MECHANICAL SPECIFICATIONS:

<u>GENERAL</u>

1. CONTRACTOR SHALL VISIT THE SITE TO DETERMINE PRE-EXISTING CONDITIONS AND ALL

NECESSARY, PRIOR TO BIDDING. VERIFY ALL MEASUREMENTS AND EXISTING CONDITIONS IN THE FIELD. GENERAL SCHEMATIC LAYOUT IS INDICATED; ALL OFFSETS, OBSTRUCTIONS, AND EXISTING CONFIGURATIONS AND CONSTRAINTS MUST BE FIELD VERIFIED.

2. OBTAIN NECESSARY PERMITS AND PAY ASSOCIATED FEES.

REQUIREMENTS FOR ALL MOTORS.

- 3. COORDINATE ANY SERVICE DISRUPTIONS WITH THE OWNER. A NOTICE SHALL BE PROVIDED TO THE OWNER A MINIMUM OF 48 HOURS BEFORE DISRUPTION OCCURS.
- 4. INSTALL ALL COMPONENTS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND ALL LOCAL CODES AND STANDARDS.
- 5. DRAWINGS ARE DIAGRAMMATIC ONLY; FIELD-VERIFY ALL EXISTING CONDITIONS. COORDINATE
- OORDINATE
 INSTALLATIONS WITH OTHER TRADES. COORDINATE ELECTRICAL POWER
- THE INTENTION OF THESE CONTRACT DOCUMENTS IS TO CALL FOR FINISHED WORK, FULLY TESTED AND READY FOR OPERATION. ANY COMPONENTS OR LABOR NOT MENTIONED IN THE CONTRACT DOCUMENTS BUT REQUIRED FOR FUNCTIONING SYSTEMS SHALL BE PROVIDED. SHOULD THERE APPEAR TO BE ANY DISCREPANCIES OR QUESTIONS OF INTENT, THE CONTRACTOR SHALL REFER THE MATTER TO THE ARCHITECT FOR DECISION BEFORE START OF ANY RELATED WORK.
- 7. PERFORM WORK IN ACCORDANCE WITH LOCAL CODES.
- 8. SEAL ALL DUCT AND PIPE PENETRATIONS WITH FIRE SEALANT.
- 9. OBSERVE THE OWNER'S CLEANLINESS PROTOCOLS.
- 10. ADD ALTERNATE:1 SHALL ADD AN ELECTRIC STEAM HUMIDIFICATION FOR THE NUCLEAR MEDICINE ROOM RENOVATION.

METAL DUCTWORK

GALVANIZED STEEL DUCTS: ASTM A 653/A 653M GALVANIZED STEEL SHEET, FORMING STEEL (FS) DESIGNATION, WITH G90/Z275 ZINC COATING.

- 2. FLEXIBLE DUCT: UL181, NFPA 90A/B. SELF EXTINGUISHING, INSULATED SEALED ENDS.
- 3. HANGER ROD: ASTM A 36/A 36M; STEEL; THREADED BOTH ENDS, THREADED ONE END, OR CONTINUOUSLY THREADED. ROD SHALL BE GALVANIZED OR ELECTROPLATED.
- 4. HANGER STRAPS: COMPLY WITH SMACNA "HVAC DUCT STANDARDS-METAL AND FLEXIBLE" FOR STEEL SHEET WIDTH AND THICKNESS AND SHALL BE GALVANIZED SHEET METAL TO MATCH DUCT.
- 5. SEALANT (SUPPLY/EXHAUST):
- A. DUCTMATE PROSEAL OR APPROVED EQUAL.
- B. NON-HARDENING, WATER RESISTANT, FIRE RESISTIVE, COMPATIBLE WITH MATING MATERIALS; LIQUID USED ALONE OR WITH TAPE, OR HEAVY MASTIC.
- C. WATER BASED WITH A VERY MILD ODOR; UL 723 LISTED. FLAME SPREAD SHALL
- NOT EXCEED 25 AND SMOKE DEVELOPED RATING SHALL NOT EXCEED 50.

 D. DRY TIME TO TOUCH: 1 HOUR
- E. DRY TIME TO CURE: 24 TO 72 HOURS.
- 6. METAL DUCTWORK AND PLENUM FABRICATION
- A. FABRICATE AND SUPPORT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE, AND AS INDICATED. PROVIDE DUCT MATERIAL, GAGES, REINFORCING, AND SEALING FOR OPERATING PRESSURES INDICATED.
- B. CONSTRUCT T'S, BENDS, AND ELBOWS WITH RADIUS OF NOT LESS THAN 1-1/2
 TIMES WIDTH OF DUCT ON CENTERLINE. WHERE NOT POSSIBLE AND WHERE
 RECTANGULAR ELBOWS MUST BE USED, PROVIDE AIR FOIL TURNING VANES.
 SQUARE THROAT OR MITRED ELBOWS WITHOUT TURNING VANES ARE PROHIBITED.
- C. RECTANGULAR BRANCH CONNECTIONS SHALL BE 45-DEGREE ENTRY TYPE.

 D. INCREASE DUCT SIZES GRADUALLY, NOT EXCEEDING 15 DEGREES DIVERGENCE
- WHEREVER POSSIBLE; MAXIMUM 30 DEGREES DIVERGENCE UPSTREAM OF EQUIPMENT AND 45 DEGREES CONVERGENCE DOWNSTREAM.

 E. ROUND BRANCHES FROM RECTANGULAR MAIN SHALL BE EITHER CONICAL OR BELLMOUTH. SPIN-IN BRANCHES ALLOWED WHERE DUCT PRESSURE CLASS IS 1"
- OR LOWER.

 F. PROVIDE STANDARD 45 DEGREE LATERAL WYE TAKEOFFS UNLESS OTHERWISE INDICATED WHERE 90 DEGREE CONICAL TEE CONNECTIONS MAY BE USED.
- 7. SEALING AND CONSTRUCTION SCHEDULES

SUPPLY, RETURN AND EXHAUST DUCTWORK.

- A. SUPPLY AIR: GALVANIZED STEEL, 2" WG, SEAL CLASS A.

 B. EXHAUST: AS NOTED BELOW, 2" WG, SEAL CLASS A. G90 GALVANIZED.
- 8. LABELING SHALL APPEAR AT INTERVALS OF NOT MORE THAN 20 FEET AND AT LEAST ONCE IN EACH ROOM AND EACH STORY TRAVERSED BY THE PIPING SYSTEM. ALL PIPING SHALL BE CLEARLY IDENTIFIED SPECIFICALLY FOR TYPE OF SERVICE WITH COILED PLASTIC PIPE MARKERS AND FLOW DIRECTION ARROWS. PROVIDE DUCT LABELS ON ALL

MECHANICAL INSULATION

- ALL SUPPLY DUCTS SHALL BE EXTERNALLY INSULATED WITH FIBERGLASS DUCT WRAP EQUAL TO SCHULLER MICOLITE TYPE 75, ASTM C533, NONCOMBUSTIBLE BLANKET, 1-½"
- ALL HOT WATER PIPING SHALL BE INSULATED WITH 1" THICK FIBERGLASS PIPE INSULATION WITH FSK JACKET.

AUTOMATIC TEMPERATURE CONTROLS

- THE CONTROLS FOR THIS PROJECT WILL BE AN EXTENSION OF THE EXISTING TRANE CONTROLS SYSTEM.
- 2. PROVIDE CONTROLS TO MEET THE SEQUENCE OF OPERATIONS.
- 3. THERMOSTAT: ZONE THERMOSTAT SHALL BE SIMILAR TO EXISTING WITH SETPOINT ADJUSTMENT, NIGHTTIME SETBACK OVERRIDE AND CANCEL BUTTONS, AND A COMMUNICATIONS JACK.
- 4. CONTROLS TESTING SHALL BE ACCOMPLISHED ON EACH CONTROL DEVICE. ACTUATORS SHOULD BE CHECKED AND ADJUSTED FOR START AND EXTENT OF TRAVEL. ALL RELAYS AND ADAPTERS SHOULD BE CHECKED SHOULD FOR PROPER OPERATION. CONTROLLERS SHOULD BE CHECKED FOR PROPER ACTION. ALL SYSTEM INTERLOCKS, INTERCONNECTIONS, AND SAFETY DEVICES SHOULD BE CHECKED FOR PROPER FUNCTION.
- 5. ALL CONTROL DEVICES SHALL BE ADJUSTED AND CALIBRATED. ALL CONTROL SETTINGS SHOULD BE VERIFIED BY COMPARING ACTUAL INPUT AND OUTPUT VALUES TO CALIBRATED VALUES.
- 6. FURNISH ALL COMPONENTS AS REQUIRED FOR COMPLETE AND FUNCTIONING SYSTEM. PROVIDE DDC CONTROL WITH FULLY MODULATING ACTUATORS.
- 7. COORDINATE SENSOR LOCATIONS.
- 8. START-UP: PROVIDE ALL REQUIRED SOFTWARE MODIFICATIONS AND DE-BUGGING. ALLOW SUFFICIENT TIME FOR START-UP PRIOR TO PLACING CONTROL SYSTEMS IN PERMANENT OPERATION. ALLOW FOR

COORDINATION WITH THE TESTING, ADJUSTING, AND BALANCING CONTRACTOR. ASSISTANCE SHALL BE

PROVIDED AS REQUIRED FOR REPROGRAMMING, COORDINATION, AND PROBLEM RESOLUTION.

- 9. REMOVE ALL UNUSED OLD CONTROLS, DEVICES, WIRING AND EBI POINTS AT PROJECT COMPLETION.
- 10. PROVIDE IN-SERVICE/TRAINING WITH INSTALLATION OF ANY NEW EQUIPMENT.
- 11. PROVIDE CONTROLS TO MEET MAINE MEDICAL PARTNERS FACILITIES ENGINEERING STANDARDS.

HYDRONIC PIPING

- 1. PROVIDE ALL PIPING COMPLETE WITH FITTINGS, VALVES, STRAINERS, MOTORIZED VALVE OPERATORS, STRAINERS, HANGERS, SUPPORTS, GUIDES, SLEEVES, AND ACCESSORIES.
- 2. ALL PRESSURIZED PIPING TO BE TESTED HYDROSTATICALLY TO 150 PSI OR 150% OF OPERATING PRESSURE, WHICHEVER IS GREATER, BUT NEVER EXCEED TEST PRESSURE ANSI B16.1 BASIS. TEST DURATION TO BE 2 HOURS WITH NO PRESSURE CHANGE CORRECTED FOR TEMPERATURE CHANGE.
- 3. REPAIR OR REPLACE LEAKS OR DEFECTS WITHOUT ADDITIONAL COST.
- 4. PROVIDE DIELECTRIC NIPPLES WHERE DISSIMILAR METALS ARE TO BE JOINED. DIELECTRIC UNIONS ARE NOT ACCEPTABLE.
- 5. PROVIDE ADEQUATE SUPPORT FOR PIPE AND CONTENTS TO PREVENT SAGGING, VIBRATION, OR SWAYING AND ALLOW FOR EXPANSION AND CONTRACTION. PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE STRUCTURE CANNOT SUPPORT POINT LOADS.
- 6. HYDRONIC PIPING SHALL BE COPPER, TYPE L, HARD DRAWN IN ACCORDANCE WITH ASTM B88, AND LEAD-FREE SOLDER JOINTS, OR THREADED STEEL.
- 7. INSPECTIONS AND TESTS SHALL BE PERFORMED ON THE PIPING INSTALLATION AS REQUIRED BY CODE.

MECHANICAL IDENTIFICATION

- 1. PROVIDE A TAG ON ALL NEW EQUIPMENT (AC UNIT(S), CONDENSING UNIT(S), VAV BOXES)
- PROVIDE DUCT LABELS ON ALL SUPPLY DUCTWORK.
- 3. PROVIDE VALVE TAGS ON ALL VALVES. PROVIDE A VALVE TAG SCHEDULE.

MECHANICAL EQUIPMENT

- 4. PROVIDE AND INSTALL MECHANICAL EQUIPMENT AS SCHEDULED, UNLESS NOTED OTHERWISE.
- 5. PROVIDE MINIMUM OF 4 HOURS IN-SERVICE/TRAINING WITH INSTALLATION OF ANY NEW EQUIPMENT.

REFRIGERANT PIPING

- 1. COMPLY WITH ASME STANDARD B31.5, "REFRIGERANT PIPING."
- 2. REFRIGERANT PIPING SHALL BE ASTM B 280, TYPE ACR COPPER TUBE. FITTINGS SHALL BE ASME B16.22 WROUGHT COPPER FITTINGS. BRAZING FILLER METAL SHALL BE AWS A5.8 CLASSIFICATION BAG-1 (SILVER).
- INSTALL OIL TRAPS IN REFRIGERANT PIPING AS RECOMMENDED BY EQUIPMENT MANUFACTURER.
- 4. SIZE PIPING PER MANUFACTURERS RECOMMENDATIONS.
- 5. PROPERLY SUPPORT HORIZONTAL AND VERTICAL REFRIGERANT PIPING RUNS.
- 6. PROVIDE ONE-INCH THICK, FLEXIBLE ELASTOMERIC TYPE INSULATION ON REFRIGERANT LIQUID AND SUCTION PIPING. PROVIDE PVC JACKET ON OUTDOOR INSULATION. SEAL WEATHER TIGHT.

TESTING, ADJUSTING, AND BALANCING

- 1. TESTING AND BALANCING CONTRACT SHALL BE THROUGH THE GENERAL CONTRACTOR. SEE ARCHITECTURAL SPECIFICATIONS.
- 2. CONTRACTOR SHALL PROVIDE TESTING, ADJUSTING, AND BALANCING FOR ALL AIR
- 3. CONTRACTOR SHALL PERFORM PRE-CONSTRUCTION TESTING AND BALANCING OF SPACES UNDER RENOVATION, INCLUDING SUPPLY DIFFUSERS AND ASSOCIATED VAVS (VAVS TO BE EFFECTED INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING: 4-01, 4-1, 4-2, 4-4, 4-6, 4-14, 4-18, 6C), RETURN GRILLES AND ASSOCIATED VAVS AND EXHAUST AIR GRILLES.
- 4. ADJUST ALL AIRFLOWS TO PLUS/MINUS 5% OF VALUES SHOWN ON THE DRAWINGS.
- 5. TAB CONTRACTOR SHALL CONFIRM THAT ALL EQUIPMENT IS INSTALLED CORRECTLY AND STARTED UP CORRECTLY PRIOR TO BALANCING.
- 6. TAB CONTRACTOR SHALL CONFIRM THAT CONTROLS AND TERMINAL BOXES ARE CALIBRATED PRIOR TO BALANCING.
- 7. TAB CONTRACTOR SHALL SUBMIT A TAB REPORT AT THE COMPLETION OF WORK.

TERMINAL BOXES

- 1. PROVIDE AND INSTALL TERMINAL BOXES WITH HOT WATER REHEAT COILS AS SCHEDULED.
- 2. TERMINAL BOXES SHALL BE DOUBLE WALLED, WITH SOLID SHEET METAL INTERIOR LINER COVERING ALL INSULATION. ALL TERMINAL BOXES SHALL COME FURNISHED WITH SOUND ATTENUATORS.
- 3. BASIS OF DESIGN: TRANE MODEL VCWF.

HUMIDIFICATION

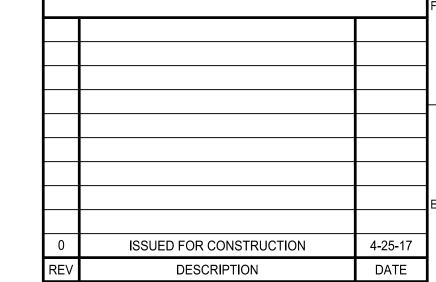
- GENERAL: PROVIDE AND INSTALL HUMIDIFIER AS SCHEDULED.
- A. MAXIMUM ALLOWABLE ABSORPTION DISTANCE IS 24 INCHES.B. MAINTAIN MINIMUM SPACE HUMIDITY AT 35% (ADJ).
- C. DISTRIBUTOR WILL BE WAND STYLE STAINLESS STEEL WITH DUCT GROMMET AND CONDENSATE RETURN TO THE UNIT PER THE MANUFACTURER'S INSTRUCTIONS

INSTALLATION SHALL BE PER THE MANUFACTURER'S REQUIREMENTS AND CODE.

- 2. DDC CONTROLS
- A. LOCAL CONTROLLER WILL CONTROL THE HUMIDITY LEVEL SUBJECT TO DUCT MOUNTED HIGH LIMIT SENSOR AND THE BMS INTERFACE WILL ALLOW REMOTE CONTROL

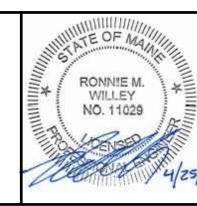
3. DUCT DRAIN PAN:

A. DUCT DRAIN PAN SHALL BE FABRICATED AND INSTALLED BY DUCTWORK CONTRACTOR DRAINAGE PIPING SHALL BE INSTALLED BY PLUMBING WORK CONTRACTOR



ISSUED FOR CONSTRUCTION 4-25-17

CURRENT ISSUE STATUS:



SMRT Architects and Engineers 144 Fore Street Portland, Maine 04104 1.877.700.7678 www.smrtinc.com

MAINE MEDICAL PARTNERS
SURGICAL CARE RENOVATIONS

MECHANICAL SPECIFICATIONS

SHEET TITLE:

0 1/8" 1/2" 1" 2"

SCALE: NOT TO SCALE

PROJECT MANAGER: DJV PROJECT NO:

A/E OF RECORD: RMW

JOB CAPTAIN: CAH

DRAWN BY: CWF

SMRT FILE:

M-002

M-002-17027 SHEET No. @CODYDIGHT 2016