# MECHANICAL SPECIFICATIONS

1. GENERAL PROVISIONS:

   A. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, NECESSARY FOR THE COMPLETE INSTALLATION OF THE PLUMBING AND MECHANICAL SYSTEMS OUTLINED.

   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 COVERING SHALL BE REMOVED BEFORE FINAL ACCEPTANCE.

   F. PROVIDE ALL NECESSARY CUTTING AND PATCHING OF WALLS, FLOORS, CEILINGS, AND ROOFS AS NECESSARY. PATCH AROUND ALL 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, CATALOG CUTS, LUBRICATION AND 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 LABELED 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 CONSTRUED AS LIMITING COMPETITION. 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 LESS THAN 10 FEET OF HEAD FOR A PERIOD OF NOT LESS THAN 15 MINUTES, PER THE LOCAL PLUMBING CODE, WITH NO LEAKS.

   C. FIRE PROTECTION PIPING SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA.

   D. 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.

   E. 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 30 PSI, FOR A PERIOD OF NOT LESS THAN 2 HOURS, WITH NO LEAKS.

   F. 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 LABELED OR MAY BE AN ELECTRONIC PDF SUBMITTAL.

   G. 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 96 AND ALL LOCAL CODES.

   H. BEFORE DOMESTIC WATER PIPING IS PLACED IN SERVICE, ALL DOMESTIC WATER DISTRIBUTION SYSTEMS, INCLUDING THOSE FOR COLD WATER AND HOT WATER SYSTEMS, SHALL BE FLUSHED, STERILIZED AND CHLORINATED IN ACCORDANCE 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. DURING THE FILLING PROCESS, VALVES AND FAUCETS 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 10 PPM, THE FLUSHING SHALL BE REPEATED. AFTER STERILIZATION, SAMPLES OF WATER IN THE SYSTEM SHALL BE APPROVED BY THE BOARD OF HEALTH.

6. PIPING:

   A. DOMESTIC COLD, HOT, AND HOT WATER RECIRCULATING (ABOVEGROUND).

      1) TYPE L 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 B16.51, OR ASME B16.18. MECHANICAL PRESS COPPER FITTINGS SHALL CONFORM TO IAPMO PS-117 OR ASME B16.51.

      2) PEX, 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 PIPE INSTITUTE IN ACCORDANCE WITH TR-4/03.
         a) PEX-A AND PEX-B TESTING ANSI/NSF61 AND ANSI/NSF372 STANDARDS FOR POTABLE WATER SAFETY AND LEAD-FREE STANDARDS AND MUST BE MARKED WITH "PEX-a", "NSF-61-S" OR OTHER NSF-APPROVED MARKING. ASTM F3223 FOR USE WITH CHLORINATED WATER.
         b) PEX MECHANICAL, CRIMP/INSERT OR EXPANSION FITTINGS INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. PIPE SIZES GIVEN ON THE DRAWINGS ARE NOMINAL COPPER PIPE SIZE. INCREASE PEX PIPING SIZE TO EQUAL OR EXCEED COPPER PIPE INSIDE DIAMETER FOR SUPPLY MAINS.

      3) VALVES
         a) GATE VALVE: JOMAR T/S-301 OR EQUAL. NSF 61-8, ANSI B16.20.1, ANSI B16.18
         b) GLOBE VALVE: CRANE 17 OR EQUAL.
         c) BALL VALVE: JOMAR T/S-100G OR EQUAL COMPACT LEAD FREE FORGED BRASS BALL VALVE. UL842, CSA 3371-12 & 3371-92, FM, NSF 61, CALIFORNIA CODE AB1953-NSF61 ANNEX G APPROVED.
         d) BALL VALVE: JOMAR T-102NE OR EQUAL. UL842, FM, CSA, NSF 61-8, 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 DWV FITTING SYSTEM. PIPE AND FITTINGS SHALL BE MANUFACTURED FROM ABS COMPOUND WITH A CELL CLASS OF 42222 FOR PIPE AND 32222 FOR 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 628 FITTINGS SHALL CONFORM TO ASTM D 2661. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2235.

      2) PVC SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DWV FITTING SYSTEM. PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 11432 PER ASTM D 2949 FOR PIPE AND 12454 PER ASTM D 1784 FOR FITTINGS AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 1488. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564.

      3) PVC SCHEDULE 40 SOLID WALL PIPE AND DWV FITTING SYSTEM: PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 12454 PER ASTM D 1784 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM D 1785 AND ASTM D 2665. INJECTION MOLDED FITTINGS SHALL CONFORM TO ASTM D 2665. FABRICATED FITTINGS SHALL CONFORM TO ASTM F 1866. 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 888 AND CISPI STANDARD 301. HUBLESS COUPLINGS SHALL CONFORM TO CISPI STANDARD 310 AND BE CERTIFIED BY NSF® INTERNATIONAL.

      5) HUB AND SPIGOT CAST IRON SOIL PIPE AND FITTINGS: HUB AND SPIGOT 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.
      (ABOVE GROUND, INTERIOR TO THE BUILDING).

      1) ABS SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DWV FITTING SYSTEM:
         PIPE AND FITTINGS SHALL BE MANUFACTURED FROM ABS COMPOUND WITH A CELL CLASS OF 42222 FOR PIPE AND 32222 FOR 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 628 FITTINGS SHALL CONFORM TO ASTM D 2661. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2235.

      2) PVC SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DWV FITTING SYSTEM:
         PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 11432 PER ASTM D 2949 FOR PIPE AND 12454 PER ASTM D 1784 FOR FITTINGS AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 891. INJECTION MOLDED FITTINGS SHALL CONFORM TO ASTM D 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 DWV FITTING SYSTEM:
         PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 12454 PER ASTM D 1784 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM D 1785 AND ASTM D 2665. INJECTION MOLDED FITTINGS SHALL CONFORM TO ASTM D 2665. FABRICATED FITTINGS SHALL CONFORM TO ASTM F 1866. 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 888 AND CISPI STANDARD 301. HUBLESS COUPLINGS SHALL CONFORM TO CISPI STANDARD 310 AND BE CERTIFIED BY NSF® INTERNATIONAL.

      5) HUB AND SPIGOT CAST IRON SOIL PIPE AND FITTINGS: HUB AND SPIGOT CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 74.

# 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 DWV FITTING SYSTEM:
         PIPE AND FITTINGS SHALL BE MANUFACTURED FROM ABS COMPOUND WITH A CELL CLASS OF 42222 FOR PIPE AND 32222 FOR 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 2680 FITTINGS SHALL CONFORM TO ASTM D 2680. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2235.

      2) PVC SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DWV FITTING SYSTEM:
         PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 11432 PER ASTM D 4396 FOR PIPE AND 12454 PER ASTM D 1784 FOR FITTINGS AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 1488. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564.

      3) PVC SOLID WALL PIPE AND DWV FITTING SYSTEM:
         PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 12454 PER ASTM D 1784 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM D 1785 AND ASTM D 2665. FABRICATED FITTINGS SHALL CONFORM TO ASTM F 1866. 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 888 AND CISPI STANDARD 301. HUBLESS COUPLINGS SHALL CONFORM TO CISPI STANDARD 310 AND BE CERTIFIED BY NSF® INTERNATIONAL.

      5) HUB AND SPIGOT CAST IRON SOIL PIPE AND FITTINGS: HUB AND SPIGOT CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 74.

   E. CONDENSATE DRAINS & INDIRECT WASTE (ABOVEGROUND).

      1) DWV, WROUGHT COPPER, ANSI B-16.29.
      2) POLYVINYLCHLORIDE (PVC) DWV 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, AWS A 5.8, CLASSIFICATION BAG-1 (SILVER).
      3) TUBING SHALL BE FACTORY CLEANED, READY FOR INSTALLATION, AND HAVE ENDS CAPPED TO PROTECT CLEANLINESS OF PIPE INTERIORS PRIOR TO SHIPPING.
      4) SIZE EQUAL TO SIZE OF PIPE SHALL BE IN ACCORDANCE WITH MANUFACTURER'S 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; VEGA MEGAPRESS FOR WATER AND GAS. CSA LC4, T58A/ASME B31 FOR USE WITH ASTM A53 SCHEDULE 40 BLACK IRON PIPE.
         c) PIPE 2-1/2" AND LARGER, WELDED.
         d) PLUG VALVE: ROCKWELL NORDSTROM FIGURE NO. 142 OR 143.
         e) BALL VALVE: JOMAR T-100NE. APPROVALS- UL842, FM, CSA, NSF 61-8, 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 ON OR NEAR EXTERIOR WALL AND PAINTED SAFETY YELLOW WHERE LOCATED ON THE ROOF.

      3) GAS PIPING LABELING:
         a) ALL ELEVATED PRESSURE GAS PIPING SHALL BE LABELED EVERY 40 FEET WITH SIGNS INDICATING "ELEVATED PRESSURE".

   H. ALL PIPE HANGERS AND SUPPORTS SHALL BE STANDARD PRODUCTS OF GRINNELL, FEE AND MASON, OR ELCEN. HANGER SPACING SHALL BE IN ACCORDANCE WITH MSS-SP-69.

   I. SLEEVES

      1) PROVIDE, SET, AND PROPERLY LOCATE PIPE SLEEVES AS REQUIRED FOR THIS WORK. ALL SLEEVES SHALL BE OF SUFFICIENT SIZE TO PERMIT PIPE MOVEMENT DUE TO EXPANSION AND CONTRACTION AND TO ACCOMMODATE PIPE INSULATION.

      2) INTERIOR PARTITIONS: 16 GAGE GALVANIZED STEEL. PACK BETWEEN PIPE AND SLEEVE WITH FIRE SAFING MATERIAL AND CAULK BOTH 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 FINISHED ROOF TO HEIGHT OF FARTHEST PENETRATION, WHICHEVER IS GREATER.

   J. PROVIDE CHROME PLATED ESCUTCHEONS ON ALL PIPE ENTERING FINISHED AREAS.

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 RATING OF NOT OVER 50, IN ACCORDANCE WITH NFPA.

   B. PIPE INSULATION - ABOVE GRADE:

      1) THE PIPING INSULATION USED SHALL HAVE A THERMAL CONDUCTIVITY OF 0.27 Btu PER in/hr*sqft*F° OR LESS.

      2) FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR BARRIER, ASJ JACKET, FACTORY APPLIED PRESSURE SEALING LONGITUDE LAP JOINT, NO STAPLES, ZESTON PREMOLDED PVC FITTING COVERS. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

      3) FLEXIBLE CLOSED CELL ELASTOMERIC THERMAL INSULATION, UNSLIT OR PRESLIT WITH PRESSURE SENSITIVE ADHESIVE SYSTEM FOR CLOSURE AND VAPOR SEALING, EQUAL TO ARMSTRONG AP 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:

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|---|---|
| a) DOMESTIC COLD WATER | 1/2" |
| b) DOMESTIC HOT WATER | 1-1/2" |
| c) HOT WATER RECIRCULATING | 1-1/2" |
| d) CONDENSATE DRAINS INSIDE BUILDING | 1/2" |
| e) REFRIGERANT SUCTION | 1-1/2" FOR PIPING UP TO 1 1/2"Ø, & 2" FOR PIPING 1-1/2"Ø 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 (DINING 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 GOVERNING SCHEDULE: MINIMUM R-6

| | |
|---|---|
| (1) ROUND SUPPLY DUCT (ABOVE CEILING) | 2" |
| (2) RECTANGULAR SUPPLY DUCT (ABOVE CEILING) | 2" |
| (3) RETURN AIR DUCT | 2" |
| (4) OUTDOOR AIR / MAKE-UP AIR DUCT | 2" |

9. GREASE HOOD AND EXHAUST DUCT:

   A. HOOD SHALL BE CONSTRUCTED OF 18 GAUGE STEEL OR 20 GAUGE STAINLESS STEEL IN ACCORDANCE WITH NFPA AND LOCAL CODES.

      1) GREASE FILTERS SHALL BE UL LISTED ALUMINUM GREASE EXTRACTORS.

      2) PROVIDE A COMPLETE AUTOMATIC WET 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 WET CHEMICAL, STORED-PRESSURE TYPE WITH A FIXED NOZZLE AGENT DISTRIBUTION SYSTEM. THE SYSTEM SHALL BE UL LISTED AND TESTED TO UL STANDARD 300.

         b) THE SYSTEM SHALL UTILIZE AN AGENT EQUAL TO AMEREX KP LIQUID FIRE SUPPRESSANT, A POTASSIUM CITRATE 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 ACTUATE 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 DUST 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 LEDGES AND OBSTRUCTIONS FROM COLLECTING GREASE OR INTERFERING WITH GRAVITY DRAINAGE TO THE INTENDED COLLECTION POINT.

# MECHANICAL SPECIFICATIONS (CONTINUED)

      c) DUCT TO HOOD CONNECTIONS SHALL BE MADE WITH LISTED AND LABELED DUCT TO HOOD COLLAR CONNECTIONS THAT ARE INSTALLED PER THE TERMS OF THEIR APPROVAL AND PER THE MANUFACTURERS INSTALLATION INSTRUCTIONS.

      d) 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 INLET UTILITY FANS. GASKET SEALING MATERIALS SHALL BE RATED FOR A MINIMUM CONTINUOUS DUTY TEMPERATURE OF 1,500°F.

   C. 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-1978 AND CAN/ULC-S662 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 .047 THICK STAINLESS STEEL AND BE AVAILABLE IN DIAMETERS 5" 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 WELDED TO THE FAN ADAPTER PLATE AND THE FAN ADAPTER 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 CAULK SEALING USED TO ENCASE THE VEE CLAMPS SHALL BE OF THE HEX-HEAD TYPE WITH FLANGED STOPS AND TAPERED "LEAD IN" THREADS FOR EASY STARTING. NUTS SHALL BE RETAINED BY MEANS OF A FREE-FLOATING CAGE TO ALLOW EASY ALIGNMENT.

      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. PANS 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 #4020-Y, OR EQUAL.
      4) UNFINISHED FLOOR: JR SMITH #4020, OR EQUAL.
      5) WALL: JR SMITH #4472, OR EQUAL. 24" ABOVE THE FLOOR.
      6) GRADE: JR SMITH #4258, OR EQUAL, WITH HEAVY DUTY CAST IRON BODY AND COVER.

   F. PROVIDE DIELECTRIC UNIONS WITH APPROPRIATE END CONNECTIONS TO MATCH THE PIPE SYSTEM IN WHICH INSTALLED (SCREWED, SOLDERED, OR FLANGED). PROVIDE DIELECTRIC UNIONS ON ALL PIPING CONNECTIONS TO HOT WATER HEATERS AND EXPANSION TANKS.

   G. 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-527, LOCKFORMING QUALITY, WITH G-90 ZINC COATING IN ACCORDANCE WITH ASTM A 525, AND MILL PHOSPHATIZED FOR EXPOSED APPLICATIONS.

   B. WHERE DUCTW

## PLUMBING SYMBOLS

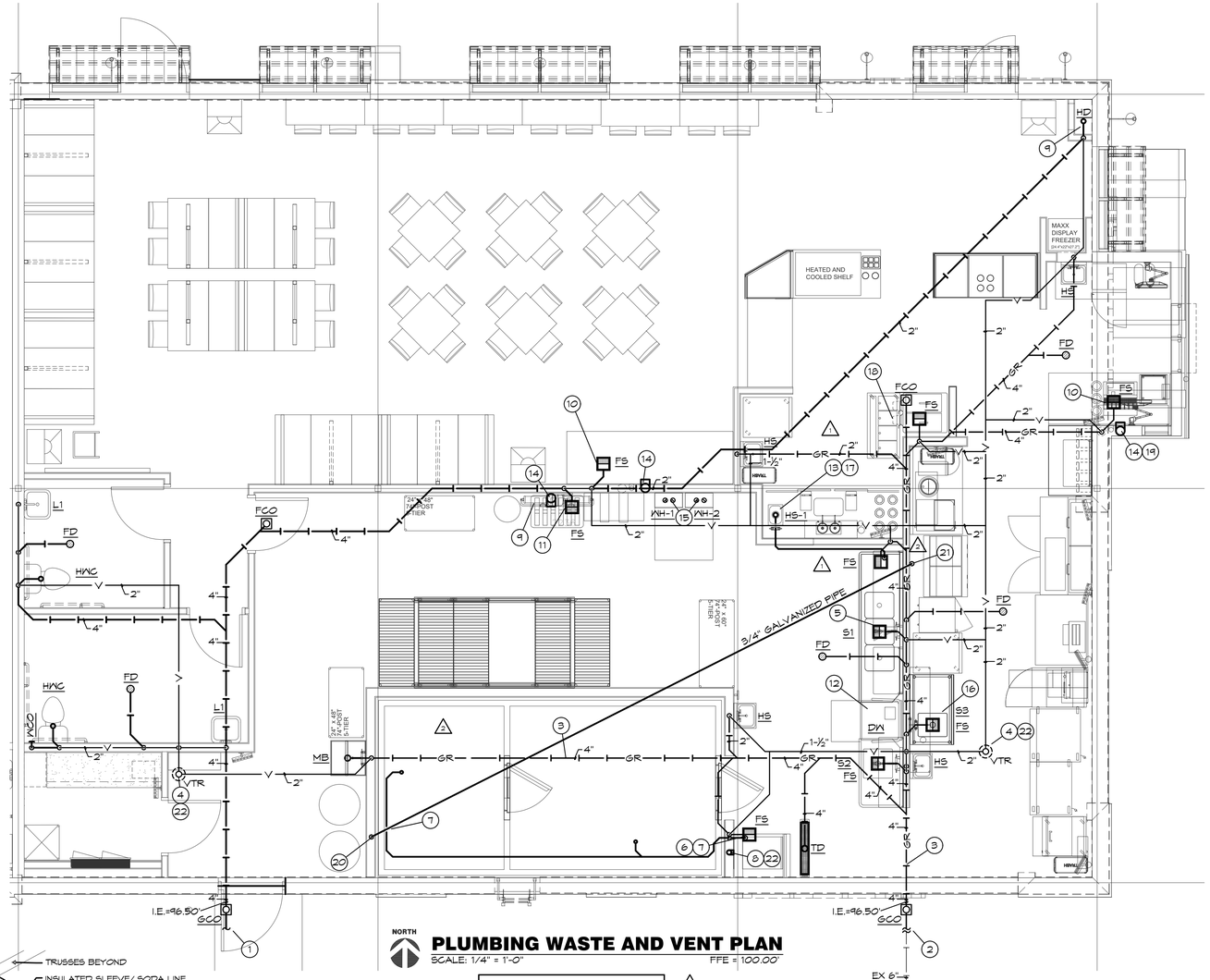
- SOIL AND WASTE PIPING BELOW GRADE
- SOIL AND WASTE PIPING ABOVE GRADE
- SOIL AND WASTE PIPING TO GREASE INTERCEPTOR
- ST — STORM PIPING BELOW GRADE
- ST — STORM PIPING ABOVE GRADE
- SO — STORM OVERFLOW PIPING ABOVE GRADE
- V — SANITARY VENT PIPING ABOVE GRADE
- V — SANITARY VENT PIPING BELOW GRADE
- DOMESTIC COLD WATER PIPING
- DOMESTIC HOT WATER PIPING
- D — EQUIPMENT DRAIN LINE
- G — GAS PIPING
- F — FIRE LINE
- C — POWER WASHER CONDUIT
- C — POWER WASHER CONDUIT UNDERFLOOR
- PIPING TURNING DOWN
- PIPING TURNING UP
- TEE TOP CONNECTION
- UNION
- BACKFLOW PREVENTER
- FCO — FLOOR CLEAN OUT
- WCO — WALL CLEAN OUT
- FD — FLOOR DRAIN
- VALVE
- SOLENOID VALVE
- PRESSURE REGULATOR
- CHECK VALVE
- (A) — MATCH MARKS ON PLUMBING RISER DIAGRAM
- I.E. — INVERT ELEVATION OF PIPE

## PLUMBING GENERAL NOTES:

1. INSTALL ALL PIPE, ETC. AS HIGH AS POSSIBLE.
2. 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.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS OF FIXTURES.
4. REFER TO ARCHITECTURAL & STRUCTURAL DRAWINGS FOR REQUIREMENTS FOR SUPPORTING PIPING, EQUIPMENT, ETC. FROM THE STRUCTURE. PROVIDE ADDITIONAL STEEL AS REQUIRED TO PROPERLY SUPPORT SYSTEMS FROM THE STRUCTURE.
5. PROVIDE 1" SCHEDULE 40 PVC CONDENSATE DRAIN PIPE FOR EACH ROOFTOP UNIT LAID DIRECTLY ON ROOF TO NEAREST ROOF DRAIN. PROVIDE WATER TRAP AND CLEAN OUTS AS DETAILED. SECURE PVC PIPE TO DRAIN WITH NYLON STRAP.
6. NO PIPING SHALL BE ROUTED OVER THE TOP OF ELECTRICAL PANELS.

## PLUMBING PLAN NOTES:

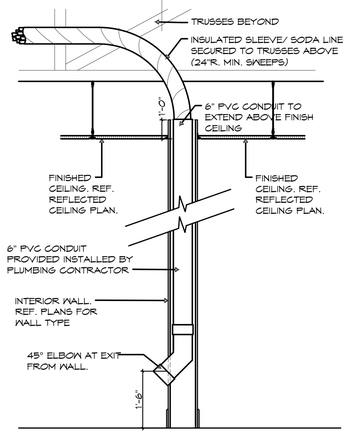
1. SEE CIVIL PLAN FOR CONTINUATION OF 4" SANITARY SEWER.
2. SEE CIVIL PLAN FOR CONTINUATION OF 4" GREASE WASTE TO EXISTING INTERCEPTOR.
3. 4" GREASE WASTE LINE BELOW GRADE.
4. PROVIDE VENT THROUGH ROOF. EXTEND UP TO PARAPET HEIGHT. FLASH AS REQUIRED TO SEAL PENETRATION WEATHER TIGHT. VERIFY 10'-0" CLEARANCE FROM ALL OUTDOOR AIR INTAKES.
5. CONNECT (3) 2" COPPER DRAINS FROM 3-COMPARTMENT SINK AND ROUTE TO FLOOR SINK WITH AN AIR GAP. LOCATE FLOOR SINK IN ACCESSIBLE LOCATION. SEE DETAIL ON P3.
6. ROUTE DRAIN FROM ICE MACHINE TO FLOOR SINK WITH AN AIR GAP, AND PER THE MANUFACTURERS REQUIREMENTS.
7. PROVIDE 1" COPPER CONDENSATE DRAIN WITH AIR GAP FROM WALK-IN COOLER/FREEZER COIL TO FLOOR SINK AS REQUIRED BY WALK IN COOLER/FREEZER MANUFACTURER. COORDINATE WITH E.C. FOR HEAT TRACING.
8. PROVIDE 3" PVC CHASE WITH LONG SWEEP ELBOWS FOR REFRIGERATION LINES IN WALL. ROUTE UP TO THROUGH ROOF AND EXIT THROUGH PARAPET WALL WHERE LOCATED ON EXTERIOR WALL. SEAL PENETRATION WEATHER TIGHT. SEE SHEET K-4 FOR DETAIL.
9. ROUTE DRAIN FROM RPZ BFP TO FLOOR SINK/ HUB DRAIN WITH AIR GAP.
10. 1" DRAIN PIPE FROM DRINK STATION TO FLOOR SINK AND DISCHARGE WITH AIR GAP.
11. ROUTE DRAIN FROM WATER FILTER TO FLOOR SINK WITH AN AIR GAP AS REQUIRED.
12. ROUTE DISHWASHER DISCHARGE PIPING TO FLOOR SINK AND DISCHARGE WITH AIR GAP AS REQUIRED.
13. ROUTE 1-½" DRAIN FROM DUMP SINK TO FLOOR SINK WITH AN AIR GAP.
14. 6"Ø SCHEDULE 40 PVC PIPE ABOVE CEILING FOR THE SODA LINES. PROVIDE LONG-SWEEP ELBOWS WITH 24" RADIUS. REFER TO DETAIL.
15. PROVIDE 3" PVC FLUE AND COMBUSTION AIR INTAKE PIPE FOR HOT WATER HEATER THROUGH ROOF. PROVIDE MANUFACTURER'S TERMINATION KIT. SEAL PENETRATION WEATHERTIGHT. VERIFY 10'-0" CLEARANCE FROM ALL OUTDOOR AIR INTAKES.
16. ROUTE 2" DRAIN FROM PRE-RINSE/VEGGIE SINK TO FLOOR SINK AND DISCHARGE WITH AIR GAP AS REQUIRED.
17. ALL HAND SINK DRAIN PIPING SHALL ROUTE TO MAXIMIZE STORAGE WITHIN THE CUSTARD COUNTER.
18. CONNECT DRAIN TO DIPPER WELL/COLD WELL AND ROUTE TO FLOOR SINK WITH AN AIR GAP.
19. COORDINATE LOCATION OF PVC SODA CHASE STUB OUT WITH KITCHEN CABINET/COUNTER AS REQUIRED.
20. ROUTE ¾" GALVANIZED PIPE DOWN FROM CEILING SPACE AND STUB 12" BELOW CEILING FOR OIL RECOVERY TANK. COORDINATE CONNECTION WITH EQUIPMENT MANUFACTURER.
21. ROUTE ¾" GALVANIZED PIPE DOWN WALL AND STUB 12" AFF FOR FRYER. COORDINATE CONNECTION WITH EQUIPMENT MANUFACTURER. ROUTE PIPING WITH SLOPE DOWN TOWARD OIL RECOVERY TANK. COORDINATE WITH ROUTING OF GREASE DUCTWORK.
22. CUT EXISTING ROOF AND FLASH INTO ROOF AS REQUIRED. ALL ROOFING WORK SHALL BE PERFORMED BY BUILDING OWNER'S ROOFING CONTRACTOR (AT THIS CONTRACTOR'S EXPENSE) TO MAINTAIN EXISTING ROOF WARRANTY. VERIFY APPROVED ROOFING CONTRACTOR WITH BUILDING OWNER PRIOR TO PERFORMING WORK. △1
23. SEE SHELL BUILDING DRAWINGS FOR EXISTING GREASE INTERCEPTOR INFORMATION.



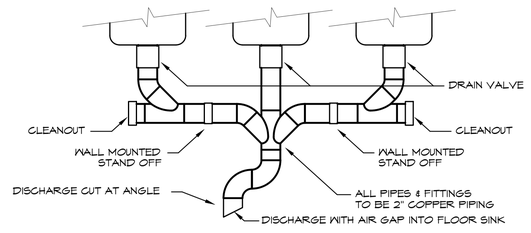

NORTH

## PLUMBING WASTE AND VENT PLAN

SCALE: 1/4" = 1'-0" FFE = 100.00'




## SODA CONDUIT IN WALL DETAIL




## 3-COMP DRAINAGE DETAIL

SCALE: NONE

## PLUMB BRANCH PIPING SCHEDULE

| FIXTURE | WASTE | VENT | CW | HW |
|---|---|---|---|---|
| WATER CLOSET | 3" | 2" | 1/2" | " " |
| URINAL | 2" | 1-1/2" | 3/4" | " " |
| LAVATORY | 1-1/4" | 1-1/4" | 1/2" | 1/2" |
| SINK | 2" | 1-1/2" | 1/2" | 1/2" |
| FLOOR DRAIN | 2" | 2" | " " | " " |
| MOP BASIN | 2" | 2" | 1/2" | 1/2" |

NOTE: INDIVIDUAL VENTS FOR FIXTURES ON PLANS AND RISER DIAGRAMS HAVE BEEN INCREASED WHERE HORIZONTAL VENT LENGTH IS IN EXCESS OF THE MAXIMUM DISTANCE INDICATED BY THE CODE.


GLMV ARCHITECTURE
1525 E. Douglas, Wichita, KS 67211
Tel: (316) 265-9367
www.glmv.com


# FREDDY'S FROZEN CUSTARD
# INDEPENDENCE CENTER
# INDEPENDENCE, MO

11/16/2023
STATE OF MISSOURI
ERIK B. KNUDSEN
NUMBER PE-2004026504
REGISTERED PROFESSIONAL ENGINEER

02132R23003

PLAN SET REVISION
- △1 9/22/23 CITY RTC
- △2 10/31/23 CITY RTC
- △3 11/17/23 BID SET

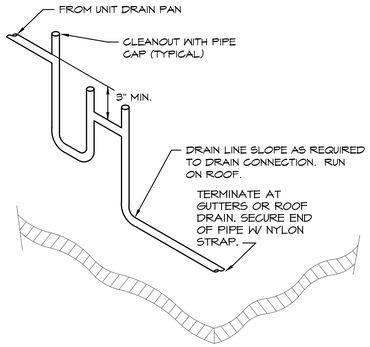
CONTRACT DATE
08.08.2023

SHEET NO.
PLUMBING WASTE AND VENT PLAN
P100

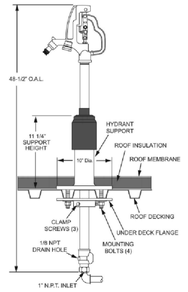
BC PROJECT #: 23315
MISSOURI PE COA #2009003629



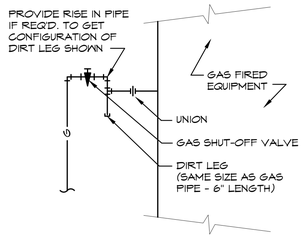

BC ENGINEERS INCORPORATED
5720 Reeder Shawnee, KS 66203 (913)262-1772



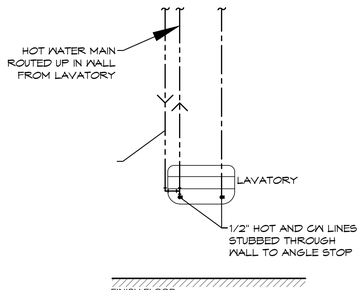

## CONDENSATE DRAIN DETAIL
SCALE: NONE



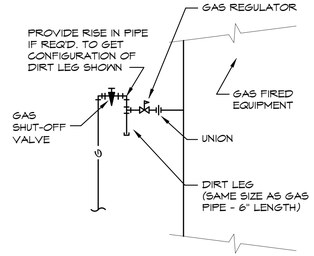

## ROOF HYDRANT DETAIL
SCALE: NONE



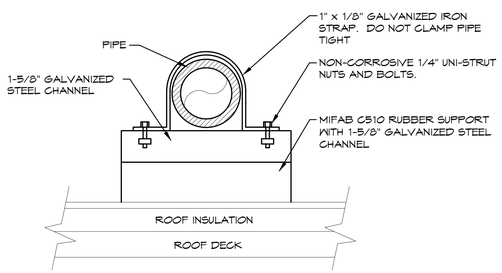

## GAS CONNECTION DETAIL
SCALE: NONE




## LAVATORY HOT WATER DETAIL
SCALE: NONE

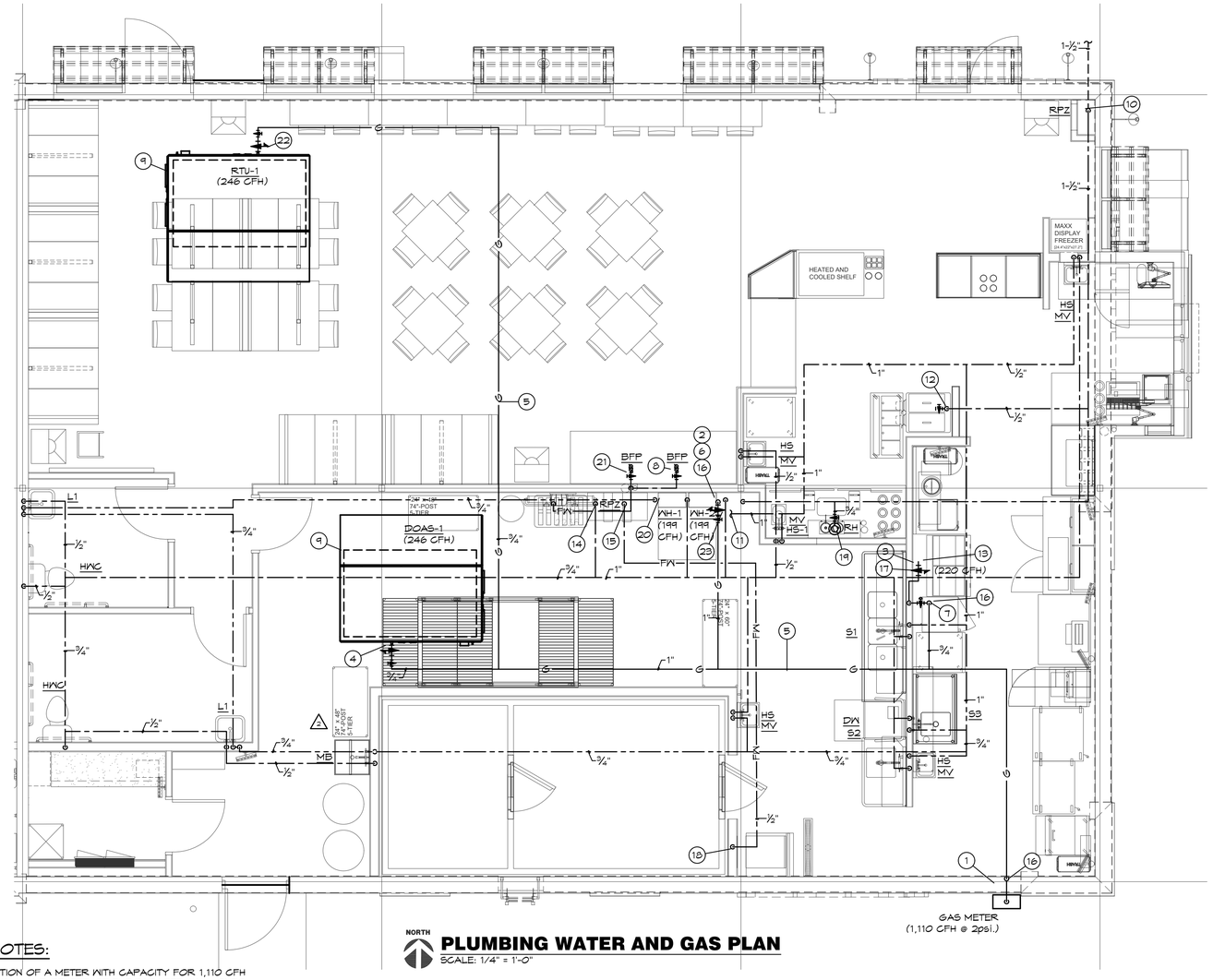



## GAS CONNECTION WITH REG. DETAIL
SCALE: NONE




## PEX PIPING REQUIREMENTS

PIPE SIZES GIVEN ON THE DRAWINGS ARE NOMINAL COPPER PIPE SIZE. IF PEX PIPING IS USED, INCREASE PEX PIPING ONE SIZE ABOVE LISTED SIZES AS REQUIRED TO EQUAL OR EXCEED COPPER PIPE INSIDE DIAMETER.




NORTH

## PLUMBING WATER AND GAS PLAN
SCALE: 1/4" = 1'-0"

## PLUMBING PLAN NOTES:

1. COORDINATE WITH GAS COMPANY FOR INSTALLATION OF A METER WITH CAPACITY FOR 1,110 CFH @ 2 psi. ROUTE PIPING UP INSIDE THE EXTERIOR WALL AND PENETRATE THE PARAPET WALL ONTO ROOF. ALL JOINTS ARE TO BE WELDED OR USE FITTINGS APPROVED FOR CONCEALED USE. VERIFY ALL EQUIPMENT GAS CAPACITIES AND OPERATING PRESSURES PRIOR TO INSTALLATION OF ANY PIPING.
2. CONNECT GAS PIPING TO EQUIPMENT AS DETAILED AND PER THE MANUFACTURERS INSTRUCTIONS.
3. ¾" GAS (2psi.) WITH SHUT-OFF VALVE AND PRESSURE REGULATOR LOCATED BEHIND FRYER. (¾" MAXITROL 325-5L, 220 CFH, 2psi. INLET PRESSURE WITH 7" W.C. OUTLET PRESSURE). PROVIDE WITH ANSI Z21.80/CSA 6.66 LISTED VENT LIMITING DEVICE. 1" PIPE TO FRYER MANIFOLD.
4. ¾" GAS (2psi.) WITH SHUT-OFF VALVE AND PRESSURE REGULATOR ON ROOF (¾" MAXITROL #325-5L, 246 CFH, 2psi. INLET PRESSURE WITH 7" W.C. OUTLET PRESSURE). CONNECT TO ROOF TOP UNIT AS DETAILED AND AS REQUIRED.
5. SUPPORT GAS PIPING ON ROOF AS DETAILED.
6. 1" GAS DOWN THROUGH ROOF AND CEILING TO WATER HEATERS. CONNECT ¾" GAS PIPING TO EACH WATER HEATER PER THE MANUFACTURERS REQUIREMENTS.
7. GAS PIPING DOWN THRU ROOF TO AUTOMATIC GAS SHUT OFF VALVE IN AN ACCESSIBLE LOCATION ABOVE CEILING AS REQUIRED.
8. PROVIDE ½" FILTERED CW TO ICE MACHINE WITH SHUT-OFF VALVE. PROVIDE WATTS® SD-3 BFP PRIOR TO CONNECTION TO WATER FILLER, LOCATED AT 72" AFF.
9. PROVIDE 1" CONDENSATE DRAIN FOR RTU/DOAS AS DETAILED.
10. INCOMING 1-1/2" DOMESTIC WATER SERVICE LINE. PROVIDE AND INSTALL RPZ, MOUNTED VERTICALLY AS REQUIRED BY LOCAL JURISDICTION. SEE CIVIL PLAN FOR CONTINUATION OF DOMESTIC SERVICE LINE OUTSIDE OF BUILDING.
11. SEE RISER DIAGRAM FOR WATER HEATER PIPING DIAGRAM. REFER TO MANUFACTURERS INSTRUCTIONS FOR EXACT REQUIREMENTS SET HOT WATER HEATER THERMOSTAT TO 140° F.
12. PROVIDE (1) ½" VALVED CW CONNECTION FOR THE CUSTARD MACHINE DIPPER WELL.

## PLUMBING PLAN NOTES:

13. ALL APPLIANCE CONNECTIONS SHALL BE MADE WITH UL LISTED FLEXIBLE APPLIANCE CONNECTOR. FLEX CONNECTORS SHALL BE PROVIDED BY TENANT. CONTRACTOR SHALL PROVIDE SAFETY LOCK AND CHAIN AT ALL GAS APPLIANCES ON WHEELS. PROVIDE PIPING REDUCERS AND INCREASERS AS REQUIRED TO MATE HARD PIPING WITH FLEX CONNECTORS.
14. CONNECT ¾" CW TO WATER FILTER WITH BYPASS PER THE MANUFACTURER'S REQUIREMENTS. REFER TO ARCHITECTURAL SHEET A5, ELEVATION E FOR PLACEMENT ON KITCHEN WALL. PLUMBING CONTRACTOR TO LOCATE WATER FILTER SUPPLY LINE ACCORDINGLY.
15. PROVIDE ½" FILTERED CW TO SODA SYSTEM. PROVIDE RPZ BACKFLOW PREVENTOR AS APPROVED BY WATER DEPARTMENT IN ACCESSIBLE LOCATION (66" AFF) ADJACENT TO BAG-IN-BOX. NO COPPER PIPE DOWNSTREAM OF RPZ.
16. CUT EXISTING ROOF AND FLASH INTO ROOF AS REQUIRED. ALL ROOFING WORK SHALL BE PERFORMED BY BUILDING OWNER'S ROOFING CONTRACTOR (AT THIS CONTRACTOR'S EXPENSE) TO MAINTAIN EXISTING ROOF WARRANTY. VERIFY APPROVED ROOFING CONTRACTOR WITH BUILDING OWNER PRIOR TO PERFORMING WORK.
17. COORDINATE ELECTRONIC GAS VALVE BETWEEN ALL SHEETS.
18. PROVIDE ½" FILTERED CW TO ICE MACHINE WITH SHUT-OFF VALVE.
19. INSTALL ROOF HYDRANT PER THE MANUFACTURER'S REQUIREMENTS. COORDINATE WITH ROOFING CONTRACTOR FOR PENETRATION. ROUTE DRAIN PIPING FROM VALVE DRAIN TO MOP BASIN WITH AN AIR GAP.
20. CONNECT RECIRCULATION PUMP TO WATER HEATER AS DETAILED IN THE RISER DIAGRAM.
21. PROVIDE SHUTOFF VALVE AND CONNECT FILTERED CW TO BEVERAGE DISPENSER WITH BACKFLOW PREVENTER AS REQUIRED BY THE MANUFACTURER. LOCATE AT 44" AFF.
22. ¾" GAS (2psi.) WITH SHUT-OFF VALVE AND PRESSURE REGULATOR ON ROOF (¾" MAXITROL #325-5L, 246 CFH, 2psi. INLET PRESSURE WITH 7" W.C. OUTLET PRESSURE). CONNECT TO ROOF TOP UNIT AS DETAILED AND AS REQUIRED.
23. ¾" GAS (2psi.) WITH SHUT-OFF VALVE AND PRESSURE REGULATOR ON ROOF (¾" MAXITROL #325-5L, 199 CFH, 2psi. INLET PRESSURE WITH 7" W.C. OUTLET PRESSURE). CONNECT TO WATER HEATER AS DETAILED AND AS REQUIRED.

NOTE: WATER SOFTENER SYSTEM IS OBTAINED THROUGH FREDDY'S NATIONAL ACCOUNT WITH 'CULLIGAN WATER' AND PROVIDED BY OWNER. SCOPE OF WORK DETAILED BELOW:

1. WATER SOFTENER EQUIPMENT WILL BE PROVIDED BY OWNER. 'CULLIGAN' REPRESENTATIVE WILL DELIVER & ASSEMBLE THE SOFTENER EQUIPMENT, INCLUDING A BYPASS VALVE ON TOP SIDE OF THE WATER SOFTENER TANK.
2. PLUMBING CONTRACTOR WILL BE RESPONSIBLE FOR FURNISHING AND INSTALLING WATER SUPPLY LINES AND MAKING CONNECTIONS (TO AND FROM) THE BYPASS VALVE.
3. PLUMBING CONTRACTOR WILL BE RESPONSIBLE FOR FURNISHING AND INSTALLING DRAIN LINE FROM WATER SOFTENER EQUIPMENT AND AIR GAPPING ABOVE FLOOR SINK AS REQUIRED.
4. 'CULLIGAN' REPRESENTATIVE WILL RETURN TO JOBSITE AFTER THE WATER HAS BEEN PLUMBED TO THE SOFTENER TO PUT SALT IN BRINE TANK AND PERFORM START-UP.

## PLUMBING PLAN NOTES:

GLMV ARCHITECTURE
1525 E. Douglas, Wichita, KS 67211
Tel: (316) 265-9367
www.glmv.com

# FREDDY'S FROZEN CUSTARD
# INDEPENDENCE CENTER
# INDEPENDENCE, MO

11/16/2023

STATE OF MISSOURI
ERIK B. KNUDSEN
NUMBER PE-2004026504
REGISTERED PROFESSIONAL ENGINEER

02132R23003

PLAN SET REVISION
1 9/22/23 CITY RTC
2 10/31/23 CITY RTC
3 11/17/23 BID SET

CONTRACT DATE
08.08.2023

SHEET NO.
PLUMBING WATER AND GAS PLAN
P200

BC PROJECT #: 23315
MISSOURI PE COA #2009003629



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

# MISSOURI
# DNR REGULATION CLAUSE
# REGARDING BACKFLOW PREVENTION

**Effective January 1, 1987 the Missouri Department of Natural Resources established a new regulation governing the installation and testing of "backflow preventers."**

**To insure that the backflow preventer required at the project is in proper working order, the customer or owner shall have the device inspected and tested by a State certified backflow prevention tester, and the report of the test returned to the Independence Water Department.**

**If the report of test is not received by the Independence Water Department within thirty (30) days after the installation of the backflow prevention device, water service to this project will be subject to discontinuance.**

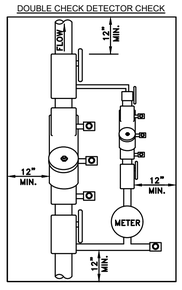
**Install device in a horizontal and upright position, before any tees or wyes.**

**The test reports for the new backflow device(s) must be received by the Independence Water Department before the Final Inspection of the project can be approved.**

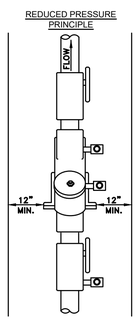
20

INDEPENDENCE WATER DEPARTMENT

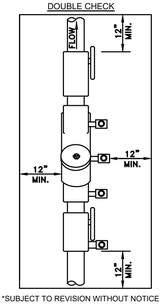
DOUBLE CHECK DETECTOR CHECK




REDUCED PRESSURE PRINCIPLE




DOUBLE CHECK




*SUBJECT TO REVISION WITHOUT NOTICE

**NOTES:**

1. TEST COCK LOCATION MAY VARY WITH EACH BRAND. DOUBLE CHECK AND REDUCED PRESSURE WILL HAVE 4 TEST COCKS EACH AND DOUBLE CHECK DETECTOR CHECK WILL HAVE 7 TEST COCKS.
2. MEASUREMENTS ARE MINIMUM FROM ALL WALLS AND OTHER APPURTENANCES.
3. DOUBLE CHECK AND DOUBLE CHECK DETECTOR MAY BE INSTALLED IN BUILDING OR WATER DEPARTMENT APPROVED VAULT. REDUCED PRESSURE PRINCIPLE MAY BE INSTALLED EITHER ABOVE GROUND OR IN BUILDING.
4. ALL ASSEMBLIES WILL BE INSTALLED IN THE HORIZONTAL POSITION.
5. ALL ASSEMBLIES WILL BE INSTALLED WITH EASY ACCESS FOR MAINTENANCE AND REPAIRS.
6. MINIMUM CLEARANCE FROM BOTTOM OF VAULT WILL BE NO LESS THAN 18".

TYPICAL INSTALLATION OF BACKFLOW PREVENTION ASSEMBLIES

WATER DEPARTMENT — CITY OF INDEPENDENCE, MISSOURI

DRAWING NO. 18
APPROVED BY: DE
DRAWN BY: DH — DATE: 2/24/97

18

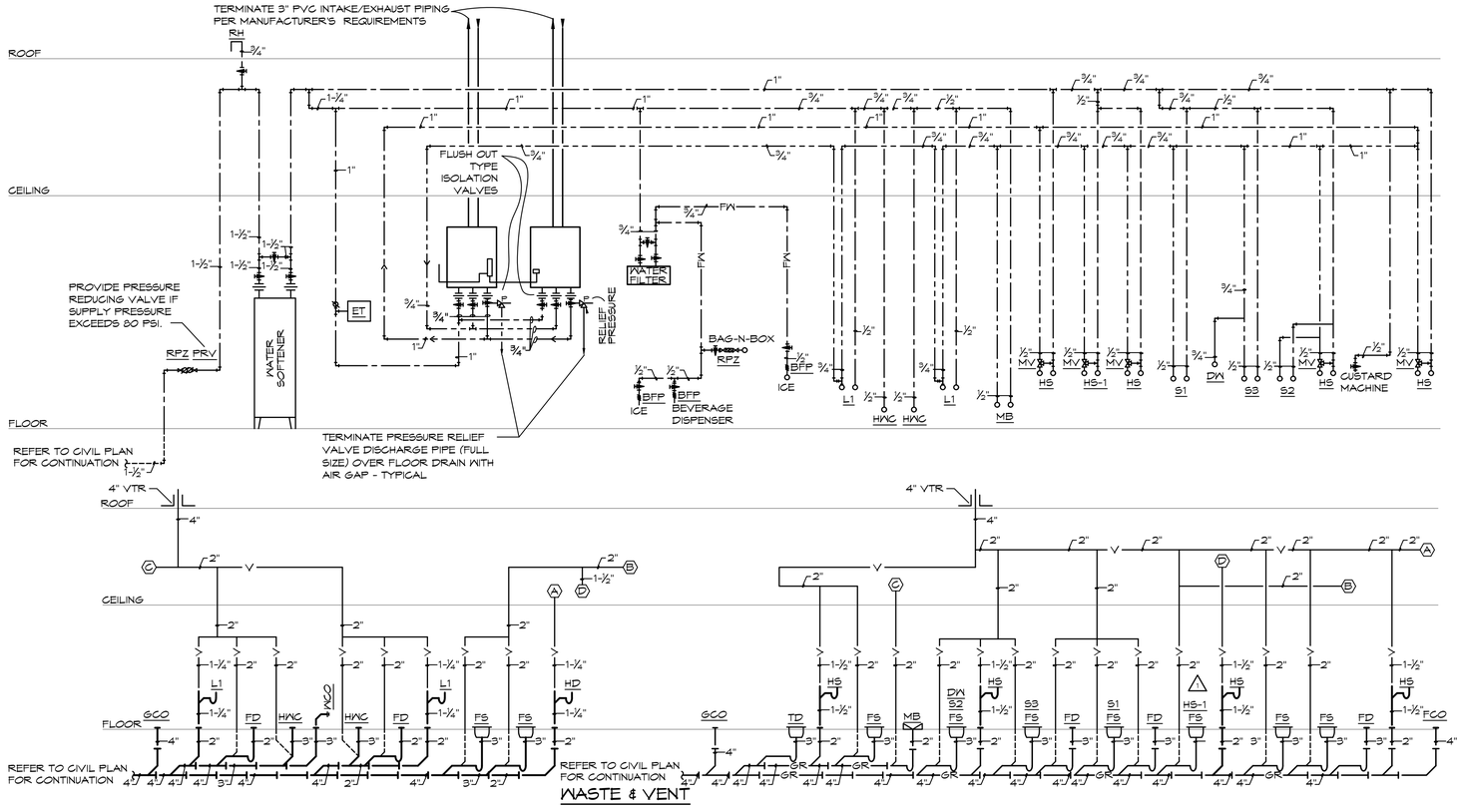
## GREASE INTERCEPTOR SIZING

GREASE INTERCEPTOR SIZING: INDEPENDENCE, MO

| | |
|---|---|
| NEW GREASE INTERCEPTOR | V = G x M x D |
| HIGH GREASE OUTPUT | G = 0.035 LBS/MEAL |
| MEALS PER DAY | M = 400 MEALS |
| DAYS PER PUMP OUT CYCLE | D = 60 DAYS |

V = 0.035 x 400 x 60 = 840 LBS CAPACITY REQUIRED

LANDLORD TO INSTALL 1,200 GALLON INTERCEPTOR




## PLUMBING RISER DIAGRAMS

SCALE: NONE

### PLUMBING FIXTURE SCHEDULE:

**HAC** — HANDICAP WATER CLOSET: TOTO, #CST744SL, "DRAKE", 1.6 GALLON FLUSH, 17" HIGH ELONGATED BOWL, FLOOR MOUNTED, FLOOR OUTLET, TANK TYPE, VITREOUS CHINA, G-MAX FLUSHING SYSTEM, OPEN FRONT SEAT WITH CHECK HINGE AND LESS COVER, CHROME PLATED ANGLE STOP AND RISER. HANDLE ON WIDE SIDE OF FIXTURE.

**L1** — HANDICAP LAVATORY, WALL HUNG: TOTO LT307, VITREOUS CHINA, TOTO TEL105-C20ET ECOPOWER SENSOR OPERATED ASSE 1070 APPROVED THERMAL MIXING FAUCET, 20 SECOND DISCHARGE WHEN ACTIVATED, 0.5 GPM FLOW AERATOR, OFFSET GRID DRAIN WITH 1-1/4" TAILPIECE, CHROME PLATED CAST BRASS P-TRAP WITH CLEANOUT (MOUNTED PARALLEL WITH WALL). CHROME PLATED ANGLE STOPS AND RISERS, FLOOR MOUNTED CONCEALED ARM LAVATORY SUPPORT, INSULATE EXPOSED DRAIN, WATER SUPPLIES, AND VALVES WITH PROVIRAP SEAMLESS MOLDED CLOSED CELL VINYL INSULATION.

**HS** — HAND SINK: PROVIDED BY KITCHEN EQUIPMENT SUPPLIER. PROVIDE GRID DRAIN WITH 1-1/2" TAILPIECE, CHROME PLATED CAST BRASS P-TRAP WITH CLEANOUT, CHROME PLATED ANGLE STOPS AND RISERS, CONCEALED ARM FLOOR MOUNTED LAVATORY CARRIER.

**FS** — FLOOR SINK: SIOUX CHIEF:, #861 SQUARE PVC FLOOR SINK WITH STAINLESS STEEL MESH DEBRIS SCREEN, PVC HALF OPEN STRAINER.

**HB** — HOSE BIBB: WOODFORD, #24, 3/4" HOSE NOZZLE OUTLET, BRASS FINISH, METAL HANDWHEEL OPERATED, INTEGRAL VACUUM BREAKER.

**RH** — ROOF HYDRANT: WOODFORD FREEZELESS ROOF HYDRANT # RHY2-MS WITH ROOF MOUNTING SYSTEM, DUAL CHECK BACKFLOW PREVENTER WITH 3/4" HOSE CONNECTION, ASSE 1052 LISTED.

**WATER FILTER** — WATER FILTER: PROVIDED BY OTHERS, INSTALLED BY PLUMBER (MODEL NUMBER #VZN-441H-T5), PROVIDE CONNECTIONS AS NOTED ON PLANS.

**FD** — FLOOR DRAIN: SIOUX CHIEF, #842-PB, PVC FLOOR DRAIN WITH ADJUSTABLE TOP AND CAST BRASS STRAINER. PROVIDE PROVENT TRAP GUARD.

**HD** — HUB DRAIN: SIOUX CHIEF, #832-UM, PVC FLOOR DRAIN WITH ADJUSTABLE TOP AND STAINLESS STEEL DEBRIS SCREEN

**DW** — DISHWASHER: OWNER FURNISHED, CONTRACTOR INSTALLED, CONNECT TO HW AND DRAIN PIPING AS REQUIRED. PROVIDE ALL PIPING AND ACCESSORIES AS REQUIRED TO MAKE CONNECTIONS.

**MB** — MOP BASIN: PROVIDED BY KITCHEN EQUIPMENT SUPPLIER, INSTALLED BY GENERAL CONTRACTOR. PROVIDE VACUUM BREAKER IF ONE IS NOT INTEGRAL TO FAUCET.

**HS1** — HAND SINK: PROVIDED BY KITCHEN EQUIPMENT SUPPLIER. PROVIDE GRID DRAIN WITH 1-1/2" TAILPIECE, CHROME PLATED CAST BRASS P-TRAP WITH CLEANOUT, CHROME PLATED ANGLE STOPS AND RISERS.

**WATER SOFTENER** — WATER SOFTENER: PROVIDED BY OWNER, INSTALLED BY GC, PROVIDE ALL CONNECTIONS AS REQUIRED.

**TD** — TRENCH DRAIN: ZURN #Z-886-P5, MEDIUM DUTY .75% PRE-SLOPED FIBERGLASS TRENCH DRAIN, 36-INCH LENGTH, BOTTOM OUTLET, 6" WIDE, CLASS A MEDIUM DUTY PERFORATED STAINLESS STEEL GRATE.

### PLUMBING FIXTURE SCHEDULE CONT.:

**WH1** — HOT WATER HEATER: NAVIEN, #NPE-240-A, GAS FIRED, 98% THERMAL EFFICIENCY, INSTANTANEOUS HEATER, 199 MBTUH INPUT, 9.8 GPM AT 100 DEGREES F RISE, WITH INTERNAL RECIRCULATION PUMP. PROVIDE WITH REMOTE CONTROLLER, NAVIEN PLUMB EASY VALVE SET, PRESSURE RELIEF VALVE, CONDENSATE DRAIN HOSE, CONDENSATE NEUTRALIZER, VENT TERMINATORS. SET AT 135°-140°F.

**WH2** — HOT WATER HEATER: NAVIEN, #NPE-240-A, GAS FIRED, 98% THERMAL EFFICIENCY, INSTANTANEOUS HEATER, 199 MBTUH INPUT, 9.8 GPM AT 100 DEGREES F RISE, WITH INTERNAL RECIRCULATION PUMP. PROVIDE WITH NAVIEN READY LINK COMMUNICATION CABLE, REMOTE CONTROLLER, NAVIEN PLUMB EASY VALVE SET, PRESSURE RELIEF VALVE, CONDENSATE DRAIN HOSE, CONDENSATE NEUTRALIZER, VENT TERMINATORS. SET AT 135°-140°F.

**RCP** — HOT WATER RECIRCULATING PUMP: BELL & GOSSETT, #SERIES NBF-22, BRONZE FITTINGS, 120 VOLT, WITH HONEYWELL 16006C AQUASTAT AND TC-1 TIMER KIT.

**ET** — HOT WATER EXPANSION TANK: AMTROL, #ST-8, 3.2 GALLON EXPANSION TANK WITH DIAPHRAGM.

**MV** — MIXING VALVE: WATTS, #LFUSG-B, THERMOSTATIC CONTROLLED MIXING VALVE, LEAD FREE BRONZE BODY, LOCKED TEMPERATURE ADJUSTMENT CAP (VANDAL RESISTANT), COPPER ENCAPSULATED THERMOSTAT ASSEMBLY WITH BRASS SHUTTLE, STAINLESSSTEEL SPRINGS, INTEGRAL CHECK VALVES ON HOT AND COLD INLETS. (SET TO 110°F). ASSE 1070 LISTED.

**S1** — 3-COMPARTMENT SINK: PROVIDED BY KITCHEN EQUIPMENT SUPPLIER, INSTALLED BY GENERAL CONTRACTOR. PROVIDE (3) 2" TAILPIECES, WASTE MANIFOLD PIPING, CHROME PLATED ANGLE STOPS AND RISERS.

**S2** — PRE-RINSE: PROVIDED BY KITCHEN EQUIPMENT SUPPLIER, INSTALLED BY GENERAL CONTRACTOR. PROVIDE 2" TAILPIECE, WASTE PIPING, CHROME PLATED ANGLE STOPS AND RISERS.

**S3** — VEGGIE SINK: PROVIDED BY KITCHEN EQUIPMENT SUPPLIER, INSTALLED BY GENERAL CONTRACTOR. PROVIDE 2" TAILPIECE, WASTE PIPING, CHROME PLATED ANGLE STOPS AND RISERS.

**RPZ** — REDUCED ZONE PRESSURE BACKFLOW PREVENTOR: WATTS #LF909, LEAD FREE BRONZE BODY CONSTRUCTION, TWO, IN-LINE INDEPENDENT CHECK VALVES, REPLACEABLE CHECK SEATS WITH AN INTERMEDIATE RELIEF VALVE, AND BALL VALVE TEST COCKS.

**BFP** — BACKFLOW PREVENTOR: WATTS #5D-3, DUAL CHECK VALVE WITH ATMOSPHERIC PORT & STRAINER FOR CARBONATED BEVERAGE MACHINES

**RD** — ROOF DRAIN: ZURN, #Z-100, CAST IRON BODY, FLASHING CLAMP, GRAVEL STOP, UNDERDECK CLAMP, SUMP RECEIVER, AND POLYETHYLENE DOME.

**ORD** — OVERFLOW DRAIN: ZURN, #Z-100-B8, CAST IRON BODY, FLASHING CLAMP, GRAVEL STOP, UNDERDECK CLAMP, SUMP RECEIVER, POLYETHYLENE DOME, AND 2" HIGH WATER DAM.

**DS** — DOWN SPOUT NOZZLE: ZURN ZANB199 DOWNSPOUT NOZZLE, ALL NICKEL BRONZE BODY, AND DECORATIVE FACE OF WALL FLANGE AND OUTLET NOZZLE.

| FIXTURE | NO. | DRAIN D.F.U. | DRAIN TOTAL D.F.U. | COLD WATER F.U. C.W. | COLD WATER TOTAL C.W. | HOT WATER F.U. H.W. | HOT WATER TOTAL H.W. |
|---|---|---|---|---|---|---|---|
| WATER CLOSET | 2 | 4 | 8 | 5 | 10 | -- | -- |
| LAVATORY | 2 | 1 | 2 | 1.5 | 3 | 1.5 | 3 |
| HAND SINK | 5 | 2 | 10 | 1.5 | 6 | 1.5 | 6 |
| PREP SINK * | 1 | -- | -- | 2 | 2 | 2 | 2 |
| PRE RINSE SINK * | 1 | -- | -- | 2 | 2 | 2 | 2 |
| 3 - COMPARTMENT SINK * | 1 | -- | -- | 3 | 3 | 3 | 3 |
| DISHWASHER | 1 | -- | -- | -- | -- | 2 | 2 |
| HOSE BIBB | 1 | -- | -- | 2.5 | 2.5 | -- | -- |
| FLOOR DRAIN | 4 | 2 | 8 | -- | -- | -- | -- |
| FLOOR SINK | 9 | 6 | 54 | -- | -- | -- | -- |
| MOP SINK | 1 | 2 | 2 | 2.25 | 2.25 | 2.25 | 2.25 |
| TOTAL | - | - | 84 | -- | 30.75 | -- | 20.25 |

PROBABLE DEMANDS/ AND PIPE SIZING REQUIREMENTS: BASED ON 2018 IPC. COLD WATER: 51 FU = 25.5 GPM USE 1-1/2" CW SERVICE. DRAIN: 84 DFU USE 4" SANITARY (MIN) *FIXTURE HAS INDIRECT WASTE TO FLOOR SINK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**INDEPENDENCE, MO**

11/16/2023

STATE OF MISSOURI — ERIK B. KNUDSEN — NUMBER PE-2004026504 — REGISTERED PROFESSIONAL ENGINEER

02132R23003

PLAN SET REVISION
1 9/22/23 CITY RTC
2 10/31/23 CITY RTC
3 11/17/23 BID SET

CONTRACT DATE 08.08.2023

SHEET NO.
WASTE AND VENT RISER DIAGRAMS
P300

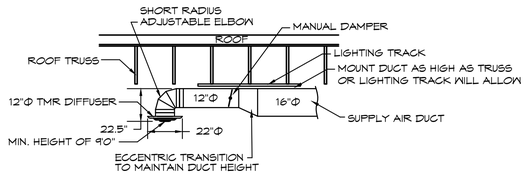
BC PROJECT #: 23315
MISSOURI PE COA #2009003629




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

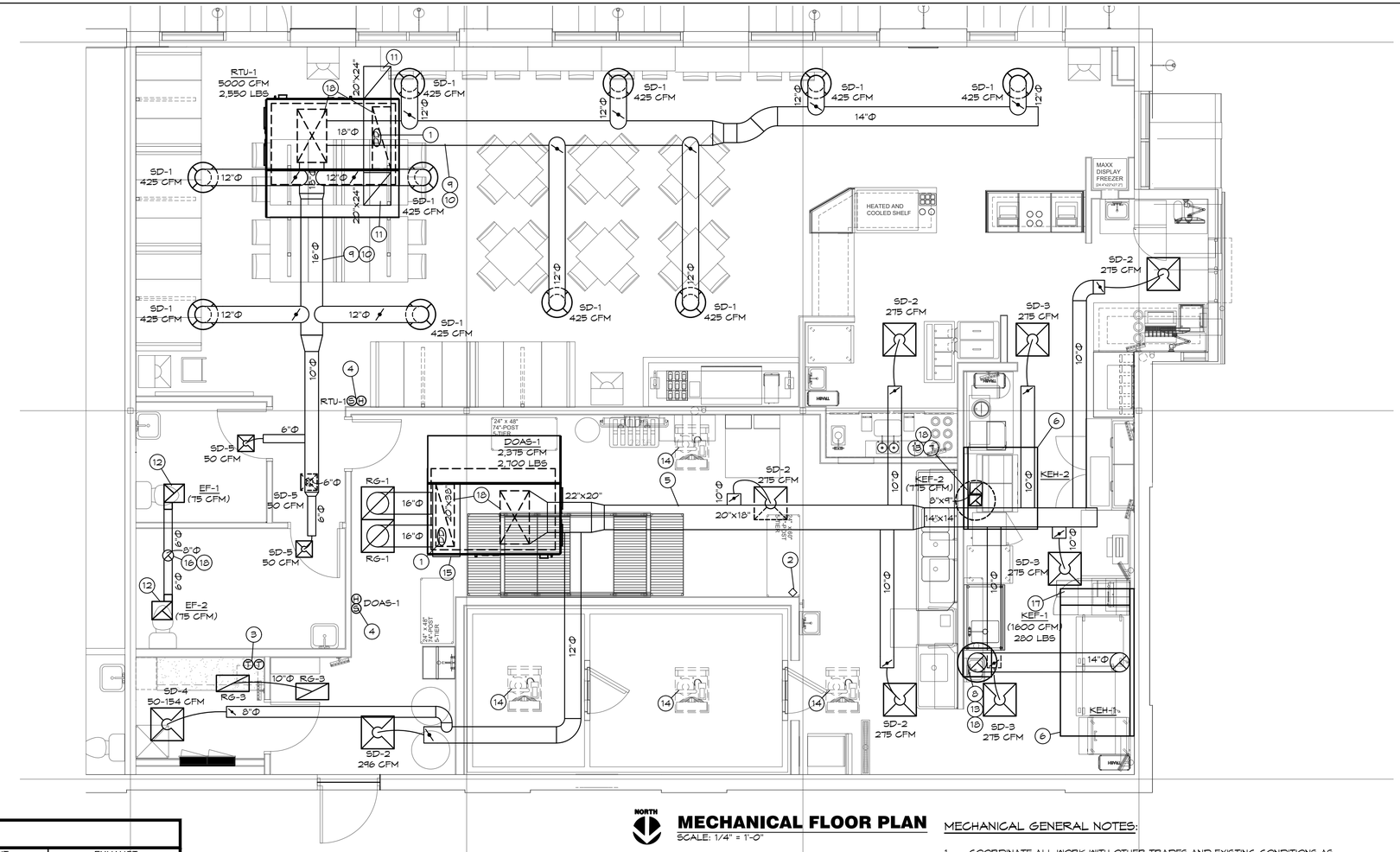
## MECHANICAL SYMBOLS

| | |
|---|---|
| | (SD) NEW SUPPLY DIFFUSER |
| | (RG) NEW RETURN AIR GRILLE |
| | EXHAUST GRILLE/FAN |
| SH | REMOTE TEMPERATURE/HUMIDITY SENSORS |
| T | THERMOSTAT, MOUNTED AT 48" AFF |
| DD | DUCT-MOUNTED SMOKE DETECTOR |
| | NEW DUCTWORK |
| 32"x14" | SIZE OF RECTANGULAR DUCT |
| 6"Φ | 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




## 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 | 900 | 4,100 | 5,000 | 17.44% | KEF-1 | 1600 |
| DOAS-1 | 2,375 | 0 | 2,375 | 100.0% | KEF-2 | 775 |
| | | | | | EF-1, EF-2 | 150 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| TOTAL | 3,275 | 4,100 | 7,375 | 44.4% | TOTAL | 2,525 |
| | | | | | RESULTING BUILDING PRESSURIZATION | 750 CFM |

THE BUILDING HVAC SYSTEM SHALL BE BALANCED BY NATIONAL TAB HIRED BY THE OWNER. CONTACT Dan Hertenstein - National TAB at: 816-215-1543 - 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 M90 FOR ADDITIONAL INFORMATION.
2. LOCATION OF MANUAL PULL STATION. INSTALL PER THE MANFUACTURERS REQUIREMENTS.
3. LOCATION OF RTU AND DOAS THERMOSTATS. GC TO LABEL EACH THERMOSTAT.
4. LOCATION OF RTU/DOAS TEMPERATURE SENSOR MOUNTED 7'-0" AFF.
5. ALL KITCHEN DUCTWORK IS INTENDED TO BE ROUTED UNDER 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"Φ 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"Φ 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 8"Φ 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.
18. CUT EXISTING ROOF AND FLASH INTO ROOF AS REQUIRED. ALL ROOFING WORK SHALL BE PERFORMED BY BUILDING OWNER'S ROOFING CONTRACTOR (AT THIS CONTRACTOR'S EXPENSE)

### 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.

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**INDEPENDENCE, MO**

11/16/2023

STATE OF MISSOURI
REGISTERED PROFESSIONAL ENGINEER
ERIK B. KNUDSEN
NUMBER PE-2004026504

02132R23003

| PLAN SET REVISION | |
|---|---|
| 1 | 9/22/23 CITY RTC |
| 2 | 10/31/23 CITY RTC |
| 4 | 11/17/23 BID SET |

CONTRACT DATE
08.08.2023

SHEET NO.
MECHANICAL FLOOR PLAN
M100

BC PROJECT #: 23315
MISSOURI PE COA #2009003629



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

SEE SHEET M7 FOR OWNER PROVIDED, GENERAL CONTRACTOR INSTALLED RTU-1 UNIT INFORMATION.

SEE SHEET M5 FOR OWNER PROVIDED, GENERAL CONTRACTOR INSTALLED DOAS UNIT INFORMATION.

## EXHAUST FAN SCHEDULE

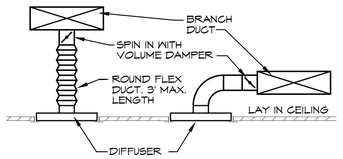
| MARK | MFGR | MODEL | CFM | EXTERNAL STATIC P. IN. WG. | RPM | ELECTRICAL | | FAN TYPE | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | VOLT/Φ/HZ | FWR | | |
| EF-1 | COOK | GC-146 | 75 | 0.25 | 900 | 120/1/60 | 30.3 W | CEILING EXH. | 1 |
| EF-2 | " | GC-146 | 75 | " | 900 | " | 30.3 W | " | 1 |
| | | | | | | | | | |

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

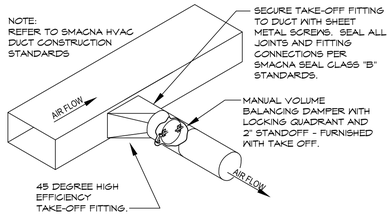
## DIFFUSER SCHEDULE

| 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 | 12"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 |
| SD-6 | " | " | 8"Φ | 12"X12" | " | WITH 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" | " | |
| | | | | | | |

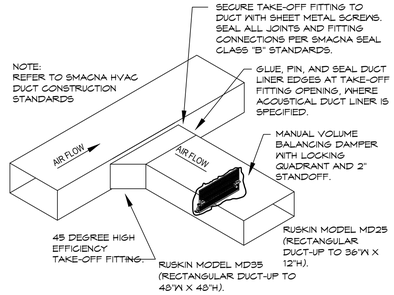
NOTES: 1. RETURN GRILL TO BE PLASTIC FILTER RETURN, FILTER TO BE AMERICAN AIR FILTER (AAF) FRONTLINE GREEN 1", WITH AAF AMERIFRAME SIZE 20x20x1.




### DIFFUSER DETAIL
SCALE: NONE

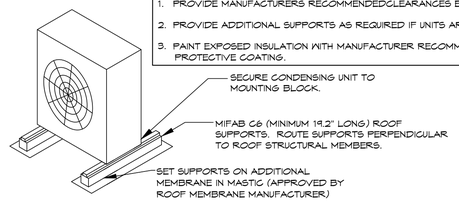



### ROUND DUCT TAKE OFF DETAIL
SCALE: NONE

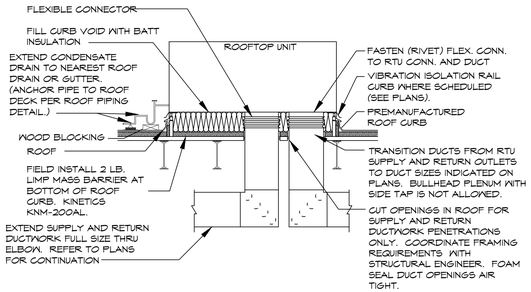



### RECTANGULAR DUCT TAKE OFF DETAIL
SCALE: NONE

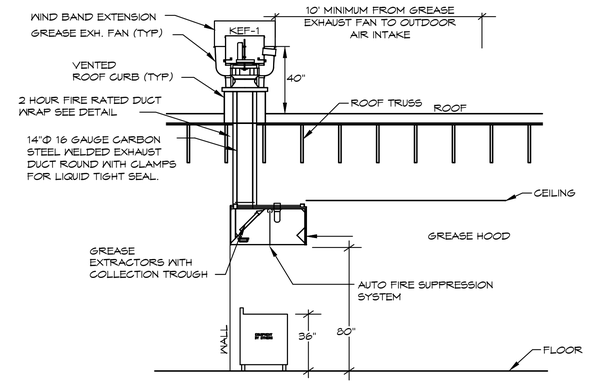
NOTES:
1. PROVIDE MANUFACTURERS RECOMMENDEDCLEARANCES BETWEEN CU & HP UNITS.
2. PROVIDE ADDITIONAL SUPPORTS AS REQUIRED IF UNITS ARE NOT SAME WIDTH.
3. PAINT EXPOSED INSULATION WITH MANUFACTURER RECOMMENDED ULTRAVIOLET PROTECTIVE COATING.




### 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.

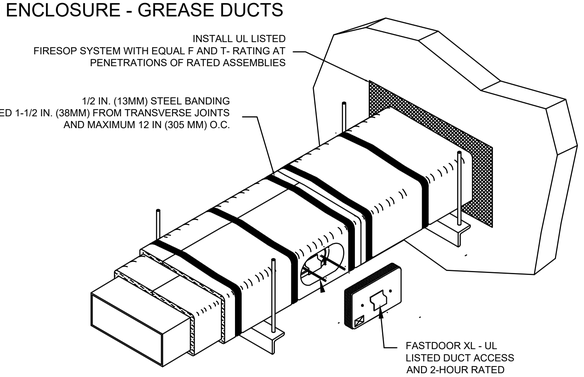
4. MINIMUM 16 GAUGE CARBON STEEL (OR 18 GAGE STAINLESS STEEL) RECTANGULAR OR ROUND GREASE EXHAUST DUCT

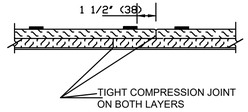
5. INSTALL UL LISTED AND LIQUID TIGHT THERMAL CERAMICS FASTDOOR XL ACCESS DOORS AT ALL CHANGES IN DIRECTION AND AT MINIMUM EVERY 20 FT ON HORIZONTAL RUNS.

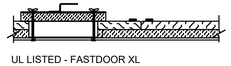
6. SUPPORT HANGER SYSTEMS DO NOT NEED TO BE WRAPPED PROVIDED THE HANGER RODS ARE MINIMUM OF 3/8 IN. DIAMETER AND SUPPORTS ARE MINIMUM 2 X 2 X 1/8 IN. STEEL ANGLE OR SMACNA EQUIVALENT SUPPORT SYSTEM.

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.





UL LISTED - FASTDOOR XL

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

GLMV ARCHITECTURE
1525 E. Douglas, Wichita, KS 67211
Tel: (316) 265-9367
www.glmv.com

**FREDDY'S FROZEN CUSTARD**
**INDEPENDENCE CENTER**
**INDEPENDENCE, MO**

11/16/2023
STATE OF MISSOURI
ERIK B. KNUDSEN
NUMBER PE-2004026504
REGISTERED PROFESSIONAL ENGINEER

02132R23003

| PLAN SET REVISION |
|---|
| 1 9/22/23 CITY RTC |
| 2 10/31/23 CITY RTC |
| 3 11/17/23 BID SET |

CONTRACT DATE
08.08.2023

SHEET NO.
MECHANICAL SCHEDULES AND DETAILS
M200

BC PROJECT #: 23315
MISSOURI PE COA #2009003629



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

## ND-2 HANGING ANGLE DETAIL

1/2" DIA. ALL THREAD ROD CONNECTED TO ROOF JOIST THROUGH ANOTHER HANGING ANGLE

1/2" DIA. HEAVY DUTY NUT ONE ABOVE AND ONE BELOW HANGING ANGLE

*ROD AND NUTS TO BE SUPPLIED BY INSTALLING CONTRACTOR HANGING ANGLE IS PRE-PUNCHED AT FACTORY

## HANGING ANGLE LOCATIONS

| HOOD STYLE | DIM FROM REAR | DIM FROM FRONT (24"H) | DIM FROM FRONT (30"H) |
|---|---|---|---|
| CANOPY ND2 | 4.166" | 2.246" | 2.246" |
| ND2-PSP-F | 4.166" | 2.246" | 2.246" |
| BACKSHELF BD-2 | 4.166" | 2.246 | – |
| VHB/VHB-G | 36"X36" | 42"X42" | 48"X48" |
| FRONT/BACK DIMS BY SIZE | 2.246" | 2.246" | 2.246" |

## CALCULATIONS UTILIZED

EXHAUST CFM=LENGTH OF HOOD X CFM/LIN.FT. (LOAD)

SUPPLY CFM=EXHAUST CFM X PERCENTAGE REQUIRED

TOTAL DUCT AREA=144 X $\frac{\text{CFM}}{\text{FPM(*)}}$

DUCT LENGTH= $\frac{\text{TOTAL DUCT AREA}}{\text{DUCT DEPTH}}$

* CAPTIVE-AIRE DUCT CONNECTION SIZES ARE CALCULATED USING AN EXHAUST VELOCITY OF 1500-1900 FPM AND A SUPPLY VELOCITY OF 500-600 FPM.

## BUILDING CODES

CAPTIVE-AIRE HOODS ARE BUILT IN COMPLIANCE WITH:

ETL LISTED #3054804-001 #3054804-002

STANDARD 710

BUILT IN ACCORDANCE WITH NFPA No. 96

Listed under ETL File number 3054804-001/002

## CLEARANCE TO COMBUSTIBLES

CAPTIVE-AIRE HOODS HAVE OPTIONAL CLEARANCE REDUCTION SYSTEMS AVAILABLE AS FOLLOWS:

| MATERIAL | CLEARANCE REDUCTION SYSTEM |
|---|---|
| NON-COMBUSTIBLE | NONE REQUIRED |
| LIMITED-COMBUSTIBLE | 3" UNINSULATED STANDOFF |
| COMBUSTIBLE | 1" INSULATED STANDOFF |

## GENERAL NOTES

INSTALLATION

1. ALL ELECTRICAL "FIELD" CONNECTIONS AND RELATED INTERCONNECTIONS BY ELECTRICAL CONTRACTORS.
2. ALL PLUMBING "FIELD" CONNECTIONS AND RELATED INTERCONNECTIONS BY PLUMBING CONTRACTORS.
3. HANGING BRACKETS LOCATED AND WELDED AS SHOWN ON PLANS. ALL OTHER HANGER MATERIALS PROVIDED BY INSTALLING CONTRACTORS.
4. ALL CONNECTIONS FROM CAPTIVE-AIRE DUCT PER MECHANICAL CONTRACTOR'S PLANS.
5. COOKING EQUIPMENT TO SHUTOFF IN EVENT OF FIRE.
6. EXHAUST FANS TO TURN ON IN EVENT OF FIRE.
7. ALL LIGHTS FIXTURE SHOWN INSTALLED BY CAPTIVE-AIRE ARE FACTORY PREWIRED. INTERCONNECTIONS BETWEEN HOODS AND TO SWITCHES BY ELECTRICAL CONTRACTORS.
8. LAMPS FOR LIGHT FIXTURES BY INSTALLING CONTRACTORS.
9. SEISMIC RESTAINTS ARE RESPONSIBILITY OF INSTALLING CONTRACTOR.
10. INSTALLING CONTRACTORS ASSUME ALL RELATED REPONSIBILITY FOR VERIFICATION OF DIMENSIONAL DATA CONTAINED ON THESE DOCUMENTS FOR ACCURACY, INTEGRATION, AND ADMINISTRATION OF CODE REQUIREMENTS IN EFFECT PRIOR TO ANY RELEASE FOR PRODUCTION OF EQUIPMENT SHOWN.

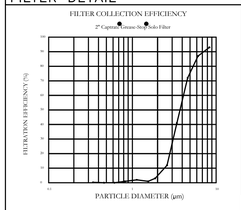
BALANCE

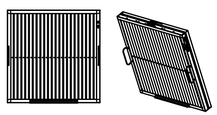
11. KITCHEN HOODS MUST BE BALANCED WITH KITCHEN.
12. KITCHEN SHALL BE NEGATIVE WITH RESPECT TO DINING AREA.
13. RESTAURANT SHALL BE POSITIVE WITH RESPECT TO AMBIENT PRESSURE.

ADDITIONAL

14. WRITTEN HOOD DIMENSIONS HAVE PRECEDENCE OVER SCALE.
15. SIGNED AND "APPROVED" COPIES OF THIS DOCUMENT MUST BE RECEIVED BY THE FACTORY PRIOR TO COMMENCEMENT OF FABRICATION.

## FILTER DETAIL



CaptiveAire Captrate Solo Filter
ETL Listed Grease Extracting Filters
Made From 430 Stainless Steel

***HOOD INFORMATION – JOB#5873095***

| HOOD NO | TAG | MODEL | MANUFACTURER | LENGTH | MAX COOKING TEMP | TYPE | APPLIANCE DUTY | DESIGN CFM/FT | TOTAL EXH CFM | EXHAUST PLENUM DIMENSIONS WIDTH | LENG | HEIGHT | DIA | CFM | VEL | SP | HOOD CONSTRUCTION | HOOD CONFIG END TO END | RDV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ITEM 33A | 5424 ND-2 | CAPTIVEAIRE | 8' 0" | 450 DEG | I | MEDIUM | 200 | 1600 | | | 4" | 14" | 1600 | 1497 | -0.734" | 430 SS WHERE EXPOSED | ALONE | FRONT |
| 2 | ITEM 33B | 5424 ND-2 | CAPTIVEAIRE | 5' 0" | 450 DEG | I | MEDIUM | 155 | 775 | | | 4" | 10" | 775 | 1421 | -0.436" | 430 SS WHERE EXPOSED | ALONE | ALONE |

***HOOD INFORMATION***

| HOOD NO | TAG | FILTER(S) TYPE | QTY | HEIGHT | LENGTH | EFFICIENCY @ 7 MICRONS | LIGHT(S) QTY | TYPE | WIRE GUARD | LOCATION | SIZE | UTILITY CABINET(S) FIRE SYSTEM TYPE | SIZE | ELECTRICAL MODEL # | SWITCHES QUANTITY | FIRE SYSTEM PIPING | HOOD HANGING WEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ITEM 33A | CAPTRATE SOLO FILTER | 5 | 16" | 16" | 95% SEE FILTER SPEC | 2 | RECESSED ROUND | NO | RIGHT | 12"x54"x24" | | | DCV-2011 | 1 LIGHT 1 FAN | NO | 505 LBS |
| 2 | ITEM 33B | CAPTRATE SOLO FILTER | 3 | 16" | 16" | 95% SEE FILTER SPEC | 2 | RECESSED ROUND | NO | | | | | | | NO | 300 LBS |

***HOOD OPTIONS***

| HOOD NO | TAG | OPTION |
|---|---|---|
| 1 | ITEM 33A | FIELD WRAPPER 18.00" HIGH FRONT, LEFT, RIGHT. |
| | | LEFT QUARTER END PANEL 23" TOP WIDTH, 0" BOTTOM WIDTH, 23" HIGH 430 SS. |
| | | RIGHT QUARTER END PANEL 23" TOP WIDTH, 0" BOTTOM WIDTH, 23" HIGH 430 SS. |
| | | RISER SENSOR INSTALL 3IN DBL. |
| 2 | ITEM 33B | FIELD WRAPPER 18.00" HIGH FRONT, LEFT, RIGHT. |
| | | RIGHT END PANEL 27" TOP WIDTH, 24" BOTTOM WIDTH, 39.5" HIGH 430 SS. |
| | | LEFT QUARTER END PANEL 23" TOP WIDTH, 0" BOTTOM WIDTH, 23" HIGH 430 SS. |
| | | RISER SENSOR INSTALL 6IN PLEN. |

### SPECIFICATION: CAPTRATE® GREASE-STOP® SOLID FILTER

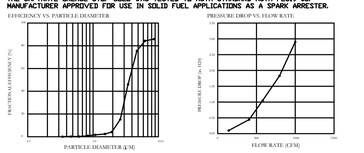
THE CAPTRATE GREASE-STOP SOLID FILTER IS A SINGLE-STAGE FILTER FEATURING A UNIQUE S-BAFFLE DESIGN IN CONJUNCTION WITH A SLOTTED REAR BAFFLE DESIGN, TO DELIVER EXCEPTIONAL FILTRATION EFFICIENCY.

FILTER IS STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD 2-INCH DEEP HOOD CHANNEL(S).

UNITS SHALL INCLUDE STAINLESS STEEL HANDLES AND A FASTENING DEVICE TO SECURE THE TWO COMPONENTS WHEN ASSEMBLED.

GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMOVE AT LEAST 75% OF GREASE PARTICLES FIVE MICRONS IN SIZE, AND 85% GREASE PARTICLES SEVEN MICRONS IN SIZE AND LARGER, WITH A CORRESPONDING PRESSURE DROP NOT TO EXCEED 1.0 INCHES OF WATER GAUGE.

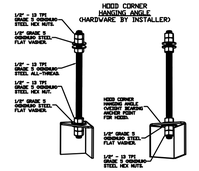
THE CAPTRATE GREASE-STOP SOLID WAS TESTED TO ASTM STANDARD ASTM F2519-05. MANUFACTURER APPROVED FOR USE IN SOLID FUEL APPLICATIONS AS A SPARK ARRESTER.




CAPTRATE FILTERS ARE BUILT IN COMPLIANCE WITH.
NFPA #96.
NSF STANDARD #2.
UL STANDARD #1046.
INT. MECH. CODE (IMC).
ULC-S649.

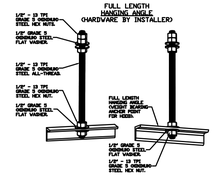
PATENT NUMBERS

EXHAUST HOODS ND-2/BD-2/SND-2 (CANADA) - CA PATENT 2520435 C.




ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 OMNIMUMO ALL-THREAD SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 OMNIMUMO STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 OMNIMUMO HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION BENEATH HOOD HANGING ANGLES AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

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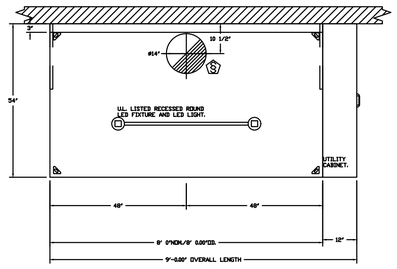
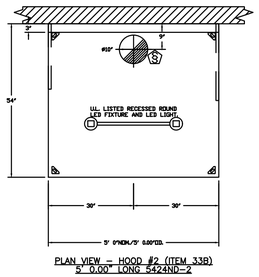
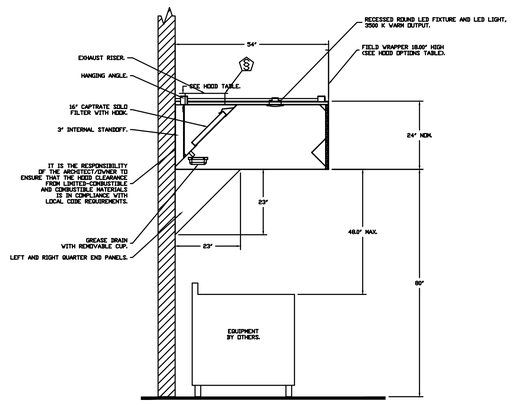


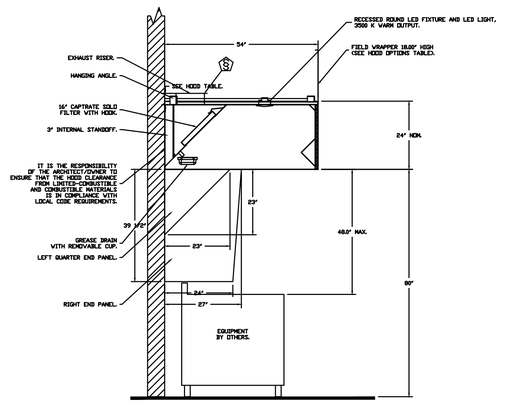

PLAN VIEW – HOOD #1 (ITEM 33A)
8' 0.00" LONG 5424ND-2




PLAN VIEW – HOOD #2 (ITEM 33B)
5' 0.00" LONG 5424ND-2




SECTION VIEW – MODEL 5424ND-2
HOOD – #1 (ITEM 33A)




SECTION VIEW – MODEL 5424ND-2
HOOD – #2 (ITEM 33B)

FOR QUESTIONS, CALL THE:
KANSAS CITY REGIONAL OFFICE
1126 SWIFT STREET, KANSAS CITY, MO 64116
PHONE: (816) 221-8575
FAX: (816) 221-8311

CUSTOMER APPROVAL TO MANUFACTURE:

Approved as Noted ☐
Approved with NO Exception Taken ☐
Revise and Resubmit ☐

SIGNATURE _____

Your Title _____ Date _____

**NOTE**

ALL WALLS AND STRUCTURES THAT COME WITHIN 18" OF HOOD MUST BE METAL STUDS AND SHEETROCK. WOOD STUDS OR ANY OTHER COMBUSTIBLE MATERIAL WITHIN 18" OF HOOD NO ALLOWED.

**NOTE**

HOOD MANUFACTURER RECOMMENDS NO RETURNS OR 4-WAY DIFFUSERS WITHIN 10 FEET OF HOOD IN ALL DIRECTION.

**NOTE**

MAKEUP AIR SHALL BE DELIVERED INTO SPACE IN MANNER THAT WILL NOT DISRUPT HOODS ABILITY TO CAPTURE AND CONTAIN.

**REVISIONS**

| | DESCRIPTION | DATE: |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |

CAPTIVE-AIRE

HBT Foodservice
104 W 9th St Suite 204, Kansas City, MO 64105 PHONE: (816) 221-8575 FAX: (816) 221-8311 EMAIL: reg68@captiveaire.com
www.captiveaire.com

Fredd's - Independence, MO
INDEPENDENCE, MO, 64052

**DATE:** 2/23/2023

**DWG.#:** 5873095

**DRAWN BY:** michael.co

**SCALE:** 1/2" = 1'-0"

**MASTER DRAWING**

**SHEET NO.** 1

BC PROJECT #: 23315
MISSOURI PE COA #2009003629



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

GLMV ARCHITECTURE
1526 E. Douglas, Wichita, KS 67211
Tel: (316) 265-9367
www.glmv.com

**FREDDY'S FROZEN CUSTARD**
**INDEPENDENCE CENTER**
**INDEPENDENCE, MO**

11/16/2023

STATE OF MISSOURI REGISTERED PROFESSIONAL ENGINEER
ERIK B. KNUDSEN
NUMBER PE-2004026504

02132R23003

PLAN SET REVISION
1 9/22/23 CITY RTC
2 10/31/23 CITY RTC
4 11/17/23 BID SET

CONTRACT DATE 08.08.2023

SHEET NO.
MECHANICAL HOOD PLANS
M300

## EXHAUST FAN INFORMATION – JOB#5873095

| FAN UNIT NO | TAG | QTY | FAN UNIT MODEL # | MANUFACTURER | CFM | ESP | RPM | MOTOR ENCL | HP | BHP | PHASE | VOLT | FLA | DISCHARGE VELOCITY | WEIGHT (LBS) | SONES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ITEM 74.1 | 1 | CASRE18DD | CAPTIVEAIRE | 1600 | 1.400 | 1105 | EDP_PREMIUM | 1.000 | 0.6270 | 3 | 208 | 3.8 | 928 FPM | 282 | 15.7 |
| 2 | ITEM 74.2 | 1 | DU50HFA | CAPTIVEAIRE | 775 | 1.250 | 1532 | TEAO-ECM | 0.500 | 0.3950 | 1 | 115 | 6.3 | 295 FPM | 102 | 16.4 |

## DOAS/RTU FAN SCHEDULE – JOB#5873095

| FAN INFORMATION | | | | | | | | | | ELECTRICAL INFORMATION | | | | | COOLING INFORMATION | | | | | | | | | REHEAT INFORMATION | | | | MOISTURE REMOVAL RATE | GAS HEAT INFORMATION | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | OUTSIDE AIR | | MIXED AIR | | LEAVING AIR | | CAPACITY | | | DISCHARGE | | CAPACITY | | | GAS TYPE | INPUT BTUs | OUTPUT BTUs | TEMP RISE | REQUIRED INPUT GAS PRESSURE | |
| FAN UNIT NO | TAG | QTY | DOAS/RTU MODEL # | MANUFACTURER | BLOWER | RETURN AIR CFM | MAX OUTSIDE AIR CFM | TOTAL CFM | WEIGHT (LBS) | ESP | HP | PHASE | VOLT | MCA | MOCP | DB | WB | DB | WB | DB | WB | DP | TOTAL | SENS. | IEER | ISMRE | DB | WB | DESIRED | MAX | | | | | | |
| 3 | DOAS-1 | 1 | CASRTU3-1300-15-1ST | CAPTIVEAIRE | 15P-3 | 0 | 2375 | 2375 | 2473 | 0.500 | 1.50 | 3 | 208 | 57.1A | 60A | 86.7°F | 79.0°F | 86.7°F | 79.0°F | 58.3°F | 56.5°F | 55.4°F | 186.0 MBH | 70.1 MBH | 18.8 | 5.7 | 70.0°F | 60.8°F | 30.1 MBH | 129.6 MBH | 104.3 LBS/HR | NATURAL | 246028 | 199283 | 71°F | 7 IN. W.C. – 14 IN. W.C. | 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15 |

NOTES:
1. INVERTER SCROLL COMPRESSOR WITH INTEGRATED OIL SENSOR. DIGITAL OR STAGED SCROLL NOT AN APPROVED EQUAL
2. DIRECT DRIVE PLENUM BLOWER. BELT DRIVEN BLOWERS ARE NOT ACCEPTABLE
3. INTEGRATED MONITORING VIA CELLULAR CONNECTION BY MANUFACTURER
4. REFRIGERATION PRESSURE MONITORING ON HIGH AND LOW PRESSURE SIDE OF SYSTEM INCLUDED THROUGH DIGITAL INTERFACE
5. EC MOTOR CONDENSING FANS
6. ELECTRONIC EXPANSION VALVE. TXV NOT ACCEPTABLE
7. SUCTION LINE ACCUMULATOR
8. FACTORY COMMISSIONING WITH 5 YEAR PARTS WARRANTY. 25 YEAR WARRANTY ON STAINLESS STEEL HEAT EXCHANGER
9. AVERAGING INTAKE, EVAP AND DISCHARGE TEMPERATURE SENSORS (DISCHARGE SENSOR TO BE FACTORY MOUNTED WITHIN UNIT)
10. 2" EXTERIOR DUAL-WALL CONSTRUCTION W/ R-13 INSULATION-MINIMUM 20GA EXTERIOR W/ 14GA BASE
11. 81% EFFICIENT FURNACE, WITH MODULATING INDUCER TO MAINTAIN CONSTANT COMBUSTION EFFICIENCY ACROSS FIRING RANGE. 64 TURNDOWN WITH NG AND 51 TURNDOWN WITH LP
12. SUPPLY CFM MONITORING INTEGRAL TO UNIT WITH CFM MEASUREMENT INCLUDED THROUGH DIGITAL INTERFACE
13. FULLY MODULATING HOT GAS REHEAT
14. HAIL GUARD FOR CONDENSING COIL
15. DOWN DISCHARGE/DOWN RETURN

## FAN OPTIONS

| FAN UNIT NO | TAG | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | ITEM 74.1 | 1 | UTILITY SET GREASE CUP |
| | | 1 | RE18 – DISCHARGE EXTENSION ASSEMBLY WITH HARDWARE |
| | | 1 | 2 YEAR PARTS WARRANTY |
| 2 | ITEM 74.2 | 1 | GREASE BOX |
| | | 1 | UPBLAST FAN WHEEL ACCESS PORT |
| | | 1 | 36" TALL STRAIGHT WIND BAND EXTENSION 13 (SHIPS LOOSE) |
| | | 1 | GUY LINE EYE BOLTS – USED FOR 3 GUY LINE TIE OFF POINTS |
| | | 1 | ECM WIRING PACKAGE – PWM SIGNAL FROM ECPMED PREVIRE (TELCO MOTOR), CCW ROTATION |
| | | 1 | 2 YEAR PARTS WARRANTY |
| 3 | DOAS-1 | 1 | INLET PRESSURE GAUGE, 0-35" |
| | | 1 | MANIFOLD PRESSURE GAUGE, 0 TO 10" WC, 1 FURNACE |
| | | 1 | RTU TOTAL CFM MONITORING |
| | | 1 | SHIP LOOSE GAS STRAINER 1" |
| | | 1 | SINGLE POINT ELECTRICAL CONNECTION FOR RTU. 750VA TRANSFORMER USED. IF A NON-DCV PREVIRE CONTROLS THIS UNIT, THE 828, 847, "MA", OR "E2" PREVIRE OPTION MUST BE SELECTED. DOES NOT PROVIDE SUPPLY STARTER IN PREVIRE |
| | | 1 | CASLINK BUILDING MONITORING SYSTEM – INTERNET OR CELLULAR CONNECTION REQUIRED |
| | | 1 | RTU3 DOWN DISCHARGE |
| | | 1 | 2" MERV 13 FILTERS FOR RTU3 (QTY. 4) |
| | | 1 | 2" MERV 8 FILTERS FOR RTU3 (QTY. 4) |
| | | 1 | OVERHEAT STAT |
| | | 1 | VFD FACTORY MOUNTED AND WIRED IN RTU COMMERCIAL CONTROL VESTIBULE |
| | | 1 | RTU3 CURB DUCT HANGER |
| | | 1 | RTU3 DOWN RETURN |
| | | 1 | 24VAC FIRE INPUT |
| | | 1 | RTU RETURN MOUNTED SMOKE DETECTOR AND SAMPLING TUBE – FACTORY INSTALLED |
| | | 1 | OCCUPIED SCHEDULING |
| | | 1 | CLOGGED FILTER SWITCH – NOTIFICATION ON HMI |
| | | 1 | 15 TON MODULATING COOLING OPTION, 208/230V. R410A REFRIGERANT, VARIABLE SPEED COMPRESSOR, ECM CONDENSING FANS |
| | | 1 | 15 TON MODULATING REHEAT OPTION – SPACE DEWPOINT CONTROL |
| | | 1 | RTU INTAKE/RETURN DAMPER – MANUAL CONTROL VIA HMI |
| | | 1 | RTU3 HAIL GUARD |
| | | 1 | FREEZESTAT |
| | | 1 | VAV PACKAGE W/ 0-10VDC INPUT CONTROL (571 VFD INCLUDED) |
| | | 1 | 5 YEAR ENTIRE UNIT PARTS WARRANTY, 10 YEAR ENTIRE UNIT PARTS WARRANTY WITH REMOTE MONITORING AND CAPTIVEAIRE SERVICE CONTRACT, 25 YEAR STAINLESS STEEL FURNACE PARTS WARRANTY (SEE ADDITIONAL DETAILS) |

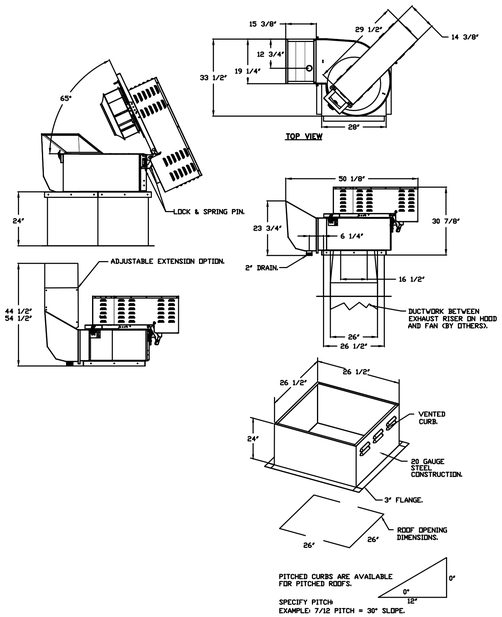
## FAN ACCESSORIES

| FAN UNIT NO | TAG | EXHAUST | | | SUPPLY | | | |
|---|---|---|---|---|---|---|---|---|
| | | GREASE CUP | GRAVITY DAMPER | WALL MOUNT | SIDE DISCHARGE | GRAVITY DAMPER | MOTORIZED DAMPER | WALL MOUNT |
| 1 | ITEM 74.1 | YES | | | | | | |
| 2 | ITEM 74.2 | YES | | | | | | |

## CURB ASSEMBLIES

| NO | ON FAN | TAG | WEIGHT | ITEM | SIZE |
|---|---|---|---|---|---|
| 1 | # 1 | ITEM 74.1 | 30 LBS | CURB | 26.500"W X 26.500"L X 24.000"H ALONG LENGTH, RIGHT VENTED. |
| 2 | # 2 | ITEM 74.2 | 31 LBS | CURB | 19.500"W X 19.500"L X 20.000"H ALONG LENGTH, RIGHT VENTED HINGED. |
| 3 | # 3 | DOAS-1 | 104 LBS | CURB | 59.500"W X 91.000"L X 14.000"H ALONG WIDTH, RIGHT INSULATED. |

FAN #1 CASRE18DD – EXHAUST FAN (ITEM 74.1)



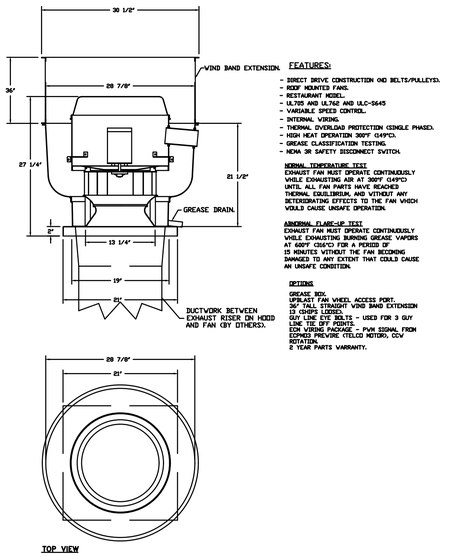

**FEATURES:**
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL762 AND ULC-S645.
- HIGH HEAT OPERATION DIRECT DRIVE 300°F (149°C).
- HEAT SLINGER.
- GREASE CLASSIFICATION TESTING.
- TILT OUT WHEEL.
- LOCKING PIN FOR POWER PACK.
- MOTOR WEATHER COVER.
- INTERLOCKED DISCONNECT SVITCH.
- NEMA 4X SAFETY DISCONNECT SVITCH.

NORMAL TEMPERATURE TEST DIRECT DRIVE
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

ABNORMAL FLARE-UP TEST BELT & DIRECT DRIVE
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

OPTIONS
UTILITY SET GREASE CUP.
RE18 – DISCHARGE EXTENSION ASSEMBLY WITH HARDWARE.
2 YEAR PARTS WARRANTY.

FAN #2 DU50HFA – EXHAUST FAN (ITEM 74.2)

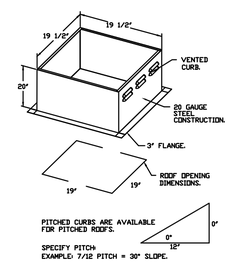


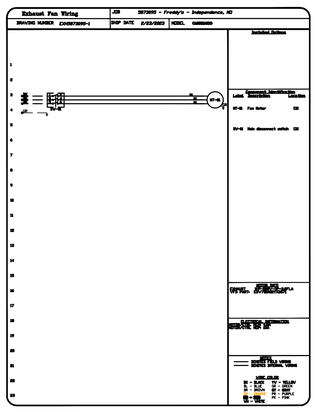

FEATURES:
- DIRECT DRIVE CONSTRUCTION AND BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT SVITCH.

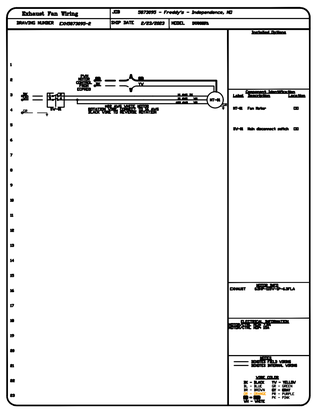
NORMAL TEMPERATURE TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

ABNORMAL FLARE-UP TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

OPTIONS
GREASE BOX.
UPBLAST FAN WHEEL ACCESS PORT.
36" TALL STRAIGHT WIND BAND EXTENSION 13 (SHIPS LOOSE)
GUY LINE EYE BOLTS – USED FOR 3 GUY LINE TIE OFF POINTS
ECM WIRING PACKAGE – PWM SIGNAL FROM ECPMED PREVIRE (TELCO MOTOR), CCW ROTATION.
2 YEAR PARTS WARRANTY.





CAPTIVEAIRE
HBT Foodservice
www.captiveaire.com
104 W 9th St Suite 204, Kansas City, MO, 64105 PHONE: (816) 221-8575 FAX: (816) 221-8311 EMAIL: reg98@captiveaire.com


**REVISIONS**

| | DESCRIPTION | DATE: |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |

Freddy's – Independence, MO
INDEPENDENCE, MO, 64052

**DATE:** 2/23/2023

**DWG.#:** 5873095

**DRAWN BY:** michael.co

**SCALE:** 1/2" = 1'–0"

**MASTER DRAWING**

**SHEET NO.** 2


GLMV ARCHITECTURE
1525 E. Douglas, Wichita, KS 67211
Tel: (316) 265-9367
www.glmv.com


**FREDDY'S FROZEN CUSTARD**
**INDEPENDENCE CENTER**
**INDEPENDENCE, MO**

11/16/2023

STATE OF MISSOURI
ERIK B. KNUDSEN
NUMBER PE-2004026504
REGISTERED PROFESSIONAL ENGINEER

02132R23003

PLAN SET REVISION
1 9/22/23 CITY RTC
2 10/31/23 CITY RTC
4 11/17/23 BID SET

CONTRACT DATE 08.08.2023

SHEET NO.
MECHANICAL HOOD PLANS
M400

BC PROJECT #: 23315
MISSOURI PE COA #2009003629



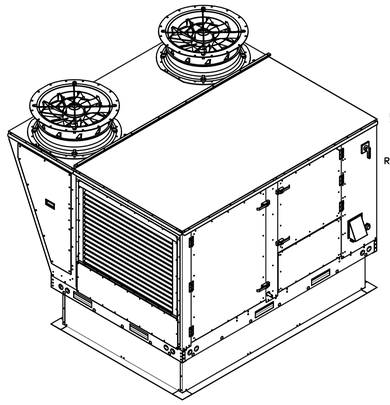

BC ENGINEERS INCORPORATED
5720 Reeder Shawnee, KS 66203 (913)262-1772

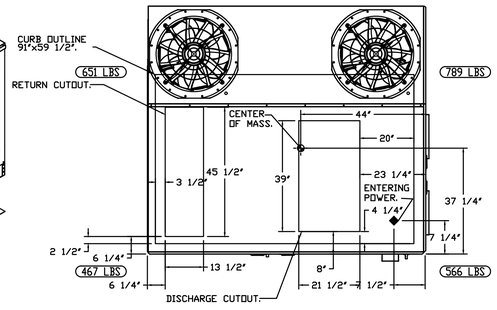
## FAN #3 CASRTU3-I.300-15-15T - HEATER (DOAS-1)

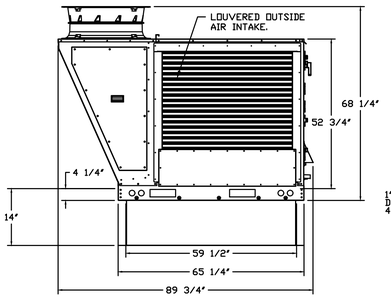
NOTES:

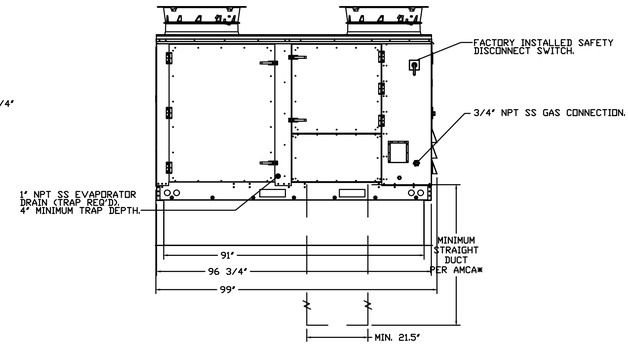
1. DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
2. ( ) DENOTES CORNER WEIGHT.
3. ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.

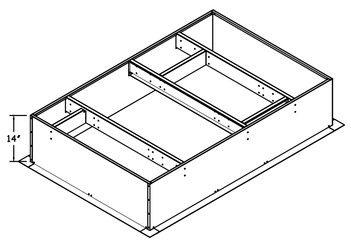
*NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 201. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE THROAT/SQUARE BACK ELBOWS SHOULD NOT BE USED. ANY TRANSITION AND/OR TURNS IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT. SYSTEM EFFECT WILL DRASTICALLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT.
SUGGESTED STRAIGHT DUCT SIZE IS 21.5" x 39".

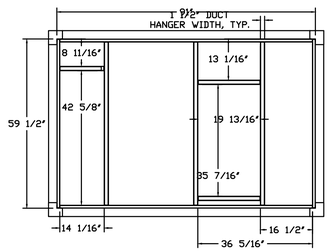


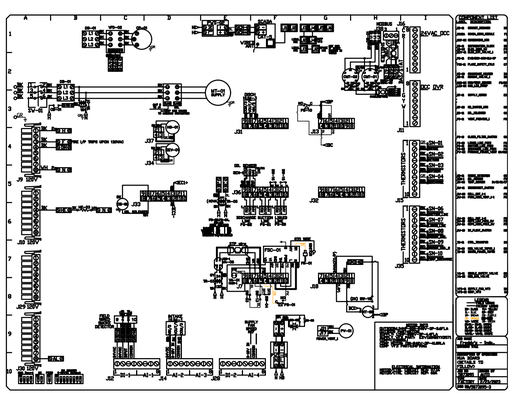


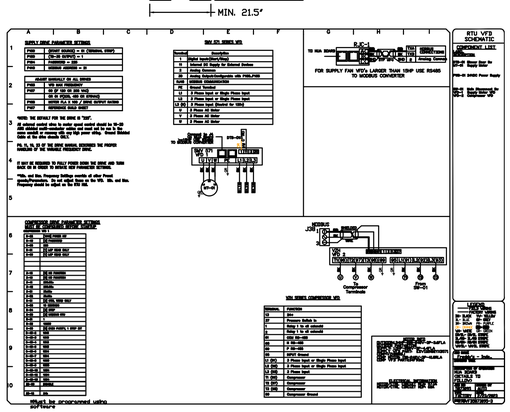



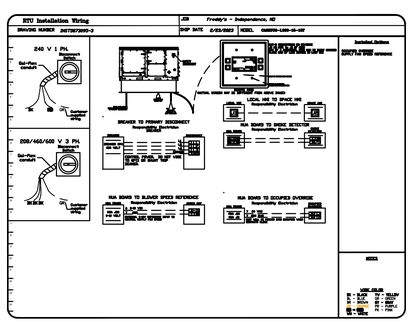








| REVISIONS | |
|---|---|
| DESCRIPTION | DATE: |
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| | |

CAPTIVE-AIRE
HBT Foodservice
104 W 9th St Suite 204, Kansas City, MO, 64105 PHONE: (816) 221-3575 FAX: (816) 221-4311 EMAIL: regM@captiveaire.com
www.captiveaire.com

Freddy's - Independence, MO
INDEPENDENCE, MO, 64052

**DATE:** 2/23/2023

**DWG.#:** 5873095

**DRAWN BY:** michael.co

**SCALE:** 1/2" = 1'-0"

**MASTER DRAWING**

**SHEET NO.** 3

BC PROJECT #: 23315
MISSOURI PE COA #2009003629



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

GLMV ARCHITECTURE
1525 E. Douglas, Wichita, KS 67211
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**FREDDY'S FROZEN CUSTARD**
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**INDEPENDENCE, MO**

**11/16/2023**

STATE OF MISSOURI
ERIK B. KNUDSEN
NUMBER PE-2004026504
REGISTERED PROFESSIONAL ENGINEER

02132R23003

PLAN SET REVISION
1 9/22/23 CITY RTC
2 10/31/23 CITY RTC
3 11/17/23 BID SET

CONTRACT DATE 08.08.2023

SHEET NO.
MECHANICAL HOOD PLANS
**M500**

*ELECTRICAL PACKAGE - JOB#5873095*

| NO | TAG | PACKAGE # | LOCATION | SWITCHES | | OPTION | FANS CONTROLLED | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LOCATION | QUANTITY | | FAN TAG | TYPE | # | HP | VOLTS | FLA |
| 1 | ECP-1 | DCV-2011 | UTILITY CABINET RIGHT | UTILITY CABINET RIGHT HOOD # 1 | 1 LIGHT 1 FAN | SMART CONTROLS DCV | ITEM 74.1 | EXHAUST | 3 | 1.000 | 208 | 3.8 |
| | | | | | | | ITEM 74.2 | EXHAUST | 1 | 0.500 | 115 | 6.3 |

JOB NO FREDDY'S

MODEL NUMBER DCV-2011

JOB NAME Freddy's - Wiring Diagram

DRAWN BY

DATE 9/23/2021

SCHEMATIC TYPE INSTALL

DWG NO ECP #1-1

**DESCRIPTION OF OPERATION:**
Demand Control Ventilation, w/ control for 2 Exhaust Fans, Exhaust on in Fire, Lights out in Fire, Fans modulate based on duct temperature. DIVERTER DUTY 3 PHASE MOTOR REQUIRES FOR USE WITH VFD. Room temperature sensor shipped loose for Field installation.Verify distance between VFD and Motors; additional cost could apply if distance exceeds 50 feet.

## BREAKER PANEL TO PRIMARY CONTROL PANEL
Responsibility: Electrician

BREAKER SIZE SHOWN IS THE MAXIMUM ALLOWED

BREAKER PANEL

BREAKER 1PH
120 V
15 A

CONTROL POWER. DO NOT WIRE TO SHUNT TRIP BREAKER.

1ST HOOD LIGHT BREAKER SHARED W/ CONTROL POWER SWITCH #1

BREAKER 3PH
208 V
MCA= 4.8 A
MOCP= 15 A

ITEM 74.1 SM-1
WIRE TO VFD QUICK CONNECTOR

PRIMARY CONTROL PANEL
Hot1
Neutral
Ground
HC
NC
GND
LINE
L1
L2
L3
GND

## BREAKER PANEL TO FANS
Responsibility: Electrician

BREAKER PANEL

BREAKER 1PH
115V
MCA= 7.9A
MOCP= 15A

ITEM 74.2

FANS
HOT
NEUTRAL
GROUND
POWER TO ECM FANS

## CONTROL PANEL TO FANS
Responsibility: Electrician

PRIMARY PANEL

Load Wiring
SM-1
WIRE TO VFD QUICK CONNECTOR

PWM SPEED SIGNAL
ECM-01 CONTROL PANEL TO ECM

FANS
ITEM 74.1
WIRE TO DISCONNECT

FAN 01

MUST HAVE ITS OWN CONDUIT DO NOT SHARE CONDUIT!

FEED STP THROUGH INNER COOLING TUBE. ALLOW FOR SHOULDER SLACK ON STP FOR PROPER HINGING. EXHAUST ONLY. NOTE: PWM SIGNAL IS POLARITY SENSITIVE.

RD TO RD NIDEC MOTOR
BK TO GR TELCO MOTOR
BK TO YW ZIEHL MOTOR
BK TO BK

ITEM 74.2
ECM-01
FAN 02

## CONTROL PANEL TO ACCESSORY ITEMS
Responsibility: Electrician

CONTROL PANEL TO FIRE SYSTEM MICROSWITCH

WIRE C1 TO COMMON (C) WIRE AR1 TO NORMALLY CLOSED (C2). C1 TO AR1 SHOULD HAVE CONTINUITY WHEN ARMED.

HOOD PANEL TO SWITCHES

ALL SWITCHES FACTORY WIRED CAT-5 CONNECTION

HOOD PANEL TO HOOD LIGHTS 1400 W MAX

WIRE TO J-BOX ON TOP OF HOOD

COMPONENT
MICROSWITCH 1
NO
C
NC
LIGHTS
BLACK
WHITE
GREEN
HOOD LIGHTS 1

## CONTROL PANEL TO ACCESSORY ITEMS
Responsibility: Electrician

CONTROL PANEL TO GAS VALVE 120V ONLY

HOOD PANEL SIGNAL FOR EXTERNAL SHUNT TRIP

ONLY ENERGIZED THROUGH LCD HMI WHEN FIRE SYSTEM ARMED.

ST TERMINAL IS ENERGIZED IN FIRE CONDITION.

HOT_TO_CONTACTOR_COIL
NEUTRAL_TO_CONTACTOR_COIL

HOT TO GAS VALVE
NEUTRAL
HOT TO SHUNT COIL
NEUTRAL FROM SHUNT COIL

COMPONENT
GAS SOLENOID
SHUNT COIL
CONTACTOR_COIL

KS
N1

## Low Voltage (Factory supplied 18/2 Wire)

## CONTROL PANEL TO ACCESSORY ITEMS
Responsibility: Electrician

CONTROL PANEL TO KITCHEN TEMP SENSOR

WIRE TO CONTROL BOARD. SENSOR MOUNTED IN ROOM AWAY FROM HEAT SOURCES. SEE MANUAL

CONTROL PANEL TO DUCT SENSOR

FACTORY WIRED TEMPERATURE SENSOR. MOUNTED IN EXHAUST DUCT

CONTROL PANEL TO DUCT SENSOR

WIRE TO CONTROL BOARD. SENSOR MOUNTED IN EXHAUST DUCT

COMPONENT
ROOM TEMP
HOOD 1 RISER 1
HOOD 2 RISER 1

## Low Voltage (Field supplied 18/8 Wire)

## CONTROL PANEL TO ACCESSORY ITEMS
Responsibility: Electrician / Low Voltage Contractor

DCC OVERRIDE TO DDAS

OCCUPIED OVERRIDE 24VAC. WIRE TO DDAS

FIRE STATE TO DDAS

ANALOG OUTPUT REFERENCE VOLTAGE. WIRE TO DDAS.

SPEED OUTPUT TO DDAS

ANALOG OUTPUT REFERENCE VOLTAGE. WIRE TO DDAS.

COMPONENT
J11 - (7)
J16 - (7)
S31
S33
J28 - (6)
J28 - (7)

## Low Voltage (Factory supplied CAT-5 Cable)

## CONTROL PANEL TO ACCESSORY ITEMS
Responsibility: Electrician / Low Voltage Contractor

DDAS HMI1 TO HMI2 / DFFICE

ALL SWITCHES FIELD WIRED CAT-5 CONNECTION

HMI2 / OFFICE TO HMI3 / KITCHEN

ALL SWITCHES FIELD WIRED CAT-5 CONNECTION

COMPONENT
J2
J2

NOTE: CAPTIVEAIRE OR FIRE SUPPRESSION COMPANY IS NOT RESPONSIBLE FOR ANY FIELD WIRING. FIELD WIRING SHALL BE COMPLETED BY ELECTRICIAN OR LOW VOLTAGE CONTRACTOR.

UNLESS SPECIFIED OTHERWISE, ALL FACTORY AC WIRING 16 AVG. ALL FACTORY DC WIRING 18 AVG.

J9 120V

CONTROL INPUT 120V
H1=LINE, N1=NEUTRAL.
15A BREAKER. DO NOT CONNECT TO SHUNT TRIP BREAKER. SEE INSTALLATION SCHEMATIC FOR ADDITIONAL REQ. TERMINAL GAS USED FOR 120V POWERED GAS VALVES ONLY

PANEL LID

J7 120V

BK 14AVG
RD-1
PR-1
HOOD LIGHTS
JUMPER

MAKE UP AIR INTERLOCK. JUMPER/JUMPER
ECP903 ECP903

FAN
PANEL COOLING

FAN
SECONDARY PANEL COOLING IF NECESSARY

NOTE: IF VFD HAS 1PH 240V INPUT, USE L1 & L2 ONLY. IF VFD HAS 1PH 120V INPUT, USE L1 & N ONLY.

NOTE: All items on ECP903 J3 line to be daisy chained from one component to the next, with EDL150A at end of line. Place PN EDL120A in empty RJ45 port.
ECP903/DAISY CHAIN

SM-1

MOTOR POWER CIRCUITS. SEE INSTALLATION DIAGRAM FOR FIELD WIRING REQUIREMENTS.

3 PH
208 V
15 A
14 AVG

SM-1
MTR-ITEM 74.1
FLA-3.8
HP-1.000
P100-93
P100N/A
P100-92
P103677.4
P107-00
P109-50
P133-N/A
P150-61
P167-627.4
P167-628.5
P410-11

VFD ESV753N02YX0571

DRY CONTACTS (SHOWN DE-ENERGIZED)
14 AVG RA-1-1 — ON/OFF WITH FUSE
14 AVG RA-2-1 — ON/OFF WITH SUP
14 AVG RA-2-2

SC-20 x 18 x 8.62 BOX

**FACTORY WIRING SCHEMATIC CIRCUIT BOARDS ECPM03**
DCV Rev. 2.14.00
HMI Rev. 2.14.00

**COMPONENT LIST**

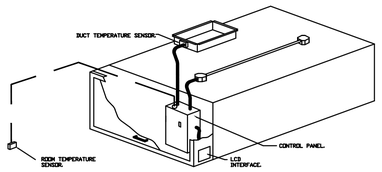
| LABEL | DESCRIPTION |
|---|---|
| ST-x | Starter Contactor |
| OL-x | Overload Relay |
| C-x | Contactor Relay |
| PS-1 | Power Sup, 24VDC PMMDR5-24A-3C |
| RA-x | 120V Relay 3PST PRM3UB05A6 |
| RR-x | 24VDC Light Relay PRM3UB05A6 |
| TS-x | Duct Thermostat PRAVD-H0F-1F-EXPL |

**LEGEND**
FIELD WIRING — FACTORY WIRING
BK- BLACK YW- YELLOW
BL- BLUE GY- GREY
BR- BROWN PR- PURPLE
OR- ORANGE RD- RED
WH- WHITE
BK/BL- BK/BL STRIPE
BL/RD- BL/RD STRIPE
RD/GY- RD/GY STRIPE
WH/BL- WH/BL STRIPE

JOB NAME Freddy's - Inden...
DRAWING TITLE DCV-2011
DESCRIPTION OF OPERATION
Demand Control Ventilation, w/ control for 2 Exhaust Fans, Exhaust on in Fire, Lights out in Fire, Fans modulate based on duct temperature. DIVERTER DUTY 3 PHASE MOTOR REQUIRES FOR USE WITH VFD. Room temperature sensor shipped loose for field installation.Verify distance between VFD and Motors; additional cost could apply if distance exceeds 50 feet.
REVISIONS
DESCRIPTION | DATE
DRAWN BY
CHECKED BY
FACTORY 2/23/2023
ECP #1-2

## DEMAND CONTROL VENTILATION HOOD CONTROL PANEL SPECIFICATIONS:

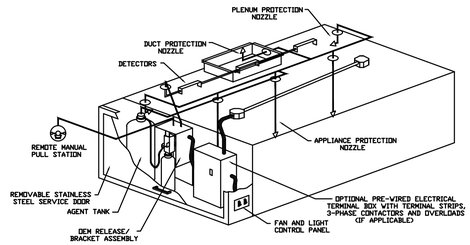
- CONTROLS SHALL BE LISTED BY ETL (UL 508A) AND SHALL COMPLY WITH DEMAND VENTILATION SYSTEM TURNDOWN REQUIREMENTS OUTLINED IN IECC 403.2.8 (2015).
- THE CONTROL ENCLOSURE SHALL BE NEMA 1 RATED AND LISTED FOR INSTALLATION INSIDE OF THE EXHAUST HOOD UTILITY CABINET. THE CONTROL ENCLOSURE MAY BE CONSTRUCTED OF STAINLESS STEEL OR PAINTED STEEL.
- TEMPERATURE PROBE(S) LOCATED IN THE EXHAUST DUCT RISER(S) SHALL BE CONSTRUCTED OF STAINLESS STEEL.
- A DIGITAL CONTROLLER SHALL BE PROVIDED TO ACTIVATE THE HOOD EXHAUST FANS DYNAMICALLY BASED ON A FIXED DIFFERENTIAL BETWEEN THE AMBIENT AND DUCT TEMPERATURES SENSORS. THIS FUNCTION SHALL MEET THE REQUIREMENTS OF IMC 507.1.1.
- A DIGITAL CONTROLLER SHALL PROVIDE ADJUSTABLE HYSTERESIS SETTINGS TO PREVENT CYCLING OF THE FANS AFTER THE COOKING APPLIANCES HAVE BEEN TURNED OFF AND/OR THE HEAT IN THE EXHAUST SYSTEM IS REDUCED.
- A DIGITAL CONTROLLER SHALL PROVIDE AN ADJUSTABLE MINIMUM FAN RUN-TIME SETTING TO PREVENT FAN CYCLING.
- VARIABLE FREQUENCY DRIVES (VFDS) SHALL BE PROVIDED FOR FANS AS REQUIRED. THE DIGITAL CONTROLLER SHALL MODULATE THE VFDS BETWEEN A MINIMUM SETPOINT AND A MAXIMUM SETPOINT ON DEMAND. THE DUCT TEMPERATURE SENSOR INPUT(S) TO THE DIGITAL CONTROLLER SHALL BE USED TO CALCULATE THE SPEED REFERENCE SIGNAL.
- THE VFD SPEED RANGE OF OPERATION SHALL BE FROM 0% TO 100% FOR THE SYSTEM, WITH THE ACTUAL MINIMUM SPEED SET AS REQUIRED TO MEET MINIMUM VENTILATION REQUIREMENTS.
- AN INTERNAL ALGORITHM TO THE DIGITAL CONTROLLER SHALL MODULATE SUPPLY FAN VFD SPEED PROPORTIONAL TO ALL EXHAUST FANS THAT ARE LOCATED IN THE SAME FAN GROUP AS THE SUPPLY FAN.
- THE SYSTEM SHALL OPERATE IN PREP MODE DURING LIGHT COOKING LOAD OR COOL DOWN MODE WHEN SUFFICIENT HEAT REMAINS UNDERNEATH THE HOOD SYSTEM AFTER COOKING OPERATIONS HAVE COMPLETED. OPERATION DURING EITHER OF THESE PERIODS WILL DISABLE THE SUPPLY FANS AND PROVIDE AN EXHAUST FAN SPEED THAT IS EQUAL TO THE MINIMUM VENTILATION REQUIREMENT.
- A DIGITAL CONTROLLER SHALL DISABLE THE SUPPLY FAN(S), ACTIVATE THE EXHAUST FAN(S), ACTIVATE THE APPLIANCE SHUNT TRIP, AND DISABLE AN ELECTRIC GAS VALVE AUTOMATICALLY WHEN FIRE CONDITION IS DETECTED ON A COVERED HOOD.
- A DIGITAL CONTROLLER SHALL ALLOW FOR EXTERNAL BMS FAN CONTROL VIA DRY CONTACT (EXTERNAL CONTROL SHALL NOT OVERRIDE FAN OPERATION LOGIC AS REQUIRED BY CODE).
- AN LCD INTERFACE SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
  A. ON/OFF PUSH BUTTON FAN & LIGHT SWITCH ACTIVATION.
  B. INTEGRATED GAS VALVE RESET FOR ELECTRONIC GAS VALVES (NO RESET RELAY REQUIRED).
  C. VFD FAULT DISPLAY WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  D. DUCT TEMPERATURE SENSOR FAILURE DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  E. MIS-WIRED DUCT TEMPERATURE SENSOR DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  F. A SINGLE LOW VOLTAGE CAT-5 RJ45 WIRING CONNECTION.
  G. AN ENERGY SAVINGS INDICATOR THAT UTILIZES MEASURED KWH FROM THE VFDS.




*TYPICAL HOOD CONTROL PANEL INSTALLATION*

## SEQUENCE OF OPERATIONS:
THE HOOD CONTROL PANEL IS CAPABLE OF OPERATING IN ONE OR MORE OF THE FOLLOWING STATES AT ANY GIVEN TIME:

- AUTOMATIC: THE SYSTEM OPERATES BASED ON THE DIFFERENTIAL BETWEEN ROOM TEMPERATURE AND THE TEMPERATURE AT THE HOOD CAVITY OR EXHAUST DUCT COLLAR. FANS ACTIVATE AT A CONFIGURABLE TEMPERATURE DIFFERENTIAL THRESHOLD. DEPENDING ON THE JOB CONFIGURATION EACH FAN ZONE CAN BE CONFIGURED AS STATIC OR DYNAMIC. THESE TERMS REFER TO WHETHER A VARIABLE MOTOR (SUCH AS EC MOTORS OR VFD DRIVEN MOTORS) MODULATE WITH TEMPERATURE. IF THE PANEL IS EQUIPPED WITH VARIABLE SPEED FANS AND THE ZONE IS DEFINED AS "DYNAMIC", THESE WILL MODULATE WITHIN A USER-DEFINED RANGE BASED ON THE TEMPERATURE DIFFERENTIAL. PANELS EQUIPPED WITH VARIABLE SPEED FANS AND A FAN ZONE DEFINED AS "STATIC", FANS WILL RUN AT A SET SPEED CALCULATED FOR THE DRIVE. DEMAND CONTROL VENTILATION SYSTEMS ARE CAPABLE OF MODULATING EXHAUST AND MAKE UP AIR FAN SPEEDS PER THE REQUIREMENTS OUTLINED IN IECC 403.2.8.
- MANUAL: THE SYSTEM OPERATES BASED ON HUMAN INPUT FROM AN HMI.
- SCHEDULE: A WEEKLY SCHEDULE CAN BE SET TO RUN FANS FOR A SPECIFIED PERIOD THROUGHOUT THE DAY. THERE ARE THREE OCCUPIED TIMES PER DAY TO ALLOW FOR THE USER TO SET UP A TIME THAT IS SUITABLE TO THEIR NEEDS. ANY TIME THAT IS WITHIN THE DEFINED OCCUPIED TIME, THE SYSTEM WILL RUN AT MODULATION MODE AND FOLLOW THE FAN PROCEDURE ALGORITHM BASED ON TEMPERATURE DURING THIS TIME. DURING UNOCCUPIED TIME, THE SYSTEM WILL HAVE AN EXTRA OFFSET TO PREVENT UNINTENDED ACTIVATION OF THE SYSTEM DURING A TIME WHERE THE SYSTEM IS NOT BEING OCCUPIED.
- OTHER: THE SYSTEM OPERATES BASED ON THE INPUT FROM AN EXTERNAL SOURCE (DDC, BMS OR HARD-WIRED INTERLOCK).
- FIRE: UPON ACTIVATION OF THE HOOD FIRE SUPPRESSION SYSTEM, THE EXHAUST FAN WILL COME ON OR CONTINUE TO TO RUN, THE HOOD MAKEUP AIR WILL SHUTDOWN, AND A SIGNAL WILL BE SENT FOR ACTIVATING THE SHUNT TRIP BREAKER PROVIDED BY THE ELECTRICIAN. FUEL GAS WILL SHUT OFF VIA A MECHANICAL/ELECTRICAL GAS VALVE ACTUATED BY THE HOOD FIRE SUPPRESSION SYSTEM.




*TYPICAL ANSUL R-102 SYSTEM LAYOUT*

## SPECIFICATIONS

THE RESTAURANT FIRE SUPPRESSION SYSTEM SHALL BE THE PRE-ENGINEERED TYPE WITH A FIXED NOZZLE AGENT DISTRIBUTION NETWORK. IT SHALL BE LISTED WITH UNDERWRITERS LABORATORIES, INC. (UL).

THE SYSTEM SHALL BE CAPABLE OF AUTOMATIC DETECTION AND ACTUATION WITH LOCAL OR REMOTE MANUAL ACTUATION. ACCESSORIES SHALL BE AVAILABLE FOR MECHANICAL OR ELECTRICAL GAS LINE SHUT-OFF APPLICATIONS.

THE EXTINGUISHING AGENT SHALL BE A POTASSIUM CARBONATE, POTASSIUM ACETATE-BASED FORMULATION DESIGNED FOR FLAME KNOCKDOWN AND SECUREMENT OF GREASE RELATED FIRES. IT SHALL BE AVAILABLE IN PLASTIC CONTAINERS WITH INSTRUCTIONS FOR LIQUID AGENT HANDLING AND USAGE.

THE REGULATED RELEASE MECHANISM SHALL BE COMPATIBLE WITH A FUSIBLE LINK DETECTION SYSTEM. THE FUSIBLE LINK SHALL BE SELECTED AND INSTALLED ACCORDING TO THE OPERATING TEMPERATURE IN THE VENTILATING SYSTEM. THE FUSIBLE LINK SHALL BE SUPPORTED BY A DETECTOR BRACKET/ LINKAGE ASSEMBLY.

**DATE:** 2/23/2023

**DWG.#:** 5873095

**DRAWN BY:** micha.el.co

**SCALE:** 1/2" = 1'-0"

**MASTER DRAWING**

**SHEET NO.** 4

BC PROJECT #: 23315
MISSOURI PE COA #2009003629



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Freddy's - Independence, MO
INDEPENDENCE, MO, 64052

11/16/2023
STATE OF MISSOURI
ERIK B. KNUDSEN
NUMBER PE-2004026504
REGISTERED PROFESSIONAL ENGINEER

02132R23003

PLAN SET REVISION
1 9/22/23 CITY RTC
2 10/31/23 CITY RTC
3 11/17/23 BID SET

CONTRACT DATE 08.08.2023

SHEET NO.
MECHANICAL HOOD PLANS
M600

FOR QUESTIONS, CALL THE
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## *DOAS/RTU FAN SCHEDULE – JOB#5453155*

| FAN INFORMATION | | | | | | | | | | ELECTRICAL INFORMATION | | | | | COOLING INFORMATION | | | | | | | | | | | HEAT INFORMATION | | | | | | | | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FAN UNIT NO | TAG | QTY | DOAS/RTU MODEL # | MANUFACTURER | BLOWER | RETURN AIR CFM | MAX OUTSIDE AIR CFM | TOTAL CFM | WEIGHT (LBS) | ESP | HP | PHASE | VOLT | MCA | MOCP | OUTSIDE AIR | | MIXED AIR | | LEAVING AIR | | | CAPACITY | | IEER | ISMRE | DISCHARGE | | CAPACITY | | MOISTURE REMOVAL RATE | GAS TYPE | INPUT BTUs | OUTPUT BTUs | TEMP RISE | | |
| | | | | | | | | | | | | | | | | DB | WB | DB | WB | DB | WB | DP | TOTAL | SENS. | | | DB | WB | DESIRED | MAX | | | | | | | |
| 1 | 12.5 TON | 1 | CASRTU3-1200-24-12.5T-DOAS | CAPTIVEAIRE | 24MF-3-RTU | 4100 | 900 | 5000 | 2406 | 0.890 | 5.00 | 3 | 208 | 68.8A | 80A | 85.4°F | 77.8°F | 76.9°F | 65.3°F | 55.1°F | 55.1°F | 55.2°F | 150.2 MBH | 113.2 MBH | 21.3 | 4.1 | 70.0°F | 60.6°F | 80.5 MBH | 101 MBH | 34.1 LBS/HR | NATURAL | 177778 | 144000 | 25°F | | 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18 |

NOTES:
1. INVERTER SCROLL COMPRESSOR WITH INTEGRATED OIL SENSOR. DIGITAL OR STAGED SCROLL NOT AN APPROVED EQUAL
2. DIRECT DRIVE PLENUM BLOWER. BELT DRIVEN BLOWERS ARE NOT ACCEPTABLE
3. INTEGRATED MONITORING VIA CELLULAR CONNECTION BY MANUFACTURER
4. REFRIGERATION PRESSURE MONITORING ON HIGH AND LOW PRESSURE SIDE OF SYSTEM INCLUDED THROUGH DIGITAL INTERFACE
5. EC MOTOR CONDENSING FANS
6. ELECTRONIC EXPANSION VALVE. TXV NOT ACCEPTABLE
7. SUCTION LINE ACCUMULATOR
8. FACTORY COMMISSIONING WITH 5 YEAR PARTS WARRANTY, 25 YEAR WARRANTY ON STAINLESS STEEL HEAT EXCHANGER
9. AVERAGING INTAKE, EVAP AND DISCHARGE TEMPERATURE SENSORS (DISCHARGE SENSOR TO BE FACTORY MOUNTED WITHIN UNIT)
10. 2" EXTERIOR DUAL-WALL CONSTRUCTION W/ R-13 INSULATION-MINIMUM 20GA EXTERIOR W/ 14GA BASE
11. 81% EFFICIENT FURNACE, WITH MODULATING INDUCER TO MAINTAIN CONSTANT COMBUSTION EFFICIENCY ACROSS FIRING RANGE. 6:1 TURNDOWN WITH NG AND 5:1 TURNDOWN WITH LP
12. SUPPLY CFM MONITORING INTEGRAL TO UNIT WITH CFM MEASUREMENT INCLUDED THROUGH DIGITAL INTERFACE
13. FULLY MODULATING HOT GAS REHEAT
14. 15 DEGREE LOW AMBIENT OPERATION
15. HAIL GUARD FOR CONDENSING COIL
16. RTU ECONOMIZER WITH FIXED ENTHALPY CONTROL
17. BAROMETRIC RELIEF DAMPER
18. DOWN DISCHARGE/DOWN RETURN

## *FAN OPTIONS*

| FAN UNIT NO | TAG | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 12.5 TON | 1 | INLET PRESSURE GAUGE, 0-5" |
| | | 1 | MANIFOLD PRESSURE GAUGE, 0 TO 10" WC, 1 FURNACE |
| | | 1 | RTU TOTAL CFM MONITORING |
| | | 1 | SHIP LOOSE GAS STRAINER 3/4" |
| | | 1 | SINGLE POINT ELECTRICAL CONNECTION FOR RTU. 750VA TRANSFORMER USED. IF A NON-DCV PREWIRE CONTROLS THIS UNIT, THE #28, #47, "MA", OR "E2" PREWIRE OPTION MUST BE SELECTED. DOES NOT PROVIDE SUPPLY STARTER IN PREWIRE |
| | | 1 | CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED |
| | | 1 | LOW AMBIENT COOLING OPERATION - DOWN TO 0F AMBIENT |
| | | 1 | RTU3 DOWN DISCHARGE |
| | | 1 | 2" MERV 13 FILTERS FOR RTU3 (QTY. 4) |
| | | 1 | 2" MERV 8 FILTERS FOR RTU3 (QTY. 4) |
| | | 1 | OVERHEAT STAT |
| | | 1 | VFD FACTORY MOUNTED AND WIRED IN RTU COMMERCIAL CONTROL VESTIBULE |
| | | 1 | 12.5 TON MODULATING COOLING OPTION, 208/230V. R410A REFRIGERANT, VARIABLE SPEED COMPRESSOR, ECM CONDENSING FANS |
| | | 1 | 12.5 TON MODULATING REHEAT OPTION - SPACE DEWPOINT CONTROL |
| | | 1 | REMOTE TEMPERATURE AND HUMIDITY SPACE SENSOR |
| | | 1 | RTU3 CURB DUCT HANGER |
| | | 1 | RTU RETURN MOUNTED SMOKE DETECTOR AND SAMPLING TUBE - FACTORY INSTALLED |
| | | 1 | OCCUPIED SCHEDULING |
| | | 1 | CLOGGED FILTER SWITCH - NOTIFICATION ON HMI |
| | | 1 | RTU3 CONVENIENCE OUTLET (GFCI), 15 AMP - REQUIRES SEPARATE 120V CONNECTION. INCLUDES RECEPTACLE, COVER AND J-BOX |
| | | 1 | RTU ECONOMIZER - FIXED ENTHALPY CONTROL |
| | | 1 | RTU3 ECONOMIZER BAROMETRIC RELIEF |
| | | 1 | RTU3 HAIL GUARD |
| | | 1 | RTU3 DOWN RETURN |
| | | 1 | VAV PACKAGE W/ MANUAL/DDC CONTROL (571 VFD INCLUDED) |
| | | 1 | RTU INTAKE/RETURN DAMPER - MANUAL CONTROL VIA HMI |
| | | 1 | 5 YEAR ENTIRE UNIT PARTS WARRANTY, 10 YEAR ENTIRE UNIT PARTS WARRANTY WITH REMOTE MONITORING AND CAPTIVEAIRE SERVICE CONTRACT, 25 YEAR STAINLESS STEEL FURNACE PARTS WARRANTY (SEE ADDITIONAL DETAILS) |

## *CURB ASSEMBLIES*

| NO | ON FAN | TAG | WEIGHT | ITEM | SIZE |
|---|---|---|---|---|---|
| 1 | # 1 | 12.5 TON | 78 LBS | CURB | 59.500"W X 91.000"L X 14.000"H ALONG WIDTH, RIGHT INSULATED. |

SYSTEM DESIGN VERIFICATION (SDV)

IF ORDERED, CAS SERVICE WILL PERFORM A SYSTEM DESIGN VERIFICATION (SDV) ONCE ALL EQUIPMENT HAS HAD A COMPLETE START UP PER THE OPERATION AND INSTALLATION MANUAL. TYPICALLY, THE SDV WILL BE PERFORMED AFTER ALL INSPECTIONS ARE COMPLETE.

ANY FIELD RELATED DISCREPANCIES THAT ARE DISCOVERED DURING THE SDV WILL BE BROUGHT TO THE ATTENTION OF THE GENERAL CONTRACTOR AND CORRESPONDING TRADES ON SITE. THESE ISSUES WILL BE DOCUMENTED AND FORWARDED TO THE APPROPRIATE SALES OFFICE. IF CAS SERVICE HAS TO RESOLVE A DISCREPANCY THAT IS A FIELD ISSUE, THE GENERAL CONTRACTOR WILL BE NOTIFIED AND BILLED FOR THE WORK. SHOULD A RETURN TRIP BE REQUIRED DUE TO ANY FIELD RELATED DISCREPANCY THAT CANNOT BE RESOLVED DURING THE SDV, THERE WILL BE ADDITIONAL TRIP CHARGES.

DURING THE SDV, CAS SERVICE WILL ADDRESS ANY DISCREPANCY THAT IS THE FAULT OF THE MANUFACTURER. SHOULD A RETURN TRIP BE REQUIRED, THE GENERAL CONTRACTOR AND APPROPRIATE SALES OFFICE WILL BE NOTIFIED. THERE WILL BE NO ADDITIONAL CHARGES FOR MANUFACTURER DISCREPANCIES.

REVISIONS

| | DESCRIPTION | DATE |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |

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Freddy's - Olathe RTU SWAP
11775 S Black Bob Rd,
Olathe, KS, 66062

**DATE:** 9/6/2022
**DWG.#:** 5453155
**DRAWN BY:** michael.co
**SCALE:** 3/4" = 1'-0"
**MASTER DRAWING**
**SHEET NO.** 1

BC PROJECT #: 23315
MISSOURI PE COA #2009003629



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11/16/2023
STATE OF MISSOURI
ERIK B. KNUDSEN
NUMBER PE-2004026504
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02132R23003

PLAN SET REVISION
1 9/22/23 CITY RTC
2 10/31/23 CITY RTC
4 11/17/23 BID SET

CONTRACT DATE
08.08.2023

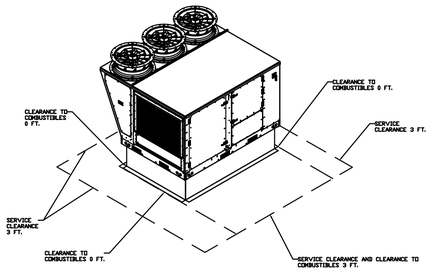
SHEET NO.
MECHANICAL EQUIPMENT PLANS
M700

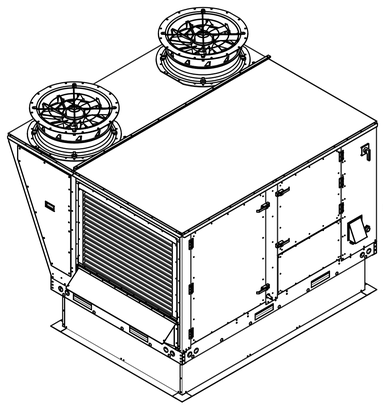
## FAN #1 CASRTU3-I.200-24MF-12.5T-DOAS - HEATER (12.5 TON)

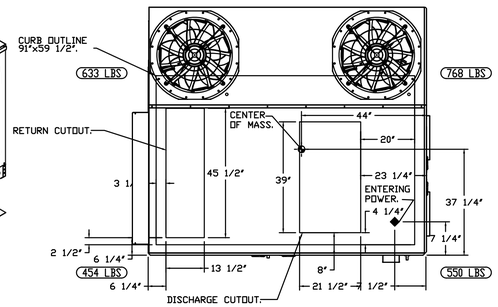
NOTES:

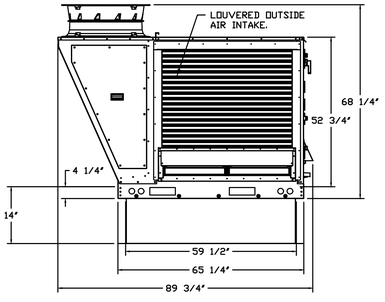
1. DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
2. ( ) DENOTES CORNER WEIGHT.
3. ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.

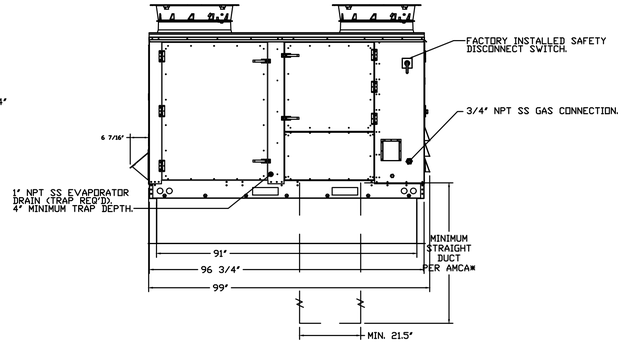
*NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 201. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE THROAT/SQUARE BACK ELBOWS SHOULD NOT BE USED. ANY TRANSITION AND/OR TURNS IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT. SYSTEM EFFECT WILL DRASTICALLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT.
SUGGESTED STRAIGHT DUCT SIZE IS 21.5" x 39".

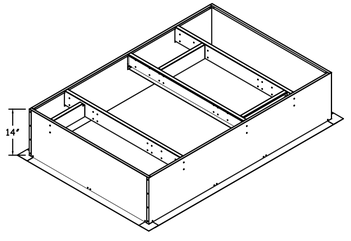


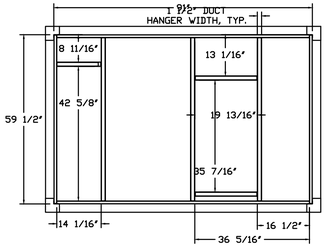



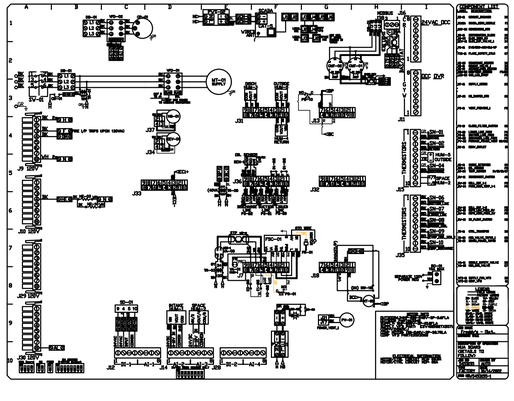


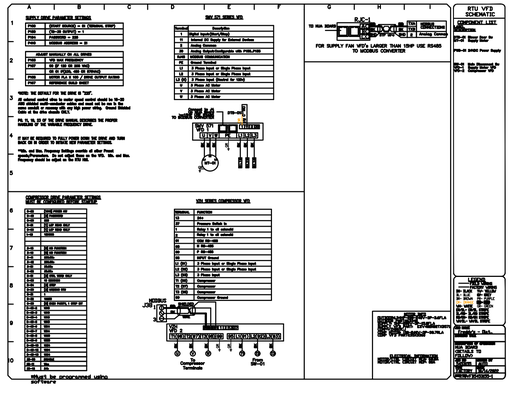



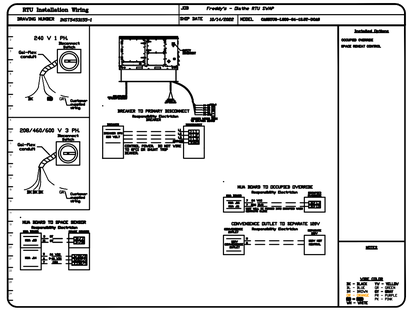








**REVISIONS**

| | DESCRIPTION | DATE: |
|---|---|---|
| 1 | | |
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**SCALE:** 1/2" = 1'-0"

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**SHEET NO.** 2

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