESCRIBED BY THE 2015 INTERNATIONAL MECHANICAL CODE, RTU-1 WILL NEED TO PROVIDE 1247 CFM OF OUTSIDE AIR AS PER EXCEPTIONS OF PARAGRAPH 403.2, THIS RATE OF CFM HAS BEEN REDUCED TO 400 CFM DUE TO AN ENGINEERED VENTILATION SYSTEM WHICH CONSIST OF A PLASMA TUBE ADDED INTO SUPPLY AIRFLOW

BASED ON VENTILATION RATES PRESCRIBED BY THE 2015 INTERNATIONAL MECHANICAL CODE, RTU-2 WILL NEED TO PROVIDE 951 CFM OF OUTSIDE AIR AS PER EXCEPTIONS OF PARAGRAPH 403.2, THIS RATE OF CFM HAS BEEN REDUCED TO 350 CFM DUE TO AN ENGINEERED VENTILATION SYSTEM WHICH CONSIST OF A PLASMA TUBE ADDED INTO SUPPLY AIRFLOW

BASED ON VENTILATION RATES PRESCRIBED BY THE 2015 INTERNATIONAL MECHANICAL CODE, RTU-3 WILL NEED TO PROVIDE 675 CFM OF OUTSIDE AIR AS PER EXCEPTIONS OF PARAGRAPH 403.2, THIS RATE OF CFM HAS BEEN REDUCED TO 300 CFM DUE TO AN ENGINEERED VENTILATION SYSTEM WHICH CONSIST OF A PLASMA TUBE ADDED INTO SUPPLY AIRFLOW

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VERSION 2.2 naming ASHRAE 62.1-2016

Zone Type	Facility Type	Zone Use	Zone Floor Area (square ft)	Zone Max Occupancy	Table 6.1 OA per Occupant (cfm)	Table 6.1 OA per Sq Ft (cfm/sq ft)	Pz * Rp	Az * Ra	Table 6.2 Ventilation Effectiveness (E _v)	Outdoor Air to Zone (CFM) with E _v correction (V _{OA})
RTU-4	Educational Facilities	Daycare through age 4	1,954.0	20.0	20.0	0.18	200	246	0.8	357

Indoor Contaminants table with columns: Contaminant, Maximum Threshold Value, Generation Rate, Filtration Effectiveness, etc.

Building materials and furnishings assumed to have no VOCs and off-gassing is complete.

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IMC 2006 & later allows for ASHRAE 62 IAQP through the engineered exception found in Section 403.2 Exhaust flow rates may differ from Table 6.5 based on ASHRAE 62 IAQP via Section 6.5.2

BASED ON VENTILATION RATES PRESCRIBED BY THE 2015 INTERNATIONAL MECHANICAL CODE, RTU-4 WILL NEED TO PROVIDE 557 CFM OF OUTSIDE AIR AS PER EXCEPTIONS OF PARAGRAPH 403.2, THIS RATE OF CFM HAS BEEN REDUCED TO 300 CFM DUE TO AN ENGINEERED VENTILATION SYSTEM WHICH CONSIST OF A PLASMA TUBE ADDED INTO SUPPLY AIRFLOW

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VERSION 2.2 naming ASHRAE 62.1-2016

Zone Type	Facility Type	Zone Use	Zone Floor Area (square ft)	Zone Max Occupancy	Table 6.1 OA per Occupant (cfm)	Table 6.1 OA per Sq Ft (cfm/sq ft)	Pz * Rp	Az * Ra	Table 6.2 Ventilation Effectiveness (E _v)	Outdoor Air to Zone (CFM) with E _v correction (V _{OA})
RTU-5	Educational Facilities	Daycare through age 4	1,417.0	34.0	34.0	0.18	340	250	0.8	244

Indoor Contaminants table with columns: Contaminant, Maximum Threshold Value, Generation Rate, Filtration Effectiveness, etc.

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BASED ON VENTILATION RATES PRESCRIBED BY THE 2015 INTERNATIONAL MECHANICAL CODE, RTU-5 WILL NEED TO PROVIDE 744 CFM OF OUTSIDE AIR AS PER EXCEPTIONS OF PARAGRAPH 403.2, THIS RATE OF CFM HAS BEEN REDUCED TO 300 CFM DUE TO AN ENGINEERED VENTILATION SYSTEM WHICH CONSIST OF A PLASMA TUBE ADDED INTO SUPPLY AIRFLOW