HVAC SPECIFICATIONS

HVAC GENERAL

REFER TO ALL OTHER DRAWINGS AND SPECIFICATIONS, AND BE RESPONSIBLE FOR ALL APPLICABLE PROVISIONS THEREIN. FURNISH AND INSTALL ALL NECESSARY LABOR AND MATERIALS FOR A COMPLETE SYSTEM. ANY APPLIANCES OR MATERIALS OBVIOUSLY A PART OF THE SYSTEM AND NECESSARY FOR ITS PROPER OPERATION, ALTHOUGH NOT SPECIFICALLY MENTIONED HEREIN, SHALL BE FURNISHED AND INSTALLED AS IF CALLED FOR IN DETAIL. WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH ALL STATE AND LOCAL CODES AND THE BUILDING REGULATIONS. ATTAIN AND PAY FOR ALL REQUIRED PERMITS AND FEES. EQUIPMENT AND MATERIALS SHALL BE NEW, UNLESS OTHERWISE SPECIFIED.

COMPLY WITH RULES, REGULATIONS OF STATE, COUNTY, AND CITY AUTHORITIES HAVING JURISDICTION OVER THE PREMISES, INCLUDING SAFETY REQUIREMENTS OF OSHA.

DRAWINGS ARE GENERALLY DIAGRAMMATIC AND DO NOT NECESSARILY SHOW EVERY FITTING, OFFSET, DROP AND RISE OF RUNS, AND DETAIL. INSTALL DUCTS, EQUIPMENT AND CONTROLS IN A NEAT, WORKMANLIKE MANNER AND IN ACCORDANCE WITH GOOD PRACTICE FOR A COMPLETE, WORKABLE INSTALLATION. AVOID CONFLICT WITH OTHER WORK, MAKE ADEQUATE PROVISIONS FOR PREVENTING NOISE AND VIBRATION. DRAWINGS INDICATE LOCATIONS OF FIXTURES, APPARATUS, DUCTWORK AND PIPING; AND WHILE THESE ARE TO BE FOLLOWED AS CLOSELY AS POSSIBLE, IF IT IS NECESSARY TO CHANGE THE LOCATION OF SAME TO ACCOMMODATE BUILDING CONDITIONS. MAKE CHANGES WITHOUT ADDITIONAL COST TO THE OWNER AND AS APPROVED BY THE ARCHITECT. PROVIDE ADEQUATE ACCESS TO THE EQUIPMENT AND APPARATUS REQUIRING OPERATION, SERVICE OR MAINTENANCE WITHIN THE LIFE OF THE SYSTEM. DO NOT RUN PIPING OR DUCTWORK, OR LOCATE EQUIPMENT, (WITH RESPECT TO SWITCHBOARDS, PANEL BOARDS, POWER PANELS, MOTOR CONTROL CENTERS OR DRY TYPE TRANSFORMERS) WITHIN 42 INCHES IN FRONT OF EQUIPMENT, OVER EQUIPMENT, OR WITHIN 36 INCHES HORIZONTALLY OF SAME. ALL SECURITY GRILLS SHALL TEMPER PROOF SCREWS.

COORDINATION

COORDINATE ALL WORK UNDER THIS DIVISION WITH WORK UNDER OTHER DIVISIONS.

PROTECTION OF WORK DURING CONSTRUCTION

PROVIDE PROTECTIVE COVERS, SKID, PLUGS OR CAPS TO PROTECT EQUIPMENT AND MATERIALS FROM DAMAGE AND DETERIORATION DURING CONSTRUCTION. PROTECT EXPOSED COILS WITH PLYWOOD OR OTHER SUITABLE RIGID COVERS TO AVOID DAMAGE TO FINS.

CONTRACTOR SHALL TAKE PRECAUTIONS AGAINST DAMAGING OR DISRUPTING BUILDING SYSTEMS, WIRING OR CONTROL TUBING FOR ADJACENT TENANTS. ANY DAMAGE SHALL BE REPAIRED AT THE CONTRACTORS COST.

PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE. ANY DAMAGE SHALL BE REPAIRED USING THE SAME MATERIALS AT THE CONTRACTORS COST.

RECORD DRAWINGS

CONTRACTOR WILL PROVIDE A COMPLETE SET OF REPRODUCIBLE AS-BUILT DRAWINGS CLEARLY INDICATING LOCATION OF DUCTWORK AND EQUIPMENT, INCLUDING DIMENSIONS ARRANGEMENT, RATING AND CAPACITIES OF ALL NEW AND EXISTING SYSTEMS.

SUBMITTALS

SUBMIT ALL SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO PURCHASE, FABRICATION AND INSTALLATION.

SUBMIT AIR AND WATER BALANCE REPORTS.

FURNISH TO THE OWNER ONE COPY OF OPERATING INSTRUCTIONS, MANUFACTURERS PARTS DATA, AND SERVICE INSTRUCTIONS.

TESTING

ALL LEAKS SHALL BE REPAIRED BY TIGHTENING, AND FITTINGS. CAULKING OF JOINTS WILL NOT BE PERMITTED.

ADJUST DAMPERS, REGISTERS AND DIFFUSERS FOR PROPER AIR DISTRIBUTION. CHECK SYSTEM UNDER ACTUAL OPERATING CONDITIONS AND MAKE ADJUSTMENTS FOR A UNIFORM TEMPERATURE THROUGH THE CONDITIONED.

CLEANING AND ADJUSTING

THE EXTERIOR SURFACES OF ALL MECHANICAL EQUIPMENT, PIPING, DUCTS, ETC., SHALL BE CLEANED OF ALL GREASE, OIL, PAINT AND OTHER CONSTRUCTION DEBRIS. DUCTS, PLENUMS AND CASINGS SHALL BE CLEANED OF ALL DEBRIS AND BLOWN FREE OF ALL PARTICLES OF RUBBISH AND DUST BEFORE INSTALLING OUTLET FACES. BEARINGS THAT REQUIRE LUBRICATION SHALL BE LUBRICATED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS. ALL CONTROL EQUIPMENT SHALL BE ADJUSTED TO THE SETTINGS INDICATED OR REQUIRED FOR PERFORMANCE AS SPECIFIED. FLUSH WATER PIPING SYSTEMS UNTIL WATER RUNS CLEAN. REMOVE ALL STICKERS, RUST, STAINS, LABELS, AND TEMPORARY COVERS BEFORE FINAL ACCEPTANCE. REMOVE FOREIGN MATTER FROM EQUIPMENT, PIPING AND DUCTWORK SYSTEMS AND APPURTENANCES. CLEAN AND POLISH IDENTIFICATION PLATES.

BALANCING

PROVIDE SERVICES OF A CERTIFIED AABC OR NEBB TEST AGENCY TO TEST AND BALANCE HVAC SYSTEM. CONDUCT ALL TEST IN ACCORDANCE WITH AABC OR NEBB, NATIONAL STANDARDS FOR FIELD MEASUREMENTS AND INSTRUMENTATION.

THE HVAC CONTRACTOR SHALL MAKE ALL CHANGES IN SHEAVES, BELTS AND DAMPERS AS REQUIRED. ADD DAMPERS AS REQUIRED TO CORRECTLY BALANCE SYSTEM AT NO ADDITIONAL

TEST AND BALANCE HVAC AIR SYSTEMS TO WITHIN +10, −5% OF DESIGN FLOWS.

COMMISSIONING PROCEDURES

THE INSTALLING CONTRACTOR WILL PERFORM THE FINAL TESTING AND BALANCING OF ALL SYSTEMS AFTER THE HVAC SYSTEM HAS BEEN OPERATED.

THE INSTALLING HVAC CONTRACTOR SHALL, PRIOR TO THE OPERATION OF THE SYSTEMS:

* SET UP ALL AIR SYSTEM TO OPERATE AT THE CFM, RPM AND AMPERAGE TO MEET THE CAPACITIES SCHEDULED ON THE PLANS.
* REPLACE THE AIR FILTERS USED DURING THE SET-UP PROCEDURE WITH NEW FILTERS.
* CLEAN AND FILL ALL WATER SYSTEMS AND TREAT ALL WATER SYSTEMS WITH OSHA AND APPROVED CORROSION AND BIOLOGICAL INHIBITORS.

PROJECT CLOSEOUT

THE COMMISSIONING OF ALL SYSTEMS AND EQUIPMENT WILL BE DOCUMENTED BY THE INSTALLING MEP CONTRACTOR IN WRITING USING THE FORMS ENCLOSED WITH PERFORMANCE SPECIFICATION.

THE INSTALLING CONTRACTOR SHALL PROVIDE WRITTEN EVIDENCE THAT ALL REQUIRED INSPECTIONS BY THE LOCAL CODE OFFICIALS HAVE BEEN COMPLETED USING THE CLOSE OUT FORM PROVIDED HEREIN.

TAGS AND CHARTS: TAG ALL VALVES, DAMPERS AND OTHER CONTROL DEVICES WITH 2-INC DIAMETER, STAMPED BRASS TAGS THAT ARE FIRMLY AFFIXED TO EACH DEVICE.

THE HVAC CONTRACTOR SHALL PROVIDE A REPRESENTATIVE OF THE OWNER WITH 8 HOURS OF ON-SITE INSTRUCTION IN THE OPERATION AND MAINTENANCE OF THE HVAC SYSTEMS.

PROVIDE A WRITTEN ONE-YEAR LABOR AND MATERIALS WARRANTY FOR THE ENTIRE INSTALLATION.

GUARANTEE

MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED AGAINST DEFECTS FOR ONE YEAR.

EQUIPMENT, MATERIALS AND BID BASIS.

SPECIFIED MANUFACTURERS NAMES AND MODEL NUMBERS ARE FOR THE PURPOSE OF DESCRIBING TYPE, CAPACITY, FUNCTION AND QUALITY OF EQUIPMENT AND MATERIALS TO BE USED.

EQUIPMENT SUPPORT

SUPPORT ALL CEILING MOUNTED EQUIPMENT, DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER.

VIBRATION ISOLATORS

SUSPENDED EQUIPMENT SHALL BE PROVIDED WITH VIBRATION ISOLATION HANGERS WHICH SHALL BE FURNISHED WITH THE UNIT, AND ISOLATOR SHALL BE MATCHED TO EQUIPMENT WEIGHT AND SUPPORT LOCATIONS. ISOLATION HANGERS SHALL BE COMBINATION STEEL SPRING AND NEOPRENE-IN-SHEAR WITH STEEL HOUSING. ISOLATORS SHALL HAVE A MINIMUM OPERATING DEFLECTION OF 1-1/2". SPRINGS SHALL HAVE A MINIMUM ADDITIONAL TRAVEL FOR 50% BETWEEN THE DESIGN HEIGHT AND THE SOLID HEIGHT.

HVAC INSULATION

QUALITY ASSURANCE: TYPE D1 ASTM C553 TYPE 1, CLASS B3: INSULATE SUPPLY DUCT, FRESH AIR DUCT WITH A MINIMUM 1 1/2" FIBERGLASS DUCT WRAP, NOMINAL 1 P.C.F. DENSITY BLANKET, K FACTOR OF 0.31 MAXIMUM AT 75 DEGREE F MEAN, WITH FACTORY APPLIED FSK (FOIL-SCRIM-KRAFT) VAPOR BARRIER JACKET, FOR TEMPERATURES TO 250 DEGREE F.
SPECIFIED COMPONENTS OF THIS INSULATION SYSTEM, INCLUDING FACINGS, MASTICS, AND ADHESIVES, SHALL HAVE A FIRE HAZARD RATING NOT TO EXCEED 25 FOR FLAME SPREAD AND 50 FOR SMOKE DEVELOPED, AS PER TESTS CONDUCTED IN ACCORDANCE WITH ASTM E84 (NFPA 255) METHODS.

APPROVED PRODUCTS:

STANDARD FIBERGLASS DUCT WRAP, TYPE 100 OWENS CORNING TYPE 100.

INSTALLATION OF DUCTWORK INSULATION:

MAINTAIN INTEGRITY OF VAPOR-BARRIER ON DUCTWORK INSULATION, AND PROTECT IT TO PREVENT PUNCTURE AND OTHER DAMAGE. TAPE ALL PUNCTURES. SECURE ALL DUCTWORK WITH GALVANIZED WIRE 12 INCHES O.C. SECURE DUCTWORK WITH OUTWARD CLINCHING STAPLES. SEAL ALL LONGITUDINAL AND CIRCUMFERENTIAL JOINTS WITH FSK TAPE.

EXTEND DUCTWORK INSULATION WITHOUT INTERRUPTION THROUGH WALLS, FLOORS AND SIMILAR DUCTWORK PENETRATIONS, EXCEPT WHERE OTHERWISE INDICATED.

PIPE INSULATION

HOT WATER PIPING: 1" GLASS FIBER: HEAVY DENSITY, ONE PIECE CONSTRUCTION.
ACCEPTABLE MANUFACTURERS: OWENS-CORNING MODEL SSL II, ALL SERVICE JACKET; KNAUF, SCHULLER.

CELLULAR FOAM ½" THICK- REFRIGERANT PIPING

ACCEPTABLE MANUFACTURERS: ARMSTRONG, MODEL AP ARMAFLEX; INSULTUBE, RUBATEX.
INSULATION: ASTM C534; FLEXIBLE, CELLULAR ELASTOMERIC, MOLDED OR SHEET.

PIPING

HOT WATER PIPING SHALL BE
COPPER TUBE ASTM B88, TYPE L HARD DRAWN (2"<), TYPE L HARD DRAWN. PIPING SHALL BE COMPLETE WITH PIPE FITTINGS, VALVES, COUPLING, STRAINERS, HANGER RODS, HANGERS, SUPPORTS, GUIDES, SLEEVES AND ACCESSORIES IN CONFORMANCE WITH THE LATEST CODES AND ASME,

CONNECTIONS BETWEEN FERROUS AND COPPER PIPING SHALL BE WITH DIELECTRIC FITTING.

PROVIDE FITTINGS FOR CHANGE IN PIPE SIZE AND FOR FINAL CONNECTION AT EQUIPMENT, AS REQUIRED.

PROVIDE UNION CONNECTIONS AT EACH PIECE OF EQUIPMENT AND ON EACH SIDE OF ALL VALVES.

PROVIDE VALVED AND CAPPED CONNECTIONS AT ALL POINTS IN PIPING SYSTEMS REQUIRED FOR DRAINING

REFRIGERANT PIPING

COPPER TUBING UP TO 7/8 INCH OD: ASTM B88, TYPE K, ANNEALED.

1. FITTINGS: ASME B16.26 CAST COPPER.
2. JOINTS: FLARED.

SHEET METAL WORK

EXCEPT AS OTHERWISE NOTED, ALL DUCTWORK AND OTHER SHEET METAL WORK SHALL BE INSTALLED IN ACCORDANCE WITH LATEST EDITION OF THE SHEET METAL AND AIR CONDITIONING CONTRACTOR NATIONAL ASSOCIATION, INC. (SMACNA), "HVAC DUCT CONSTRUCTION STANDARDS" MANUAL. DUCTWORK SHALL BE GALVANIZED SHEET STEEL, UNLESS OTHERWISE NOTED. FIBERGLASS DUCTWORK IS NOT ACCEPTABLE.

LOW PRESSURE FLEXIBLE DUCT SHALL BE SIMILAR TO FLEXMASTER TYPE 5, OR APPROVED EQUAL, WITH 1 1/2 INCH THICK INSULATION AND SHALL CONFORM TO U.L. 181 AND NFPA BULLETIN 90A. MAXIMUM LENGTH SHALL NOT EXCEED FOUR (4) FEET.

VOLUME DAMPER: SAME MATERIAL AS DUCT, PER SMACNA, EXCEPT PROVIDE BEARING AT ONE END OF DAMPER ROD AND QUADRANT, WITH LEVER AND LOCKSCREW AT OTHER END. FOR INSULATED DUCTS, QUADRANTS MOUNTED ON COLLAR TO CLEAR INSULATION, INSTALL WITH LEVERS ACCESSIBLE.

ACCESS TILE IDENTIFICATIONS: PROVIDE BUTTONS, TABS AND MARKERS TO IDENTIFY LOCATION OF ALL CONCEALED VALVES, DAMPERS AND EQUIPMENT. SUBMIT TO ARCHITECT FOR APPROVAL.

DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS. WHERE INTERNAL INSULATION IS CALLED FOR, DIMENSIONS SHALL BE INCREASED BY THICKNESS OF INSULATION.

PORTIONS OF DUCTWORK VISIBLE THROUGH SUPPLY AND RETURN AIR OPENINGS SHALL BE PAINTED FLAT BLACK.

TRANSITION RECTANGULAR DUCTWORK ON THE BOTTOM AND THE SIDES. MAINTAIN DUCTWORK LEVEL AND AS HIGH AS POSSIBLE UNLESS NOTED OTHERWISE.

FLEXIBLE DUCT RUNOUTS TO ALL DIFFUSERS SHALL BE INSTALLED FREE OF KINKS AND SAGS. ALL BRANCH DUCTWORK SHALL BE SIZED TO MATCH THE INLET OF THE DIFFUSERS SERVED

ALL DUCT TRANSITIONS FROM SQUARE TO ROUND SHALL BE SMOOTH. SQUARE TO ROUND TRANSITIONS. SPIN-IN FITTINGS AT THE END OF CAPPED DUCTS ARE NOT ACCEPTABLE.

ALL OPEN ENDED DUCTS SHALL BE REINFORCED WITH 1-1/2"x1-1/2"x1/8" GALVANIZED STEEL ANGLES BOLTED OR RIVETED 6" ON CENTER ALL AROUND THE EXTERIOR PERIMETER OF THE DUCT.

AUTOMATIC CONTROLS

MECHANICAL CONTRACTOR SHALL RETAIN THE SERVICES OF A QUALIFIED AUTOMATIC CONTROLS CONTRACTOR.

MOUNT THERMOSTATS WHERE INDICATED ON PLANS 48" A.F.F., UNLESS NOTED OTHERWISE.

CONTRACTOR SHALL PROVIDE AND INSTALL ALL INTERCONNECTING CONTROL WIRING AS REQUIRED FOR A COMPLETE AND OPERABLE INSTALLATION. THIS CONTRACTOR IS TO ASSUME COMPLETE RESPONSIBILITY FOR INSTALLATION OF CONTROL WIRING WITH APPROPRIATE CONNECTIONS.

INSTALL PROGRAMMABLE THERMOSTAT FOR AHU'S TO RUN TIME SCHEDULE.

INSTALL HONEYWELL ZONE CONTROL SYSTEM AS PER THE MANUFACTURERS INSTRUCTION.

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No. 42431
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CHECKED BY: AK
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