

MECHANICAL SPECIFICATIONS

1. GENERAL PROVISIONS:
A. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, NECESSARY FOR THE COMPLETE INSTALLATION OF THE PLUMBING AND MECHANICAL SYSTEMS OUPUT.
B. OBTAIN ALL PERMITS, FEES, LICENSES, INSPECTIONS, AND CERTIFICATES OF COMPLIANCE OR APPROVAL AS REQUIRED BY THE AUTHORITIES.
C. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE LAWS, CODES AND REGULATIONS OF THE GOVERNMENTAL BODIES HAVING JURISDICTION OVER THE SITE.
D. ALL TESTING REQUIRED BY AUTHORITIES SHALL BE CONSIDERED PART OF THIS WORK.
E. DURING CONSTRUCTION, ALL FIXTURES, EQUIPMENT, PIPE, DUCT, ETC. SHALL BE COVERED, PLUGGED, OR CAPPED AS REQUIRED TO KEEP CLEAN AND UNDamaged. ALL Damaged ITEMS SHALL BE RESTORED TO ORIGINAL CONDITION OR REPLACED. ALL PROTECTIVE COVERINGS SHALL BE REMOVED BEFORE FINAL ACCEPTANCE.
F. PROVIDE ALL NECESSARY CUTTING AND PATCHING OF WALLS, FLOORS, CEILINGS, AND ROOFS AS NECESSARY. PATCH AROUNDS AND OPENINGS SHALL MATCH ADJACENT AREA. COORDINATE ALL ROOFING WORK WITH OWNER OR RESPONSIBLE PARTY, SO THAT THE EXISTING ROOFING WARRANTY WILL BE MAINTAINED.
G. CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS AGAINST DEFECTS FOR A PERIOD OF ONE YEAR FROM FINAL ACCEPTANCE.
2. OPERATION AND MAINTENANCE MANUALS:
A. DURING THE COURSE OF CONSTRUCTION, COLLECT AND COMPILE OPERATING INSTRUCTIONS, WIRING DIAGRAMS, CATALOGS, LITERATURE, PREVENTIVE MAINTENANCE INSTRUCTIONS, PARTS LISTS, ETC. FOR ALL EQUIPMENT FURNISHED UNDER THIS CONTRACT.
B. ALL LITERATURE AND INSTRUCTIONS SHIPPED WITH THE EQUIPMENT SHALL BE SAVED FOR INCLUSION IN THE OPERATION AND MAINTENANCE MANUALS.
C. ALL LITERATURE LISTED ABOVE AND ALL PAPERS LISTING WARRANTIES, ETC. SHALL BE BOUND IN A 3-RING BINDER AND LABELLED WITH THE PROJECT NAME, ADDRESS, ARCHITECT, ENGINEER, CONTRACTORS, ETC.
3. MANUFACTURERS:
A. MANUFACTURERS, MODEL NUMBERS, ETC. INDICATED OR SCHEDULED ON THE DRAWINGS SHALL BE INTERPRETED AS HAVING ESTABLISHED A STANDARD OF QUALITY AND SHALL NOT BE CONSIDERED AS LIMITED SPECIFICATION. ARTICLES, FIXTURES, ETC. OF EQUAL QUALITY BY MANUFACTURERS SHALL BE ACCEPTABLE SUBJECT TO STRUCTURAL AND ELECTRICAL CONSTRAINTS OF THE PROJECT DESIGN, UNLESS NOTED OTHERWISE.
4. MOTORS:
A. PROVIDE THERMAL OVERLOAD PROTECTION FOR EACH MOTOR PROVIDED BY THIS WORK.
5. TESTING, BALANCING, AND CLEANING:
A. ALL PIPING SHALL BE TESTED FOR LEAKS BEFORE BEING CONCEALED IN WALL CONSTRUCTION OR COVERED WITH INSULATION.
B. SEWER AND VENT PIPING SHALL BE HYDROSTATICALLY TESTED WITH NO LEAKS THAN 10 FEET OF HEAD FOR A PERIOD OF NOT LESS THAN 15 MINUTES, PER THE LOCAL PLUMBING CODE, WITH NO LEAKS.
C. DOMESTIC WATER PIPING SHALL BE HYDROSTATICALLY TESTED AT A PRESSURE OF NOT LESS THAN 1-1/2 TIMES THE OPERATING PRESSURE, BUT NOT LESS THAN 60 PSI, FOR A PERIOD OF NOT LESS THAN 2 HOURS, WITH NO LEAKS.
D. NATURAL GAS PIPING SHALL BE PNEUMATICALLY TESTED AT A PRESSURE OF NOT LESS THAN 1-1/2 TIMES THE OPERATING PRESSURE, BUT NOT LESS THAN 50 PSI, FOR A PERIOD OF NOT LESS THAN 2 HOURS, WITH NO LEAKS.
E. DUCTWORK AND PIPING SHALL BE BALANCED BY QUALIFIED INDEPENDENT BALANCING PERSONNEL WHO HAVE PREVIOUS EXPERIENCE WITH BALANCING PROCEDURES AND ARE CERTIFIED BY THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB).
1) BALANCING SHALL INCLUDE THE BALANCING OF THE EQUIPMENT AND AIR DISTRIBUTION SYSTEMS TO PROVIDE DESIGN QUANTITIES INDICATED AND VERIFICATION OF PERFORMANCE OF ALL EQUIPMENT AND AUTOMATIC CONTROLS.
2) WITH IN 30 DAYS OF THE COMPLETION OF THE TESTING AND BALANCING WORK, SUBMIT THE TEST AND BALANCING REPORT BEARING THE SIGNATURE OF THE TEST AND BALANCE ENGINEER. THE REPORTS SHALL BE CERTIFIED PROOF THAT THE SYSTEMS HAVE BEEN TESTED, ADJUSTED, AND BALANCED IN ACCORDANCE WITH THE REFERENCED STANDARDS. ARE AN ACCURATE REPRESENTATION OF HOW THE SYSTEMS HAVE BEEN INSTALLED AND ARE OPERATING. REPORTS SHALL BE BOUND IN A VINYL BINDER AND THE BINDER LABELLED OR MAY BE AN ELECTRONIC PDF SUBMITTAL.
F. GREASE DUCT SHALL BE TESTED PRIOR TO USE OR CONCEALMENT OF ANY PORTION OF THE GREASE DUCT SYSTEM. DUCTS SHALL BE CONSIDERED TO BE CONCEALED WHEN INSTALLED IN SHAFTS OR COVERED BY DUCT WRAP INSULATION THAT PREVENTS THE DUCTWORK FROM BEING VISUALLY INSPECTED FROM ALL SIDES. THE PERMIT HOLDER SHALL BE RESPONSIBLE TO PROVIDE THE NECESSARY EQUIPMENT AND PERFORM THE GREASE DUCT LEAKAGE TEST PER NFPA 46 AND ALL LOCAL CODES.
6. BEFORE DOMESTIC WATER PIPING IS PLACED IN SERVICE, ALL DOMESTIC WATER DISTRIBUTION SYSTEMS, INCLUDING PIPING FOR COLD WATER AND HOT WATER SYSTEMS SHALL BE FLUSHED, RINSED, STERILIZED AND CHLORINATED IN CONFORMANCE WITH HEALTH DEPARTMENT REGULATIONS. THE SYSTEMS SHALL BE THOROUGHLY FLUSHED OF ALL DIRT AND FOREIGN MATTER, THEN FILLED WITH WATER TREATED WITH 50 PPM OF CHLORINE. THE PIPING SHALL BE INSPECTED FROM ALL SIDES. THE PIPING SHALL BE OPENED SEVERAL TIMES TO ASSURE TREATMENT OF THE ENTIRE SYSTEM. THE TREATED WATER SHALL BE LEFT IN THE SYSTEM FOR 24 HOURS AFTER WHICH TIME THE SYSTEM SHALL BE FLUSHED, IF THE RESIDUAL CHLORINE IS NOT LESS THAN 1.0 PPM. THE FLUSHING SHALL BE REPEATED AFTER STERILIZATION. SAMPLES OF WATER IN THE SYSTEM SHALL BE APPROVED BY THE BOARD OF HEALTH.
7. PIPING:
A. DOMESTIC GOLD, HOT, AND HOT WATER REGULATORING (ABOVEGROUND).
1) TYPE 1 HARD DRAWN COPPER TUBING, ASTM B-88.
a) WROUGHT COPPER SOLDERED FITTINGS, ASTM B75 ALLOY C12200, ANSI B16.22, MSS SP-104.
b) MECHANICAL PRESS COPPER FITTINGS FOR USE IN PLUMBING OR MECHANICAL APPLICATIONS, ASME B16.22, ASME B16.11, OR ASME B16.10. MECHANICAL PRESS COPPER FITTINGS SHALL CONFORM TO APFMO PS-117 OR ASME B16.51.
2) FLEX, HIGH-DENSITY CROSS-LINKED POLYETHYLENE TUBING SHALL BE MANUFACTURED TO THE REQUIREMENTS OF ASTM F876 AND MEET THE STANDARD GRADE HYDROSTATIC PRESSURE RATINGS FROM PLASTIC INSTITUTE IN ACCORDANCE WITH THE (2).
a) FLEX AND FLEX-B MEETINGS (ANSI/ANSI AND ANSI/NSF312 STANDARDS FOR POTABLE WATER SAFETY AND LEAD-FREE STANDARDS AND MUST BE MARKED WITH "PW-0", "NSF-61-0" OR OTHER NSF-APPROVED MARKING, ASTM F2028 FOR USE WITH CHLORINATED WATER.
b) FLEX MECHANICAL PRESS FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. PIPE SIZES GIVEN ON THE DRAWINGS ARE NOMINAL COPPER PIPE SIZE. INCREASE FLEX PIPING SIZE TO EQUAL OR EXCEED COPPER PIPE INSIDE DIAMETER FOR SUPPLY MAINS.
3) VALVES
a) GATE VALVE, JOHAR T78-301 OR EQUAL, NSF 61-0, ANSI B16.20, ANSI B16.10.
b) GLOBE VALVE, CRANE FT OR EQUAL.
c) BALL VALVE, JOHAR T78-100C OR EQUAL, COMPACT LEAD FREE FORGED BRASS BALL VALVE, UL642, CSA 337.1 (1), CALIFORNIA 61, CALIFORNIA 61, CALIFORNIA 61, CALIFORNIA 61, CALIFORNIA 61, CALIFORNIA 61, CALIFORNIA 61, CALIFORNIA 61.
d) BALL VALVE, JOHAR T-100NE OR EQUAL, UL642, FM, CSA, NSF 61-0, MSS SP-110.
B. STORM SEWER, SANITARY SEWER, GREASE WASTE, AND VENTS (UNDERGROUND, INTERIOR TO THE BUILDING).
1) ABS SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DRY FITTING SYSTEM: PIPE AND FITTINGS SHALL BE MANUFACTURED FROM ABS COMPOUND WITH A CELL CLASS OF 42222 FOR PIPE AND FITTINGS AS PER ASTM D 2665 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 2660 FITTINGS SHALL CONFORM TO ASTM D 2235.
2) PVC SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DRY FITTING SYSTEM: PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 1432 PER ASTM D 4936 FOR PIPE AND 1254 PER ASTM D 1134 FOR FITTINGS AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 2665. FABRICATED FITTINGS SHALL CONFORM TO ASTM F 1866. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564.
3) PVC SCHEDULE 40 SOLID WALL PIPE AND DRY FITTING SYSTEM: PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 12454 PER ASTM D 1184 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 174. FITTINGS SHALL CONFORM TO ASTM F 174. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564.
4) HUBLESS CAST IRON SOIL PIPE AND FITTINGS: HUBLESS CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 880 AND GISI STANDARD 301. HUBLESS COUPLINGS SHALL CONFORM TO GISI STANDARD 310 AND BE CERTIFIED BY NSF INTERNATIONAL. HUB AND SPOUT CAST IRON SOIL PIPE AND FITTINGS: HUB AND SPOUT CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 74.
C. STORM SEWER, SANITARY SEWER, GREASE WASTE, AND VENTS (UNDERGROUND, INTERIOR TO THE BUILDING).
1) ABS SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DRY FITTING SYSTEM: PIPE AND FITTINGS SHALL BE MANUFACTURED FROM ABS COMPOUND WITH A CELL CLASS OF 42222 FOR PIPE AND FITTINGS AS PER ASTM D 2665 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 2660 FITTINGS SHALL CONFORM TO ASTM D 2235.
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3) PVC SCHEDULE 40 SOLID WALL PIPE AND DRY FITTING SYSTEM: PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 12454 PER ASTM D 1184 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 174. FITTINGS SHALL CONFORM TO ASTM F 174. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564.
4) HUBLESS CAST IRON SOIL PIPE AND FITTINGS: HUBLESS CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 880 AND GISI STANDARD 301. HUBLESS COUPLINGS SHALL CONFORM TO GISI STANDARD 310 AND BE CERTIFIED BY NSF INTERNATIONAL. HUB AND SPOUT CAST IRON SOIL PIPE AND FITTINGS: HUB AND SPOUT CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 74.
D. GREASE HOOD AND EXHAUST DUCT:
A. HOOD SHALL BE CONSTRUCTED OF 16 GAUGE STEEL OR 20 GAUGE STAINLESS STEEL IN ACCORDANCE WITH NFPA AND LOCAL CODES.
1) GREASE FILTERS SHALL BE UL LISTED UL1000 GREASE EXTRACTORS.
2) PROVIDE A COMPLETE AUTOMATIC NET CHEMICAL FIRE EXTINGUISHING SYSTEM FOR THE HOOD AND DUCT AS REQUIRED BY NFPA AND LOCAL CODES. ALL COOKING EQUIPMENT UNDER THE HOOD SHALL BE INTERLOCKED WITH THE SYSTEM, TO SHUTDOWN IN AN ALARM CONDITION.
a) THE GREASE HOOD FIRE SUPPRESSION SYSTEM SHALL BE EQUAL TO AMEREX KP SERIES PRE-ENGINEERED, NET CHEMICAL, STORED-PRESSURE TYPE WITH A FIXED NOZZLE ASSENT DISTRIBUTION SYSTEM. THE SYSTEM SHALL BE UL LISTED AND TESTED TO UL STANDARD 300.
b) THE SYSTEM SHALL UTILIZE AN ASSENT EQUAL TO AMEREX KP LIQUID FIRE SUPPRESSANT, A POTASSIUM ACETATE BASED SOLUTION THAT SUPPRESSES COOKING GREASE FIRES, SHALL HAVE A PH OF 9 OR LESS, AND SHALL NOT HARM STAINLESS STEEL SURFACES.
c) THE SYSTEM SHALL BE PROVIDED WITH A MANUAL "DUAL ACTION" TYPE PULL STATION. PULL STATION SHALL BE LOCATED NOT LESS THAN 10 FEET AND A MAXIMUM OF 20 FEET FROM THE GREASE HOOD AND IN THE PATH OF EGRESS. THE MANUAL ACTUATION SHALL REQUIRE A MAXIMUM FORCE OF 40 POUNDS AND A MAXIMUM MOVEMENT OF 14 INCHES TO ACTIVATE THE FIRE SUPPRESSION SYSTEM.
d) PROVIDE A GAS SHUT OFF VALVE FOR MOUNTING IN THE GAS PIPE THAT WILL SHUT OFF GAS FLOW TO EQUIPMENT UNDER THE HOOD IN AN ALARM CONDITION. PROVIDE AN ELECTRICAL SWITCH WHICH SHALL BE CAPABLE OF DE-ENERGIZING ALL ELECTRICAL DEVICES AND EQUIPMENT UNDER THE HOOD IN AN ALARM CONDITION.
B. GREASE DUCT SHALL BE CONSTRUCTED OF 16 GAUGE CARBON STEEL OR 18 GAUGE STAINLESS STEEL IN ACCORDANCE WITH NFPA AND LOCAL CODES.
a) JOINTS, SEAMS AND PENETRATIONS OF GREASE DUCTS SHALL BE MADE WITH A CONTINUOUS LIQUID TIGHT WELD OR BRAZE MADE ON THE EXTERNAL SURFACE OF THE DUCT SYSTEM.
b) DUCT JOINTS SHALL BE BUTT JOINTS, WELDED FLANGE JOINTS WITH A MAXIMUM FLANGE DEPTH OF 1/2" OR OVERLAPPING DUCT JOINTS OF EITHER THE TELESCOPING OR BELL TYPE. OVERLAPPING JOINTS SHALL BE INSTALLED TO PREVENT LEAKING OF GREASE OR INTERFERING WITH GRAVITY DRAINAGE TO THE INTENDED COLLECTION POINT.

MECHANICAL SPECIFICATIONS (CONTINUED)

D. STORM SEWER, SANITARY SEWER, GREASE WASTE, AND VENTS (UNDERGROUND, EXTERIOR TO THE BUILDING).
1) ABS SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DRY FITTING SYSTEM: PIPE AND FITTINGS SHALL BE MANUFACTURED FROM ABS COMPOUND WITH A CELL CLASS OF 42222 FOR PIPE AND FITTINGS AS PER ASTM D 2665 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 2660 FITTINGS SHALL CONFORM TO ASTM D 2235.
2) PVC SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DRY FITTING SYSTEM: PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 1432 PER ASTM D 4936 FOR PIPE AND 1254 PER ASTM D 1134 FOR FITTINGS AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 2665. FABRICATED FITTINGS SHALL CONFORM TO ASTM F 1866. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564.
3) PVC SCHEDULE 40 SOLID WALL PIPE AND DRY FITTING SYSTEM: PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 12454 PER ASTM D 1184 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 174. FITTINGS SHALL CONFORM TO ASTM F 174. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564.
4) HUBLESS CAST IRON SOIL PIPE AND FITTINGS: HUBLESS CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 880 AND GISI STANDARD 301. HUBLESS COUPLINGS SHALL CONFORM TO GISI STANDARD 310 AND BE CERTIFIED BY NSF INTERNATIONAL. HUB AND SPOUT CAST IRON SOIL PIPE AND FITTINGS: HUB AND SPOUT CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 74.
E. CONDENSATE DRAINS 4 INDIRECT WASTE (ABOVEGROUND).
1) DRY, WROUGHT COPPER, ANSI B16.22.
2) POLYVINYLCHLORIDE (PVC) DRY PIPE, SCHEDULE 40, SOLVENT JOINT.
F. REFRIGERANT.
1) ASTM B 280, TYPE ACR, HARD-DRAWN STRAIGHT LENGTHS, AND SOFT-ANNEALED COILS, SEAMLESS COPPER TUBING.
2) WROUGHT COPPER, ANSI B16.22, STREAMLINED PATTERN, FITTINGS, BRAZED JOINTS, ANS A 5.0, CLASSIFICATION BAG-1 (BILVER).
3) TUBING SHALL BE CLEANLY CLEANED, READY FOR INSTALLATION, AND HAVE ENDS CAPPED TO PROTECT CLEANLINESS OF PIPE INTERIORS PRIOR TO SHIPPING.
4) SIZE AND INSTALLATION OF PIPE SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
G. NATURAL GAS.
1) BLACK STEEL PIPE, SCHEDULE 40, ASTM A53.
a) PIPE 2" AND SMALLER, 150 LB. MALLEABLE IRON, THREADED FITTINGS.
b) PIPE 2" AND SMALLER, YEGA MEGAPRESS FOR WATER AND GAS, CSA LC4, T56A/ASME B31 FOR USE WITH ASTM A53 SCHEDULE 40 BLACK IRON PIPE.
c) PIPE 2-1/2" AND LARGER, WELDED.
d) FLUS VALVE, ROCKWELL NORBOSTROM FIGURE NO. 142 OR 143.
e) BALL VALVE, JOHAR T-100NE APPROVALS- UL642, FM, CSA, NSF 61-0, MSS SP-110.
2) GAS PIPING PAINTING:
a) ALL BLACK STEEL GAS PIPING LOCATED EXTERIOR TO THE BUILDING SHALL BE PRIMED AND PAINTED TO EITHER MATCH ADJACENT EXTERIOR WHERE LOCATED OR NEAR EXTERIOR WALL AND PAINTED SAFETY YELLOW WHERE LOCATED ON THE ROOF.
H. ALL PIPE HANGERS AND SUPPORTS SHALL BE STANDARD PRODUCTS OF GRINNELL, FEE AND MASON, OR ELGEN. HANGER SPACING SHALL BE IN ACCORDANCE WITH MSS-89-69.
I. SLEEVES
1) PROVIDE, SET, AND PROPERLY LOCATE PIPE SLEEVES AS REQUIRED FOR THIS WORK. ALL SLEEVES SHALL BE IN ACCORDANCE WITH THE REFERENCED STANDARDS, ARE AN ACCURATE REPRESENTATION OF HOW THE SYSTEMS HAVE BEEN INSTALLED AND ARE OPERATING. REPORTS SHALL BE BOUND IN A VINYL BINDER AND THE BINDER LABELLED OR MAY BE AN ELECTRONIC PDF SUBMITTAL.
2) INTERIOR PARTITIONS: 16 GAGE GALVANIZED STEEL, PACK BETWEEN PIPE AND SLEEVE WITH FIRE SAFING AND CAULK AT EACH END WITH FIRE RESISTANT SEALANT.
3) ROOF: PROSET OR EQUAL, MANUFACTURED PVC SCHEDULE 40 PIPE SLEEVE WITH WATERPROOF SEAL. COORDINATE WITH ROOFING CONTRACTOR AND FLASH AS REQUIRED TO MAINTAIN ROOF WARRANTY.
4) PLUMBING VENTS: FLASH ROOF VENT INTO ROOFING SYSTEM AS REQUIRED BY THE ROOFING CONTRACTOR TO MAINTAIN EXISTING ROOF WARRANTY. ALL PLUMBING VENT TERMINALS SHALL TERMINATE A MINIMUM OF 12" ABOVE ROOF OR EQUAL TO HEIGHT OF PARAPET, WHICHEVER IS GREATER.
J. PROVIDE CHROME PLATED ESCUTCHEONS ON ALL PIPE ENTERING FINISHED AREAS.
7. GAS PIPING LABELING:
A. ALL ELEVATED PRESSURE GAS PIPING SHALL BE LABELLED EVERY 40 FEET WITH SIGNS INDICATING "ELEVATED PRESSURE".
8. INSULATION AND DUCT LINING:
A. ALL INSULATIONS AND ACCESSORIES SHALL HAVE A FIRE HAZARD CLASSIFICATION WITH A FLAME SPREAD RATING OF NOT OVER 25, A FUEL CONTRIBUTION RATING OF NOT OVER 50, AND A SMOKE DEVELOPED RATINGS OF NOT OVER 50, IN ACCORDANCE WITH NFPA.
B. PIPE INSULATION - ABOVE GRADE:
1) THE PIPING INSULATION USED SHALL HAVE A THERMAL CONDUCTIVITY OF 0.21 Btu per in/ft^2/ft^2 OR LESS.
2) FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR BARRIER, ASJ JACKET, FACTORY APPLIED PRESSURE SEALING LONGITUDE LAP JOINT, NO STAPLES, ZESTON FRESHMOLDED PVC FITTING COVERS. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
3) FLEXIBLE CLOSED CELL ELASTOMERIC THERMAL INSULATION, UNSLT OR PRESUIT WITH PRESSURE SENSITIVE ADHESIVE SYSTEM OR CLOSURE AND VAPOR SEALING, EQUAL TO ARMOSTRONG AF ARMAFLEX OR ARMAFLEX 2000.
4) FOR NON CIRCULATING SYSTEMS, THE FIRST 8 FEET OF INLET AND OUTLET PIPING BETWEEN THE TANK AND THE HEAT TRAP (INCLUDING THE HEAT TRAP) MUST BE INSULATED.
5) INSULATION SCHEDULE:
a) DOMESTIC GOLD WATER 1/2"
b) DOMESTIC HOT WATER 1-1/2"
c) HOT WATER REGULATORING 1-1/2"
d) CONDENSATE DRAINS INSIDE BUILDING 1/2"
e) REFRIGERANT SUCTION 1-1/2" FOR PIPING UP TO 1 1/2", 4" FOR PIPING 1-1/2" DUCT AND LARGER.
C. DUCTWORK: ACOUSTICAL INSULATION.
1) DUCT LINING: 2 LB/CF, THICKNESS AS SCHEDULED, AIR STREAM SIDE COATED, INSTALL PER SMACNA STANDARDS.
a) DUCT LINING SCHEDULE:
(1) RECTANGULAR SUPPLY DUCT 1/2" - THROUGHOUT THE FIRST 10 FEET OF DUCT.
(2) RETURN AIR DUCT (DNING UNITS ONLY) 1/2" - THROUGHOUT THE FIRST 10 FEET OF DUCT.
D. DUCTWORK: THERMAL INSULATION (WHERE CONCEALED ABOVE CEILING).
1) DUCT COVERING: 3/4 LB/CF, FIBERGLASS BLANKET WITH FACTORY APPLIED VAPOR BARRIER AND FACING, THICKNESS AS SCHEDULED, INSTALLATION IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
a) DUCT COVERING SCHEDULE: MINIMUM R-6
(1) ROUND SUPPLY DUCT (ABOVE CEILING) 2"
(2) RECTANGULAR SUPPLY DUCT (ABOVE CEILING) 2"
(3) RETURN AIR DUCT 2"
(4) MAKE-UP AIR DUCT 2"
9. GREASE HOOD AND EXHAUST DUCT:
A. HOOD SHALL BE CONSTRUCTED OF 16 GAUGE STEEL OR 20 GAUGE STAINLESS STEEL IN ACCORDANCE WITH NFPA AND LOCAL CODES.
1) GREASE FILTERS SHALL BE UL LISTED UL1000 GREASE EXTRACTORS.
2) PROVIDE A COMPLETE AUTOMATIC NET CHEMICAL FIRE EXTINGUISHING SYSTEM FOR THE HOOD AND DUCT AS REQUIRED BY NFPA AND LOCAL CODES. ALL COOKING EQUIPMENT UNDER THE HOOD SHALL BE INTERLOCKED WITH THE SYSTEM, TO SHUTDOWN IN AN ALARM CONDITION.
a) THE GREASE HOOD FIRE SUPPRESSION SYSTEM SHALL BE EQUAL TO AMEREX KP SERIES PRE-ENGINEERED, NET CHEMICAL, STORED-PRESSURE TYPE WITH A FIXED NOZZLE ASSENT DISTRIBUTION SYSTEM. THE SYSTEM SHALL BE UL LISTED AND TESTED TO UL STANDARD 300.
b) THE SYSTEM SHALL UTILIZE AN ASSENT EQUAL TO AMEREX KP LIQUID FIRE SUPPRESSANT, A POTASSIUM ACETATE BASED SOLUTION THAT SUPPRESSES COOKING GREASE FIRES, SHALL HAVE A PH OF 9 OR LESS, AND SHALL NOT HARM STAINLESS STEEL SURFACES.
c) THE SYSTEM SHALL BE PROVIDED WITH A MANUAL "DUAL ACTION" TYPE PULL STATION. PULL STATION SHALL BE LOCATED NOT LESS THAN 10 FEET AND A MAXIMUM OF 20 FEET FROM THE GREASE HOOD AND IN THE PATH OF EGRESS. THE MANUAL ACTUATION SHALL REQUIRE A MAXIMUM FORCE OF 40 POUNDS AND A MAXIMUM MOVEMENT OF 14 INCHES TO ACTIVATE THE FIRE SUPPRESSION SYSTEM.
d) PROVIDE A GAS SHUT OFF VALVE FOR MOUNTING IN THE GAS PIPE THAT WILL SHUT OFF GAS FLOW TO EQUIPMENT UNDER THE HOOD IN AN ALARM CONDITION. PROVIDE AN ELECTRICAL SWITCH WHICH SHALL BE CAPABLE OF DE-ENERGIZING ALL ELECTRICAL DEVICES AND EQUIPMENT UNDER THE HOOD IN AN ALARM CONDITION.
B. GREASE DUCT SHALL BE CONSTRUCTED OF 16 GAUGE CARBON STEEL OR 18 GAUGE STAINLESS STEEL IN ACCORDANCE WITH NFPA AND LOCAL CODES.
a) JOINTS, SEAMS AND PENETRATIONS OF GREASE DUCTS SHALL BE MADE WITH A CONTINUOUS LIQUID TIGHT WELD OR BRAZE MADE ON THE EXTERNAL SURFACE OF THE DUCT SYSTEM.
b) DUCT JOINTS SHALL BE BUTT JOINTS, WELDED FLANGE JOINTS WITH A MAXIMUM FLANGE DEPTH OF 1/2" OR OVERLAPPING DUCT JOINTS OF EITHER THE TELESCOPING OR BELL TYPE. OVERLAPPING JOINTS SHALL BE INSTALLED TO PREVENT LEAKING OF GREASE OR INTERFERING WITH GRAVITY DRAINAGE TO THE INTENDED COLLECTION POINT.

MECHANICAL SPECIFICATIONS (CONTINUED)

DUCT TO HOOD CONNECTIONS SHALL BE MADE WITH LISTED AND LABELLED DUCT TO HOOD COLLAR CONNECTIONS THAT ARE INSTALLED PER THE TERMS OF THEIR APPROVAL, AND PER THE MANUFACTURERS INSTALLATION INSTRUCTIONS.
DUCT TO EXHAUST FAN CONNECTIONS SHALL BE FLANGED AND GASKETED AT THE BASE OF THE FAN FOR VERTICAL DISCHARGE FANS, OR SHALL BE FLANGED, GASKETED AND BOLTED TO THE INLET OF THE FAN FOR SIDE DISCHARGE FANS. GASKET SEALING MATERIALS SHALL BE RATED FOR A MINIMUM CONTINUOUS DUTY TEMPERATURE OF 1500°F.
SINGLE WALL ROUND GREASE DUCT:
1. FURNISH SINGLE-WALL, FACTORY BUILT, GREASE DUCT FOR USE WITH TYPE I KITCHEN HOODS, WHICH CONFORMS TO THE REQUIREMENTS OF NFPA 96. PRODUCTS SHALL BE ETL LISTED TO UL 1410 AND CSA 1184.2 FOR VENTING AIR AND GREASE VAPORS FROM COMMERCIAL COOKING OPERATIONS AS DESCRIBED IN NFPA-96.
2. THE DUCT WALL SHALL BE CONSTRUCTED OF .036 AND .041 THICK STAINLESS STEEL AND BE AVAILABLE IN DIAMETERS Ø THROUGH 24".
3. ALL SUPPORTS, FAN ADAPTERS, HOOD CONNECTIONS, FITTINGS AND EXPANSION JOINTS REQUIRED TO INSTALL GREASE DUCT SHALL BE INCLUDED.
4. ROOF PENETRATIONS SHALL COMPLY WITH LISTED CLEARANCE TO COMBUSTIBLES, SEE "CLEARANCE TO COMBUSTIBLES" GUIDE FOR DETAILS. THE GREASE DUCT WILL TERMINATE AT THE FAN ADAPTER PLATE, WILL BE FULLY VULCANIZED TO THE FAN ADAPTER PLATE AND THE FAN ADAPTERS PLATE WILL BE FASTENED TO THE CURB USING A SUITABLY SIZED FASTENER PROVIDED BY OTHERS; SEE PAGE 12 OF THE "INSTALLATION, OPERATION AND MAINTENANCE MANUAL" FOR DETAILS.
5. GREASE DUCT JOINTS SHALL BE HELD TOGETHER BY MEANS OF FORMED VEE CLAMPS AND SEALED WITH 3M FIRE BARRIER 2000. GROMETS USED TO SECURE THE VEE CLAMPS SHALL BE ETL LISTED TO UL 1410 AND CSA 1184.2 FOR VENTING AIR AND GREASE VAPORS FROM COMMERCIAL COOKING OPERATIONS AS DESCRIBED IN NFPA-96.
6. SINGLE-WALL GREASE DUCT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S "INSTALLATION, OPERATION AND MAINTENANCE MANUAL", ETL LISTING AND STATE AND LOCAL CODES.
7. GREASE DUCT INSTALLED OUTSIDE OF THE BUILDING SHALL BE PROTECTED AGAINST ACCIDENTAL DAMAGE OR VANDALISM.
8. SUPPORT VERTICALLY INSTALLED GREASE DUCT FROM THE BUILDING STRUCTURE USING RIGID STRUCTURAL SUPPORTS, ANCHOR SUPPORTS TO THE STRUCTURE BY WELDING OR BOLTING STEEL EXPANSION ANCHORS OR CONCRETE INSERTS, SUPPORT HORIZONTALLY INSTALLED GREASE DUCT FROM THE BUILDING STRUCTURE USING ABOVE METHOD. 1/2" THREADED ROD AND SADDLES MAY ALSO BE USED FOR THE SUPPORT OF HORIZONTAL GREASE DUCT.
9. FANS SHALL BE SUPPORTED INDEPENDENTLY FROM THE GREASE DUCT SECTIONS. PROTECT GREASE DUCT FROM TWISTING OR MOVEMENT CAUSED BY FAN TORQUE OR VIBRATION.
10. PLUMBING:
A. PROVIDE AN APPROVED WATER HAMMER ARRESTOR FOR EACH PLUMBING FIXTURE SUPPLY AS REQUIRED BY FIXTURE MANUFACTURER.
B. ALL EXPOSED PIPE SHALL BE CHROME PLATED BRASS PIPE, NO FERROUS PIPE.
C. PROVIDE CLEANOUTS AT EACH CHANGE OF DIRECTION AND AT 100 FOOT INTERVALS IN STRAIGHT RUNS.
D. PROVIDE ACCESS PANELS FOR ALL CONCEALED VALVES AND TRAPS.
E. CLEANOUTS:
1) VINYL TILE FLOOR: JR SMITH #4140, OR EQUAL.
2) QUARRY TILE FLOOR: JR SMITH #4200, OR EQUAL.
3) CARPETED FLOOR: JR SMITH #4200, OR EQUAL.
4) UNFINISHED FLOOR: JR SMITH #4020, OR EQUAL.
5) WALL: JR SMITH #4412, OR EQUAL. 24" ABOVE THE FLOOR.
6) GRADE: JR SMITH #4286, OR EQUAL, WITH HEAVY DUTY GAST IRON BODY AND COVER.
F. PROVIDE DIELECTRIC UNIONS WITH APPROPRIATE END CONNECTIONS TO MATCH THE PIPE SYSTEM IN WHICH INSTALLED (SCREWED, OR FLANGED). PROVIDE DIELECTRIC UNIONS ON ALL PIPING CONNECTIONS TO HOT WATER HEATERS AND EXPANSION TANKS.
6. ALL SEWER PIPING LOCATED INSIDE THE BUILDING SHALL BE INSTALLED WITH THE FOLLOWING SLOPES.
1) INSTALL 2-1/2" AND SMALLER PIPE AT 1/4" PER FOOT FALL.
2) INSTALL 3" AND LARGER PIPE AT 1/8" PER FOOT FALL.
H. ALL SEWER PIPING LOCATED EXTERIOR TO THE BUILDING SHALL BE INSTALLED WITH THE FOLLOWING SLOPES.
1) INSTALL 4" AND SMALLER PIPE AT A MINIMUM OF 2% SLOPE.
2) INSTALL 6" AND LARGER PIPE AT A MINIMUM OF 1% SLOPE.
3) INSTALL ALL GREASE WASTE PIPING AT 1/4" PER FOOT FALL.
11. DUCTWORK:
A. ALL DUCTWORK, UNLESS OTHERWISE INDICATED, SHALL BE FABRICATED FROM GALVANIZED SHEET STEEL COMPLYING WITH ASTM A 521, LOCKFORMING QUALITY, WITH 60 ZINC COATINGS IN ACCORDANCE WITH ASTM A 525, AND MILL PHOSPHATIZED FOR EXPOSED LOCATIONS.
B. WHERE DUCTWORK IS INDICATED TO BE EXPOSED TO VIEW IN OCCUPIED SPACES, PROVIDE MATERIALS WHICH ARE FREE FROM VISUAL IMPERFECTIONS INCLUDING FITTING, SEAM MARKS, ROLLER MARKS, STAINS AND DISCOLORATIONS, AND OTHER IMPERFECTIONS, INCLUDING THOSE WHICH WOULD IMPAIR PAINTING.
C. DUCTWORK, METAL GAUGES, REINFORCING, ETC. SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS", LATEST EDITION FOR A 2 INCH WATER GAUGE STATIC PRESSURE.
1) RECTANGULAR DUCT:
a) ELBOWS, UNLESS INDICATED OTHERWISE SHALL BE CONSTRUCTED WITH CENTERLINE RADIUS OF NOT LESS THAN 1.5 DUCT WIDTH OR SQUARE ELBOW WITH DOUBLE WALL STREAMLINE VANES.
b) RETURN AIR ACOUSTICAL ELBOWS AND SOUND BOOTS SHALL BE A SQUARE ELBOW WITH NO TURNING VANES.
c) SLOPES FOR TRANSITIONS OR OTHER CHANGES IN DIMENSIONS SHALL BE MINIMUM 1 TO 3.
2) ROUND AND OVAL SPIRAL SEAM DUCT:
a) PROVIDE RADIIUS TYPE FITTINGS FABRICATED OF MULTIPLE SECTIONS WITH MAXIMUM 15 DEGREE CHANGE OF DIRECTION PER SECTION UNLESS SPECIFICALLY DETAILED OTHERWISE. USE 45 DEGREE LATERALS FOR BRANCH TAKEOFF CONNECTIONS. WHERE 90 DEGREE BRANCHED ARE INDICATED PROVIDE CONICAL TYPE TEES.
b) SLOPES FOR TRANSITIONS OR OTHER CHANGES IN DIMENSIONS SHALL BE MINIMUM 1 TO 3.
c) AS AN OPTION, PROVIDE FACTORY-FABRICATED DUCT AND FITTINGS, IN LIEU OF SHOP-FABRICATED DUCT AND FITTINGS.
(1) ELBOWS: ONE PIECE CONSTRUCTION FOR 90 DEGREES AND 45 DEGREE ELBOW 14" AND SMALLER. PROVIDE MULTIPLE GORE CONSTRUCTION FOR LARGER DIAMETERS WITH STANDING SEAM CIRCUMFERENTIAL JOINT.
(2) DIVIDED FLOW FITTINGS: 90 DEGREE TEES, CONSTRUCTED WITH SADDLE TAP SPOT WELDED AND BONDED TO DUCT FITTING BODY.
d) ROUND LONGITUDINAL SEAM DUCT: USE FOR RIGID METAL DUCT ON LEAVING SIDE OF DUCT IN CONCEALED LOCATIONS FOR EXTENSION TO FLEX FOR DIFFUSERS, UNLESS OTHERWISE INDICATED.
D. SEAL ALL CONCEALED DUCTWORK JOINTS WITH NON-HARDENING, NON-MIGRATING MASTIC SEALANT, AS RECOMMENDED FOR SEALING SEAMS AND JOINTS IN DUCTWORK. OIL-BASE CAULKING AND GLAZING COMPOUNDS SHALL NOT BE ACCEPTABLE.
E. DUCT SIZES SHOWN ON THE DRAWINGS ARE SHEETMETAL SIZES. ALLOWANCE FOR DUCT LINER HAS BEEN MADE WHERE APPLICABLE.
F. INSTALLATION OF METAL DUCTWORK:
1) GENERAL: ASSEMBLE AND INSTALL DUCTWORK IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES WHICH WILL ACHIEVE AIR-TIGHT SYSTEMS (MAXIMUM 5% LEAKAGE), WITH NO OBJECTIONABLE NOISE, AND CAPABLE OF PERFORMING INDICATED SERVICE. INSTALL EACH RUN WITH MINIMUM NUMBER DUCTWORK ACCURATELY WITH INTERNAL SURFACES SMOOTH. SUPPORT DUCTS RIGIDLY WITH SUITABLE STRAPS, BRACES, HANGERS AND ANCHORS IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS", LATEST EDITION. DUCT HANGERS SHALL BE OF THE TYPE WHICH WILL HOLD DUCTS TRUE-TO-SHAPE AND TO PREVENT BUCKLING. SUPPORT VERTICAL DUCTS AT EVERY FLOOR.
2) AUXILIARY STEEL: PROVIDE AUXILIARY STEEL AS REQUIRED TO ADEQUATELY SUPPORT DUCTWORK.
3) ROUTING: LOCATE DUCTWORK RUNS, EXCEPT AS OTHERWISE INDICATED, VERTICALLY AND HORIZONTALLY AND AVOID DIAGONAL RUNS WHEREVER POSSIBLE. LOCATE RUNS AS INDICATED BY DIAGRAMS, DETAILS AND NOTATIONS OR, IF NOT OTHERWISE INDICATED, RUN DUCTWORK IN SHORTEST ROUTE WHICH DOES NOT OBSTRUCT USABLE SPACE OR BLOCK ACCESS FOR SERVICING BUILDING AND ITS EQUIPMENT. HOLD DUCTS CLOSE TO WALLS, OVERHEAD CONSTRUCTION, COLUMNS, AND OTHER STRUCTURAL AND PERMANENT ENCLOSURE ELEMENTS OF BUILDING, WHEREVER POSSIBLE IN FINISHED AND OCCUPIED SPACES. CONCEAL DUCTWORK FROM VIEW, BY LOCATING IN MECHANICAL SHAFTS, UNFINISHED WALL CONSTRUCTION OR ABOVE SUSPENDED CEILINGS. DO NOT ENGAGE HORIZONTAL RUNS IN SOLID PARTITIONS, EXCEPT AS SPECIFICALLY SHOWN. COORDINATE LAYOUT WITH SUSPENDED CEILING AND LIGHTING LAYOUTS AND SIMILAR FINISHED WORK.
4) DO NOT ROUTE DUCTWORK THROUGH ELECTRICAL EQUIPMENT SPACES AND ENCLOSURES, UNLESS INDICATED OTHERWISE.
5) PENETRATIONS:
a) WHERE DUCTS PASS THROUGH INTERIOR PARTITIONS OR EXTERIOR WALLS, AND ARE EXPOSED TO VIEW, CONICAL SPACE BETWEEN OPENINGS AND DUCT OR DUCT INSULATION WITH SHEET METAL FLANGES OF SAME GAGE AS DUCT. OVERLAP OPENING ON 4 SIDES BY AT LEAST 1-1/2". FASTEN TO DUCT AND WALL.
b) WHERE DUCTS PASS THROUGH FIRE-RATED FLOORS, WALLS, OR PARTITIONS, PROVIDE FIRESTOPPING BETWEEN DUCT AND WALL.
6) COORDINATION: COORDINATE DUCT INSTALLATIONS WITH INSTALLATION OF ACCESSORIES, DAMPERS, COIL FRAMES, EQUIPMENT, CONTROLS, AND OTHER ASSOCIATED WORK OF THE DUCTWORK SYSTEM.
7) INSTALLATION: INSTALL METAL DUCTWORK IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS', LATEST EDITION.

MECHANICAL SPECIFICATIONS (CONTINUED)

EQUIPMENT CONNECTIONS:
1) CONNECT METAL DUCTWORK TO EQUIPMENT AS INDICATED. PROVIDE FLEXIBLE CONNECTION FOR EACH DUCTWORK CONNECTION TO EQUIPMENT MOUNTED ON VIBRATION ISOLATORS AND/OR EQUIPMENT CONTAINING ROTATING MACHINERY. PROVIDE ACCESS DOORS AS REQUIRED.
H. SEAL ALL CONCEALED DUCTWORK JOINTS WITH NON-HARDENING, NON-MIGRATING MASTIC SEALANT, AS RECOMMENDED FOR SEALING SEAMS AND JOINTS IN DUCTWORK. OIL-BASE CAULKING AND GLAZING COMPOUNDS SHALL NOT BE ACCEPTABLE. DUCTS SHALL BE SEALED TO THE CLASS LEVEL LISTED BELOW.
1) UNCONDITIONED SPACES CLASS B
2) CONDITIONED SPACES (PLENUM) CLASS C CLASS B CLASS B CLASS C
SUPPLY > 2" P.C. EXHAUST RETURN
12. FLEXIBLE DUCT:
A. ATCO #086 (R-6), OR EQUAL.
B. FACTORY APPLIED INSULATION AND VAPOR BARRIER, 1-1/2" THICK.
C. MAXIMUM LENGTH OF 6'-0".
13. FLUES AND ACCESSORIES:
A. FLUE FOR GAS FIRED CONDENSING WATER HEATER SHALL BE AS RECOMMENDED BY THE GAS APPLIANCE MANUFACTURER. FLUES SHALL BE SCHEDULE 40, PVC OR CPVC PIPE PER THE MANUFACTURERS INSTALLATION REQUIREMENTS.
B. PROVIDE MANUFACTURERS STANDARD ACCESSORY ITEMS INCLUDING BIRD PROOF TOP, STORM COLLAR, ROOF THIMBLE, ETC. AS REQUIRED FOR A COMPLETE INSTALLATION. ROOF THIMBLES THROUGH THE BUILDING ROOF SHALL BE SUITABLE FOR USE WITH THE ROOF PROVIDED.
14. EXHAUST FANS:
A. CENTRIFUGAL TYPE FAN WITH CHARACTERISTICS AND CAPACITY AS SCHEDULED. ELECTRICALLY POWERED, SUITABLE FOR MOUNTING ON ROOF CURB, DIRECT OR BELT DRIVEN, HEAVY GAUGE SPUN-ALUMINUM WEATHERPROOF HOUSINGS OF THE HOODED DOME OR UPBLAST TYPE. PROVIDE PERMANENT SPLIT-CAPACITOR TYPE MOTOR FOR DIRECT DRIVEN FANS, AND CAPACITOR-START, INDUCTION-RUN TYPE MOTOR FOR BELT DRIVEN FANS.
B. CENTRIFUGAL CEILING EXHAUSTERS SHALL BE ELECTRICALLY POWERED CENTRIFUGAL TYPE FAN SUITABLE FOR MOUNTING IN THE CEILING WITH A PERFORATED OFF-WHITE METAL GRILLE WITH A THUMBSCREW ATTACHMENT FOR EASY ACCESS TO FAN HOUSING. UNIT SHALL CONSIST OF A GALVANIZED STEEL HOUSING LINED WITH ACOUSTICAL INSULATION AND SHALL INCLUDE AN INTEGRAL BACKDRAFT DAMPER ON FAN DISCHARGE. MOTOR SHALL BE A PERMANENT SPLIT-CAPACITOR TYPE MOTOR, PERMANENTLY LUBRICATED, WITH THERMAL OVERLOAD PROTECTION. PROVIDE DISCONNECT SWITCH OR OTHER MEANS OF DISCONNECT AT MOTOR IN FAN HOUSING.
15. CONTROL WIRING:
A. ELECTRICAL WIRING AND WIRING CONNECTIONS REQUIRED FOR THE INSTALLATION OF THE TEMPERATURE CONTROL SYSTEM, SHALL BE PROVIDED BY THIS CONTRACTOR, UNLESS SPECIFICALLY SHOWN ON THE ELECTRICAL DRAWINGS OR SPECIFICATIONS.
B. INSTALL CONTROL WIRING, WITHOUT SPLICES BETWEEN TERMINAL POINTS, COLOR CODED, INSTALL IN NEAT WORKMANLIKE MANNER, SECURELY FASTENED, INSTALL IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AND THE ELECTRICAL SPECIFICATIONS.
1) INSTALL CIRCUITS OVER 25 VOLT WITH COLOR CODED NUMBER 12 WIRE.
2) INSTALL CIRCUITS UNDER 25 VOLT WITH COLOR CODED NUMBER 18 WIRE WITH 0.031 INCH HIGH TEMPERATURE 105 DEGREES F PLASTIC INSULATION ON EACH CONDUCTOR AND PLASTIC SHEATH OVER ALL.
3) INSTALL ELECTRICAL CIRCUITS WITH COLOR CODED NUMBER 22 WIRE WITH 0.025 INCH POLYETHYLENE INSULATION ON EACH CONDUCTOR WITH PLASTIC JACKETED GROUND SHEILD OVER ALL.
4) INSTALL LOW VOLTAGE CIRCUITS, LOCATED IN CONCRETE SLABS AND MASONRY WALLS, OR EXPOSED IN OCCUPIED AREAS, IN ELECTRIC CONDUIT.
5) ALL WIRING IN AREAS USED AS AIR PLenums SHALL BE IN ELECTRIC CONDUIT EXCEPT THAT LOW VOLTAGE WIRING MAY BE TEFLOON COATED ALUMINUM SHEATHED CABLE OR OTHER WIRE SPECIFICALLY APPROVED FOR INSTALLATION IN AIR PLenums, WHERE ACCEPTABLE BY LOCAL CODES.
6) ALL WIRING IN AREAS NOT USED FOR AIR MOVEMENT SHALL BE IN ELECTRIC METALLIC TUBING EXCEPT LOW VOLTAGE WIRING MAY BE IN APPROVED SIGNAL CABLE WHERE ACCEPTED BY LOCAL CODES.
16. ROOFTOP UNITS:
A. UNIT SHALL BE FACTORY-ASSEMBLED AND TESTED, DESIGNED FOR ROOF INSTALLATION, AND SHALL CONSIST OF COMPRESSOR(S), CONDENSERS, EVAPORATOR COILS, CONDENSER AND EVAPORATOR FANS, CONDENSER FANS TO BE SEQUENCED, REFRIGERATION CONTROLS, GAS FIRED HEAT EXCHANGER, FILTERS, AND DAMPERS. CAPACITIES AND ELECTRICAL CHARACTERISTICS SHALL BE AS SCHEDULED ON THE DRAWINGS.
B. COMPRESSOR(S) UNIT SHALL INCLUDE VIBRATION ISOLATORS AND CRANKCASE HEATER. REFRIGERANT CIRCUIT SHALL INCLUDE A FILTER DRYER, SIGHT GLASS, COMPRESSOR SERVICE VALVES, AND LIQUID LINE SERVICE VALVES.
C. SAFETY CONTROLS SHALL INCLUDE:
a) LOW PRESSURE CUTOFF, MANUAL RESET.
b) HIGH PRESSURE CUTOFF, MANUAL RESET.
c) COMPRESSOR MOTOR OVERLOAD PROTECTION, MANUAL RESET.
d) ANTI-RECYCLING TRIPING DEVICE.
e) ADJUSTABLE LOW-AMBIENT LOCKOUT.
f) OIL PRESSURE SWITCH.
D. REFRIGERANT COIL: ALUMINUM FINS BONDED TO SEAMLESS COPPER TUBE BY MEANS OF MECHANICAL EXPANSION. AN EQUALIZING TIE VERTICAL DISTRIBUTOR SHALL ENSURE EACH COIL CIRCUIT RECEIVES THE SAME AMOUNT OF REFRIGERANT.
E. ECONOMIZER SHALL CONSIST OF RETURN AIR DAMPER, OUTDOOR AIR DAMPER, AND BAROMETRIC RELIEF DAMPER. PROVIDE POWERED EXHAUST FAN WITH MANUFACTURERS STANDARD CONTROLS FOR UNITS SCHEDULED ON THE DRAWINGS.
F. GAS HEAT, INDIRECT FIRED, GAS HEAT EXCHANGER, AUTOMATIC SPARK IGNITION, MANUFACTURERS STANDARD GAS TRAP WITH REGULATOR (IF REQUIRED), AS APPROVED. VERIFY GAS SERVICE PRESSURE TO INDIVIDUAL ROOFTOP UNITS.
G. ROOFTOP UNITS SHALL BE WIRED TO SHUTDOWN ON A SIGNAL FROM THE SMOKE DETECTORS OR HOOD CONTROL PANEL, AND SHALL AUTOMATICALLY RESET WHEN THE SMOKE DETECTORS ARE RESET.
17. SMOKE DETECTORS:
A. UNITS MOUNTED IN THE DUCTWORK SHALL BE A DUCT MOUNTED UL LISTED PHOTO-ELECTRIC SELF-CONTAINED SMOKE DETECTOR WITH HOUSING. UNITS SHALL BE EQUAL TO SIMPLEX #4208-8901. THE SAMPLING TUBE SHALL BE #2008-8304, LENGTH AS REQUIRED FOR DUCT.
B. DUCT DETECTOR REMOTE TEST STATION SHALL BE SIMPLEX #4098-8942 WITH REMOTE ALARM INDICATOR, POWER-ON INDICATOR, TONE-ALERT, TONE-ALERT SILENCE SWITCH, AND TEST/RESET SWITCH.
1) DEVICES SHALL BE MOUNTED IN APPROVED LOCATION AS INDICATED ON THE FLOOR PLANS OR AS DIRECTED BY LOCAL AUTHORITY HAVING JURISDICTION.
C. PROVIDE AND INSTALL A PHOTO-ELECTRIC SMOKE DETECTOR IN THE RETURN AIR DUCT FOR EACH HVAC UNIT AS INDICATED ON THE FLOOR PLANS. DETECTORS ARE TO BE PROVIDED WITH A SUB-BASE CONTAINING AUXILIARY RELAY CONTACTS. RELAY CONTACTS SHALL BE WIRED INTO UNIT CONTROL WIRING, SO AS TO SHUT UNIT DOWN IN THE CASE OF SMOKE DETECTION. PROVIDE ALL CONTROL WIRING. ELECTRICAL CONTRACTOR SHALL PROVIDE 120 VOLT POWER TO EACH DETECTOR.
D. SMOKE DETECTORS SHALL BE INTERLOCKED. IN ALARM CONDITION OF A SINGLE DETECTOR ALL UNITS SHALL SHUT DOWN.



FREDDY'S FROZEN CUSTARD
10757 US 15-501 HWY
SOUTHERN PINES, NC

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

MECHANICAL AND PLUMBING SPECIFICATIONS

DATE 01/17/2022

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

SHEET NO. MPO

BC PROJECT #: 21970
NO CAROLINA PE COA #C-4169
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1/17/2022



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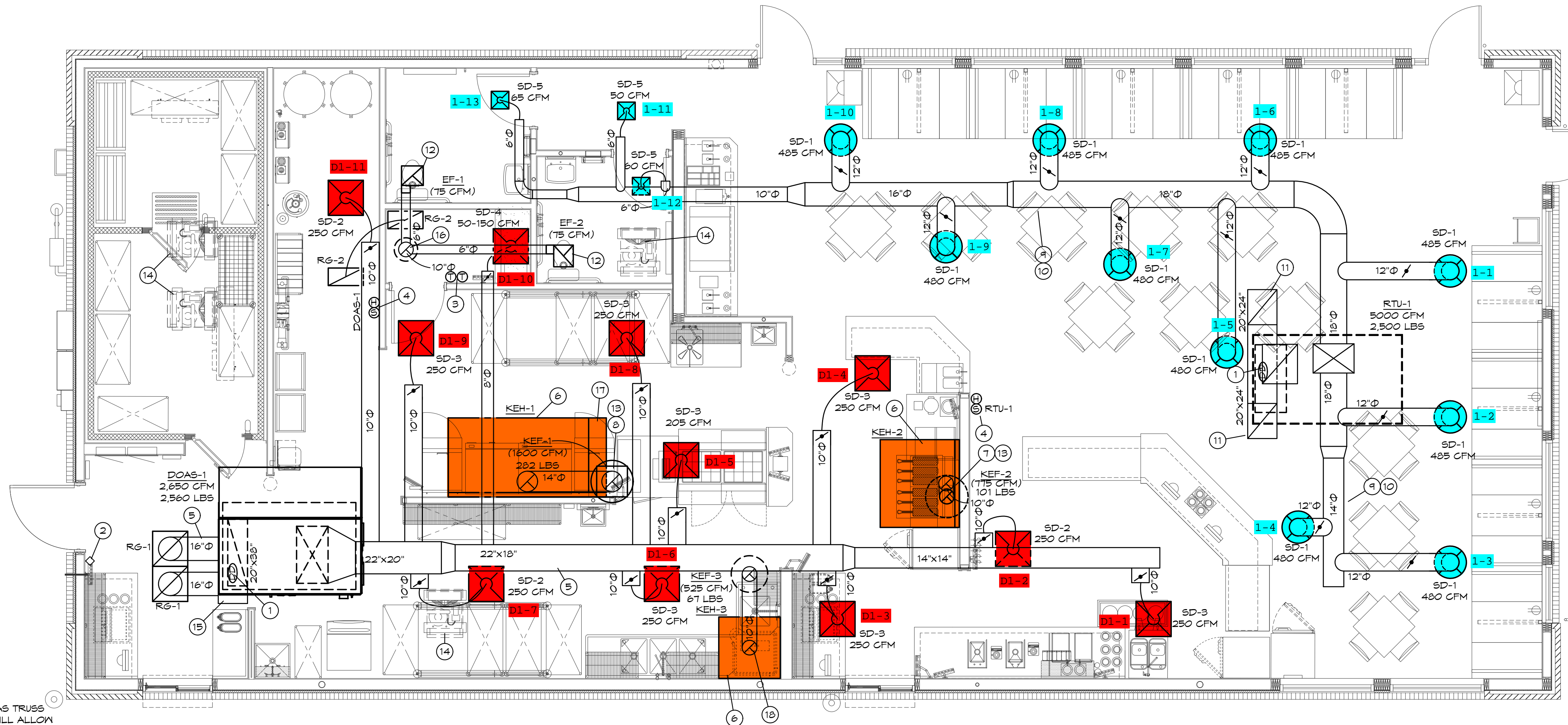
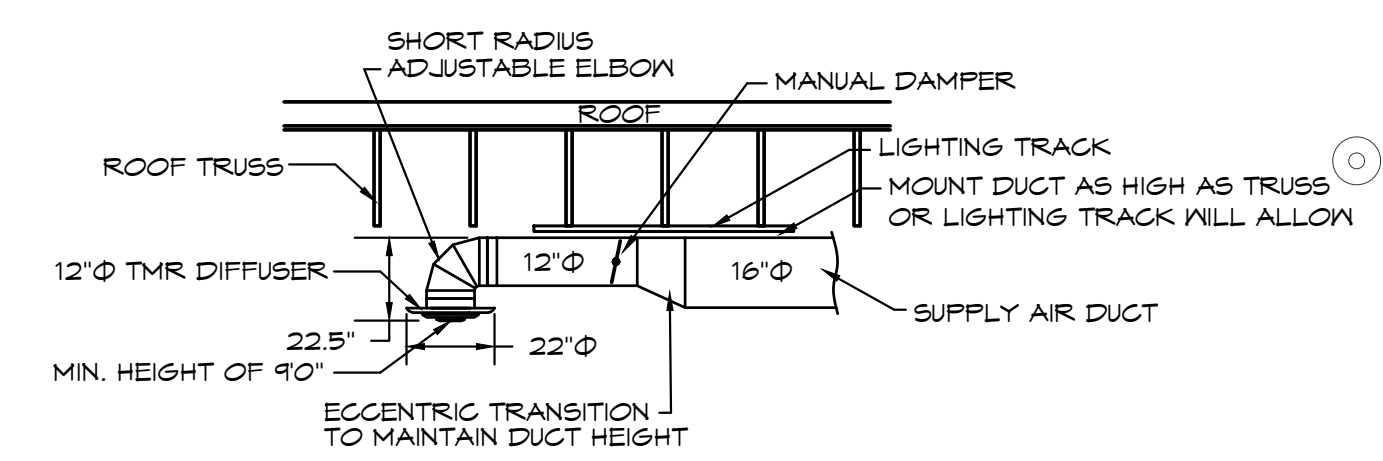
**MECHANICAL FLOOR PLAN**

DATE  
**01/17/2022**

DRAWN BY:  
**SM/MS**  
CHECKED BY:  
**DS/BQ**

SHEET NO.  
**M1**

- MECHANICAL SYMBOLS**
- (SD) NEW SUPPLY DIFFUSER
  - (RG) NEW RETURN AIR GRILLE
  - EXHAUST GRILLE/FAN
  - REMOTE TEMPERATURE/HUMIDITY SENSORS
  - THERMOSTAT, MOUNTED AT 48" AFF
  - DUCT-MOUNTED SMOKE DETECTOR
  - NEW DUCTWORK
  - 32"x14" SIZE OF RECTANGULAR DUCT
  - 6" SIZE OF ROUND DUCT
  - FLEXIBLE DUCTWORK
  - 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
  - SUPPLY AIR DUCT UP/DOWN
  - RETURN AIR DUCT UP/DOWN
  - EXHAUST AIR DUCT UP/DOWN
  - CHANGE IN ELEVATION UP (UP) DOWN (DN) IN DIRECTION OF FLOW
  - RTU-1 SCHEDULED MECHANICAL EQUIPMENT



**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	2,650	0	2,650	100.0%	KEF-2	775
					KEF-3	525
					EF-1, EF-2	150
<b>TOTAL</b>	<b>3,522</b>	<b>4,328</b>	<b>7,650</b>	<b>46.0%</b>	<b>TOTAL</b>	<b>3,050</b>
RESULTING BUILDING PRESSURIZATION						472 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 2019 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
<b>Total</b>									<b>792</b>

- MECHANICAL PLAN NOTES:**
- LOCATION OF DUCT MOUNTED SMOKE DETECTOR. PROVIDE REMOTE ENUNCIATOR AUDIO/VISUAL. VERIFY LOCATION WITH FIRE MARSHAL PRIOR TO INSTALLATION. REFER TO SPEC SHEET MPO FOR ADDITIONAL INFORMATION.
  - LOCATION OF MANUAL PULL STATION. INSTALL PER THE MANUFACTURERS REQUIREMENTS. COORDINATE WITH FIRE MARSHAL/AHJ PRIOR TO INSTALLATION.
  - LOCATION OF RTU AND DOAS THERMOSTATS. GC TO LABEL EACH THERMOSTAT.
  - LOCATION OF RTU TEMPERATURE SENSOR MOUNTED T-0" AFF.
  - ALL KITCHEN DUCTWORK IS INTENDED TO BE ROUTED THROUGH OR BETWEEN TRUSSES. COORDINATE EXACT ROUTING WITH TRUSSES DURING INSTALLATION.
  - EXHAUST HOOD PROVIDED BY OTHERS. INSTALLED BY THIS CONTRACTOR PER THE MANUFACTURERS INSTRUCTIONS.
  - TRANSITION AND CONNECT 10" 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.
  - TRANSITION AND CONNECT 14" 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.
  - COORDINATE DUCT ROUTING WITH LIGHTING.
  - EXPOSED DUCTWORK SHALL BE OF PAINTLOCK CONSTRUCTION AND PAINTED PER THE DIRECTION OF ARCHITECT.
  - RETURN AIR DUCT LOCATED BETWEEN ROOF TRUSSES. OPEN END OF DUCTWORK TURNED UP TOWARD STRUCTURE WITH A MINIMUM 3" CLEARANCE TO DECK.
  - SUPPORT EXHAUST FAN FROM STRUCTURE AS REQUIRED BY THE MANUFACTURER.
  - GC TO INSTALL CAPTIVE AIR WBE WINDBAND EXTENSION FOR KEF-1 AND KEF-2 PROVIDED BY KITCHEN EQUIPMENT SUPPLIER.
  - 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.
  - RETURN DUCT TO BE ROUTED BETWEEN JOISTS, AS HIGH AS STRUCTURE WILL ALLOW.
  - ROUTE 10" EXHAUST DUCT UP THROUGH ROOF TO ROOF CAP. MAINTAIN 10'-0" CLEARANCE TO ALL OUTDOOR AIR INTAKES.
  - HOOD SHALL BE PROVIDED WITH FACTORY PRE-WIRE PACKAGE AND A PRE-ENGINEERED UL-300 FIRE SUPPRESSION SYSTEM. SEE HOOD DRAWINGS FOR DETAILS.
  - TRANSITION AND CONNECT 10" ALUMINUM DUCT TO CONDENSATE 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' FROM PARAPET WALLS.

- MECHANICAL GENERAL NOTES:**
- 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.
  - THIS CONTRACTOR SHALL PERFORM ALL WORK INDICATED AND/OR AS REQUIRED FOR THE PROPER INSTALLATION AND OPERATION OF THE MECHANICAL SYSTEMS.
  - REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF DIFFUSERS.
  - INSTALL ALL DUCT, PIPE, ETC. AS HIGH AS POSSIBLE.
  - DUCT SIZES SHOWN ARE ACTUAL SHEET METAL SIZES AND INCLUDE A 1/2 INCH ALLOWANCE FOR DUCT LINER WHERE APPLICABLE.
  - PROVIDE FLEXIBLE CONNECTION BETWEEN DUCTWORK AND ROOFTOP UNITS, EXHAUST FANS, AND OTHER MOTORIZED EQUIPMENT.
  - NO DUCT SHALL BE ROUTED OVER THE TOP OF ELECTRICAL PANELS.
  - ALL EXPOSED DUCT WORK SHALL BE PAINTED. REFER TO ARCHITECTURAL PLANS FOR DETAILS.

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NO CAROLINA PE COA #C-4169

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ROOFTOP UNIT SCHEDULE																				
MARK	MFG	MODEL NO.	NOM. TONS	EVAP. CFM	EXT. STATIC P. IN. WG. (NOTE 2)	COOLING			HEATING (GAS)		ELECTRICAL			TOTAL WEIGHT (LBS)	EER	FREON	REMARKS			
						TOTAL BTUH	SENS. BTUH	AMB.	EVAP. EAT DB/WB	BTUH INPUT	BTUH OUTPUT	VOLT/Φ/HZ	BLOWER MOTOR					MIN. MCA (AMPS)	MIN. MOCF (AMPS)	MINIMUM OUTDOOR AIR (CFM)
RTU-1	TRANE	YHD15063R	12.5	5,000	1.0	149,000	105,400	105	80/67	250,000	203,000	208/3/60	3 HP	65	90	872	2,500	13.5	R-410a	1,2,3,4,5,6,7

ALTERNATE RTU MANUFACTURER																				
MARK	MFG	MODEL NO.	NOM. TONS	EVAP. CFM	EXT. STATIC P. IN. WG. (NOTE 2)	COOLING			HEATING (GAS)		ELECTRICAL			TOTAL WEIGHT (LBS)	EER	FREON	NOTES			
						TOTAL BTUH	SENS. BTUH	AMB.	EVAP. EAT DB/WB	BTUH INPUT	BTUH OUTPUT	VOLT/Φ/HZ	BLOWER MOTOR					MIN. MCA (AMPS)	MIN. MOCF (AMPS)	MINIMUM OUTDOOR AIR (CFM)
RTU-1	YORK	ZR150N24D	12.5	5,000	1.0	150,000	106,000	105	80/67	240,000	192,000	208/3/60	5 HP	72.8	90	872	1,800	12.9	R-410a	1,2,3,4,5,6,7

- NOTES:**
- PROVIDE DIGITAL CONTROLS, OUTDOOR AIR ECONOMIZER WITH DRY BULB CONTROL IV FDD, 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 IV FAN SHUTDOWN FOR ALL UNITS.
  - 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.
  - 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.
  - PROVIDE 18" HIGH (AT LOWEST POINT) PRE-FABRICATED INSULATED ROOF CURB.
  - PROVIDE HAIL GUARDS FOR EACH UNIT.
  - PROVIDE FACTORY INSTALLED UNIT MOUNTED CIRCUIT BREAKERS.
  - MECHANICAL CONTRACTOR SHOULD CLEAN OR PROVIDE ALL NEW FILTERS ON DAY OF TURNOVER.

ALTERNATE RTU MANUFACTURERS 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 M5 FOR OWNER PROVIDED, GENERAL CONTRACTOR INSTALLED DOAS UNIT INFORMATION.

EXHAUST FAN SCHEDULE									
MARK	MFG	MODEL	CFM	EXTERNAL STATIC P. IN. WG.	RPM	ELECTRICAL		FAN TYPE	NOTES
						VOLT/Φ/HZ	PHASE		
EF-1	COOK	6C-146	75	0.25	900	120/1/60	30.3 W	CEILING EXH.	1
EF-2	COOK	6C-146	75	0.25	900	120/1/60	30.3 W	CEILING EXH.	1

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

DIFFUSER SCHEDULE						
MARK	MFG	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		TSSQ4	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	PAR/3	10"x22"	12"x24"		

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

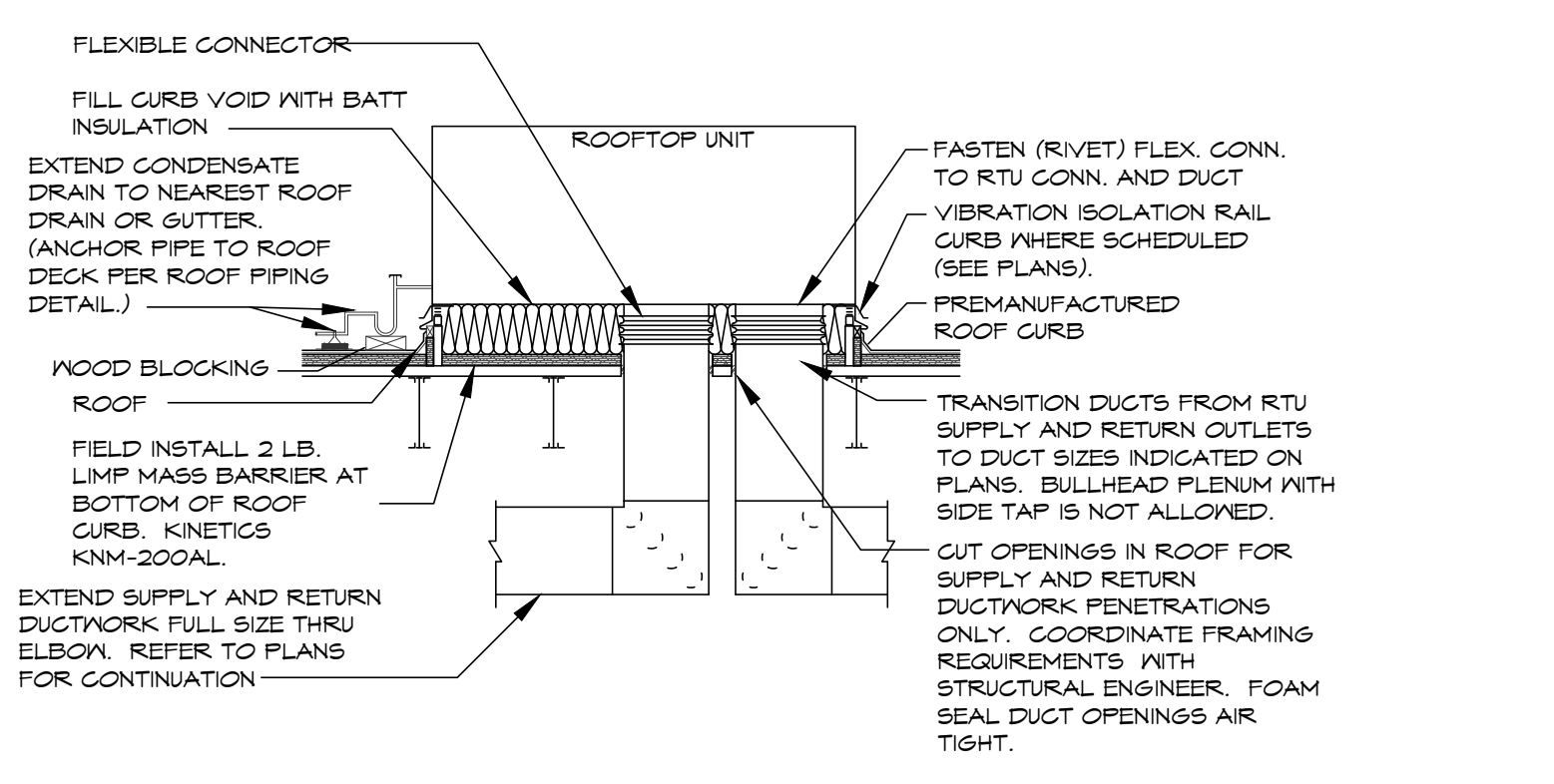
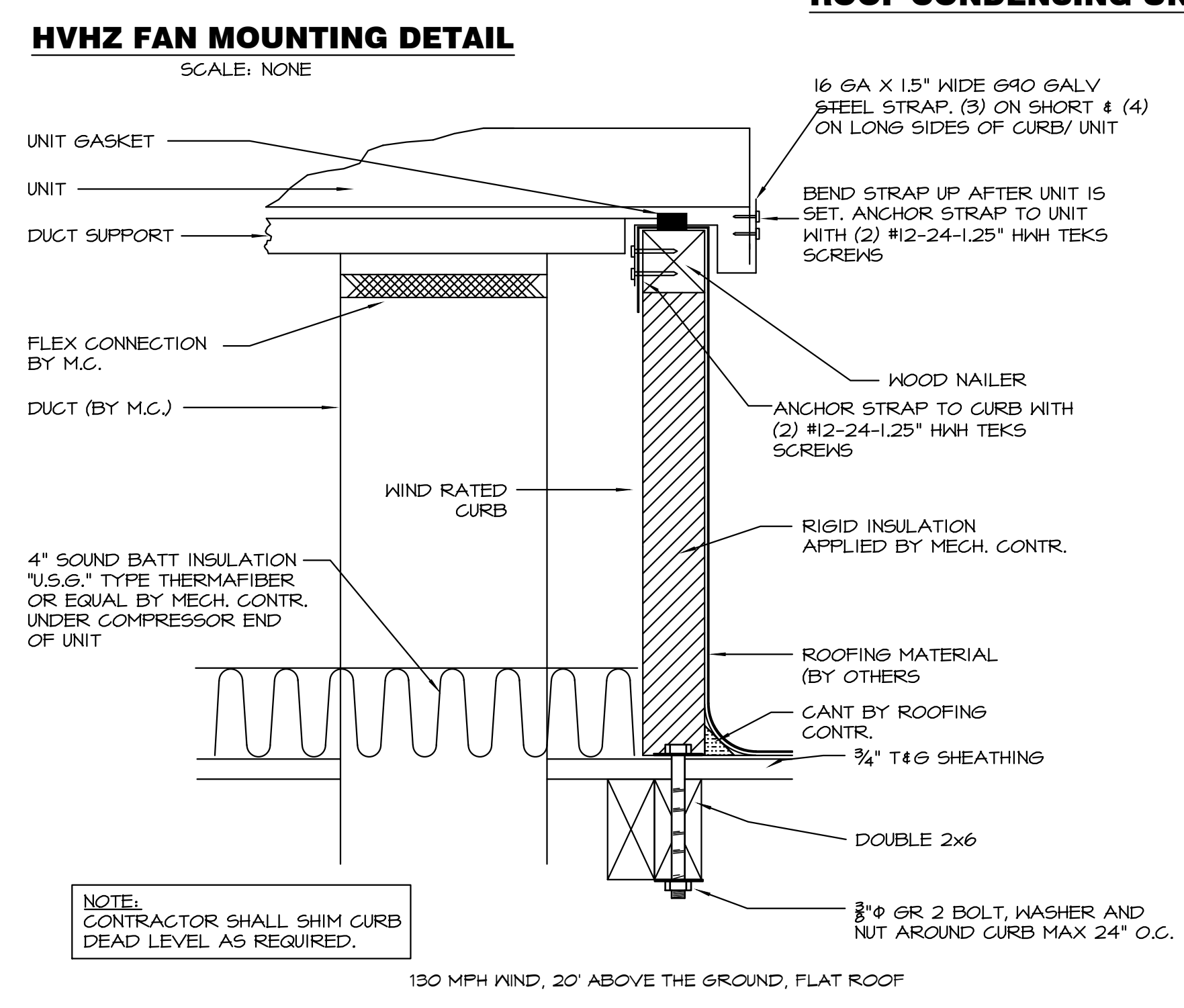
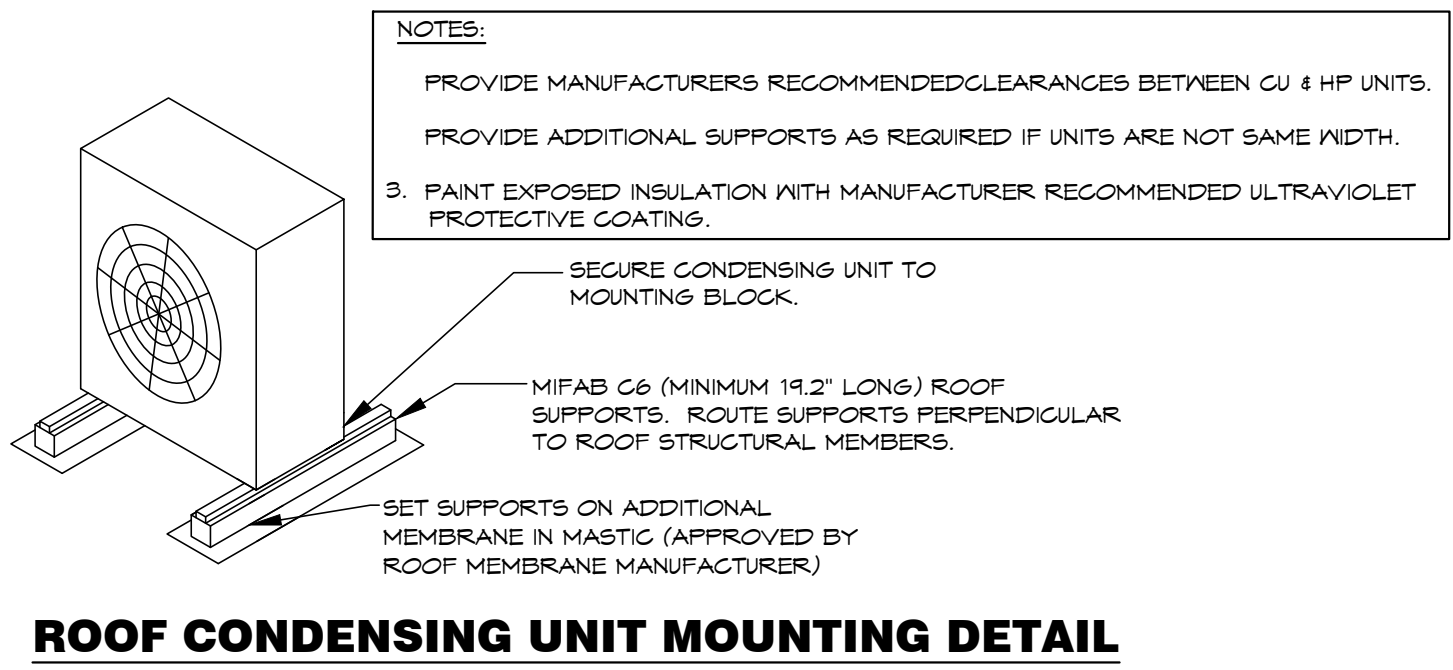
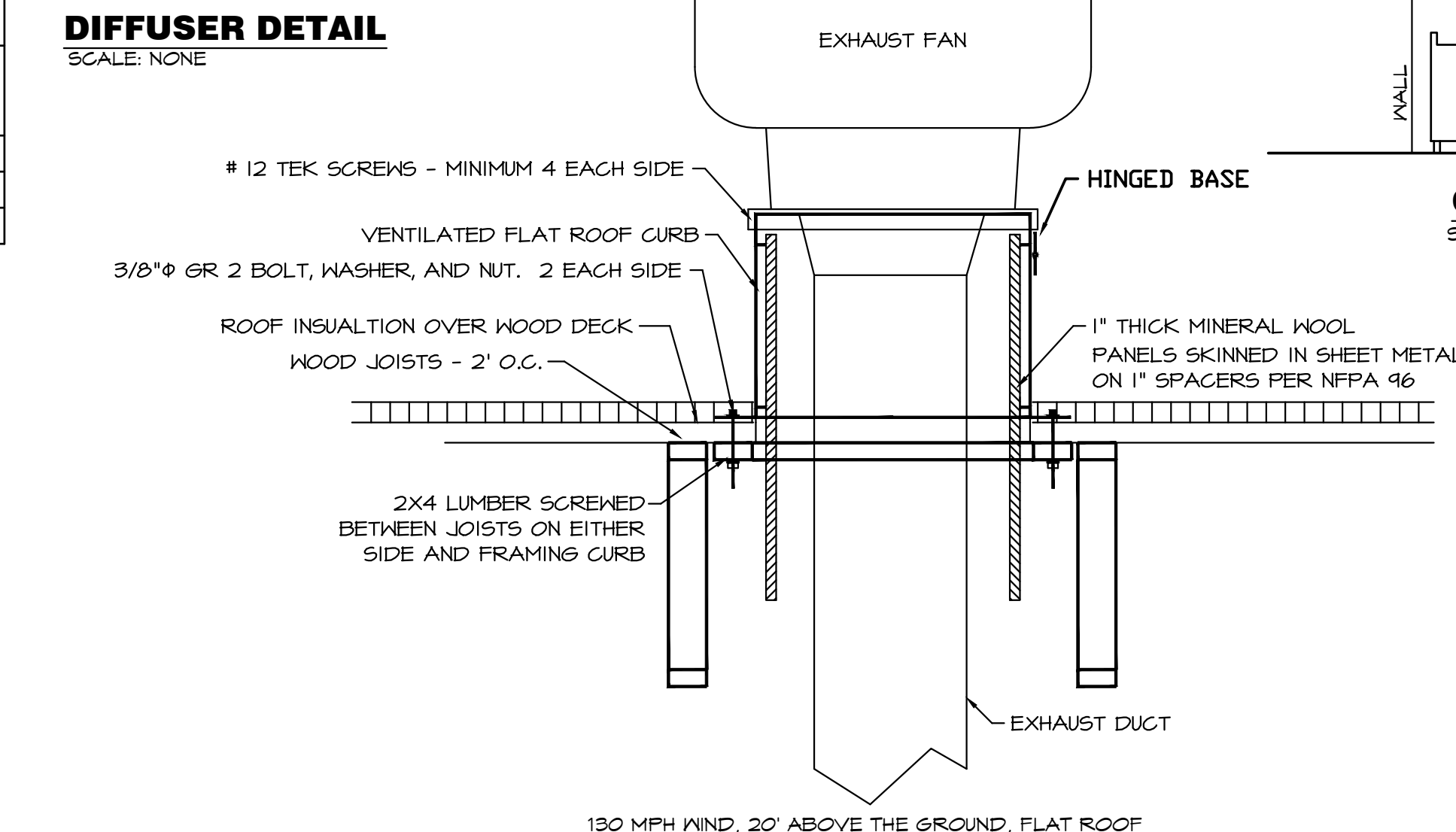
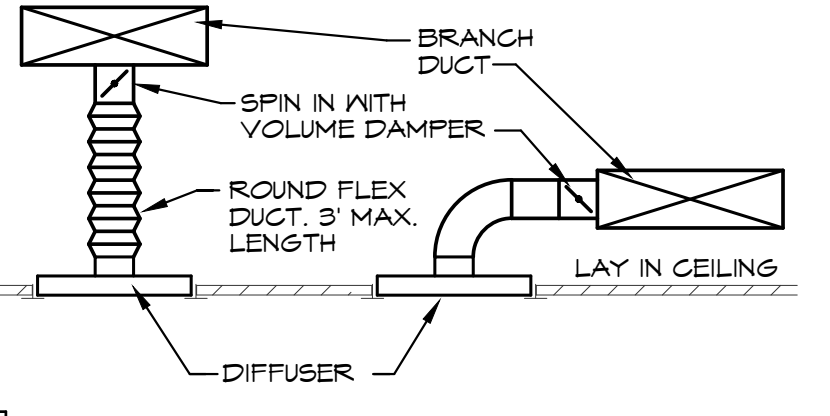
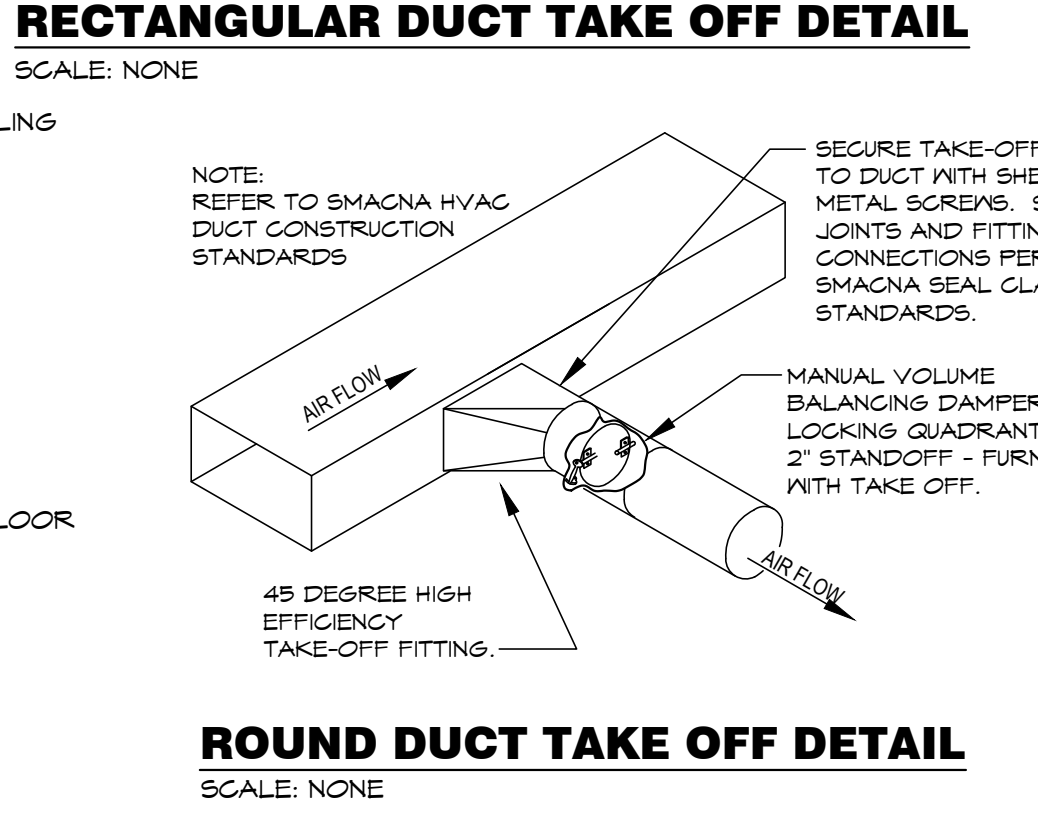
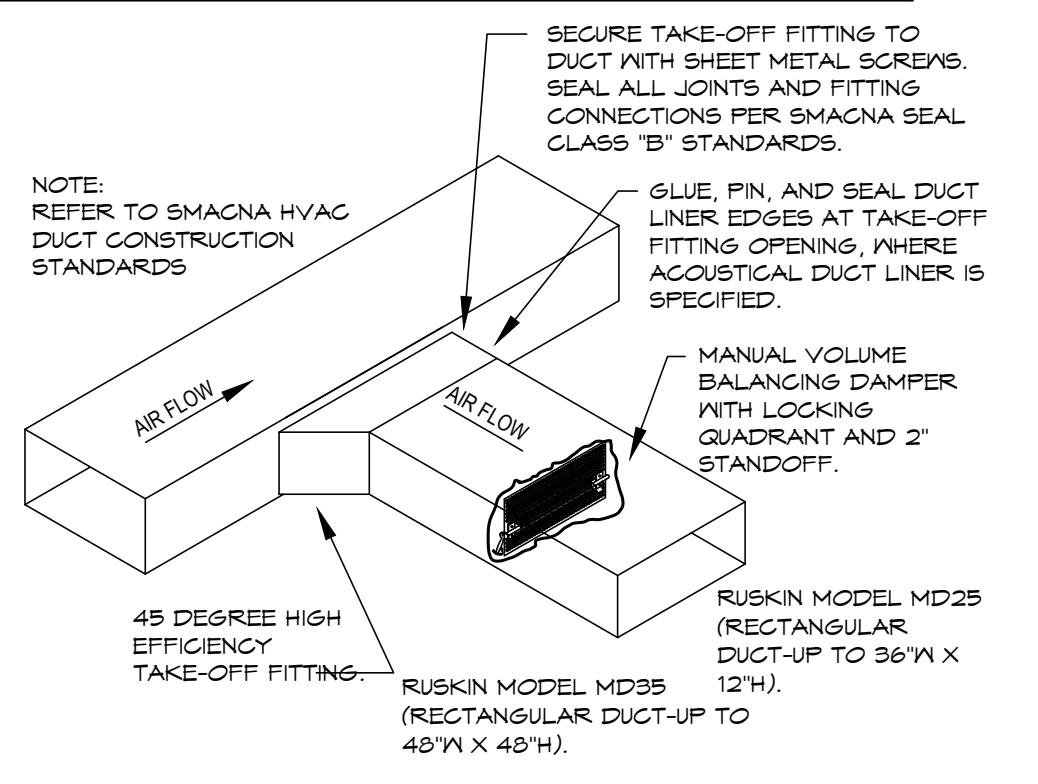
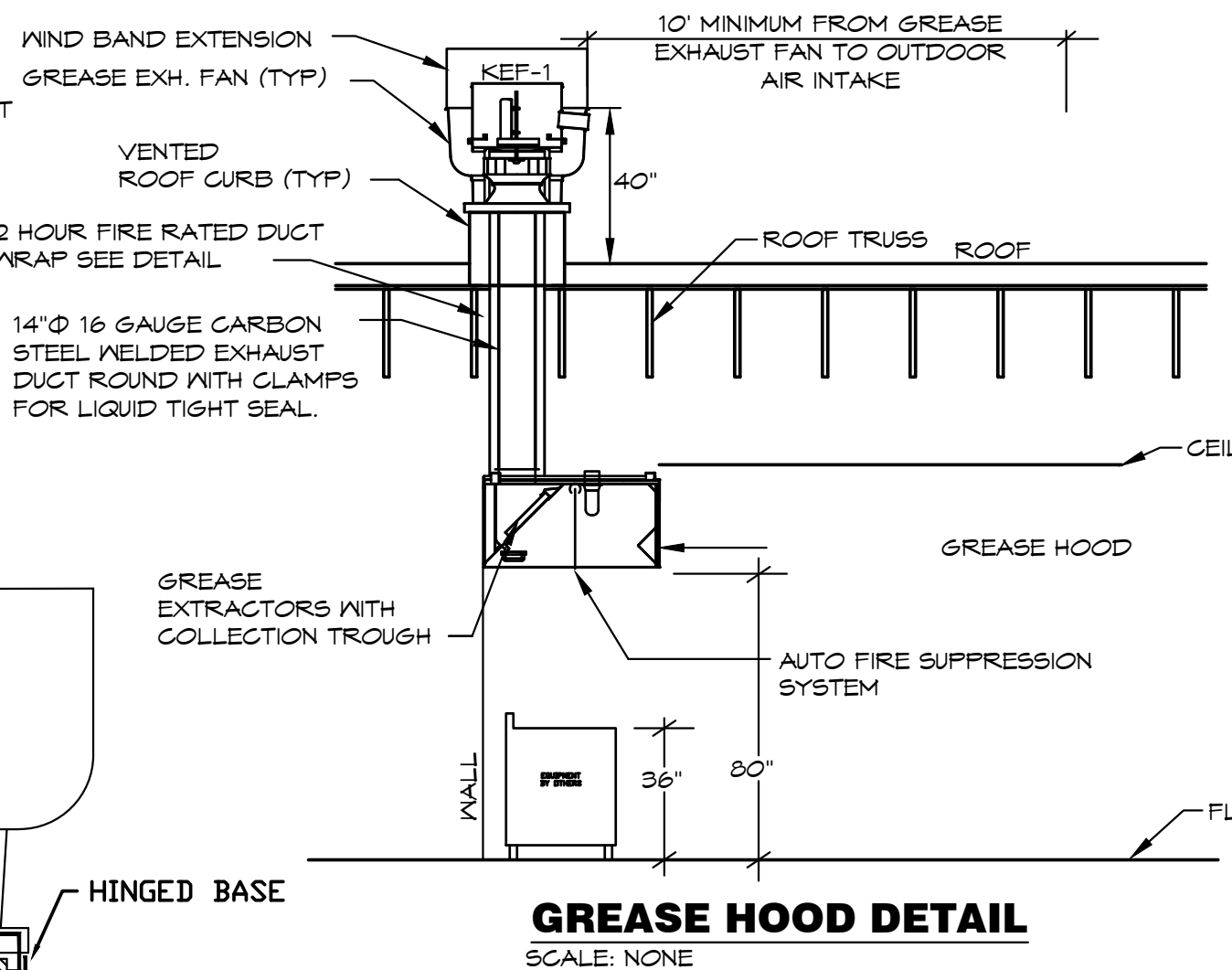
### FIRE RATED ENCLOSURE - GREASE DUCTS

- THERMAL CERAMICS FIREMASTER FASTWRAP XL IS TESTED TO ASTM E2336 AND UL LISTED PER HNK1.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.
- COMPLIANT TO THE FOLLOWING CODES: NFPA 96 INTERNATIONAL MECHANICAL CODES UNIFORM MECHANICAL CODE. CALIFORNIA MECHANICAL CODE
- INSULATION APPLIED IN TWO LAYERS WITH TIGHT COMPRESSION JOINT ON BOTH LAYERS AT ALL JOINTS.
- MINIMUM 16 GAUGE CARBON STEEL (OR 18 GAGE STAINLESS STEEL) RECTANGULAR OR ROUND GREASE EXHAUST DUCT
- 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.
- 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.
- THERMAL CERAMICS DUCT WRAP SHALL BE INSTALLED DIRECTLY ONTO THE DUCT AND APPLIED FROM THE HOOD CONNECTION TO THE CONNECTION TO THE FAN.
- THERMAL CERAMICS DUCT ENCLOSURE SYSTEM SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND UL LISTINGS.

**Morgan ThermalCeramics**  
P.O. Box 923  
Augusta, Georgia 30903-0923  
Phone: (706) 560-4038

### NATIONAL ACCOUNT INFORMATION

FREDDY'S FROZEN CUSTARD HAS NATIONAL ACCOUNT AGREEMENTS FOR ROOF TOP UNITS WITH TRANE.  
FOR TRANE EQUIPMENT EQUAL TO THE UNITS SPECIFIED CONTACT:  
TOM ROOD, TRANE ACCOUNT MANAGER - NATIONAL ACCOUNTS, (800) 729-9115  
FREDDY'S@TRANE.COM



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**FREDDY'S FROZEN CUSTARD**  
10757 US 15-501 HWY  
SOUTHERN PINES, NC

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

**MECHANICAL SCHEDULES & DETAILS**

DATE  
01/17/2022

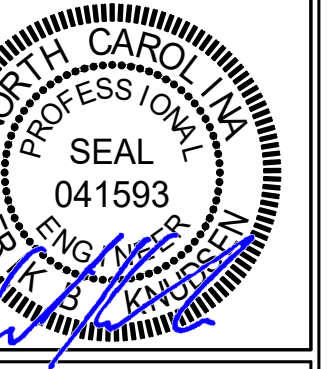
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CHECKED BY:  
DS/BQ

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**FREDDY'S FROZEN CUSTARD**  
10757 US 15-501 HWY  
SOUTHERN PINES, NC

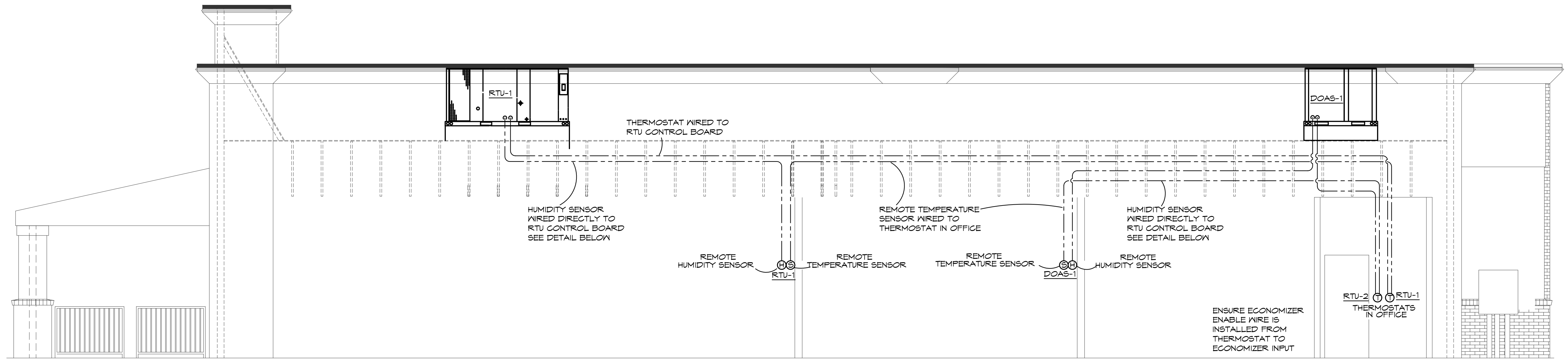
**DAN WINTER ARCHITECT**  
1024 EAST FIRST STREET  
WICHITA, KS. 67214  
PH. 316-267-7142

**REMOTE TEMPERATURE AND HUMIDITY SENSOR WIRING DETAILS**

DATE  
01/17/2022

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**SM/MS**  
CHECKED BY:  
**DS/BQ**

SHEET NO.  
**M2.1**



**REMOTE TEMPERATURE AND HUMIDITY SENSOR WIRING**

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

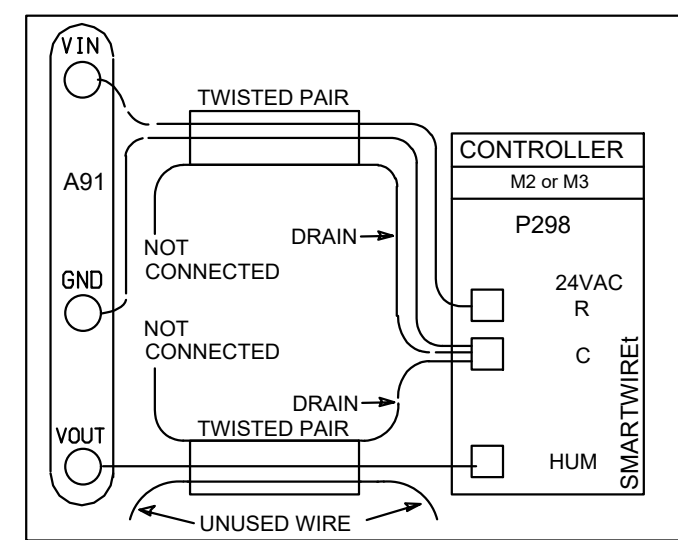


Figure 1. Field Wiring (150' [46m] or shorter runs)

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 (plenium) or equivalent. Connect both cable shield drain wires as shown in figure 1.

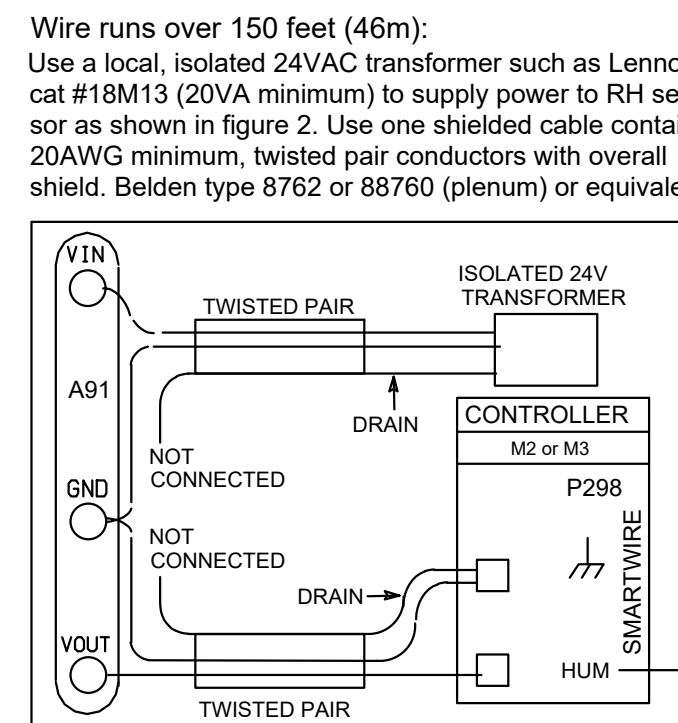
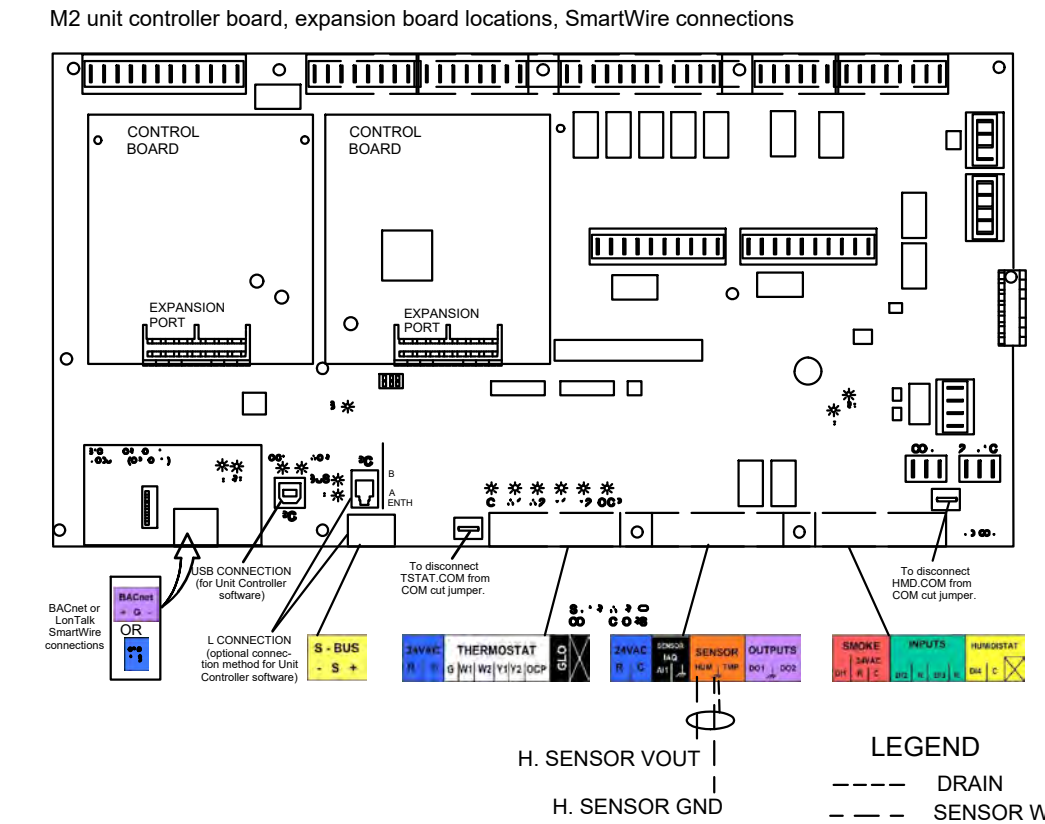
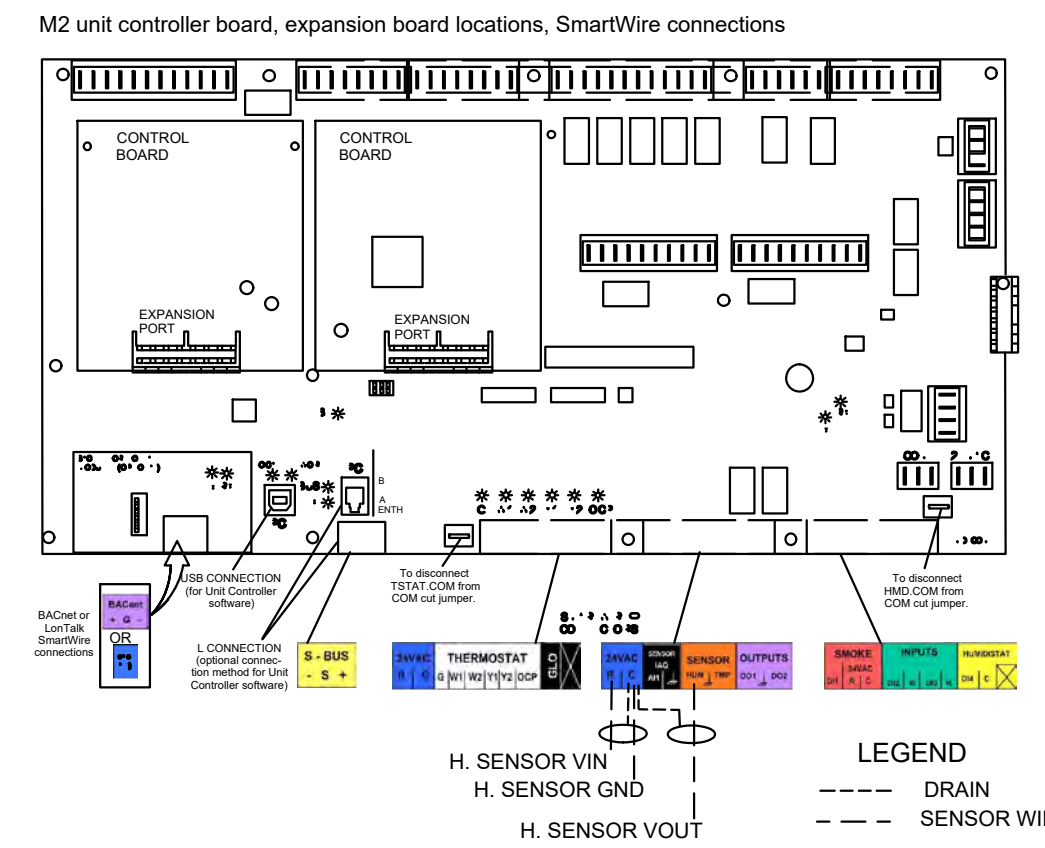


Figure 2. Field Wiring (150' [46m] or longer runs)

Wire runs over 150 feet (46m):  
Use a local, isolated 24VAC transformer such as Lennox cat #18M13 (20VA minimum) to supply power to RH sensor as shown in figure 2. Use one shielded cable containing 20AWG minimum, twisted pair conductors with overall shield. Belden type 8762 or 88760 (plenium) or equivalent.



**LENNOX HUMIDITY SENSOR WIRING**

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

**Installation**

**DC Conductors**

Distance from Unit to Control	Recommended Wire Size
0 - 150 feet	22 gauge
0 - 45.7 m	0.33 mm <sup>2</sup>
151 - 240 feet	20 gauge
46 - 73.1 m	0.50 mm <sup>2</sup>
241 - 385 feet	18 gauge
73.5 - 117.3 m	0.75 mm <sup>2</sup>
386 - 610 feet	16 gauge
117.7 - 185.9 m	1.3 mm <sup>2</sup>
611 - 970 feet	14 gauge
186.2 - 295.7 m	2.0 mm <sup>2</sup>

Figure 60. ReliaTel™ options module (RTOM board)

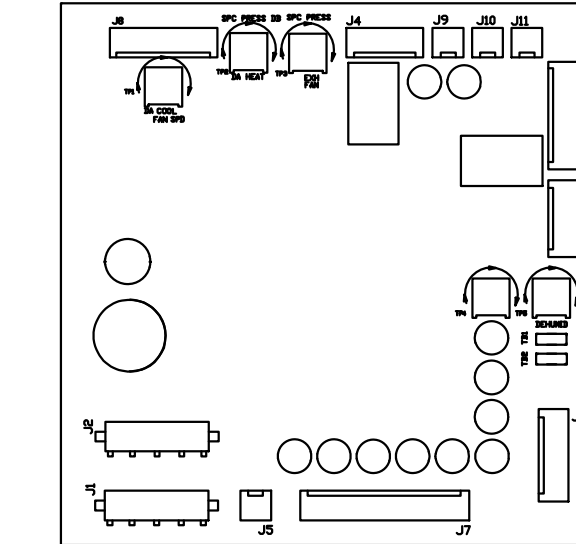


Figure 61. ReliaTel™ relative humidity sensor (dehumidification option) LDV VOLTAGE TERMINAL BLOCK

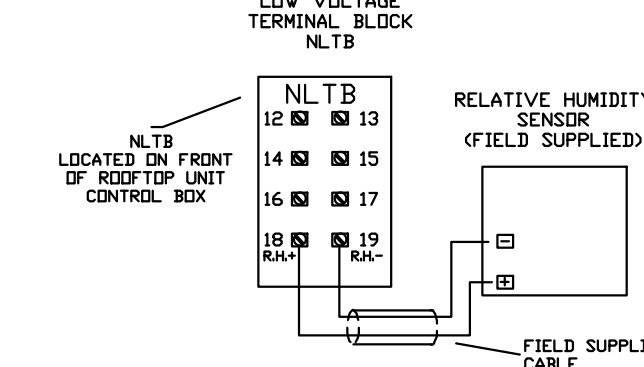
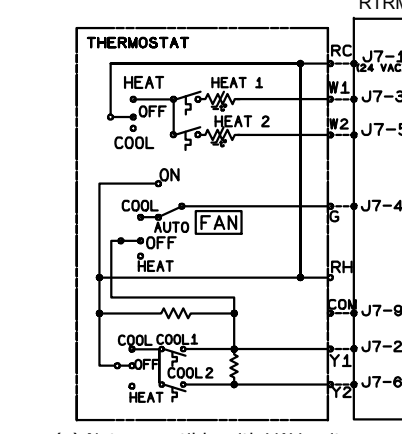


Figure 59. ReliaTel™ conventional thermostat field wiring diagrams (a)



(a) Not compatible with VAV units.

**TRANE HUMIDITY SENSOR WIRING**

FOR GENERAL INFORMATION ONLY.  
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