MECHANICAL SPECIFICATIONS

1. GENERAL PROVISIONS
   A. THE PROVISIONS OF THE INSTRUCTIONS TO BIDDERS, GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, ALTERNATES, ADDENDA'S, AND DIVISION 1 ARE A PART OF THIS SPECIFICATION. CONTRACTORS AND SUBCONTRACTORS SHALL EXAMINE SAME AS WELL AS OTHER DIVISIONS OF THE SPECIFICATIONS WHICH AFFECT WORK UNDER THIS DIVISION.
   B. THIS CONTRACTOR SHALL PROVIDE ALL LABOR, EQUIPMENT, SUPPLIES, SERVICES, AND SHALL PERFORM ALL WORK COMPLETE AND IN STRICT ACCORDANCE WITH THIS SPECIFICATION AND APPLICABLE DRAWINGS. ANY DEVIATIONS SHALL BE CLEARLY DEFINED AND ITEMIZED IN ACCORDANCE WITH SECTION 10.F OF THIS SPECIFICATION.
   C. THIS CONTRACTOR IS INSTRUCTED TO READ CAREFULLY THE SPECIFICATIONS FOR ALL PARTS OF THE WORK, WHICH INCLUDE THE ARCHITECTURAL, ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, CIVIL, STRUCTURAL AND ALL OTHER DRAWINGS AS WELL AS THE SPECIFICATIONS FOR ALL THE DIVISIONS THAT ARE PART OF THE CONTRACT DOCUMENTS.
   D. ALL ITEMS OF LABOR, MATERIAL, AND EQUIPMENT NOT SPECIFICALLY MENTIONED HEREIN OR SHOWN ON PLAN, BUT INCIDENTAL TO, OR REQUIRED FOR THE COMPLETE INSTALLATION AND PROPER OPERATION OF THE WORK, SHALL BE FURNISHED AS IF CALLED FOR IN DETAIL BY THE SPECIFICATIONS OR DRAWINGS.
   E. AS USED IN THIS SPECIFICATION, "PROVIDE" MEANS "FURNISH AND INSTALL". "FURNISH" MEANS "TO PURCHASE AND DELIVER TO THE PROJECT SITE COMPLETE WITH EVERY NECESSARY APPURTENANCE AND SUPPORT," AND "INSTALL" MEANS "TO UNLOAD AT THE DELIVERY POINT AT THE SITE AND PERFORM EVERY OPERATION NECESSARY FOR PROPER INSTALLATION PER CODES AND MANUFACTURERS REQUIREMENTS, TO ESTABLISH SECURE MOUNTING AND CORRECT OPERATION AT THE PROPER LOCATION IN THE PROJECT."
2. PERMITS, CODES, INSPECTIONS AND TESTS.
   A. THE HVAC CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND INSPECTIONS REQUIRED FOR THE PROSECUTION OF HVAC WORK. ALL PERMITS AND CERTIFICATES OF INSPECTION AND APPROVAL SIGNED BY THE CONTROLLING BUILDING DEPARTMENT SHALL BECOME PROPERTY OF THE OWNER
   B. DRAWINGS INDICATE THE MINIMUM DESIGN REQUIREMENTS. NATIONAL, STATE, AND LOCAL CODES SHALL BE FOLLOWED, COMPLY WITH THE LATEST EDITIONS OF THE STATE MECHANICAL CODE, NFPA, SMACNA, AND ASHRAE STANDARDS. THE CONTRACTOR SHALL INCLUDE THE COST OF SATISFYING SUCH CODES AND STANDARDS IN THE BID.
   C. FOLLOWING COMPLETION OF THE HVAC WORK, FURNISH TO THE OWNER, IN DUPLICATE, CERTIFICATES OF INSPECTION AND APPROVAL BY REGULATORY AGENCIES HAVING JURISDICTION.
      1. DEMONSTRATE TO THE OWNER'S SATISFACTION THE PROPER OPERATION OF EACH OF THE SYSTEMS COMPRISING THIS CONTRACT BEFORE FINAL PAYMENT.
      2. IMMEDIATELY CORRECT ANY WORK FOUND AT VARIANCE WITH THESE SPECIFICATIONS, THE NATIONAL, STATE, AND LOCAL CODES, AND REQUIREMENTS OF GOVERNING REGULATORY AGENCIES.
      3. TEST PIPING FOR LEAKS: REPAIR LEAKS IN COPPER TUBING BY SWEATING OUT JOINT; THOROUGHLY CLEANING BOTH TUBE AND FITTING, AND RESOLDERING. CORRECT LEAKS IN SCREWED JOINT BY REPLACING THREAD OR FITTING OR BOTH.
      4. PROVIDE SERVICES OF A CERTIFIED A.A.B.C. OR N.E.E.B. TEST AGENCY. CONDUCT ALL TESTS IN ACCORDANCE WITH ASSOCIATED AIR BALANCE COUNCIL STANDARDS. TEST AND ADJUST AIR HANDLING SYSTEM TO WITHIN 5% OF DESIGN REQUIREMENTS.
3. VISIT TO THE SITE
   A. THE CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND BECOME FAMILIAR WITH ALL CONDITIONS AFFECTING THE WORK. THE SUBMISSION OF A PROPOSAL SHALL PRESUPPOSE KNOWLEDGE OF ALL SUCH CONDITIONS AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED WHERE EXTRA LABOR OR MATERIALS ARE REQUIRED BECAUSE OF IGNORANCE OF THESE CONDITIONS.
4. PROTECTION
   A. THE HVAC CONTRACTOR SHALL PROVIDE ALL NECESSARY PROTECTION FROM DIRT AND WATER DURING CONSTRUCTION NECESSITATED BY HVAC WORK. PROTECTION METHODS ARE SUBJECT TO APPROVAL BY THE ARCHITECT.
5. EQUIPMENT AND MATERIALS
   A. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND SHALL CONFORM TO UNDERWRITERS' LABORATORIES STANDARDS, WHERE APPLICABLE. WHERE SPECIFICATIONS DESCRIBE, OR PLANS SHOW, MATERIALS OR EQUIPMENT OF HIGHER QUALITY THAN REQUIRED BY CODE AND LOCAL RULING, THE DRAWINGS AND SPECIFICATIONS SHALL GOVERN THE QUALITY OF THE MATERIAL OR EQUIPMENT. USED EQUIPMENT OR MATERIALS ARE PROHIBITED UNLESS NOTED OTHERWISE.
   B. NEW OR EXISTING TO REMAIN EQUIPMENT SHALL NOT BE OPERATED DURING CONSTRUCTION. HVAC CONTRACTOR SHALL COORDINATE WITH OTHER TRADES AND PROVIDE TEMPORARY SPACE CONDITIONING IN ORDER TO MAINTAIN TEMPERATURES AND HUMIDITY LEVELS AS REQUIRED FOR GENERAL CONSTRUCTION.
   C. THE CONTRACTOR SHALL SUBMIT PROOF, IF REQUESTED BY THE OWNER, THAT THE MATERIALS, APPLIANCES, EQUIPMENT OR DEVICES FURNISHED AND INSTALLED UNDER THIS CONTRACT MEET THE REQUIREMENTS OF THE UNDERWRITERS' LABORATORIES, INC. IN REGARDS TO FIRE AND CASUALTY HAZARDS. THE LABEL OF OR LISTING BY THE UNDERWRITERS' LABORATORIES, INC. WILL BE ACCEPTED AS CONFORMING TO THIS REQUIREMENT. IN LIEU OF THE LABEL OR LISTING, THE CONTRACTOR MAY SUBMIT INDEPENDENT PROOF SATISFACTORY TO THE ARCHITECT THAT THE MATERIAL, APPLIANCES OR DEVICES CONFORM TO THE PUBLISHED STANDARDS, INCLUDING METHODS OF TEST FOR THE UNDERWRITERS' LABORATORIES INCORPORATED. UNDERWRITERS LABORATORIES, INC. AND ITS PUBLICATIONS WILL BE REFERRED TO HEREINAFTER BY THE ABBREVIATION UL. WITH OR WITHOUT ADDITIONAL IDENTIFYING SYMBOLS.
6. GUARANTEE
   A. THE HVAC CONTRACTOR SHALL GUARANTEE FOR A PERIOD OF ONE YEAR THAT ALL WORK AND EQUIPMENT WILL REMAIN FREE FROM ALL DEFECTS IN WORKMANSHIP AND MATERIALS, AND THAT IT WILL COMPLY WITH ALL THE SPECIFIC REQUIREMENTS OF THE SPECIFICATIONS AND OTHER CONTRACT DOCUMENTS GOVERNING THE WORK.
   B. ALL WORK FOUND BY THE ENGINEER TO BE DEFECTIVE WILL BE REPLACED WITH NEW WORK MEETING ALL THE REQUIREMENTS OF THE CONTRACT. THE HVAC CONTRACTOR WILL BEAR ALL COSTS OF SUPPLYING SUCH NEW, AND INSTALLING AND FINISHING SAME, AND WILL ASSUME ALL COSTS FOR REPLACING OTHER WORK DAMAGED BY THE REMOVAL AND REPLACEMENT OF ANY OF THE WORK. THE HVAC CONTRACTOR WILL BEAR ALL COSTS FOR FREIGHT, DRAYAGE AND DEMURRAGE, AND ALL LABOR IN CONNECTION THEREWITH.
7. CUTTING, PATCHING, FIRESTOPPING AND PAINTING
   A. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING ALL HOLES REQUIRED FOR INSTALLATION OF HVAC WORK. HOLES SHALL BE CUT IN A NEAT MANNER SATISFACTORY TO THE ARCHITECT.
   B. CONTRACTOR SHALL EMPLOY AN BUILDING OWNER APPROVED ROOFING CONTRACTOR FOR ALL ROOF PENETRATIONS. ROOF SHALL BE REPAIRED SO AS NOT TO VOID ROOF WARRANTY.
   C. UNLESS NOTED OTHERWISE, ALL HOLES OR DAMAGE CAUSED BY THE REMOVAL OF EXISTING WORK OR THE INSTALLATION OF NEW WORK SHALL BE PROPERLY PATCHED BY THIS CONTRACTOR. HOLES SHALL BE NEATLY PATCHED AND PAINTED WITH SUITABLE MATERIAL TO MATCH EXISTING SURFACES. HOLES THROUGH FLOORS OR FIRE WALLS SHALL BE SEALED WITH THE APPROPRIATE INTUMESCENT CAULK, PUTTY, STRIP OR SHEET FIRE BARRIER PRODUCT.
   D. FIRESTOP SYSTEM (REQUIRED FIRESTOPPING MATERIALS) SHALL BE DETERMINED BY THE WALL OR FLOOR/CEILING ASSEMBLY AND PENETRATION TYPE AND SHALL BE UL LISTED AND TESTED IN ACCORDANCE WITH ASTM E814, FIRE RATING OF THE FIRESTOP SYSTEM SHALL BE EQUIVALENT TO THE ASSEMBLY WHICH IS PENETRATED.
   E. ACCEPTABLE FIRE BARRIER PRODUCTS: HILTI "FS-ONE" NELSON FLAMESEAL" OR APPROVED EQUAL AS MANUFACTURED BY 3M.
8. CLEANING AND PAINTING
   A. CLEAN NEW PIPING AFTER WORK IS COMPLETE TO REMOVE PIPE DOPE. LOOSE MILL SCALE, AND OTHER EXTRANEOUS MATERIALS.
   B. TOUCH UP AND REPAIR ANY DAMAGED FACTORY FINISHES ON EQUIPMENT AND MATERIALS FURNISHED. OTHER PAINTING WILL BE DONE UNDER THE PAINTING DIVISION OF THE SPECIFICATIONS.
9. COORDINATION AND CONDUCT OF WORK
   A. HVAC DRAWINGS ARE DIAGRAMMATIC, INDICATING GENERAL ARRANGEMENT, APPROXIMATE SIZES, GENERAL LOCATIONS OF EQUIPMENT AND PIPING. VERIFY DIMENSIONS IN FIELD; ADJUST TO MANUFACTURER'S SHOP DRAWINGS. DO NOT SCALE DRAWINGS.
   B. ALL REQUESTS FOR INFORMATION SUPPLEMENTAL TO THE CONSTRUCTION DOCUMENTS SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT FOR DISTRIBUTION TO THE APPROPRIATE PARTY(S).
   C. DRAWINGS AND SPECIFICATIONS ARE TO BE CONSIDERED AS SUPPLEMENTING EACH OTHER. WORK SPECIFIED BUT NOT SHOWN, OR SHOWN BUT NOT SPECIFIED, SHALL BE PERFORMED OR FURNISHED AS THOUGH MENTIONED IN BOTH SPECIFICATIONS AND DRAWINGS.
   D. ANY DISCREPANCIES BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER.
   E. ARCHITECTURAL AND STRUCTURAL DRAWINGS SUPERSEDE HVAC DRAWINGS. DETERMINE THAT WORK OF THIS DIVISION CAN BE ACCOMMODATED WITHIN SPACES PROVIDED. NOTIFY ARCHITECT OF ANY INTERFERENCE BEFORE STARTING INSTALLATION.
   F. DETERMINE SIZES, LOCATIONS FOR CHASES AND OPENINGS NECESSARY FOR INSTALLATION OF HVAC WORK, COOPERATE WITH OTHER TRADES IN PROVIDING SLEEVES, INSERTS AND HANGERS.
   G. COORDINATE THIS WORK WITH ALL TRADES. ARRANGE OPERATIONS SO AS NOT TO DELAY COMPLETION OF INSTALLATION OF ANY PARTS OF INTERRELATED WORK SO THAT CONSTRUCTION MAY PROCEED ON SCHEDULE.
   H. COOPERATE WITH ALL TRADES IN PREPARING INTERFERENCE DRAWINGS FOR AREAS WHERE THERE IS POSSIBLE CONFLICT BETWEEN TRADES. EXACT LOCATION OF PIPES, DUCTS AND EQUIPMENT SHALL BE BASED ON FIELD MEASUREMENT WITH FINAL ARRANGEMENT DETERMINED BY INTRA-TRADE AGREEMENTS SUBJECT TO ARCHITECT'S APPROVAL.
   I. ARCHITECT RESERVES THE RIGHT TO MAKE REASONABLE CHANGES IN INDICATED LOCATIONS WITHOUT EXTRA COST TO THE OWNER.
   J. ALL WORK SHALL BE INSTALLED IN NEAT AND WORKMANLIKE MANNER BY FIRST-CLASS MECHANICS. THE CONTRACTOR SHALL PROVIDE ADEQUATE AND COMPETENT SUPERVISION OF THE JOB AS REQUIRED.
   K. DUCTWORK, PIPING AND EQUIPMENT SHALL BE ARRANGED SUBSTANTIALLY AS INDICATED. ANY CHANGE RESULTING IN A SAVINGS IN LABOR OR MATERIAL SHALL BE MADE ONLY IN ACCORDANCE WITH A CONTRACT CHANGE ORDER. DEVIATIONS SHALL BE MADE ONLY WHERE NECESSARY TO AVOID INTERFERENCES AND ONLY AFTER DRAWINGS SHOWING THE PROPOSED DEVIATIONS HAVE BEEN SUBMITTED TO AND APPROVED BY THE ARCHITECT.
   L. COORDINATE ALL SHUTDOWNS OF ANY HVAC SYSTEM IN ADVANCE WITH THE OWNER.
10. SUBMITTALS
   A. PROVIDE DIGITAL SHOP DRAWINGS/SUBMITTALS FOR ALL SCHEDULED AND/OR SPECIFIED EQUIPMENT FOR APPROVAL BY THE ARCHITECT AND ENGINEER. INFORMATION SHALL INCLUDE, BUT IS NOT LIMITED TO; CFM, HP, GPM, MBH, EER, COP, %EFF, VOLTAGE/PHASE, MCA, CONNECTION SIZES, WEIGHT, DIMENSIONS, SCHEDULED EQUIPMENT, DIFFUSERS, DAMPERS, LISTED ACCESSORIES, ETC. AND OTHER COMPONENTS REQUIRED FOR A COMPLETE INSTALLATION.
   B. WHERE ONLY ONE MAKE OF EQUIPMENT IS NAMED, IT SHALL BE PROVIDE AS SPECIFIED.
   C. VERBAL REQUESTS OF APPROVALS FOR ANY SUBSTITUTION WILL NOT BE BINDING ON THE ARCHITECT, ENGINEER AND OWNER.
   D. THIS CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR ALL COSTS FOR REDESIGN AND CHANGES NECESSARY BY ALL TRADES TO ACCOMMODATE THE USE OF EQUIPMENT NOT SPECIFIED ON PROJECT DOCUMENTS.
   E. BIDS SHALL BE BASED UPON THE SPECIFIED PRODUCTS OR LISTED ALTERNATIVES. DRAWINGS AND SPECIFICATIONS ARE BASED ON THE PRODUCTS SPECIFIED BY TYPE, MODEL, AND SIZE, AND THUS ESTABLISH MINIMUM QUALITIES, WHICH SUBSTITUTES MUST MEET TO QUALIFY FOR REVIEW.
   F. SHOULD THE CONTRACTOR PROPOSE TO FURNISH MATERIALS, EQUIPMENT, AND DEVICES, OTHER THAN THOSE SPECIFIED AND LISTED. THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST FOR SUBSTITUTIONS TO THE ENGINEER AT LEAST FOURTEEN (14) CALENDAR DAYS PRIOR TO BID OPENING. THE REQUEST SHALL BE AN ALTERNATE TO THE ORIGINAL BID AND SHALL INCLUDE AND BE ACCOMPANIED WITH COMPLETE SPECIFICATION CUT SHEET SUBMITTALS AS OUTLINED IN SECTION 10.A OF THIS SPECIFICATION SECTION, COMPLETE WITH DESCRIPTIVE (MANUFACTURER, BRAND NAME, CATALOG NUMBER, ETC) AND TECHNICAL DATA FOR ALL ITEMS. INDICATE ANY ADDITIONS OR DEDUCTIONS TO THE CONTRACT PRICE ON BOTH THE SUBSTITUTION SUBMITTAL AND THE BID FORM. FAILURE TO PERFORM THESE ACTIONS EQUATES TO ACKNOWLEDGEMENT THAT THE PROJECT HAS BEEN BID WITH STRICT ACCORDANCE TO THIS SPECIFICATION AND APPLICABLE DRAWINGS.
   G. ACCEPTANCE OR REJECTION OF THE PROPOSED SUBSTITUTIONS SHALL BE SUBJECT TO APPROVAL OF THE ARCHITECT AND ENGINEER. IF REQUESTED, THE CONTRACTOR SHALL SUBMIT INSPECTION SAMPLES OF BOTH THE SPECIFIED AND THE PROPOSED SUBSTITUTE ITEMS.
   H. IF ANY SUBSTITUTIONS ARE APPROVED, AN ADDENDUM LISTING THE APPROVED ITEMS(S) WILL BE ISSUED TO ALL BIDDING CONTRACTORS PRIOR TO THE BID DATE.
   I. IN ALL CASES WHERE SUBSTITUTIONS ARE PERMITTED, THE CONTRACTOR SHALL BEAR ANY EXTRA COST OF EVALUATING THE EQUALITY OF THE MATERIAL AND EQUIPMENT TO BE INSTALLED.
11. EQUIPMENT IDENTIFICATION
   A. THE CONTRACTOR SHALL FURNISH AND INSTALL A SYSTEM OF NAMEPLATES DESIGNED TO IDENTIFY EACH PIECE OF EQUIPMENT.
      1. NAMEPLATE LETTERS AND NUMBERS SHALL MATCH EQUIPMENT DESIGNATION AS INDICATED ON THE DRAWINGS.
      2. NAMEPLATES SHALL BE LAMINATED PHENOLIC WITH BLACK SURFACE AND WHITE CORE. USE 1/16" THICK MATERIAL FOR PLATES UP TO 2" BY 4". FOR LARGER SIZES USE 1/8" THICK. LETTERS AND NUMBERS SHALL BE A MINIMUM OF ½" HIGH.
      3. FASTEN NAMEPLATES TO ALL EQUIPMENT BY THE USE OF STAINLESS STEEL SHEET METAL SCREWS.
12. AS-BUILT DRAWINGS
   A. AS WORK PROGRESSES, RECORD ON A SET OF "AS-BUILT" PRINTS ANY DEVIATIONS FROM DESIGN DRAWINGS. DELIVER THIS SET TO THE OWNER BEFORE SUBMITTING REQUEST FOR FINAL PAYMENT. THE "AS-BUILT" PRINTS SHALL BE AN ACCURATE DEPICTION OF THE PROJECT AS COMPLETED.
13. OPERATING AND MAINTENANCE MANUALS
   A. PROVIDE TO OWNER AT PROJECT TURNOVER, THREE (3) HARDBOUND COPIES OF OPERATING AND MAINTENANCE MANUALS FOR ALL EQUIPMENT AND SYSTEMS INSTALLED.
   B. MANUALS SHALL INCLUDE ALL RELEVANT INFORMATION NEEDED FOR DAY-TO-DAY OPERATION AND MANAGEMENT OF EACH SYSTEM AND EQUIPMENT MAINTENANCE INFORMATION REQUIRED TO SUPPORT THE MAINTENANCE PROGRAM.
   C. MANUALS SHALL INCLUDE THE SEQUENCE OF OPERATION FOR EACH SYSTEM WHICH DESCRIBES THE CONTROL COMPONENTS AND HOW THE SYSTEM WILL START, STOP AND OPERATE.
14. INSULATION
   A. PROVIDE ALL INSULATION MATERIALS (INSULATION, JACKETS, FITTING COVERS, ADHESIVES, CEMENTS, MASTICS, SEALERS AND FINISHES) WITH A FLAME-SPREAD INDEX OF 25 OR LESS AND SMOKE DEVELOPED INDEX OF 50 OR LESS. AS TESTED UNDER PROCEDURE ASTM E-84 (NFPA 255)
   B. ALL INSULATION SHALL BE INSTALLED OVER CLEAN, DRY SURFACES. INSULATION MUST BE DRY AND IN GOOD CONDITION. WET OR DAMAGED INSULATION IS NOT ACCEPTABLE. NO INSULATION SHALL BE APPLIED PRIOR TO PRESSURE TEST COMPLETION OF THE RESPECTIVE SYSTEM.
   C. ALL INSULATION SHALL BE CONTINUOUS (INCLUDING VAPOR BARRIER) THROUGH WALL AND CEILING OPENINGS AND SLEEVES. OVERLAP AT SEAMS PER MANUFACTURER'S RECOMMENDATIONS.
   D. ALL INSULATION PRODUCTS SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN RECOMMENDATION. THE WORKMANSHIP SHALL BE FIRST CLASS AND ALL JOINTS SHALL BE MADE TIGHT.
   E. INSULATION MUST MEET ADOPTED ASHRAE 90.1 STANDARDS.
   F. INSULATE CONCEALED SUPPLY AIR DUCTWORK WITH 2" THICK OWENS-CORNING FIBERGLASS DUCTWRAP WITH FOIL FACED ALL-SERVICE JACKET.
   G. INSULATE SUPPLY AIR DUCTWORK LOCATED IN PLENUM SPACES WITH 1-1/2" THICK OWENS-CORNING FIBERGLASS DUCTWRAP WITH FOIL FACED ALL-SERVICE JACKET.
   H. INSULATE OUTDOOR AIR DUCTWORK WITH 1-1/2" THICK OWENS-CORNING FIBERGLASS DUCTWRAP WITH FOIL FACED ALL-SERVICE JACKET.
   I. INTERNAL DUCT INSULATION SHALL BE USED ON EXPOSED DUCTWORK.
   J. INSULATE SUPPLY AIR DUCTWORK DOWNSTREAM OF DUCT TERMINAL UNITS WITH 1-1/2" THICK OWENS-CORNING FIBERGLASS DUCTWRAP WITH FOIL FACED ALL-SERVICE JACKET.
   K. REPAIR EXISTING INSULATION WHERE REMOVED FOR NEW CONNECTIONS OR INSULATION DAMAGED DURING CONSTRUCTION. INSULATION SHALL BE THE SAME AS SPECIFIED FOR NEW SERVICE.
   L. ALL INSULATION USED AS PLENUM WRAP COVERING FOR COMBUSTIBLE MATERIALS IN A PLENUM SPACE SHALL BE 3M PLENUM PROTECTION SYSTEM (PP-100-P), ONE LAYER OF 3M FIRE BARRIER DUCT WRAP 5A, IN ACCORDANCE WITH UL910 & UL1887.
   M. ACOUSTICAL DUCT LINING:
      1. INTERNALLY LINE FIRST TEN FEET OF DUCTWORK FROM AIR HANDLERS AND TERMINAL UNITS AND WHERE INDICATED ON PLANS.
      2. FIBROUS GLASS, COMPLYING WITH THERMAL INSULATION MANUFACTURERS ASSOCIATION (TIMA) AHC-101.
      3. ASTM C 1071, TYPE II, WITH COATED SURFACE EXPOSED TO AIRSTREAM TO PREVENT EROSION OF GLASS FIBERS 1" THICK. 1- ½ LB. DENSITY. COATING MATERIAL SHALL BE ANTI-MICROBIAL AND COMPLY WITH NFPA 90A AND 90B.
      4. K-FACTOR" EQUAL TO 0.28 OR BETTER, AT MEAN TEMPERATURE OF 75 DEG. F.
      5. FLAME SPREAD INDEX SHALL BE 25 OR LESS AND SMOKE DEVELOPED INDEX SHALL BE 50 OR LESS, AS TESTED IN ACCORDANCE WITH ASTM C 411.
      6. DUCT LINING ADHESIVE SHALL COMPLY WITH ASTM C 916 SPECIFICATIONS FOR ADHESIVES FOR "DUCT THERMAL INSULATION". DUCT LINING FASTENERS ALL COMPLY WITH SMACNA DUCT CONSTRUCTION STANDARDS, ARTICLE S2.11
      7. ALTERNATE DUCT LINING MATERIAL - ARMACELL AP ARMAFLEX SA BLACK DUCT LINER, 3/4" THICK, MICROBAN ANTI-MICROBIAL PROTECTION.
15. METAL DUCTWORK
   A. HVAC CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO FABRICATION OF DUCTWORK. ANY CONFLICTS OR INTERFERENCES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
   B. GALVANIZED DUCTWORK SHALL BE FABRICATED OF NO.1 PRIME GALVANIZED SHEET METAL OF LOCK FORMING QUALITY.
   C. SEALING MATERIALS SHALL BE SUITABLE FOR; USE WITH AIR DISTRIBUTION DUCTWORK. ACCEPTABLE MANUFACTURERS ARE MONOCO INDUSTRIES, 3M, OR UNITED SHEET METAL.
   D. PROVIDE ALL DUCTWORK AS INDICATED ON THE DRAWINGS, MAKING ALL NECESSARY OFFSETS (WHETHER OR NOT SPECIFICALLY INDICTED) AS REQUIRED TO MEET THE VARIOUS BUILDING CONDITIONS. DUCTWORK INSTALLATION SHALL NOT CONFLICT WITH EQUIPMENT OR PIPING.
   E. EXPOSED DUCTWORK SHALL BE PRIMED AND PAINTED. COORDINATE WITH ARCHITECTURAL PLANS FOR COLOR SELECTION.
   F. ALL CHANGES IN CROSS SECTION SHALL BE MADE WITHOUT REDUCING THE DESIGN AREA OF THE DUCT OR RAISING THE PRESSURE DROP PER 100 FEET OF DUCT SHOWN ON DOCUMENTS.
   G. NO PIPE OR OTHER OBSTRUCTIONS SHALL PASS THROUGH AIR DUCTS, UNLESS SPECIFICALLY SHOWN ON PLANS.
   H. CAP ALL OPEN ENDS TO DUCTWORK DURING CONSTRUCTION TO PREVENT ENTRANCE OF DUST, DEBRIS, MOISTURE ETC.
   I. INSTALL DUCTWORK RUN ABOVE CEILING AS HIGH AS POSSIBLE SO AS TO MAINTAIN DESIGN CEILING HEIGHTS. EXPOSED DUCTWORK SHALL BE INSTALLED TO PROVIDE MAXIMUM HEADROOM OR AT HEIGHT SPECIFIED ON PLANS.
   J. DUCTWORK SHALL NOT BE HUNG FROM EQUIPMENT, PIPING, CONDUIT, ROOF DECKING OR OTHER DUCTWORK.
   K. ALL DUCTWORK JOINTS AND SEAMS SHALL BE AIR-TIGHT PER SMACNA TABLE 1.1. POORLY MADE JOINTS, SPLITS, VISIBLE HOLES AT CORNERS, ETC SHALL BE REWORKED AND REPAIRED. WHERE EXCESSIVE PULSATING OF DUCTWORK IS FOUND, ADDITIONAL STIFFENERS SHALL BE ADDED. ANY CRACKING IN THE SEALANT THAT IS APPARENT UPON INSPECTION SHALL BE SUFFICIENT TO WARRANT REJECTION.
   L. IF THE INTERIOR OF SHEET METAL IS EXPOSED TO VIEW THROUGH AIR DISTRIBUTION DEVICES IN FINISHED AREAS OF THE BUILDING, IT SHALL BE COATED WITH PRIMER AND A FLAT BLACK FINISH COAT.
   M. ALL DUCTWORK SHALL BE SUPPORTED PER SMACNA REQUIREMENTS.
   N. RECTANGULAR DUCTWORK FITTINGS.
      1. BRANCH CONNECTIONS SHALL BE 45 DEGREES ENTRY. STRAIGHT TAPS ARE NOT PERMITTED.
      2. CHANGES IN DIRECTION SHALL BE MADE WITH FULL RADIUS ELBOWS WITH RADIUS EQUAL TO 1-1/2 TIMES THE HORIZONTAL WIDTH OF THE DUCT OR WITH SQUARE ELBOWS WITH TURNING VANES. TURNING VANES SHALL BE DOUBLE THICKNESS TYPE CONSTRUCTED OF THE SAME MATERIAL AS THE SURROUNDING DUCTWORK, PER SMACNA REQUIREMENTS.
   O. ROUND DUCTWORK FITTINGS:
      1. BRANCH CONNECTIONS SHALL BE MADE WITH 45 DEGREE ENTRY TEES.
      2. CHANGE IN DIRECTION SHALL BE MADE WITH FULL RADIUS ELBOWS WITH RADIUS EQUAL TO 1-1/2 TIMES THE DIAMETER OF THE DUCT.
   P. LOW PRESSURE DUCTWORK SHALL BE CONSTRUCTED PER SMACNA "HVAC DUCT CONSTRUCTION STANDARDS" FOR 2 INCH STATIC PRESSURE, SEAL CLASS "B".
   Q. HANGERS AND SUPPORTS
      1. PROVIDE GALVANIZED STEEL STRAPS, ALL-THREAD ROD AND HORIZONTAL ANGLE SUPPORTS SIZED PER SMACNA REQUIREMENTS.
      2. DUCT ATTACHMENTS SHALL BE MADE USING SHEET METAL SCREWS COMPATIBLE WITH DUCT MATERIALS.
      3. BUILDING ATTACHMENTS SHALL BE CONCRETE INSERTS OR STRUCTURAL STEEL FASTENERS APPROPRIATE FOR THE BUILDING MATERIALS. DO NOT USE POWER ACTIVATE CONCRETE FASTENERS. "C TYPE MALLEABLE IRON BEAM CLAMPS ARE ACCEPTABLE ONLY IF USED WITH CARBON STEEL RETAINER STRAP.
16. KITCHEN HOOD EXHAUST AIR DUCTWORK (TYPE 1 GREASE EXHAUST)
   A. A. DUCTWORK SHALL BE 16 GA. (STAINLESS STEEL, BLACK IRON) WITH RADIUS WELDED STAINLESS STEEL ELBOWS PER INTERNATIONAL MECHANICAL CODE OR LOCAL CODE FOR GREASE DUCT STANDARDS.
   A.A. ALTERNATE - UL LISTED MANUFACTURED GREASE DUCT SYSTEM. APPROVAL PENDING REVIEW OF ENGINEER AND LOCAL AUTHORITY HAVING JURISDICTION.
   B. GREASE DUCTWORK SHALL SLOPE BACK TO HOOD AT 1/2" PER FOOT.
   C. EXHAUST HOOD MAKE-UP AIR SYSTEM
      1. SYSTEM SHALL CONFORM TO THE LOCAL STATE MECHANICAL CODE.
   D. INSULATION: GREASE DUCT FIRE WRAP SHALL BE 2" THICK 3M FOIL WRAPPED FIRE DUCT WRAP 20A IN ACCORDANCE WITH ASTM E2336. IT MUST BE INSTALLED AROUND ALL GREASE DUCT FOR ZERO CLEARANCE INSTALLATION.
17. FLEXIBLE DUCTWORK
   A. TESTED AND CLASSIFIED BY UNDERWRITERS LABORATORIES, INC. AS CLASS I AIR DUCT AND LABELED IN ACCORDANCE WITH U.L. 181, STANDARD FOR AIR DUCTS". THE FLAME SPREAD RATING SHALL BE 25 OR LESS AND THE SMOKE DEVELOPED RATING SHALL BE 50 OR LESS.
   B. LINER SHALL BE CONSTRUCTED OF ALUMINUM FOIL, FIBERGLASS AND ALUMINIZED POLYESTER, MECHANICALLY LOCKED WITHOUT ADHESIVES, HELIX SHALL BE GALVANIZED STEEL, FORMED AND MECHANICALLY LOCKED TO FABRIC.
   C. WHERE DUCTWORK IS TO BE INSULATED, FLEXIBLE DUCTWORK LINER SHALL BE COVERED BY A FACTORY WRAPPED, 1-1/2" THICK, 3/4 POUND DENSITY FIBERGLASS INSULATION BLANKET WITH A FIRE RETARDANT REINFORCED ALUMINUM OUTER JACKET.
   D. INSTALL FLEXIBLE DUCTWORK FULLY EXTENDED, FREE OF SAGS AND KINKS. MAXIMUM LENGTH OF FLEXIBLE DUCTWORK SHALL BE 3'-0". FASTEN FLEXIBLE DUCTWORK TO RIGID DUCTWORK AND DEVICES WITH SELF-LOCKING 100 PERCENT NYLON, ADJUSTABLE DIAMETER CLAMPS.
   E. ACCEPTABLE MANUFACTURERS ARE THERMAFLEX, FLEXMASTER U.S.A. INC. AND CLEVAFLEX.
18. BALANCING DAMPERS
   A. PROVIDE BALANCING DAMPERS FOR ALL AIR TERMINAL DEVICES (SUCH AS BUT NOT LIMITED TO, DIFFUSERS, REGISTERS, GRILLES, ETC.) AND BRANCH DUCTWORK REQUIRED FOR PROPER BALANCING OF SYSTEM.
   B. ROUND DAMPERS SHALL BE SINGLE BLADE TYPE CONSTRUCTION, MINIMUM 18 GAUGE GALVANIZED STEEL. PIVOT ROD SHAFT SHALL BE CONTINUOUS.
   C. RECTANGULAR DAMPERS SHALL BE SINGLE BLADE OR MULTIPLE (OPPOSED BLADE) TYPE CONSTRUCTION. MAXIMUM BLADE WIDTH IS 8 INCHES.
   D. ALL BALANCING DAMPERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS"
   E. FURNISH ALL BALANCING DAMPERS WITH YOUNG REGULATOR COMPANY VALCALOX REGULATORS WITH HANDLE PERMANENTLY ATTACHED. DAMPER HANDLE POSITION SHALL BE SECURELY LOCKED IN PLACE BY TIGHTENING OF A LOCK NUT. WHERE DUCTWORK IS EXTERNALLY INSULATED, REGULATOR BASE HEIGHT SHALL ACCOMMODATE INSULATION THICKNESS.
   F. PROVIDE ALL MANUAL BALANCING DAMPERS WHERE INDICATED ON THE DRAWINGS AND WHERE NECESSARY TO PROPERLY DISTRIBUTE AND BALANCE THE AIR.
19. REGISTERS, GRILLES AND DIFFUSERS
   A. PROVIDE REGISTERS, GRILLS AND DIFFUSERS WHERE SHOWN ON THE DRAWINGS, OF SIZE TYPE, AND MATERIAL AS INDICATED AND AS REQUIRED FOR A COMPLETE INSTALLATION.
   B. BORDER TYPES SHALL BE COMPATIBLE WITH THE CEILINGS WHERE THE GRILLES AND DIFFUSERS ARE TO BE INSTALLED.
   C. ALL GRILLES AND DIFFUSERS SHALL BE FINISHED WITH A FACTORY APPLIED OFF-WHITE FINISH UNLESS NOTED OTHERWISE.
   D. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF GRILLES AND DIFFUSERS.
20. VIBRATION ISOLATION
   A. PROVIDE ADEQUATE VIBRATION ISOLATION FOR EACH PIECE OF EQUIPMENT.
   B. PROVIDE FLEXIBLE CONNECTIONS WITH 1" SLACK BETWEEN DUCTS AND FANS AS MANUFACTURED BY DURO-DYNE, OR EQUIVALENT.
   C. PROVIDE FLEXIBLE FITTING ON PIPING CONNECTIONS TO EQUIPMENT.
21. REFRIGERATION AND AIR CONDITIONING CONDENSATE PIPING SYSTEMS
   A. USE TYPE DWV COPPER PIPING WITH BRAZED DRAINAGE FITTINGS FOR CONDENSATE PIPING.
   B. USE TYPE ACR COPPER PIPING WITH BRAZED WROUGHT COPPER FITTINGS FOR ALL REFRIGERATION PIPING.
   C. PITCH PUMPED AND GRAVITY CONDENSATE PIPING AT 1/8 INCH PER FOOT IN DIRECTION OF FLOW.
   D. INSULATE ALL INTERIOR CONDENSATE PIPING AND REFRIGERATION SUCTION PIPING WITH 3/4 INCH ARMACELL CLOSED CELL SELF SEALING ARMAFLEX INSULATION.
22. EXHAUST FANS
   A. CEILING MOUNTED DIRECT DRIVE CENTRIFUGAL EXHAUST VENTILATOR. FANS SHALL BE UL LISTED AND BEAR THE AMCA CERTIFIED RATING SEAL FOR SOUND AND AIR PERFORMANCE.
   B. ALL FASTENERS SHALL BE CORROSION RESISTANT. ALUMINUM BASE SHALL HAVE CONTINUOUSLY WELDED CURB CAP CORNERS. MOTOR, BEARINGS AND DRIVE SHALL BE MOUNTED ON A STEEL ASSEMBLY, ISOLATED FROM THE FAN STRUCTURE WITH RUBBER VIBRATION ISOLATORS.
   C. WHEEL SHALL BE CENTRIFUGAL BACKWARD INCLINED TYPE, CONSTRUCTED OF ALUMINUM, WITH A MACHINED CAST ALUMINUM HUB.
   D. MOTOR SHALL BE HEAVY DUTY TYPE WITH PERMANENTLY LUBRICATED SEALED BALL BEARINGS.
   E. FAN BEARINGS SHALL BE HEAVY DUTY REGREASABLE BALL TYPE WITH A CAST IRON HOUSING, RATED IN EXCESS OF 200,000 HOURS AT MAXIMUM CATALOGED OPERATING SPEED.
   F. BELTS SHALL BE OIL AND HEAT RESISTANT, NON-STATIC TYPE. DRIVES SHALL BE MACHINED CAST IRON, KEYED AND SECURELY ATTACHED TO WHEEL AND MOTOR SHAFTS AND SIZED FOR 150 PERCENT OF THE INSTALLED MOTOR HORSEPOWER
   G. ACCEPTABLE MANUFACTURERS: BROAN, PENN VENTILATOR, COOK GREENHECK AND ACME.
23. EXTERIOR LOUVERS
   A. EXTRUDED ALUMINUM ALLOY FRAME AND DRAINABLE BLADES. ALUMINUM BIRD SCREEN. MILL FINISH.
   B. ACCEPTABLE MANUFACTURERS: RUSKIN, GREENHECK
24. MOTOR OPERATED DAMPERS
   A. GALVANIZED STEEL, LOW LEAKAGE CONTROL DAMPERS WITH 16 GAUGE REINFORCED GALVANIZED STEEL HAT CHANNEL FRAME. BLADES SHALL BE 16 GAUGE REINFORCED SINGLE SKIN GALVANIZED STEEL.
   B. EDGE SEALS SHALL BE PVC COATED POLYESTER FABRIC MECHANICALLY LOCKED INTO THE BLADE EDGE. ADHESIVE OR CLIP-ON STYLES ARE NOT ACCEPTABLE.
   C. JAMB SEALS SHALL BE FLEXIBLE METAL, COMPRESSION TYPE TO PREVENT LEAKAGE BETWEEN BLADE END AND DAMPER FRAME. BLADE END OVERLAPPING FRAME IS UNACCEPTABLE.
   D. BEARINGS SHALL BE CORROSION RESISTANT. AXLES SHALL BE SQUARE OR HEXAGONAL POSITIVELY LOCKED INTO THE DAMPER BLADE. LINKAGE SHALL BE OUT OF THE AIRSTREAM.
   E. DAMPER ACTUATORS SHALL BE FURNISHED AND INSTALLED BY THE TEMPERATURE CONTROL CONTRACTOR.
   F. ACCEPTABLE MANUFACTURERS: RUSKIN, GREENHECK
25. TEMPERATURE CONTROLS
   A. PROVIDE A BUILDING MANAGEMENT TEMPERATURE CONTROL SYSTEM.
   B. ALL TEMPERATURE CONTROL COMPONENTS, WIRING AND CONDUIT SHALL BE THE RESPONSIBILITY OF THE HVAC CONTRACTOR.
   C. WIRING AND CONDUIT
      1. ALL 24 VOLT WIRING SHALL BE INSTALLED IN CONDUIT, IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE.
      2. ALL OUTDOOR 24 VOLT WIRING SHALL BE INSTALLED IN CONDUIT, IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE.
   D. HVAC CONTRACTOR SHALL USE OWNER APPROVED TEMPERATURE CONTROL CONTRACTOR AND MANUFACTURER.
26. PROJECT COMPLETION:
   A. UPON COMPLETION OF PROJECT THIS CONTRACTOR SHALL PROVIDE NEW FILTERS WITHIN ALL FAN POWERED EQUIPMENT.
   B. ALL FAN POWERED EQUIPMENT SHALL HAVE THEIR EXTERIOR CLEANED WITH A MILD SOAP AND WATER SOLUTION AND THOROUGHLY DRIED.
   C. PROVIDE 3 COPIES OF FINAL TEST AND BALANCE REPORT TO OWNER/ARCHITECT.

HVAC LEGEND

Symbol	Description
	FOR ROOMS OR AREAS SHOWN SHADED WITH THE SHADE TYPE , UNDER NO CIRCUMSTANCES, SHALL PIPING, DUCTWORK, OR EQUIPMENT BE INSTALLED IN OR ROUTED THROUGH THESE ROOMS OR AREAS EXCEPT FOR BRANCH PIPING OR DUCTWORK SPECIFICALLY SERVING THE ROOM OR AREA. DEDICATED SPACE SHALL EXTEND VERTICALLY FROM FLOOR TO STRUCTURAL CEILING.
SD	DUCT-TYPE SMOKE DETECTOR WITH REMOTE TEST STATION AND AUXILIARY RELAY FURNISHED AND WIRED BY ELECTRICAL CONTRACTOR; INSTALLED IN DUCTWORK BY MECHANICAL CONTRACTOR PER CODE. COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR AND MANUFACTURER. PROVIDE CONDUIT AND WIRING NECESSARY TO SHUT DOWN HVAC UNIT UPON ACTIVATION OF SMOKE DETECTOR.
	EXISTING DUCTWORK TO REMAIN
	EXISTING DUCTWORK TO BE REMOVED
DTS	DUCT TEMPERATURE SENSOR
MFSD	MOTORIZED FIRE/SMOKE DAMPER
FD	FIRE DAMPER
SD	SMOKE DAMPER
MOD	MOTOR OPERATED DAMPER
BDD	BACKDRAFT DAMPER
CO2	CARBON DIOXIDE DETECTOR
CO	CARBON MONOXIDE DETECTOR
H	HUMIDISTAT
T	THERMOSTAT
S	SENSOR
S T	TEMPERATURE SENSOR
S H	HUMIDITY SENSOR
	POINT OF CONNECTION
XX-X	EQUIPMENT TAG
XXX	KITCHEN / FOODSERVICE EQUIPMENT TAG
	SUPPLY OR OUTDOOR AIR DUCT
	RETURN OR EXHAUST AIR DUCT
	DUCT LINING
	DUCT UP
	DUCT DOWN
UCD	3/4" DOOR UNDERCUT
T	TRANSFER AIR
	DIFFUSER BLANK-OFF
	AIRFLOW DIRECTION

HVAC GENERAL NOTES:

1. GENERAL NOTES SHALL APPLY TO ALL HVAC DRAWINGS.
2. ALL KEY NOTES INDICATED ON THE DRAWINGS AS "TYPICAL" ARE TO BE CONSIDERED AS SHOWN AT ALL OTHER SIMILAR CONDITIONS WHETHER NOTED OR NOT.
3. ALL HVAC WORK SHALL BE COMPLETE AND READY FOR SATISFACTORY SERVICE.
4. THE CONTRACT DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY THE GENERAL ARRANGEMENT OF THE WORK.
5. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS, METHODS, AND WORK SCHEDULING ASSOCIATED WITH THE INSTALLATION OF THE HVAC SYSTEMS.
6. EXAMINE THE SITE AND OBSERVE THE CONDITIONS UNDER WHICH THE WORK WILL BE INSTALLED. NO ALLOWANCES WILL BE MADE FOR ERRORS OR OMISSIONS RESULTING FROM THE FAILURE TO COMPLETELY EXAMINE THE SITE.
7. VERIFY SIZE AND LOCATIONS OF ALL EXISTING SERVICES. NOTIFY THE ENGINEER OF ALL DISCREPANCIES THAT EXIST BETWEEN THE CONTRACT DOCUMENTS AND THE EXISTING SERVICES BEFORE MAKING ANY CONNECTIONS TO THE EXISTING SERVICES.
8. COORDINATE THE SIZE AND LOCATION OF ROOF PENETRATIONS AND FLASHING REQUIREMENTS WITH THE WORK OF OTHER TRADES.
9. ROUTE PIPING AND DUCT SYSTEMS PARALLEL AND PERPENDICULAR TO THE BUILDING LINES. MOUNT AS CLOSE AS POSSIBLE TO THE UNDERSIDE OF THE BUILDING STRUCTURE.
10. COORDINATE THE INSTALLATION OF HVAC SYSTEMS WITH THE WORK OF OTHER TRADES. PROVIDE OFFSETS IN PIPING AND DUCTWORK AS REQUIRED AT NO ADDITIONAL COST TO AVOID OBSTRUCTIONS.
11. MOUNT ROOM SENSORS AND SWITCHES AT 4'-0". ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE.
12. SUPPORT ALL EQUIPMENT FROM THE BUILDING STRUCTURE TO PROVIDE A VIBRATION-FREE INSTALLATION.
13. DUCTWORK DIMENSIONS SHOWN ON THE DRAWINGS ARE INTERNAL AIRFLOW DIMENSIONS. INCREASE THE SHEET METAL DUCTWORK DIMENSIONS BY 2 IN. TO ACCOMMODATE 1-IN. DUCT LINER WHERE REQUIRED.
14. PROVIDE FLEXIBLE DUCT CONNECTORS ON ALL DUCTWORK CONNECTIONS TO FANS OR AIR HANDLING UNITS.
15. PROVIDE ½-IN. MESH ALUMINUM SCREEN OVER THE OPENING OF ALL OPEN-ENDED DUCTWORK.
16. ENSURE THAT ADEQUATE CLEARANCE EXISTS FOR THE INSTALLATION AND MAINTENANCE OF ALL WORK SHOWN ON THE DRAWINGS AND DESCRIBED IN THE SPECIFICATIONS.
17. PROVIDE ACCESS PANELS (INSTALLED IN WALLS OR CEILINGS) AND/OR ACCESS DOORS (INSTALLED IN DUCTWORK) THAT ARE INDICATED OR REQUIRED FOR ACCESS TO CONCEALED HVAC DEVICES THAT MAY REQUIRE FUTURE INSPECTION, REPAIR, OR ADJUSTMENT.
18. IDENTIFY ALL HVAC EQUIPMENT WITH ENGRAVED, COLOR-CODED LAMINATED PLASTIC MARKERS WITH CONTACT-TYPE, PERMANENT ADHESIVE. MATCH EQUIPMENT SCHEDULES ON THE DRAWINGS AS CLOSELY AS POSSIBLE FOR EQUIPMENT DESIGNATIONS.
19. PROVIDE SLEEVES AND CAULK ALL PIPING PENETRATIONS THROUGH WALLS AND FLOORS AND PATCH TO MATCH THE ADJACENT CONSTRUCTION. PROVIDE CHROME-PLATED ESCUTCHEONS ON ALL PIPING PENETRATIONS IN EXPOSED LOCATIONS.
20. PROVIDE SLEEVES AND PATCH ALL DUCT PENETRATIONS THROUGH WALLS AND FLOORS TO MATCH THE EXISTING CONSTRUCTION. SLEEVE DIMENSIONS SHALL BE 1 IN. LARGER THAN INSULATED DUCT DIMENSIONS. THE SPACE BETWEEN THE DUCT AND THE SLEEVE SHALL BE PACKED WITH MINERAL FIBER AND CAULKED.
21. FIRESTOP ALL PENETRATIONS THROUGH FIRE-RESISTANCE-RATED WALLS, FLOORS, OR ASSEMBLIES IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS.
22. SEAL ALL PENETRATIONS THROUGH WATERPROOF CONSTRUCTION IN ACCORDANCE WITH THE WATERPROOFING MANUFACTURER'S INSTRUCTIONS. ALL WORK SHALL BE PERFORMED BY APPROVED CONTRACTORS IF REQUIRED BY THE MANUFACTURER TO MAINTAIN THE WARRANTY ON THE MATERIAL.
23. PROVIDE ALL LOW PRESSURE DUCTWORK SIZED EQUAL TO OR LESS THAN 0.1" W.G./100' (TYP.) UNLESS SCHEDULED OTHERWISE. INDICATE ALL DUCT SIZES ON SHOP DRAWINGS.
24. PROVIDE MINIMUM DUCT RADIUS ON ELBOWS AT 1-1/2 TIMES DUCT SIZE.
25. ALL DUCTS SHALL BE FREE FROM CONTACT WITH ALL: PIPING, WALLS, ELECTRICAL CONDUITS, CEILING SUSPENSION SYSTEMS, ETC.
26. PROVIDE THROAT WITH PROPORTIONAL SPLIT AND TURNING VANES ON TEE TRANSITIONS. (BULLHEAD TEE'S WILL NOT BE PERMITTED.
27. ALL PIPING AND DUCTWORK SHALL FREELY PASS THROUGH ALL WALLS AND FLOORS WITHOUT RIGID CONNECTIONS. PENETRATION POINTS SHALL BE SLEEVED TO ALLOW PASSAGE OF PIPING OR DUCTWORK AND MAINTAIN 3/4" TO 1-1/4" CLEARANCE AROUND THE OUTSIDE SURFACES. THIS CLEARANCE SHALL BE TIGHTLY PACKED WITH ONE POUND DENSITY GLASS FIBER, AND CAULKED AIR TIGHT WITH NON-HARDENING SEALANT AFTER INSTALLATION OF PIPING OR DUCTWORK.
28. PROVIDE FIRE DAMPERS WITH ACCESS IN ALL RATED WALLS IN ACCORDANCE WITH LOCAL CODES.
29. FABRICATE, INSTALL, SEAL, AND INSULATE ALL DUCTWORK IN STRICT CONFORMANCE WITH THE REQUIREMENTS OF THE STATE MECHANICAL CODE AND ASME STANDARDS.
30. ALL EQUIPMENT, MATERIALS AND WORK SHALL CONFORM TO THE APPLICABLE CODES OF THE STATE BUILDING, FIRE, MECHANICAL, AND NATIONAL ELECTRICAL CODES AS ADOPTED BY THE CITY AND ALL OTHER CODES, SAFETY ORDERS AND REGULATIONS AS ENFORCED BY THE STATE AND CITY FIRE MARSHALL'S PERTAINING TO THIS PROJECT
31. PROTECTIVE BARRIERS SHALL BE INSTALLED IN FRONT OF EQUIPMENT WHERE EQUIPMENT IS SUBJECT TO MECHANICAL DAMAGE.
32. SUITABLE OPENINGS WITH TIGHTLY FITTED COVERS SHALL BE PROVIDED TO MAKE FIRE DAMPERS ACCESSIBLE FOR INSPECTION.
33. ACCESSIBILITY: ALL EQUIPMENT SHOWN IN WALLS OR ABOVE NON-ACCESSIBLE CEILINGS SHALL BE INSTALLED WITHIN 24" OF, AND BEHIND, AN ACCESS PANEL.
34. SPECIFICATION: THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH, AND BE CONSIDERED TO BE A PART OF THE SPECIFICATIONS.
35. PATCHING: THE CONTRACT SHALL BE RESPONSIBLE FOR PATCHING AND REPAIRING ALL AREAS WHICH ARE EXCAVATED AND/OR DAMAGED BY HIS OPERATIONS.

HVAC ABBREVIATIONS

A	AMPS	EQ	EQUIPMENT	NEC	NATIONAL ELECTRIC CODE
ACU	AIR CONDITIONING UNIT	ETR	EXISTING TO REMAIN	NF	NON FUSED
ADD'L	ADDITIONAL	EUH	ELECTRIC UNIT HEATER	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
AF	AIRFOIL BLADE FAN	EWC	ELECTRIC WATER COOLER	(NIC)	NOT IN CONTRACT
AFC	ABOVE FINISH COUNTER	EWH	ELECTRIC WATER HEATER	NTS	NOT TO SCALE
AFF	ABOVE FINISH FLOOR	EXIST (E)	EXISTING	OA	OUTSIDE AIR
AFG	ABOVE FINISH GRADE	EXP	EXPANSION	OAI	OUTSIDE AIR INTAKE
AHU	AIR HANDLING UNIT	F	FURNACE	OBD	OPPOSED BLADE DAMPER
AP	ACCESS PANEL	FA	FIRE ALARM	OC	ON CENTER
ARCH	ARCHITECTURAL	FBD	FACE & BYPASS DAMPER	P	PUMP
B	BOILER	FC	FORWARD CURVE BLADE FAN	PC	PLUMBING CONTRACTOR
BDD	BACKDRAFT DAMPER	FCO	FLOOR CLEAN-OUT	PH (Ø)	PHASE
BLDG	BUILDING	FCU	FAN COIL UNIT	PNL	PANEL
BOT	BOTTOM	FD	FLOOR DRAIN / FIRE DAMPER	PRE	POWER ROOF EXHAUSTER
C	CONDENSER	FFE	FINISH FLOOR ELEVATION	PRV	PRESSURE REDUCING VALVE
CB	CATCH BASIN	FFU	FAN FILTER UNIT	PSF	POUNDS/SQUARE FOOT
CC	COOLING COIL	FPB	FAN POWER BOX	PSI	POUNDS/SQUARE INCH
CD	CEILING DIFFUSER	FPC	FIRE PROTECTION CONTRACTOR	PVC	POLYVINYL CHLORIDE
CFH	CUBIC FEET PER HOUR	FS	FLOW SWITCH	RA	RETURN AIR
CFM	CUBIC FEET PER MINUTE	FT	FIN TUBE RADIATION / FEET	RAD	RADIUS
CH	CHILLER	G	GRILLE (EXHAUST, RETURN, OR TRANSFER)	RE	RETURN EXHAUST
CI	CAST IRON	GA	GAUGE	REF	RETURN EXHAUST FAN
CJ	CONTROL JOINT	GALV	GALVANIZED	REQ'D	REQUIRED
CL	CENTERLINE	GC	GENERAL CONTRACTOR	RF	RETURN FAN
CLG	CEILING	GE	GENERAL EXHAUST	RG	RETURN GRILLE
CO	CLEANOUT / CARBON MONOXIDE	GND	GROUND	RHC	REHEAT COIL
CO2	CARBON DIOXIDE	GRE	GRAVITY ROOF EXHAUSTER	RTU	ROOF TOP UNIT
COL	COLUMN	GUH	GAS UNIT HEATER	SA	SUPPLY AIR
CONST	CONSTRUCTION	GWH	GAS WATER HEATER	SECT	SECTION
CONT	CONTINUOUS	H	HUMIDIFIER	SG	SUPPLY GRILLE
CONTR	CONTRACTOR	HC	HEATING COIL	SF	SUPPLY FAN
CONV	CONVECTOR	HE	HOOD EXHAUST	SQ	SQUARE
CT	COOLING TOWER	HOA	HAND-OFF-AUTOMATIC	STL	STEEL
CTX	CONNECT TO EXISTING	HORIZ	HORIZONTAL	STRUCT	STRUCTURAL
CU	CONDENSING UNIT	HP	HORSEPOWER	SWSI	SINGLE WIDTH SINGLE INLET FAN
CUH	CABINET UNIT HEATER	HVAC	HEATING, VENTILATION, AIR CONDITIONING	SYM	SYMMETRICAL
D	DAMPER	HX	HEAT EXCHANGER	TA	TRANSFER AIR
DE	DISHWASHER EXHAUST	IE	INVERT ELEVATION	TC	TEMPERATURE CONTROL
DET	DETAIL	JB	JUNCTION BOX	TCC	TEMPERATURE CONTROL CONTRACTOR
DIA(ø)	DIAMETER	KEC	KITCHEN EQUIPMENT CONTRACTOR	TG	TRANSFER GRILLE
DN	DOWN	KHE	KITCHEN HOOD EXHAUST	TS	TAMPER SWITCH
DSW	DISCONNECT SWITCH	KVA	KILOVOLT AMPERE	TYP (T/)	TYPICAL
DWDI	DOUBLE WIDTH DOUBLE INLET FAN	KW	KILOWATT	UH	UNIT HEATER
DWG	DRAWING	L	LOUVER	UL	UNDERWRITER'S LABORATORY
DWH	DOMESTIC WATER HEATER	LTG	LIGHTING	UNO	UNLESS NOTED OTHERWISE
EA	EXHAUST AIR	MA	MAKE-UP AIR	UV	UNIT VENTILATOR
EBB	ELECTRIC BASEBOARD	MAU	MAKE-UP AIR UNIT	V	VOLTS
EC	ELECTRICAL CONTRACTOR	MAX	MAXIMUM	VAV	VARIABLE AIR VOLUME BOX
EF	EXHAUST FAN	MBH	1,000 BTUH	VD	VOLUME DAMPER
EG	EXHAUST GRILLE	MC	MECHANICAL CONTRACTOR	VERT	VERTICAL
EH	ELECTRIC HEATER	MECH	MECHANICAL	VTR	VENT THRU ROOF
EJ	EXPANSION JOINT	MFR	MANUFACTURER	W	WATTS
EL	ELEVATION	MIN	MINIMUM	W/	WITH
ELEC	ELECTRICAL	MTD	MOUNTED	WP	WEATHERPROOF
ELEV	ELEVATOR	MVD	MANUAL VOLUME DAMPER		
EM	EMERGENCY	MXB	MIXING BOX		
		(N)	NEW		

HVAC AND PLUMBING GENERAL DEMOLITION NOTES:

1.01 SECTION INCLUDES
A. DEMOLITION MAY INCLUDE, BUT NOT BE LIMITED TO THE COMPLETE REMOVAL OF THE FOLLOWING SYSTEMS. REFERENCE REMOVAL DRAWINGS:
   1. AIR DISTRIBUTION SYSTEMS.
   2. GRILLES.
   3. REGISTERS.
   4. PLUMBING FIXTURES AND ASSOCIATED PIPING.
   5. VALVES AND FITTINGS.
   6. SUPPORTS.

1.02 DEFINITIONS
A. REMOVED: REFERS TO MECHANICAL SERVICES WHICH ARE TO BE DISCONNECTED AND REMOVED FROM PROJECT SITE.
B. SALVAGED: REFERS TO ITEMS WHICH ARE DISCONNECTED, TAKEN OUT OF SERVICE AND TURNED OVER TO THE OWNER.

2.01 MATERIALS
A. PROVIDE ALL MATERIALS NECESSARY FOR DEMOLITION WORK.

3.01 PREPARATION
A. COORDINATE UTILITY SERVICE OUTAGES WITH BUILDING OWNER.
B. PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEM IN SERVICE DURING CONSTRUCTION. WHEN CONTRACTOR ELECTS TO PERFORM WORK ON ENERGIZED EQUIPMENT, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS.
C. BEGINNING OF DEMOLITION MEANS INSTALLER ACCEPTS EXISTING CONDITIONS.

3.03 SCHEDULING AND PHASING
A. PRIOR TO THE START OF ANY DEMOLITION WORK WITHIN THE BUILDING, PROVIDE THE A/E AND OWNER A SCHEDULE OF PHASED SELECTIVE DEMOLITION FOR ALL MECHANICAL DEMOLITION AT THE SITE.
B. COORDINATE THE MECHANICAL DEMOLITION SCHEDULE WITH ALL ASPECTS OF DEMOLITION UNDER OTHER DIVISIONS OF THE SPECIFICATIONS.

FIELD VERIFY ALL CONDITIONS

- DESIGN DRAWINGS ARE SCHEMATIC. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS.
- THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATI0NS MADE BY THE ARCHITECT, ENGINEER OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT CONTRACTORS COST.
- BIDDING CONTRACTORS SHALL HAVE A WORKING KNOWLEDGE OF LOCAL CODES AND ORDINANCES AND SHALL INCLUDE IN THEIR BIDS THE COSTS FOR ALL WORK INSTALLED IN STRICT ACCORDANCE WITH GOVERNING CODES, THE PLANS AND SPECIFICATIONS NOT WITHSTANDING. THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER OR OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT.

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PROFESSIONAL SEAL:

COMMONWEALTH OF MASSACHUSETTS
WILLIAM H. SHEPARDSON
MECHANICAL
No. 47472
REGISTERED PROFESSIONAL ENGINEER

NVA #233 Westover Animal Clinic Relocation

79 Lyman St.
South Hadley, MA 01075

JOB NUMBER: 230323.00

DRAWING RELEASE:

No.	Date	Description
	10/02/2023	Bid/ Permit

SHEET TITLE:

HVAC SPECIFICATIONS AND GENERAL NOTES

SHEET NUMBER:

M000

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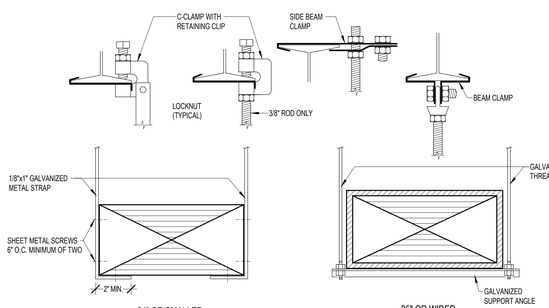


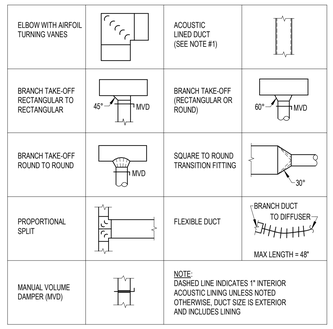
24" OR SMALLER

25" OR WIDER

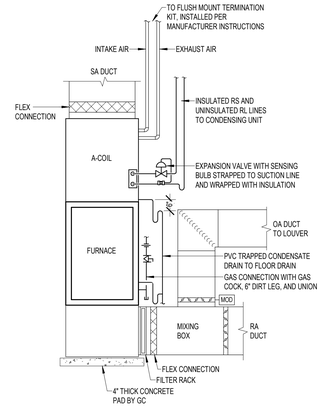
DUCT WIDTH	ROD DIA.	SUPPORT ANGLE OR EQUIV. CHANNEL	MAXIMUM SPACING	MAXIMUM AREA
25" TO 30"	3/8"	1 1/2" X 1 1/2" X 1/8"	8'-0" O.C.	4 SQ. FT.
31" TO 42"	3/8"	1 1/2" X 1 1/2" X 1/8"	6'-0" O.C.	10 SQ. FT.
43" TO 60"	1/2"	1 1/2" X 1 1/2" X 1/8"	6'-0" O.C.	10 SQ. FT.
61" TO 84"	1/2"	2" X 2" X 1/4"	4'-0" O.C.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

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

DUCT SUPPORT DETAIL
NO SCALE



TYPICAL DUCT TAKE-OFF DETAILS
NO SCALE



AIR HANDLING UNIT DETAIL
NO SCALE

AIR HANDLING UNIT SCHEDULE (GAS HEAT / DX COOLING)

REMARKS:
1. ACCEPTABLE MANUFACTURERS: CARRIER, TRANE, LENNOX
2. MERV 13 FILTERS
3. CRANKCASE HEATER
4. 7-DAY PROGRAMMABLE THERMOSTAT

MARK	NOMINAL TONS	SERVICE	FAN CFM	EXTERNAL STATIC PRESSURE ("WC)	FAN HP	COOLING CAPACITY	HEATING CAPACITY	ELECTRICAL				MANUFACTURER	MODEL	REMARKS
						TOTAL (MBH)	INPUT (MBH)	OUTPUT (MBH)	VOLT.	PH.	MCA	MOCP			
AHU 1	3.5	SEE PLANS	1500	0.5	3/4	40.5	88	85	120	1	7.60	15	LENNOX	EL296UH090XE48C / CX35-48C-F	1,2,3,4
AHU 2	3.5	SEE PLANS	1500	0.5	3/4	40.5	88	85	120	1	7.60	15	LENNOX	EL296UH090XE48C / CX35-48C-F	1,2,3,4
AHU 3	3.5	SEE PLANS	1500	0.5	3/4	40.5	88	85	120	1	7.60	15	LENNOX	EL296UH090XE48C / CX35-48C-F	1,2,3,4

CONDENSING UNIT SCHEDULE

REMARKS:
1. ACCEPTABLE MANUFACTURERS: CARRIER, TRANE, LENNOX
2. MOUNT ON VIBRATION SPRING ISOLATORS ON PREFABRICATED CURB
3. LOW AMBIENT COOLING

MARK	NOMINAL TONS	SERVICE	LOCATION	CAPACITY (MBH)	ELECTRICAL				SEER	MANUFACTURER	MODEL	WEIGHT (LBS)	REMARKS
					VOLT.	PH.	MCA	MOCP					
CU 1	3.5	AHU-1	GRADE	40.5	208	3	18.00	20	14.25	LENNOX	ML14XC1-042-233	220	1,2,3
CU 2	3.5	AHU-2	GRADE	40.5	208	3	18.00	20	14.25	LENNOX	ML14XC1-042-233	220	1,2,3
CU 3	3.5	AHU-3	GRADE	40.5	208	3	18.00	20	14.25	LENNOX	ML14XC1-042-233	220	1,2,3

FAN SCHEDULE

REMARKS:
1. DISCONNECT SWITCH
2. BACKDRAFT DAMPER
3. TO RUN CONTINUOUS DURING OCCUPIED HOURS
4. VENT CAP FOR ROOFTOP TERMINATION

MARK	QTY.	SERVICE	CFM	STATIC PRESSURE ("WC)	RPM	SONES	ELECTRICAL			MANUFACTURER	MODEL	WEIGHT (LBS)	REMARKS
							HP or WATTS	VOLT.	PH.				
EF 1	1	GUEST RR	75	0.29	950	0.8	17 WATTS	120	1	GREENHECK	SP-A110	20	1,2,3,4
EF 2	1	EMPLOYEE RR	75	0.29	950	0.8	17 WATTS	120	1	GREENHECK	SP-A110	20	1,2,3,4
EF 3	1	TENANT RR	75	0.29	950	0.8	17 WATTS	120	1	GREENHECK	SP-A110	20	1,2,3,4
EF 4	1	GENERAL EA	550	0.5	1158	4.6	1/4 HP	120	1	GREENHECK	G-100-VG	40	1,2,3

ELECTRIC UNIT HEATER SCHEDULE

REMARKS:
1. DISCONNECT SWITCH
2. BUILT-IN THERMOSTAT
3. SUSPENDED FROM CEILING/STRUCTURE
4. RECESSED MOUNTING
5. SECURITY FRONT COVER

MARK	QTY.	SERVICE	CFM	MBH	ELECTRICAL				MANUFACTURER	MODEL	WEIGHT (LBS)	REMARKS
					KW	VOLT.	PH.	MCA	MOCP				
ECUH 1	1	ENTRY	200	20.5	8.0	208	1	38.50	50	QMARK	EFQR008	50	1,2,4,5
ECUH 2	1	SIDE ENTRY	200	20.5	8.0	208	1	38.50	50	QMARK	EFQR008	50	1,2,4,5
ECUH 3	1	RESTROOM	100	5.1	1.5	120	1	12.50	20	QMARK	AWH3150F	25	1,2,4,5
ECUH 4	1	RESTROOM	100	5.1	3.0	120	1	12.50	20	QMARK	AWH3150F	25	1,2,4,5
ECUH 5	1	RESTROOM	100	5.1	1.5	120	1	12.50	20	QMARK	AWH3150F	25	1,2,4,5
ECUH 6	1	RESTROOM	100	5.1	1.5	120	1	12.50	20	QMARK	AWH3150F	25	1,2,4,5
EUH 1	1	MECH / ELEC ROOM	350	10.2	3.0	208	1	15.00	30	QMARK	MUH03-B1	30	1,2,3

MINI-SPLIT SYSTEM SCHEDULE

REMARKS:
1. LOW AMBIENT WIND BAFFLE KIT
2. R-410A REFRIGERANT
3. INDOOR UNIT POWERED FROM OUTDOOR UNIT BY EC
4. 5-YEAR COMPRESSOR WARRANTY
5. PROVIDE WITH CONDENSATE PUMP: ASPEN MINI-AQUA.

MARK	NOMINAL TONS	RATED COOLING CAPACITY (MBH)	CFM RANGE	ELECTRICAL				SEER	MANUFACTURER	MODEL	REMARKS
				VOLT.	PH.	MCA	MOCP				
AC A	1.5	-	425	208	1	1.00	20	-	MITSUBISHI	PKA-A18HA7	1,2,3,4,5
CU A	1.5	18	-	208	1	11.00	20	18.5	MITSUBISHI	PUY-A18NKA7	1,2,3,4,5

GRILLE AND DIFFUSER SCHEDULE

REMARKS:
1. PROVIDE WITH LCD THERMOSTAT WITH MOTION SENSOR (°F)
2. 2" HEPA FILTER, MERV 8 PRE-FILTER, FILTER AND MOTOR STATUS LIGHT AND BACNET INTEGRATION
3. 115V ECM MOTOR, CONSTANT FLOW ECM PROGRAM, DISCONNECT SWITCH
4. ROOM SIDE AND TOP ACCESSIBLE CONTROLS
5. FOR DRYWALL CEILING INSTALLATION, PROVIDE PLASTER FRAMES TO RECEIVE LAY-IN TYPE BORDERS...

MARK	QTY.	MANUFACTURER	MODEL	DAMPER	FRAME / BORDER	MODULE SIZE	PATTERN	FINISH	REMARKS
SUPPLY									
S-1	12	PRICE	SPD	MVD IN DUCT	LAY-IN	24x24	4-WAY THROW	WHITE	6
S-2	1	PRICE	SPD	MVD IN DUCT	SURFACE	24x24	4-WAY THROW	WHITE	5,6
S-3	7	PRICE	PPD	MVD IN DUCT, VAV IN DIFFUSER	LAY-IN	24x24	4-WAY THROW	WHITE	1,6
S-4	4	PRICE	SPD	MVD IN DUCT	SURFACE	12x12	4-WAY THROW	WHITE	5,6
S-5	1	PRICE	FFU-RSR	MVD IN DUCT	LAY-IN	24x24 - 10"ø INLET	PERFORATED FACE	WHITE	2,3,4,6
S-6	1	PRICE	22	OBD IN GRILLE	DUCT MTD	6x4	DOUBLE DEFLECTION - ADJUSTABLE	WHITE	6
RETURN									
R-1	13	PRICE	80	MVD IN DUCT	LAY-IN	SEE PLANS	EGG CRATE	WHITE	6
EXHAUST									
E-1	5	PRICE	60	MVD IN DUCT	LAY-IN	SEE PLANS	45° DEFLECTION	WHITE	6

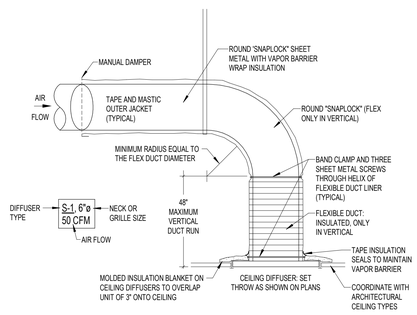
LOUVER SCHEDULE

REMARKS:
1. INSTALL PER MANUFACTURER INSTRUCTIONS
2. COLOR BY ARCHITECT
3. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION
4. TRANSITION TO FULL SIZE LOUVER
5. PROVIDE PLENUM BOX AS REQUIRED

MARK	SERVICE	CFM	PRESSURE DROP ("WC)	VELOCITY (FPM)	MIN. FREE AREA (FT²)	SIZE (W"xH"xD")	MANUFACTURER	MODEL	REMARKS
L 1	AHU-1,2,3 - OA INTAKE	900	.04	521	1.7	30x18x6	GREENHECK	ESD-635	1,2,3,4,5

AIR BALANCE SUMMARY

EQUIPMENT	NOMINAL TONS	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	% OUTSIDE AIR (CFM)	EXHAUST AIR (CFM)	RETURN AIR (CFM)
AHU-1	3.5	1500	300	20	-	1200
AHU-2	3.5	1500	300	20	-	1200
AHU-3	3.5	1500	300	20	-	1200
EF-1	-	-	-	-	75	-
EF-2	-	-	-	-	75	-
EF-4	-	-	-	-	550	-
		Total:	900		700	



CEILING DIFFUSER CONNECTION DETAIL
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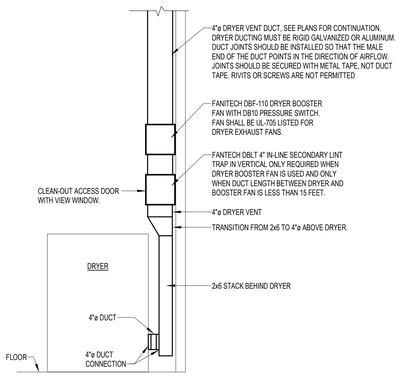
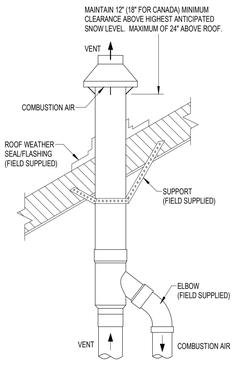


CLOTHES DRYER EXHAUST WITH BOOSTER FAN CONNECTION DETAIL
NO SCALE



ROOF CONCENTRIC VENT DETAIL
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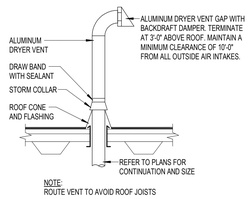
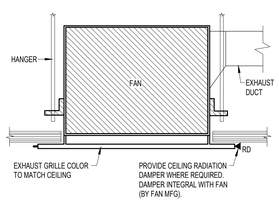


NOTE:
ROUTE VENT TO AVOID ROOF JOISTS

DRYER VENT THROUGH ROOF DETAIL
NO SCALE



CEILING/SUSPENDED FAN DETAIL
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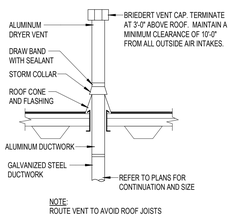
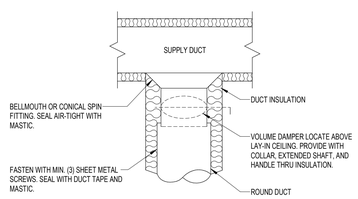


NOTE:
ROUTE VENT TO AVOID ROOF JOISTS

EXHAUST VENT THROUGH ROOF DETAIL
NO SCALE



ROUND DUCT TAKE-OFF DETAIL
NO SCALE

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PROFESSIONAL SEAL:

NVA #233 Westover Animal Clinic Relocation

79 Lyman St.
South Hadley, MA 01075

JOB NUMBER: 230323.00

DRAWING RELEASE:

No.	Date	Description
	10/02/2023	Bid/ Permit

SHEET TITLE:

HVAC SCHEDULES AND DETAILS

SHEET NUMBER:

M001

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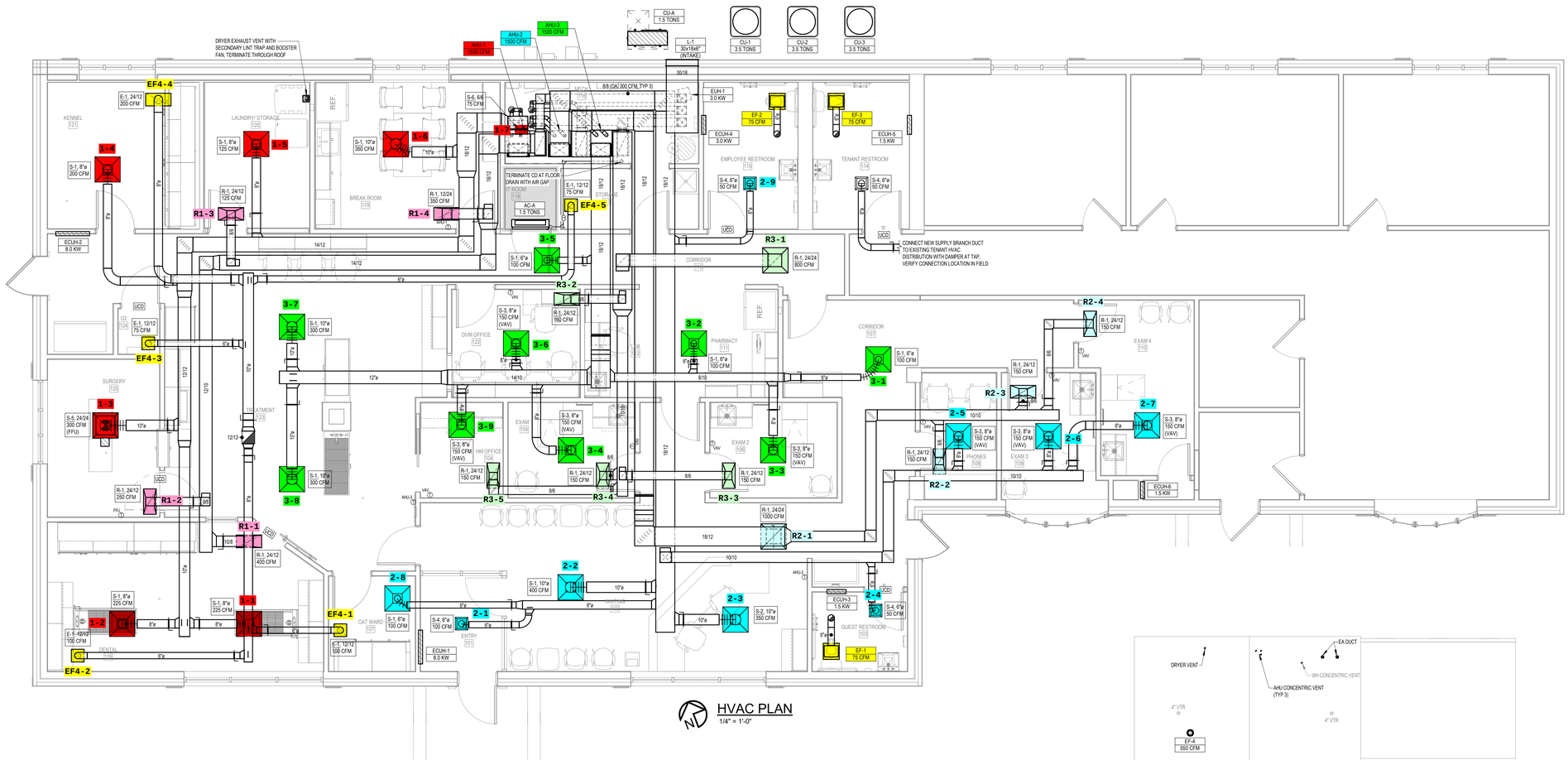
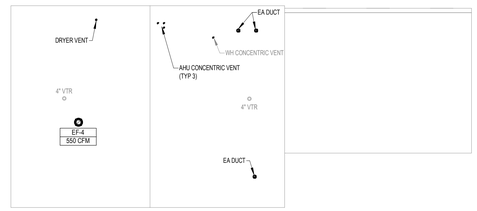
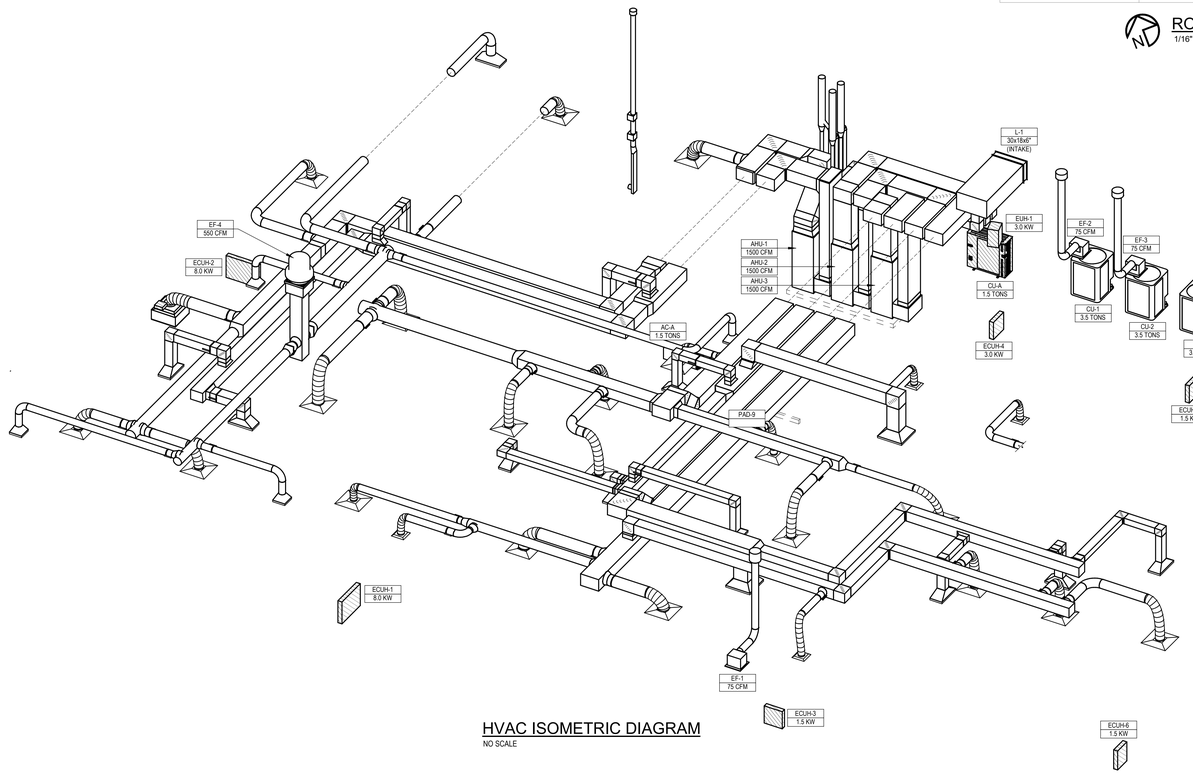


HVAC PLAN
1/4" = 1'-0"



ROOF HVAC PLAN
1/16" = 1'-0"



HVAC ISOMETRIC DIAGRAM
NO SCALE

FIELD VERIFY ALL CONDITIONS

- DESIGN DRAWINGS ARE SCHEMATIC. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS.
- THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT CONTRACTORS COST.
- BIDDING CONTRACTORS SHALL HAVE A WORKING KNOWLEDGE OF LOCAL CODES AND ORDINANCES AND SHALL INCLUDE IN THEIR BIDS THE COSTS FOR ALL WORK INSTALLED IN STRICT ACCORDANCE WITH GOVERNING CODES, THE PLANS AND SPECIFICATIONS NOT WITHSTANDING. THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER OR OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT.

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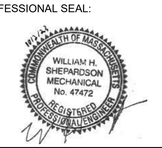

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SHEET TITLE:

HVAC PLANS

SHEET NUMBER:

M101