

## MECHANICAL SPECIFICATIONS

### PART 1 - GENERAL

- A. CONTRACTOR DEFINITION - THE PERSON WHO AGREES TO FINISH AND INSTALL THE WORK OF THIS SECTION FOR A PRICE. THE CONTRACTOR IS REFERRED IN STATEMENTS LIKE VERIFY DIMENSIONS BEFORE CONSTRUCTION.
  - B. DISCREPANCIES - CONTACT ARCHITECT FOR CLARIFICATION OF CONTRACT DOCUMENTS BEFORE BIDDING.
  - C. CODES AND STANDARDS - COMPLY WITH STANDARD BUILDING CODE.
  - D. PERMITS AND FEES - OBTAIN REQUIRED PERMITS. PAY REQUIRED FEES.
  - E. MECHANICAL DRAWINGS - AVOID INTERFERENCES.
  - F. SHOP DRAWINGS - SUBMIT REQUIRED DRAWINGS IN A SINGLE BROCHURE SUBMIT ON HVAC UNITS INCLUDING SPLIT SYSTEMS, EXHAUST FANS, THERMOSTATS AND INSULATION.
  - G. ELECTRICAL COORDINATION - GIVE MINUS DIAGRAMS FOR MECHANICAL EQUIPMENT TO ELECTRICAL CONTRACTOR.
  - H. GUARANTEE - REPLACE OR REPAIR ANY ITEM FOUND DEFECTIVE DURING FIRST YEAR OF OPERATION WITHOUT COST TO OWNER.
- PART 2 PRODUCTS**
- MOTORS AND STARTERS**
- A. PROVIDE MOTORS AND STARTERS IN DIVISION 15 AND INSTALL IN DIVISION 16.
  - B. PROVIDE HIGH EFFICIENCY MOTORS. CHOOSE FROM GENERAL ELECTRIC ENERGY SAVER, RELIANCE ELECTRIC XE, OR CENTURY E PLUS METAL WAVE PLATES REQUIRED.
- PART 3 EXECUTION**
- A. COORDINATION OF WORK - THE CONTRACTOR IS RESPONSIBLE TO COORDINATE DIVISION 15 WORK. PROVIDE A COMPLETE AND FUNCTIONING SYSTEM.
  - B. SPACE CONDITIONS
    1. ALL APPARATUS, DUCTWORK, PIPING ETC., MUST FIT INTO THE AVAILABLE SPACES IN THE BUILDING AND BE INTRODUCED INTO THE BUILDING AT SUCH TIME AND MANNER AS TO CAUSE NO DAMAGE.
    2. THE CONTRACTOR SHALL BE FAMILIAR WITH THE MECHANICAL, ELECTRICAL, STRUCTURAL, AND ARCHITECTURAL DRAWINGS, AND WITH THE PROJECT SCHEDULE OF OPERATIONS, AND INSTALL HIS WORK TO CONFORM TO THE LIMITATIONS.
    3. LEAVE ALL EQUIPMENT AND APPARATUS NORMALLY REQUIRING OPERATION SERVICE OR MAINTENANCE READILY ACCESSIBLE.
    4. VERIFY BUILDING DIMENSIONS BEFORE BEGINNING WORK.
    5. DRAWINGS ARE SCHEMATIC. ALL INLET DEVICES TO BE 10'-0" FROM ANY OUTLET DEVICE.
    6. WALLS TO STRUCTURE TO HAVE RETURN AIR OPENINGS IN PLenum SPACE. FIRE RATED WALLS TO HAVE FIRE DAMPERS IN RAOS.
  - C. MISCELLANEOUS REQUIREMENTS
    1. CUT, PATCH AND REPAIR AS REQUIRED. DO NOT DAMAGE THE BUILDING.
    2. PROVIDE TOUCH-UP PAINTING OF SURFACES DAMAGED AS A RESULT OF DIVISION 15 WORK, AND ANY OTHER PAINTING EXPRESSLY REQUIRED.
    3. TAKE ALL PRECAUTIONS NECESSARY FOR PROPER PROTECTION OF EQUIPMENT, APPARATUS AND MATERIALS. FAILURE TO DO SO WILL BE CAUSE FOR REJECTION OF ANY ITEM COMING UNDER QUESTION.
- INSULATION**
- PART 1 - GENERAL**
- A. PRODUCT MARKING**
1. ALL PRODUCTS OR THEIR SHIPPING CARTONS SHALL BEAR A LABEL INDICATING THAT THEY MEET THE SPECIFIED FIRE AND SMOKE HAZARD RATINGS.
  - B. SUBMITTALS
    1. INSULATION SPECIFICATION OR DATA SHEETS
    2. MANUFACTURERS PUBLISHED RECOMMENDATIONS FOR APPLICATION

- C. SCOPE
    1. INSULATE CONDENSATE DRAIN PIPING BRANCH LINES
    2. INSULATE REFRIGERANT SUCTION LINES
    3. INSULATE SUPPLY DUCTS RETURN DUCTS, AND OUTSIDE AIR DUCTS OVER DROPPED CEILING SPACES.
    4. DO NOT INSULATE EXPOSED DUCTWORK (WHERE APPLICABLE)
- PART 2 - PRODUCTS**
- A. FIRE AND SMOKE HAZARD RATINGS**
1. ALL INSULATION UNLESS SPECIFICALLY EXCEPTED, SHALL HAVE COMPOSITE (INSULATION, JACKET OR FACING, AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) FIRE AND SMOKE HAZARD RATINGS (AS TESTED BY PROCEDURE COMPLYING WITH NFPA 285) NOT EXCEEDING:

FLAME SPREAD	25
SMOKE DEVELOPED	50
  2. ACCESSORIES SUCH AS ADHESIVES, MASTICS, CEMENTS, AND TAPES SHALL HAVE THE SAME COMPONENT RATINGS AS LISTED ABOVE.

- B. DUCTWORK** - INSULATE WITH 2 INCH THICK FIBER GLASS DUCT WRAP ONE POUND DENSITY.
- C. REFRIGERANT LINES** - INSULATE WITH ONE INCH RUBATEX.
- D. CONDENSATE** - INSULATE WITH HALF INCH RUBATEX.
- PART 3 - EXECUTION**
- A. APPLICATION OF INSULATION - GENERAL**
1. INSULATION SHALL BE APPLIED ON CLEAN, DRY SURFACES. INSPECTION AND RELEASE FOR INSULATION APPLICATION AS REQUIRED.
  2. ALL INSULATION SHALL BE CONTINUOUS THROUGH WALL AND CEILING OPENINGS AND SLEEVES.
  3. INSULATION ON ALL COLD SURFACES WHERE VAPOR BARRIER JACKETS ARE USED, SHALL BE APPLIED WITH A CONTINUOUS UNBROKEN VAPOR SEAL. HANGERS, SUPPORTS, ANCHORS, OR OTHER ITEMS THAT ARE SECURED DIRECTLY TO COLD SURFACES MUST BE INSULATED AND VAPOR-SEALED TO PREVENT CONDENSATION.
  4. INSULATION SHALL BE PROTECTED FROM PHYSICAL DAMAGE AT POINTS OF SUPPORT WHERE THE INSULATION MUST CARRY THE LOAD IMPOSED BY THE SUPPORT.
- AIR DISTRIBUTION SYSTEMS**
- PART 1 - GENERAL**
- A. FINISH AND INSTALL SHEET-METAL DUCTWORK, PLenums, GRILLES, REGISTERS, FITTINGS AND RELATED SHEET-METAL WORK.
  - B. APPLICABLE CONSTRUCTION STANDARDS
    1. NFPA BULLETIN NO. 90 A
    2. SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION DUCT MANUAL AND SHEET METAL CONSTRUCTION FOR VENTILATING AND AIR CONDITIONING SYSTEMS' SECTIONS 1 AND 2 (SMACNA).
    3. AIRRAE FUNDAMENTALS AND EQUIPMENT GUIDE AND DATA BOOK
- C. SYSTEM CLASSIFICATION - LOW PRESSURE.**
- PART 2 - PRODUCTS**
- A. FANS**
- CABINET FANS**
1. ABOVE CEILING CABINET FAN WITH ACOUSTIC LINING AND WALL SWITCH
  2. ROOF OR WALL CASES AS INDICATED ON PLAN.
  3. DIRECT DRIVE FANS WITH SPEED CONTROL UNLESS NOTED.
  4. MANUFACTURER: PENN. COOK, GREENECK.
- B. DUCTWORK**
1. USE ROUND OR SPIRAL DUCTWORK UNLESS NOTED.
  2. DUCTWORK SHALL BE GALVANIZED STEEL SHEETS OF LOCK FORMING QUALITY WITH A GALVANIZED COATING OF 1/4 OUNCES TOTAL FOR BOTH SIDES OF ONE SQUARE FOOT.

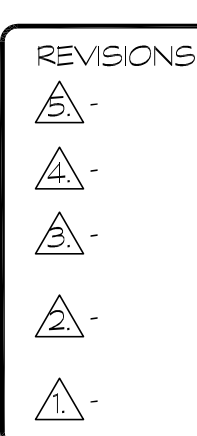
- C. FLEXIBLE CONNECTIONS 90 DEGREE U.L. APPROVED GLASS FABRIC REINFORCE COATED ON BOTH SIDES, VENT-FABRICS, INC., VENTGLAS COMPLETE WITH ATTACHMENT ACCESSORIES.
  - D. FLEXIBLE DUCTWORK INSULATED TYPE - THERMAFLEX H-ME-10 OR EQUIVALENT FLEXMATEX OR MENDOZA CONFORMING TO NFPA-40A.
- E. LOW PRESSURE SPRINK TAKE-OFF FITTINGS - GENIE/FLEX TYPE OR FLEXMATEX.**
- F. FIRE DAMPERS** - GALVANIZED STEEL WITH BLADE CUT OF AIR STREAM. FIRE DAMPERS ARE LOW PRESSURE RISIN TYPE BDD-LR OR EQUAL. PROVIDE DUCT ACCESS DOOR FOR ACCESS TO DAMPER.
- G. GRILLES, REGISTERS AND DIFFUSERS**
1. CEILING
  2. MANUFACTURER: TITUS, KRUGER, AEROSTAT.
- H. LOUVERS**
1. LOUVERS AND DAMPERS 1/2" 4 OR EQUAL RISIN OR AIRLITE
  2. GALVANIZED STEEL, 1/8 GAGE PREPARED FOR PAINTING.
  3. BOX FRAME, 4 INCH DEPTH, 91 DEGREE BLADE, BIRD SCREEN WITH 1/2 INCH OPENINGS.
- PART 3 - EXECUTION**
- A. FANS**
1. PROVIDE SAFE AND FUNCTIONAL OPERATION.
  2. PREVENT VIBRATION, NOISE AND LEAKS.
- B. DUCTWORK**
1. INSTALL DUCT NEATLY, HANG PROPERLY AND AVOID INTERFERENCES. DUCT TO BE SMOOTH ON THE INSIDE.
  2. PROVIDE FOR DUCT SYSTEM EXPANSION.
  3. SEAL SLEEVE SPACE WITH FIBERGLASS OR FIRE FOAM.
  4. INSTALL BALANCING DAMPERS AND ACCESS DOORS.
  5. CONNECT TO EQUIPMENT WITH FLEXIBLE MATERIAL.
  6. USE INSULATED FLEX DUCT TO CONNECT TO SUPPLY DIFFUSERS, MAXIMUM LENGTH 12 FEET. AVOID SHARP BENDS.
  7. INSTALL SMOKE DETECTORS IN RETURN DUCTS OF UNITS ABOVE 2000 CFM.
  8. LINE ALL DUCT FROM UNIT TO 10' OR FIRST TURN.
- ELECTRIC HEAT PUMP SPLIT SYSTEM**
- PART 1 - GENERAL**
- A. SPLIT SYSTEM CONSISTS OF INSIDE UNIT WITH COOLING COIL, FAN SECTION, FILTER SECTION, ELECTRIC HEATING COIL, BACKUP HEAT AND MOUNTING KIT AND OUTSIDE HEAT PUMP UNIT.
  - B. FINISH AND INSTALL INDOOR UNITS AS SHOWN IN MECHANICAL SPACE. EQUIPMENT SCHEDULES ARE BASED ON CARRIER. PROVIDE FIRE DAMPERS IF REQUIRED WHERE DUCTWORK PASSES THROUGH RATED CEILING OR WALLS.
  - C. COMPLY WITH NFPA 90 AND AIRRAE 90.1.
- PART 2 - PRODUCTS**
- A. OUTDOOR HEAT PUMP UNITS HAVE A PAINTED GALVANIZED STEEL CASING.
  - B. COMPRESSORS TO BE OPERABLE AT 30F.
  - C. INSIDE UNITS HAVE DIRECT DRIVE FANS.
  - D. FINISH PROGRAMMABLE THERMOSTAT 2 STAGES OF HEATING (COOLING AUTO CHANGE OVER TO CONTROL SPACE.
  - E. MANUFACTURER: CARRIER, LENOX, OR EQUAL.

### PART 3 - EXECUTION

- A. COORDINATE INSTALLATION OF INSIDE AND OUTSIDE UNITS.
  - B. INSTALL REFRIGERANT LINES, INSTALL CONDENSATE DRAIN LINES WITH TRAP AND RUN TO NEAREST R.A. VENT IF ALLOWED OR NEAREST APPROVED FIXTURE.
  - C. PROVIDE MANUFACTURER LONG-LINE APPLICATION KIT FOR REFRIGERANT PIPING LENGTHS GREATER THAN 50 FT.
  - D. TEST AND BALANCE SYSTEM TO AIR QUANTITIES SHOWN. NO REPORT.
- PACKAGED ROOFTOP UNIT**
- PART 1 - GENERAL**
- A. PACKAGED SINGLE ZONE ROOFTOP HEAT PUMP UNITS OF THE SIZE AND CAPACITIES SHOWN ON THE DRAWINGS.
  - B. UNITS SHALL BE COMPLIANT WITH ASHRAE 90.1.
  - C. MANUFACTURERS: LENOX, CARRIER, WOLVAY.
- PART 2 - PRODUCT UNIT DESCRIPTION**
- A. HOIST UNITS ON THE FULL PERMITTER ROOF CURB THAT THE MANUFACTURER FURNISHES WITH THE UNIT. THE UNIT SHALL INCLUDE WEATHERPROOF HOUSING, AIR COOLED CONDENSING AND DX REFRIGERATION SYSTEM COIL SECTION, SLOPED CONDENSATE DRAIN PAN, ELECTRIC RESISTANCE HEATING, FILTERS, AND ALL OPERATING AND SAFETY CONTROLS.
  - B. MANUFACTURERS ALTERNATE BELT DRIVE MOTOR SHALL BE FACTORY INSTALLED.
  - C. THE COMPRESSOR SHALL BE ISOLATED FROM VIBRATION, AND THE FAN MOTORS SHALL BE RESILIENTLY MOUNTED.
  - D. THE UNIT SHALL BE FACTORY WREID, CHANGED AND TESTED AND BE AS CRITERIA. IT SHALL BE FINISHED WITH A NON-FIBER DISCONNECT SWITCH, SHORT CIRCUIT FUSE PROTECTION OF ALL INTERNAL ELECTRICAL COMPONENTS, AND ALL NECESSARY MOTOR STARTERS, CONTROLS, AND OVERCURRENT PROTECTION.
  - E. UNITS SHALL BE EQUIPPED WITH FACTORY INSTALLED ECONOMIZERS TO LOOK OUTDOOR AIR.
  - F. UNITS SHALL BE EQUIPPED WITH BAROMETRIC RELIEF DAMPER CAPABLE OF RELIEVING UP TO 100% OF RETURN AIR.
  - G. COMPRESSORS SHALL BE WARRANTED AGAINST FAILURE FOR A PERIOD OF 5 YEARS. IT SHALL HAVE A THERM LOCK-OUT TO PREVENT SHORT CYCLING.
  - H. ACCESS DOORS SHALL HAVE VENT OR REVERSE GASKETS. THE EXTERIOR CABINET SHALL BE REFINISHED AND COATED WITH AN EPOXY FINISH. ALL UNITS SHALL BE COMPLETELY INSULATED WITH NONFIBER GLASS FIBER. A MINIMUM OF THICK THAT IS SECURED WITH ADHESIVE AND MECHANICAL FASTENERS.
- EVAPOATOR AND CONDENSER COILS SHALL BE COPPER TUBE AND EXTENDED SURFACE ALUMINUM FIN.**
1. THE UNIT CONTROLS SHALL INCLUDE A LOW AND HIGH REFRIGERANT PRESSURE OUT-OUT. A THERMOSTAT AND COORDINATE ALL CONTROLS AS REQUIRED BY THE CONTROL SECTION OF THIS DIVISION.
  2. CORRECT AND PAINT ANY DAMAGE TO FINIS, GUARDS, OR HOUSING AS NECESSARY.
  3. LINE THE UNIT ROOF CURB AND THE ROOF BELOW THE UNIT WITH 2" OF ACOUSTICAL FIBERGLASS MATERIAL.
  4. THE MANUFACTURER SHALL PROVIDE 2" HIGH EFFICIENCY THROUGHWAY FILTERS TO BE USED DURING CONSTRUCTION. BEFORE FINAL INSTALLATION, INSTALL NEW FILTERS.

### CONTROLS

- PART 1 - GENERAL**
- A. SEBNT ON PROGRAMMABLE THERMOSTATS.
  - B. SEBNT ON HANDEDY CONTROLS AND SENSORS.
  - C. MOUNTING HARDWARE MUST BE BACK AND MOUNTED.
  - D. MOTOR OPERATED OA DAMPER REQUIRED.
  - E. CONTROL OUTSIDE AIR MOTOR OPERATED DAMPERS WITH DALI, PROBEZE THERMOSTAT AND CARBON DIOXIDE SENSORS.
  - F. OA DAMPERS SHALL OPEN FULLY WHEN CO2 SENSOR INDICATES CO2 ABOVE 1000 PPM (PARTS PER MILLION).
  - G. OA DAMPERS SHALL CLOSE COMPLETELY WHEN CO2 SENSOR INDICATES 400 PPM.
  - H. INTERLOCK OA VOD WITH UNIT FANS.
- PART 2 - PRODUCTS**
- A. THERMOSTATS TO BE HONEYWELL OR EQUAL.**
- PART 3 - EXECUTION**
- SEQUENCE OF OPERATION**
- A. OCCUPIED**
1. COOLING AS ZONE TEMPERATURE RISES ONE DEGREE ABOVE COOL SET POINT COOLING IS CALLED.
  2. HEATING AS ZONE TEMPERATURE FALLS ONE DEGREE BELOW HEAT SET POINT HEATING IS CALLED.
  3. ZONE SUPPLY FANS RUN WHEN BUILDING IS OCCUPIED.
- D. UNOCCUPIED**
1. NIGHT SETBACK AT UNIT PROGRAM TIME.
  2. MORNING WARM UP AT UNIT PROGRAM TIME.
  3. NO HEATING IF SPACE ABOVE 50 F. NO COOLING IF SPACE BELOW 90 F.
- TEST AND BALANCE**
- PART 1 - GENERAL**
- A. TEST AND BALANCE AIR FLOWS TO AIR QUANTITIES SHOWN.
  - B. TEST EXHAUST FANS.
- PART 2 - PRODUCTS**
- A. USE INDEPENDENT TEST AND BALANCE AGENCY.**
- B. USE MEMBERS OF AASB, EQUIPPED WITH REQUIRED AND CALIBRATED TEST EQUIPMENT.**
- C. FURNISH WRITTEN REPORT.**
- PART 3 - EXECUTION**
- A. COOPERATE WITH T 1 B AGENCY.**
- B. MAKE REQUIRED ADJUSTMENTS PROMPTLY.**
- C. COORDINATE TEST AND BALANCE WITH OWNER.**



REVISIONS TO BE INDICATED BY NUMBER AND DATE. ALL CHANGES TO BE MADE BY THE DESIGNER AND NOTED ON THE DRAWING AND COPIES OF THE DRAWING. ANY SET OF THE DRAWING IS TO BE CONSIDERED VOID UNLESS IT IS ACCOMPANIED BY THE ORIGINAL AND SIGNED BY THE DESIGNER.

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new facility for:  
**washington seventh day baptist church**  
CRITTENDEN @ 16TH, WASHINGTON, D.C.

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