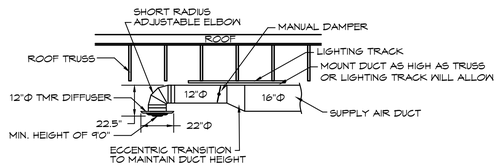
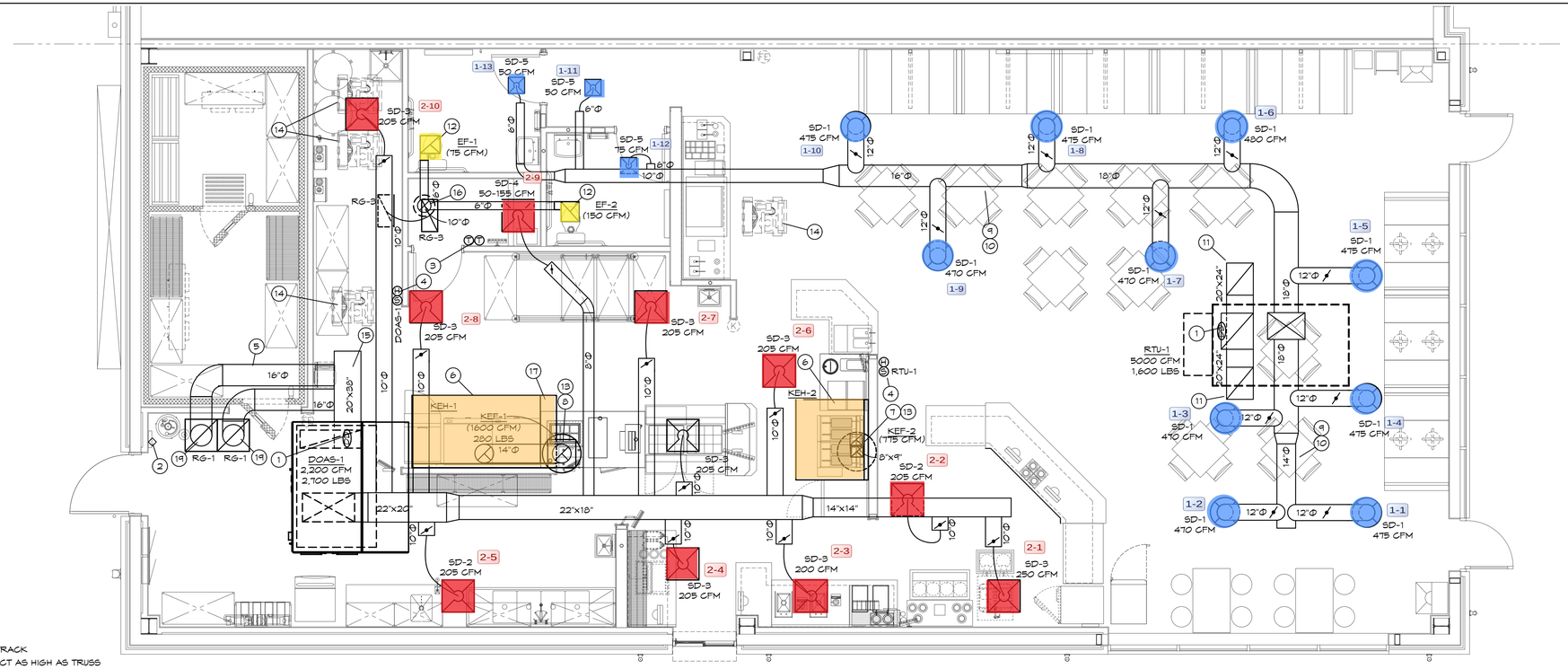
MECHANICAL SYMBOLS

	(SD) NEW SUPPLY DIFFUSER
	(RG) NEW RETURN AIR GRILLE
	EXHAUST GRILLE/FAN
(S)(H)	REMOTE TEMPERATURE/HUMIDITY SENSORS
(T)	THERMOSTAT, MOUNTED AT 48" AFF
(SD)	DUCT-MOUNTED SMOKE DETECTOR
	NEW DUCTWORK
32"X14"	SIZE OF RECTANGULAR DUCT
6"Ø	SIZE OF ROUND DUCT
	FLEXIBLE DUCTWORK
(3)	FLOOR PLAN NOTE DESIGNATION
S.A.	SUPPLY AIR
R.A.	RETURN AIR
EXH.	EXHAUST AIR
	TRANSITION IN DUCT SIZE
	ELBOW WITH TURNING VANES
	MANUAL VOLUME DAMPER
	MANUAL VOLUME DAMPER
	SUPPLY AIR DUCT UP/DOWN
	RETURN AIR DUCT UP/DOWN
	EXHAUST AIR DUCT UP/DOWN
UP	CHANGE IN ELEVATION UP (UP) DOWN (DN) IN DIRECTION OF FLOW
RTU-1	SCHEDULED MECHANICAL EQUIPMENT



DINING ROOM DIFFUSER DETAIL

SCALE: NONE



NORTH

MECHANICAL FLOOR PLAN

SCALE: 1/4" = 1'-0"

AIR BALANCE SCHEDULE

SUPPLY AIR UNIT	OUTSIDE AIRFLOW (CFM)	RETURN AIRFLOW (CFM)	SUPPLY AIRFLOW (CFM)	OA/SA %	EXHAUST AIR UNIT	EXHAUST AIRFLOW (CFM)
RTU-1	872	4,328	5,000	17.44%	KEF-1	1600
DOAS-1	2,200	0	2,200	100.0%	KEF-2	775
					EF-1, EF-2	150
TOTAL	3,072	4,328	7,650	46%	TOTAL	2,525
				RESULTING BUILDING PRESSURIZATION		547 CFM

THE BUILDING HVAC SYSTEM SHALL BE BALANCED BY NATIONAL TAB HIRED BY THE OWNER. CONTACT Dan Hertenstein - National TAB at: 816-215-1593 - DAN@NATIONALTAB.COM

THE RTU SUPPLY FANS SHALL OPERATE IN SINGLE ZONE VAV MODE WITH 2 STAGES OF FAN CONTROL. LOW SPEED SHALL BE USED DURING PERIODS OF LOW COOLING LOAD AND VENTILATION ONLY OPERATION PER 2018 IECC REQUIREMENTS.

THE ECONOMIZER DAMPERS SHALL HAVE TWO POSITIONS DEPENDENT ON THE FAN SPEED TO MAINTAIN CONSTANT OUTDOOR AIR VOLUME AND BUILDING PRESSURE. REFER TO THE BUILDING AIR BALANCE SCHEDULE ON SHEET M2.

THE UNIT SHALL HAVE ITS FRESH AIR HEATING OPTION ENABLED TO HEAT VENTILATION AIR TO A NEUTRAL VALUE DURING COLD WEATHER OPERATION. REFER TO THE MANUFACTURERS PROGRAMMING DOCUMENTATION FOR SETUP INSTRUCTIONS.

OUTDOOR AIR CALCULATIONS

UNIT	Area (sqft)	OCCUPANCY CLASSIFICATION	Occupant Density #/1000 sqft	People outdoor airflow rate in breathing zone, (Rp) cfm/person	Area outdoor airflow rate in breathing zone, (Ra) cfm/sqft	Exhaust airflow rate cfm/sqft	Breathing zone outdoor airflow (Vbz)	Zone air distribution effectiveness (Ez)	Zone outdoor airflow (cfm)
RTU-1	884	Dining rooms	70	7.5	0.18		623	0.8	779
	173	Corridors	0	0	0.06		10	0.8	13
								Total	792

MECHANICAL PLAN NOTES:

1. LOCATION OF DUCT MOUNTED SMOKE DETECTOR. PROVIDE REMOTE ENUNCIATOR AUDIO/VISUAL. VERIFY LOCATION WITH FIRE MARSHAL PRIOR TO INSTALLATION. REFER TO SPEC SHEET MP0 FOR ADDITIONAL INFORMATION.
2. LOCATION OF MANUAL PULL STATION. INSTALL PER THE MANFUACTURERS REQUIREMENTS. COORDINATE WITH FIRE MARSHALL/AHJ PRIOR TO INSTALLATION.
3. LOCATION OF RTU AND DOAS THERMOSTATS. GC TO LABEL EACH THERMOSTAT.
4. LOCATION OF RTU TEMPERATURE SENSOR MOUNTED 7'-0" AFF.
5. ALL KITCHEN DUCTWORK IS INTENDED TO BE ROUTED THROUGH OR BETWEEN TRUSSES. COORDINATE EXACT ROUTING WITH TRUSSES DURING INSTALLATION.
6. EXHAUST HOOD PROVIDED BY OTHERS. INSTALLED BY THIS CONTRACTOR PER THE MANUFACTURERS INSTRUCTIONS.
7. TRANSITION AND CONNECT 10"Ø GREASE DUCT TO EXHAUST HOOD WITH AS SHOWN. ROUTE DUCT UP AND CONNECT TO EXHAUST FAN. OFFSET AS NECESSARY TO MISS ROOF STRUCTURE, AND TO MAINTAIN 10'-0" CLEARANCE FROM ALL OUTDOOR AIR INTAKES, AND 5'-0" FROM PARAPET WALLS. ALL GREASE DUCT IS TO BE INSTALLED WITH DUCT WRAP AS DETAILED AND PER THE MANUFACTURERS REQUIREMENTS FOR 0" CLEARANCE TO COMBUSTIBLES.
8. TRANSITION AND CONNECT 14"Ø GREASE DUCT TO COLLAR ON EXHAUST HOOD. ROUTE DUCT UP AND CONNECT TO EXHAUST FAN. OFFSET AS NECESSARY TO MISS ROOF STRUCTURE, AND TO MAINTAIN 10'-0" CLEARANCE FROM ALL OUTDOOR AIR INTAKES, AND 5'-0" FROM PARAPET WALLS. REFER TO DETAIL ON SHEET M2. ALL GREASE DUCT IS TO BE INSTALLED WITH DUCT WRAP AND ACCESS DOORS AS DETAILED AND PER THE MANUFACTURERS REQUIREMENTS FOR 0" CLEARANCE TO COMBUSTIBLES.
9. COORDINATE DUCT ROUTING WITH LIGHTING.
10. EXPOSED DUCTWORK SHALL BE OF PAINTLOCK CONSTRUCTION AND PAINTED PER THE DIRECTION OF ARCHITECT.
11. RETURN AIR DUCT LOCATED BETWEEN ROOF TRUSSES. OPEN END OF DUCTWORK TURNED UP TOWARD STRUCTURE WITH A MINIMUM 8" CLEARANCE TO DECK.
12. SUPPORT EXHAUST FAN FROM STRUCTURE AS REQUIRED BY THE MANUFACTURER.
13. GC TO INSTALL CAPTIVE AIRE WBE WINDBAND EXTENSION FOR KEF-1 AND KEF-2 PROVIDED BY KITCHEN EQUIPMENT SUPPLIER.
14. MOUNT CONDENSING UNIT ON ROOF AS DETAILED AND AS REQUIRED BY THE MANUFACTURER. CONNECT REFRIGERANT PIPING AS REQUIRED BY THE MANUFACTURER. SEE ARCHITECTURAL PLANS FOR MOUNTING DETAIL.
15. RETURN DUCT TO BE ROUTED BETWEEN JOISTS, AS HIGH AS STRUCTURE WILL ALLOW.
16. ROUTE 10"Ø EXHAUST DUCT UP THROUGH ROOF TO ROOF CAP. MAINTAIN 10'-0" CLEARANCE TO ALL OUTDOOR AIR INTAKES.
17. HOOD SHALL BE PROVIDED WITH FACTORY PRE-WIRE PACKAGE AND A PRE-ENGINEERED UL-300 FIRE SUPPRESSION SYSTEM. SEE HOOD DRAWINGS FOR DETAILS.

MECHANICAL GENERAL NOTES:

1. COORDINATE ALL WORK WITH OTHER TRADES AND EXISTING CONDITIONS AS REQUIRED TO PROPERLY INSTALL ALL SYSTEMS AS INTENDED, WITHIN THE CONFINES OF THE SPACES AVAILABLE, AND WITHOUT INTERFERENCES.
2. THIS CONTRACTOR SHALL PERFORM ALL WORK INDICATED AND/OR AS REQUIRED FOR THE PROPER INSTALLATION AND OPERATION OF THE MECHANICAL SYSTEMS.
3. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF DIFFUSERS.
4. INSTALL ALL DUCT, PIPE, ETC. AS HIGH AS POSSIBLE.
5. DUCT SIZES SHOWN ARE ACTUAL SHEET METAL SIZES AND INCLUDE A 1/2 INCH ALLOWANCE FOR DUCT LINER WHERE APPLICABLE.
6. PROVIDE FLEXIBLE CONNECTION BETWEEN DUCTWORK AND ROOFTOP UNITS, EXHAUST FANS, AND OTHER MOTORIZED EQUIPMENT.
7. NO DUCT SHALL BE ROUTED OVER THE TOP OF ELECTRICAL PANELS.
8. ALL EXPOSED DUCT WORK SHALL BE PAINTED. REFER TO ARCHITECTURAL PLANS FOR DETAILS.

FREDDY'S FROZEN CUSTARD
1123 WEST MERCURY BLVD.
HAMPTON, VIRGINIA 23666

9/22/2021

COMMONWEALTH OF VIRGINIA
ERIK BRADLEY KNUDSEN
Lic. No. 0402054561
PROFESSIONAL ENGINEER

DAN WINTER ARCHITECT
1024 EAST FIRST STREET
WICHITA, KS. 67214
PH. 316-267-7142

MECHANICAL FLOOR PLAN

DATE
09/22/2021

DRAWN BY:
SM/MS
CHECKED BY:
DS/EK

SHEET NO.
M1

BC PROJECT #: 21734
VIRGINIA PE COA #0407006723

BC ENGINEERS INCORPORATED
5720 Reeder Shawnee, Ks. 66203 (913)262-1772

ROOFTOP UNIT SCHEDULE

MARK	MFGR	MODEL NO.	NOM. TONS	EVAP. CFM	EXT. STATIC P. IN. WG. (NOTE 2)	COOLING				HEATING (GAS)		ELECTRICAL				MINIMUM OUTDOOR AIR (CFM)	TOTAL WEIGHT (LBS)	IEER	FREON	REMARKS
						TOTAL BTUH	SENS. BTUH	AMB.	EVAP. EAT DB/WB	BTUH INPUT	BTUH OUTPUT	VOLT/Φ/HZ	BLOWER MOTOR	MIN. MCA (AMPS)	MIN. MOCP (AMPS)					
RTU-1	LENNOX	LGH150H4M	12.5	5,000	1.0"	154,800	116,100	95	80/67	240,000	192,000	208/3/60	5 HP	71	90	900	1,600	12.2	R-410a	1,2,3,4,5,6,7

ALTERNATE RTU MANUFACTURER

MARK	MFGR	MODEL NO.	NOM. TONS	EVAP. CFM	EXT. STATIC P. IN. WG. (NOTE 2)	COOLING				HEATING (GAS)		ELECTRICAL				MINIMUM OUTDOOR AIR (CFM)	TOTAL WEIGHT (LBS)	IEER	FREON	NOTES
						TOTAL BTUH	SENS. BTUH	AMB.	EVAP. EAT DB/WB	BTUH INPUT	BTUH OUTPUT	VOLT/Φ/HZ	BLOWER MOTOR	MIN. MCA (AMPS)	MIN. MOCP (AMPS)					
RTU-1	TRANE	YHD150G3R	12.5	5,000	1.0	149,000	105,400	105	80/67	250,000	175,000	208/3/60	3 HP	65	90	900	1,600	13.5	R-410a	1,2,3,4,5,6,7

NOTES:
1. PROVIDE DIGITAL CONTROLS, OUTDOOR AIR ECONOMIZER WITH DRY BULB CONTROL, BAROMETRIC RELIEF DAMPER, TIME DELAY ON COMPRESSOR RE-START, CRANKCASE HEATER, BAROMETRIC RELIEF DAMPER, HOT GAS REHEAT FOR DEHUMIDIFICATION, DRAIN PAN OVERFLOW SWITCH, FRESH AIR TEMPERING KIT, HINGED ACCESS DOORS, SMOKE DETECTOR MOUNTED IN RETURN, AND STANDARD COOLING DOWN TO 0°F FOR EACH UNIT. OUTDOOR AIR DAMPER TO FULLY CLOSE W/ FAN SHUTDOWN FOR ALL UNITS.
2. EXTERNAL STATIC PRESSURE LISTED REPRESENTS STATIC PRESSURE REQUIRED FOR DUCTWORK AND DIFFUSERS OUTSIDE THE HVAC UNIT COMPLETELY INDEPENDENT OF ANY PRESSURE DROP THROUGH THE HVAC EQUIPMENT INCLUDING BUT NOT LIMITED TO FILTERS, COILS AND ECONOMIZERS. THE FAN AND MOTOR SHALL BE SIZED APPROPRIATELY TO MEET THIS DEFINITION OF EXTERNAL STATIC PRESSURE.
3. PROVIDE COMMERCIAL 7-DAY PROGRAMMABLE HEAT/COOL/AUTO CHANGEOVER THERMOSTAT WITH ECONOMIZER OUTPUT AND REMOTE, TEMPERATURE SENSOR FOR EACH UNIT (HONEYWELL VISION PRO 8000 OR EQUAL), ECONOMIZER/OUTDOOR AIR DAMPER IS TO CLOSE DURING UNOCCUPIED HOURS.
4. PROVIDE 18" HIGH (AT LOWEST POINT) PRE-FABRICATED INSULATED ROOF CURB.
5. PROVIDE HAIL GUARDS FOR EACH UNIT.
6. PROVIDE FACTORY INSTALLED UNIT MOUNTED CIRCUIT BREAKERS.
7. MECHANICAL CONTRACTOR SHOULD CLEAN OR PROVIDE ALL NEW FILTERS ON DAY OF TURNOVER.

ALTERNATE RTU MANUFACTURER'S MAY BE CONSIDERED UPON DESIGN APPROVAL. UNITS TO BE SUBMITTED AND REVIEWED BY DESIGN TEAM PRIOR TO ORDER. STRUCTURAL MODIFICATIONS MAY BE REQUIRED, AT THIS CONTRACTOR'S EXPENSE TO FIT ALTERNATE RTU DROPS.

SEE SHEET M3 FOR OWNER PROVIDED, GENERAL CONTRACTOR INSTALLED DOAS UNIT INFORMATION.

NATIONAL ACCOUNT INFORMATION

FREDDY'S FROZEN CUSTARD HAS NATIONAL ACCOUNT AGREEMENTS FOR ROOF TOP UNITS WITH LENNOX AND TRANE. NO ALTERNATE MANUFACTURERS ARE ALLOWED.

FOR LENNOX EQUIPMENT CONTACT:
DAVE EBNER, LENNOX INDUSTRIES NATIONAL ACCOUNT MANAGER, (651) 223-1582, Dave.Ebner@Lennoxind.com; FOR LENNOX SUPPORT, CALL 800-367-6285

FOR TRANE EQUIPMENT EQUAL TO THE UNITS SPECIFIED CONTACT:
TOM ROOD, TRANE ACCOUNT MANAGER - NATIONAL ACCOUNTS, (800) 729-9115
FREDDYS@TRANE.COM

EXHAUST FAN SCHEDULE

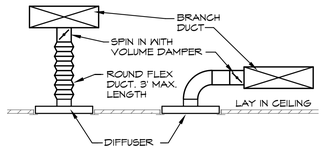
MARK	MFGR	MODEL	CFM	EXTERNAL STATIC P. IN. WG.	RPM	ELECTRICAL		FAN TYPE	NOTES
						VOLT/Φ/HZ	PWR		
EF-1	COOK	GC-146	715	0.25	900	120/1/60	30.3 W	CEILING EXH.	1
EF-2	COOK	GC-168	150	0.25	1099	120/1/60	50.4 W	CEILING EXH.	1

NOTES: 1. PROVIDE CEILING GRILLE, INTEGRAL BACK DRAFT DAMPER, AND ROOF CAP.

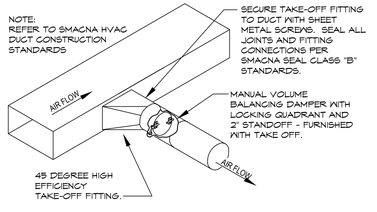
DIFFUSER SCHEDULE

MARK	MFGR	MODEL	NECK SIZE	FACE SIZE	FINISH	REMARKS
SD-1	TITUS	TMR	12"Φ	22"Φ	WHITE	FIELD PREP FOR PAINTING
SD-2		TMS/3	10"Φ	24"X24"		
SD-3		PAR/3	"	"	"	RETURN - NO DEFLECTOR
SD-4		T35Q4	8"Φ	"	"	THERMAL VAV DIFFUSER
SD-5		TMS/3	6"Φ	12"x12"	"	WITH O.B. DAMPER AND TRM KIT
RG-1	AMER. LOUVER CO.	STRATUS	20"x20"	24"x24"	"	SEE NOTE 1.
RG-2	TITUS	350RL	8"x8"	"	"	
RG-3	"	PAR/3	10"x22"	12"x24"	"	

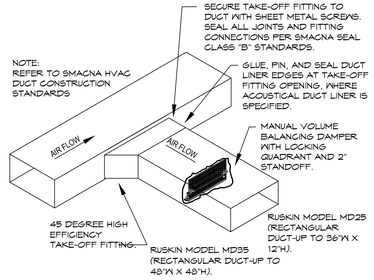
NOTES: 1. RETURN GRILL TO BE PLASTIC FILTER RETURN, FILTER TO BE AMERICAN AIR FILTER (AAF) FRONTLINE GREEN 1", WITH AAF AMERIFRAME SIZE 20x20x1.



DIFFUSER DETAIL
SCALE: NONE

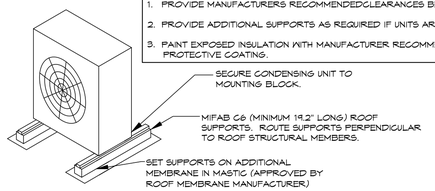


ROUND DUCT TAKE OFF DETAIL
SCALE: NONE

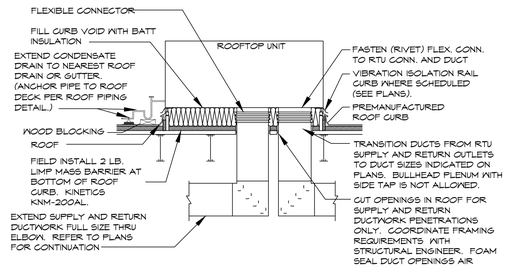


RECTANGULAR DUCT TAKE OFF DETAIL
SCALE: NONE

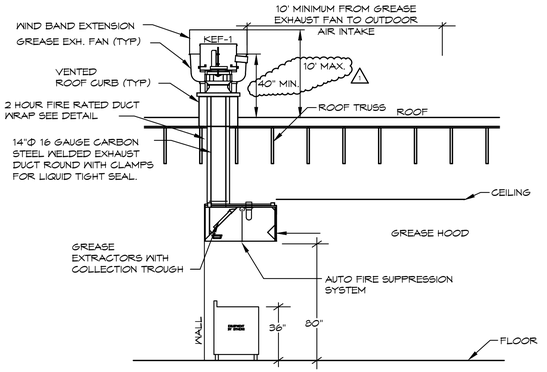
NOTES:
1. PROVIDE MANUFACTURERS RECOMMENDEDCLEARANCES BETWEEN CU ≤ HP UNITS.
2. PROVIDE ADDITIONAL SUPPORTS AS REQUIRED IF UNITS ARE NOT SAME WIDTH.
3. PAINT EXPOSED INSULATION WITH MANUFACTURER RECOMMENDED ULTRAVIOLET PROTECTIVE COATING.



ROOF CONDENSING UNIT MOUNTING DETAIL
SCALE: NONE



DOWNFLOW ROOF TOP UNIT DETAIL
SCALE: NONE



GREASE HOOD DETAIL

FIRE RATED ENCLOSURE - GREASE DUCTS

1. THERMAL CERAMICS FIREMASTER FASTWRAP XL IS TESTED TO ASTM E2336 AND UL LISTED PER HNKT.G18 TO PROVIDE ZERO CLEARANCE TO COMBUSTIBLES AND TO PROVIDE A 1- OR 2- HOUR ENCLOSURE. THROUGH PENETRATIONS FIRESTOP SYSTEMS ARE TESTED IN ACCORDANCE WITH ASTM E 814 (UL 1479). ICC-ES APPROVAL PER REPORT ESR 2213 OR ESR 2832.

2. COMPLIANT TO THE FOLLOWING CODES:
NFPA 96
INTERNATIONAL MECHANICAL CODES
UNIFORM MECHANICAL CODE.
CALIFORNIA MECHANICAL CODE

3. INSULATION APPLIED IN TWO LAYERS WITH TIGHT COMPRESSION JOINT ON BOTH LAYERS AT ALL JOINTS.

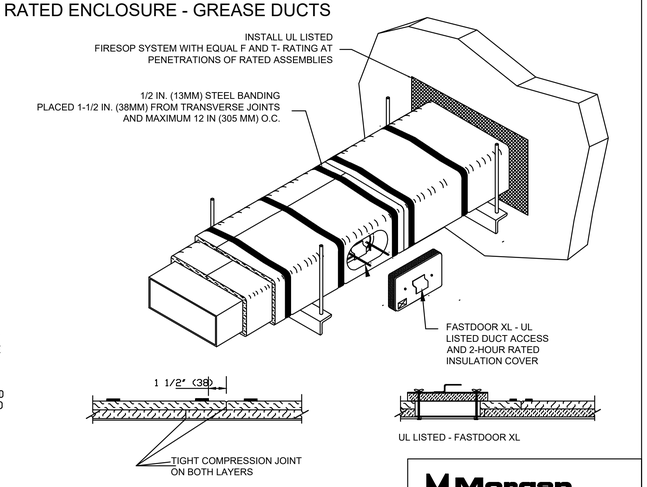
4. MINIMUM 16 GAUGE CARBON STEEL (OR 18 GAGE STAINLESS STEEL) RECTANGULAR OR ROUND GREASE EXHAUST DUCT

5. INSTALL UL LISTED AND LIQUID TIGHT THERMAL CERAMICS FASTDOOR XL ACCESS DOORS AT ALL CHANGES IN DIRECTION AND AT MINIMUM EVERY 20 FT ON HORIZONTAL RUNS.

6. SUPPORT HANGER SYSTEMS DO NOT NEED TO BE WRAPPED PROVIDED THE HANGER RODS ARE MINIMUM OF 3/8 IN. DIAMETER AND SUPPORTS ARE MINIMUM 2 X 2 X 1/8 IN. STEEL ANGLE OR SMACNA EQUIVALENT SUPPORT SYSTEM.

7. THERMAL CERAMICS DUCT WRAP SHALL BE INSTALLED DIRECTLY ONTO THE DUCT AND APPLIED FROM THE HOOD CONNECTION TO THE CONNECTION TO THE FAN.

8. THERMAL CERAMICS DUCT ENCLOSURE SYSTEM SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND UL LISTINGS.



Morgen ThermalCeramics
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BC PROJECT #: 21734
VIRGINIA PE COA #0407006723

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FREDDY'S FROZEN CUSTARD
1123 WEST MERCURY BLVD.
HAMPTON, VIRGINIA 23666

12/6/2021

COMMONWEALTH OF VIRGINIA
ERIK BRADLEY KNUDSEN
Lic. No. 0402054561
PROFESSIONAL ENGINEER

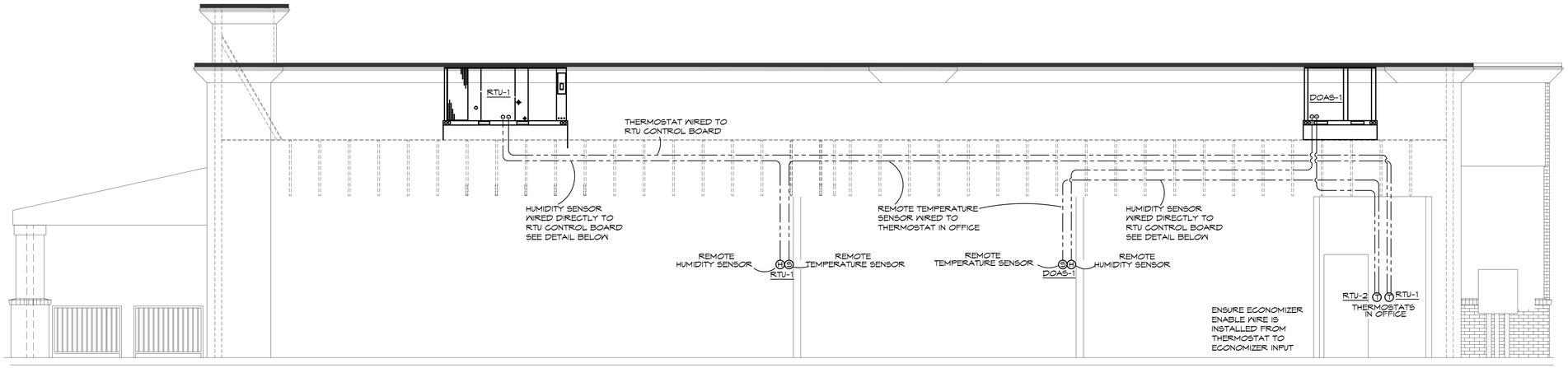
DAN WINTER ARCHITECT
1024 EAST FIRST STREET
WICHITA, KS. 67214
PH. 316-267-7142

MECHANICAL SCHEDULES & DETAILS

DATE
09/22/2021
⚠ REV 1 12/06/21

DRAWN BY: SM/MS
CHECKED BY: DS/EK

SHEET NO. M2



REMOTE TEMPERATURE AND HUMIDITY SENSOR WIRING

ALL LOW VOLTAGE WIRING FOR THE HVAC SYSTEM IS TO BE PROVIDED AND INSTALLED BY THE HVAC CONTRACTOR.

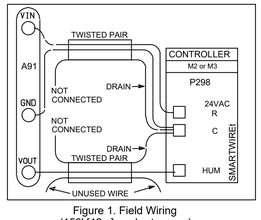


Figure 1. Field Wiring
(150' [46m] or shorter runs)

Wire runs of 150' (46m) or less:
Use two separate shielded cables containing 18AWG minimum, twisted pair conductors with overall shield. Belden type 8760 or 88760 (plenum) or equivalent. Connect both cable shield drain wires as shown in figure 1.

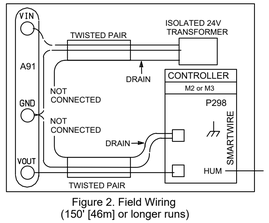
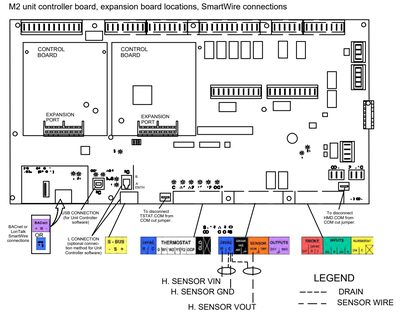
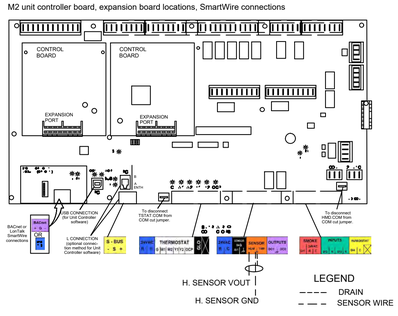


Figure 2. Field Wiring
(150' [46m] or longer runs)

M2 unit controller board, expansion board locations, SmartWire connections



M2 unit controller board, expansion board locations, SmartWire connections



Installation

DC Conductors

Table 11. Zone sensor module wiring

Distance from Unit to Control	Recommended Wire Size
0 - 150 feet	22 gauge
0 - 45.7 m	0.33 mm2
151 - 240 feet	20 gauge
46 - 73.1 m	0.50 mm2
241 -385 feet	18 gauge
73.5 - 117.3 m	0.75 mm2
386 - 610 feet	16 gauge
117.7 - 185.9 m	1.3 mm2
611 - 970 feet	14 gauge
186.2 - 295.7 m	2.0 mm2

Figure 58. Typical field wiring diagrams for electromechanical

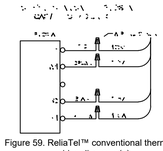
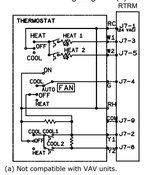


Figure 59. ReliaTel™ conventional thermostat field wiring diagrams(a)



(a) Not compatible with VAV units.

Figure 60. ReliaTel™ options module (RTOM board)

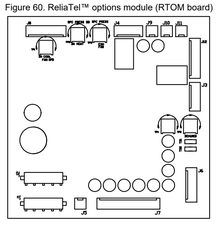
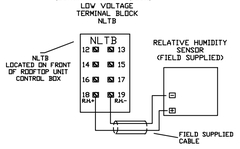


Figure 61. ReliaTel™ relative humidity sensor (dehumidification option)



LENNOX HUMIDITY SENSOR WIRING

FOR GENERAL INFORMATION ONLY.
REFER TO THE MANUFACTURERS INSTALLATION INSTRUCTIONS PROVIDED WITH THE EQUIPMENT FOR EXACT INSTALLATION INSTRUCTIONS AND REQUIREMENTS.

TRANE HUMIDITY SENSOR WIRING

FOR GENERAL INFORMATION ONLY.
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FREDDY'S FROZEN CUSTARD
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HAMPTON, VIRGINIA 23666

9/22/2021

COMMONWEALTH OF VIRGINIA
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REMOTE TEMPERATURE AND HUMIDITY SENSOR WIRING DETAILS

DATE
09/22/2021

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SHEET NO.
M2.1

BC PROJECT #: 21734
VIRGINIA PE COA #0407006723

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