SPECIFICATIONS:

GENERAL
1. INTENT OF PROJECT IS FOR NEW MATERIALS AND COMPONENTS TO MATCH EXISTING. ALL MATERIALS SHALL BE APPROVED BY MERCY HOSPITAL.
2. REVIEW PROTOCOL AND PROCEDURES WITH MERCY HOSPITAL PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING BUILDING OWNER'S PROTOCOL AND PROCEDURES BY ITS EMPLOYEES AND SUB-CONTRACTORS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS IN THE FIELD PRIOR TO ANY DEMOLITION OR NEW INSTALLATION.
4. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2009 EDITION OF THE INTERNATIONAL BUILDING CODE AND ANY AND ALL OTHER APPLICABLE FEDERAL, STATE, AND LOCAL ORDINANCES.
5. THE CONTRACTOR SHALL VERIFY SHUTDOWN AND ISOLATION VALVE LOCATIONS. THE CONTRACTOR SHALL COORDINATE ALL SHUTDOWN WORK WITH THE PROJECT COORDINATOR FOR MERCY HOSPITAL.
6. THE CONTRACTOR SHALL VISIT THE SITE, BECOME FAMILIAR WITH THE EXISTING FIELD CONDITIONS, AND MAKE HIS OWN ESTIMATE OF THE DIFFICULTIES IN EXECUTING THE WORK PRIOR TO SUBMITTING ITS BID. NO COMPENSATION WILL BE AWARDED TO THE CONTRACTOR BASED ON A CLAIM OF LACK OF KNOWLEDGE OF EXISTING FIELD CONDITIONS.
7. PIPING, DUCTWORK AND EQUIPMENT ARE NOT COMPLETELY DETAILED ON THE DIAGRAMS AND ELEVATIONS PROVIDED ON THE DRAWINGS ARE APPROXIMATE. THE DISTRIBUTION IS INTENDED AS A GENERAL ROUTING ONLY, BUT DOES ILLUSTRATE THE DESIRED LOCATION. THE CONTRACTOR SHALL AVOID INTERFERENCES WITH OTHER EQUIPMENT AND THE WORK OF OTHER DISCIPLINES.
8. NOT ALL VALVES, INSTRUMENTS AND CONTROLS ARE SHOWN IN THE PLAN VIEWS. INSTALL PIPING AND VALVES AS SHOWN ON PIPING DIAGRAMS AND DETAILS.
9. DUCTWORK, PIPING AND SUPPORTS SHALL NOT INTERFERE WITH EQUIPMENT MAINTENANCE ACCESS OR PULL SPACE.
10. DRAWINGS OF REVISED DUCTWORK OR PIPING ARRANGEMENTS SHALL BE SUBMITTED IF ITEMS ARE NOT SHOWN ON THE DRAWINGS. REVISIONS SHALL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO COMMENCEMENT OF THE CHANGES.
11. MECHANICAL CONTRACTOR SHALL PROVIDE ALL SUPPLEMENTARY STRUCTURAL SUPPORTS, ANGLE IRON, PLATES, ROD, ETC. AS NECESSARY FOR PROPER INSTALLATION OF PIPING, EQUIPMENT, AND ACCESSORIES.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR SIZING SUPPORTS, STRUT RACKS, TRAPEZE STEEL, PIPE SUPPORT COMPONENTS, ETC.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGE MADE BY ITS FIRM ON NEW OR EXISTING EQUIPMENT INSTALLED OR RELOCATED BY HIM UNDER THIS CONTRACT. THIS SHALL INCLUDE ALL TOUCH-UP PAINTING.
14. THE CONTRACTOR SHALL RETURN AS-BUILT DRAWINGS TO OWNER.
15. CONTRACTOR TO PROVIDE ALL MATERIALS NEEDED FOR CONSTRUCTION UNLESS OTHERWISE NOTED OR DIRECTED.
16. DIELECTRIC UNIONS SHALL BE INSTALLED BETWEEN DISSIMILAR METALS IN SOLDERED AND THREADED PIPING SYSTEMS AND INSULATED FLANGES FOR WELDING SYSTEMS.
17. CONTRACTOR TO LABEL ALL NEW PIPING AND DUCTWORK EVERY 10 FEET. LABELING TO INCLUDE DIRECTION OF FLOW AS WELL AS DESCRIPTION OF CONTENTS. LABELING SHALL BE COLOR/SIZE ACCORDING TO OSHA SPECIFICATIONS.
18. PRIOR TO CONNECTING TO ANY EXISTING PIPING, CONFIRM TIE-IN LOCATIONS WITH MERCY HOSPITAL PROJECT MANAGER.
    A. PROVIDE HANGERS, SUPPORTS, AND INSERTS CONFORMING TO:
    1. MSS SP-58
    2. MSS SP-69
    3. ANSI B31.9
    B. PROVIDE PIPE HANGERS, SUPPORTS, AND ACCESSORIES WHICH:
    1. PERMIT VERTICAL ADJUSTMENT AFTER INSTALLATION OF PIPING.
    2. ARE DESIGNED FOR SUPPORT OF PIPING AND CONTENTS UNDER ALL CONDITIONS OF OPERATION INCLUDING TESTING.
    3. WILL NOT CRUSH, INDENT, OR OTHERWISE DAMAGE PIPE, PIPE INSULATION, OR JACKETING.
    C. PROVIDE COMPLETE HANGER AND SUPPORT ASSEMBLIES, INCLUDING CLAMPS, RODS, WASHERS, NUTS, TURNBUCKLES, AND LOCKING DEVICES, CONSTRUCTED FOR COMPATIBILITY WITH ITEMS SUPPORTED AND SUPPORTING STRUCTURE.
    D. PROVIDE ALL SIMILAR SUPPORT COMPONENTS BY SAME MANUFACTURER.
    E. PROVIDE OVERSIZED CLEVIS AND/OR ROLLER HANGERS TO FIT ON OUTSIDE OF INSULATED PIPING.
    F. PROVIDE INSULATION PROTECTORS AT SUPPORT POINTS FOR ALL INSULATED UNJACKETED PIPING.
    G. SPECIAL REQUIREMENTS: ALL COMPONENTS SHALL BE SUITABLY SIZED FOR THE LOAD SUPPORTED.

SUBMITTALS
1. PRODUCT DATA: SUBMIT MANUFACTURERS PRODUCT DATA AND INSTALLATION INSTRUCTIONS FOR EACH MATERIAL AND PRODUCT USED.
2. OPERATION AND MAINTENANCE DATA: SUBMIT MANUFACTURERS OPERATION AND MAINTENANCE DATA, INCLUDING OPERATION INSTRUCTIONS, LIST OF SPARE PARTS AND MAINTENANCE SCHEDULE.

OPERATION AND MAINTENANCE DATA
1. COMMENCE PREPARATION OF THE OPERATING AND MAINTENANCE (O&M) MANUALS IMMEDIATELY UPON RECEIPT OF "APPROVED" OR "APPROVED AS NOTED" SHOP DRAWINGS AND SUBMIT EACH SECTION WITHIN ONE MONTH. THE FINAL SUBMISSION SHALL BE NO LATER THAN TWO MONTHS PRIOR TO THE PROJECTED DATE OF SUBSTANTIAL COMPLETION OF THE PROJECT.
2. THE MANUAL SHALL CONSIST OF (3) SETS OF MANUALS AND INCLUDE (3) SETS OF CDS, WHICH SHALL CONTAIN THE SCANNED CONTENT OF THE ENTIRE MANUAL. THE MANUAL SHALL HIGHLIGHT THE ACTUAL EQUIPMENT USED AND NOT BE A MASTER CATALOG OF ALL SIMILAR PRODUCTS OF THE MANUFACTURER.

WARRANTIES
1. SUBMIT MANUFACTURER'S STANDARD REPLACEMENT WARRANTIES FOR MATERIAL AND EQUIPMENT FURNISHED UNDER THIS SECTION. SUCH WARRANTIES SHALL BE IN ADDITION TO AND NOT IN LIEU OF ALL LIABILITIES WHICH THE MANUFACTURER AND THE HVAC SUBCONTRACTOR MAY HAVE BY LAW OR BY PROVISIONS OF THE CONTRACT DOCUMENTS.
2. ALL MATERIALS, EQUIPMENT AND WORK FURNISHED UNDER THIS SECTION SHALL BE GUARANTEED AGAINST ALL DEFECTS IN MATERIALS AND WORKMANSHIP FOR A MINIMUM PERIOD OF ONE YEAR COMMENCING WITH THE DATE OF SUBSTANTIAL COMPLETION. WHERE INDIVIDUAL EQUIPMENT SECTIONS SPECIFY LONGER WARRANTEES, PROVIDE THE LONGER WARRANTEE. ANY FAILURE DUE TO DEFECTIVE MATERIAL, EQUIPMENT OR WORKMANSHIP WHICH MAY DEVELOP, SHALL BE CORRECTED AT NO EXPENSE TO THE OWNER INCLUDING ALL DAMAGE TO AREAS, MATERIALS AND OTHER SYSTEMS RESULTING FROM SUCH FAILURES.

INTERPRETATION OF DRAWINGS AND SPECIFICATIONS
1. IT IS THE INTENTION OF THE SPECIFICATIONS AND DRAWINGS TO CALL FOR COMPLETE, FINISHED WORK, TESTED AND READY FOR CONTINUOUS OPERATION. ANY APPARATUS, APPLIANCE, MATERIAL OR WORK NOT SHOWN ON THE DRAWINGS, BUT MENTIONED IN THE SPECIFICATIONS OR VICE VERSA, OR ANY INCIDENTAL ACCESSORIES NECESSARY TO MAKE THE WORK COMPLETE IN ALL RESPECTS AND READY FOR OPERATION, EVEN IF NOT PARTICULARLY SPECIFIED, SHALL BE PROVIDED BY THE CONTRACTOR OR HIS/HER SUB SUBCONTRACTORS, WITHOUT ADDITIONAL EXPENSE TO THE OWNER.
2. THE DRAWINGS ARE GENERALLY DIAGRAMMATIC. THE LOCATIONS OF ALL ITEMS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS MUST BE DETERMINED AT THE SITE AND SHALL HAVE THE APPROVAL OF THE ARCHITECT BEFORE BEING INSTALLED. THE HVAC CONTRACTOR SHALL FOLLOW DRAWINGS, INCLUDING SHOP DRAWINGS, IN LAYING OUT WORK AND SHALL CHECK THE DRAWINGS OF OTHER TRADES TO VERIFY SPACES IN WHICH WORK WILL BE INSTALLED. MAINTAIN MAXIMUM HEADROOM AND SPACE CONDITIONS. WHERE SPACE CONDITIONS APPEAR INADEQUATE, NOTIFY THE ARCHITECT BEFORE PROCEEDING WITH THE INSTALLATION. THE HVAC CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE REASONABLE MODIFICATIONS IN THE LAYOUT AS NEEDED TO PREVENT CONFLICT WITH WORK OF OTHER TRADES OR FOR PROPER EXECUTION OF THE WORK.
3. SIZES OF DUCTS AND PIPES AND ROUTING ARE SHOWN, BUT IT IS NOT INTENDED TO SHOW EVERY OFFSET AND FITTING, NOR EVERY STRUCTURAL DIFFICULTY THAT MAY BE ENCOUNTERED. TO CARRY OUT THE INTENT AND PURPOSE OF THE DRAWINGS, ALL NECESSARY PARTS TO MAKE COMPLETE APPROVED WORKING SYSTEMS READY FOR USE, SHALL BE FURNISHED WITHOUT EXTRA CHARGE.

TESTING, ADJUSTING, AND BALANCING (T-A-B)
1. TEST, ADJUST, AND BALANCE EQUIPMENT AND DISTRIBUTION SYSTEMS IN ACCORDANCE WITH NEBB OR AABC PROCEDURAL STANDARDS.
2. T-A-B ALL NEW AND REVISED AIR INLETS AND OUTLETS WITHIN THE PROJECT AREA, INCLUDING DESIGN AND ACTUAL CFM. TEST AND ADJUST ADJACENT AFFECTED AREAS IF REQUIRED.
3. THE TAB AGENCY SHALL ASSIST THE BUILDING CONTROL SYSTEMS CONTRACTOR IN VERIFYING THE OPERATION AND CALIBRATION OF ALL HVAC AND TEMPERATURE CONTROL SYSTEMS.

DUCTWORK
1. GALVANIZED STEEL DUCTWORK: ASTM A653 GALVANIZED STEEL SHEETS, LOCK FORMING QUALITY, G90 ZINC COATING.
2. FLEXIBLE DUCTWORK: UL 181 CLASS 1 AIR DUCT, INSULATED, ATCO, OR APPROVED EQUAL. FLEXIBLE DUCTWORK INNER CORE SHALL CONSIST OF A DOUBLE LAMINATION OF POLYESTER ENCAPSULATING A STEEL WIRE HELIX.
3. ALL DUCTWORK SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH SMACNA STANDARDS. SEAL ALL DUCT JOINTS AND SEAMS (CLASS "A", 2 INCH PRESSURE CLASS).
4. DUCT SEALANT SHALL BE HARDCAST, INC."IRON GRIP", WATER-BASED, VINYL ACRYLIC SEALANT.
5. INSTALL DIFFUSERS TO DUCTWORK WITH AIRTIGHT CONNECTION. SEAL GAPS BETWEEN SURFACE MOUNTED AIR INLETS AND OUTLETS AIRTIGHT.
6. PROVIDE DUCT ACCESS DOORS AT ALL COMPONENTS THAT REQUIRE SERVICING; INCLUDING BUT NOT LIMITED TO CONTROL DAMPERS TEMPERATURE CONTROL DEVICES, AND FIRE DAMPERS. PROVIDE SHEET-ROCK CEILING ACCESS PANELS WHERE REQUIRED.

DUCTWORK INSULATION
1. ALL SUPPLY DUCTS SHALL BE EXTERNALLY INSULATED WITH FIBERGLASS DUCT WRAP EQUAL TO JOHNS MANVILLE MICROLITE TYPE 75, ASTM C533, NONCOMBUSTIBLE BLANKET, 1-½" THICK.

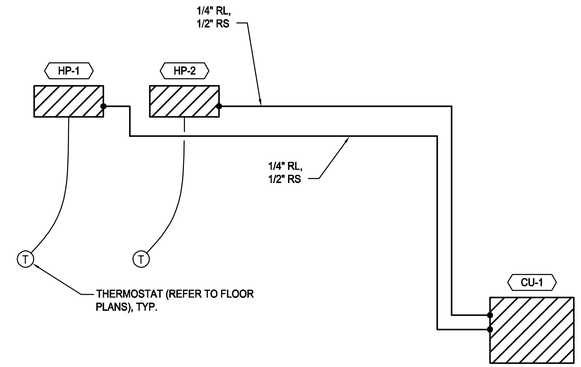
VRF HEAT PUMP SYSTEM (SEE SCHEDULE ON PLANS)
1. EVAPORATOR-FAN COMPONENTS
    A. CABINET: 2'X2', CEILING CASSETTE INDOOR UNIT FOR CEILING GRID MOUNTING APPLICATION.
    B. REFRIGERANT COIL: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINS, COMPLYING WITH ARI 210/240.
    C. FAN: DIRECT DRIVE, CENTRIFUGAL FAN.
    D. FILTERS: PERMANENT, CLEANABLE.
2. AIR-COOLED, COMPRESSOR-CONDENSER COMPONENTS
    A. CASING: GALVANIZED STEEL, FINISHED WITH ACRYLIC OR POLYESTER POWDER COSTING FINISH. REMOVABLE PANELS FOR ACCESS TO CONTROLS, WEEP HOLES FOR WATER DRAINAGE, AND MOUNTING HOLES IN BASE. PROVIDE BRASS SERVICE VALVES, FITTINGS, AND GAGE PORTS ON EXTERIOR OF CASING.
    B. COMPRESSOR: INVERTER-DRIVEN, HERMETICALLY SEALED, VARIABLE-SPEED. COMPRESSOR MOTOR SHALL HAVE THERMAL AND CURRENT-SENSITIVE OVERLOAD DEVICES.
3. REFRIGERANT COIL: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINS, COMPLYING WITH ARI 210/240.
    A. FAN: VARIABLE SPEED, ALUMINUM-PROPELLER TYPE, DIRECTLY CONNECTED TO MOTOR.
    B. MOTOR: PERMANENTLY LUBRICATED, DC.
    C. BASE PAN HEATER: INTEGRAL TO THE UNIT.
4. ACCESSORIES
    A. THERMOSTAT: LOW VOLTAGE, DIGITAL DISPLAY FOR EACH INDOOR UNIT.
    B. SNOW STAND.
    C. REFRIGERANT LINE KITS: SOFT-ANNEALED COPPER SUCTION AND LIQUID LINES FACTORY CLEANED, DRIED, PRESSURIZED AND SEALED; FACTORY-INSULATED SUCTION LINE WITH FLARED FITTINGS AT BOTH ENDS.

PIPING INSULATION
1. FLEXIBLE ELASTOMERIC THERMAL INSULATION, EQUAL TO ARMSTRONG AP ARMAFLEX, 25 FLAME SPREAD, 50 SMOKE DEVELOPED.
    1.1. COOLING COIL CONDENSATE: 1" THICKNESS.
    1.2. REFRIGERANT SUCTION AND LIQUID PIPING PIPING: 1" THICKNESS. APPLY CONTINUOUS, WEATHERPROOF PVC JACKETING ON OUTDOOR INSTALLATIONS.

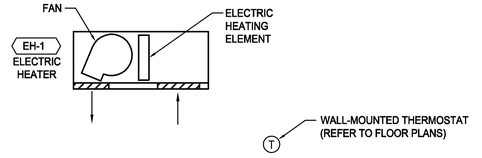
REGISTERS & DIFFUSERS (SEE SCHEDULE ON PLANS)
1. SUPPLY DIFFUSERS: PRICE MODEL SPD, SQUARE PLAQUE DIFFUSER.
2. EXHAUST GRILLES: PRICE MODEL 535, GRILLE WITH 1/2" SPACING LOUVERED FACE, WHITE FINISH.
3. PROVIDE DAMPERS IN BRANCH DUCTWORK FOR ALL REGISTERS AND DIFFUSERS.

AIR CURTAIN (SEE SCHEDULE ON PLANS)
1. AIR CURTAIN SHALL BE CEILING CONCEALED TYPE, WITH EXPOSED BOTTOM PANEL WITH WHITE FINISH.
2. FILTERS: CLEANABLE POLYESTER.
3. CABINET: ALUMINUM CONSTRUCTION.
4. AIR CURTAIN SHALL BE INTERLOCKED WITH DOOR SWITCH TO OPERATE WHEN DOOR IS OPEN.

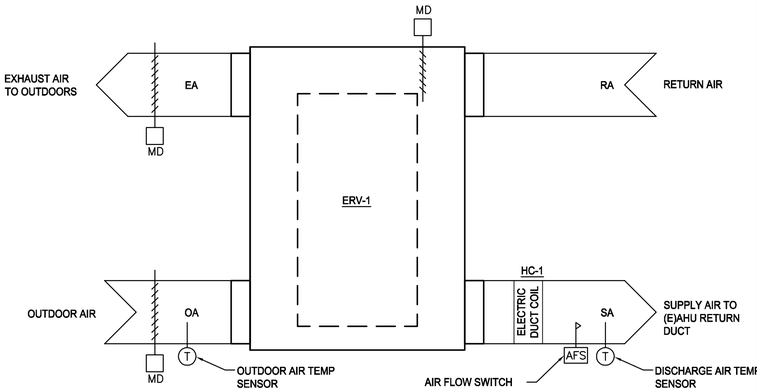
VRF SYSTEM SCHEMATIC
1. VRF SYSTEM CONTROLS SHALL CONSIST OF PACKAGED CONTROLLERS AND RELATED COMPONENTS, PROVIDED BY EQUIPMENT MANUFACTURER.
2. VRF SYSTEM PACKAGED CONTROLS SHALL USE MANUFACTURER'S STANDARD CONTROL SEQUENCES TO MODULATE/ CYCLE COMPRESSOR(S), VALVES AND FANS AS REQUIRED TO OPERATE AT OPTIMUM EFFICIENCY AND MAINTAIN ROOMS WITHIN TEMPERATURE SETPOINTS.
3. THERMOSTAT: ZONE THERMOSTAT SHALL BE A SENSOR WITH DIGITAL DISPLAY AND SETPOINT ADJUSTMENT.
4. FURNISH ALL COMPONENTS AS REQUIRED FOR COMPLETE AND FUNCTIONING SYSTEM.



SEQUENCE OF OPERATION - ELECTRIC HEATERS
1. ELECTRIC HEATER SHALL BE CONTROLLED BY STAND-ALONE THERMOSTAT.
2. ON A CALL FOR HEAT FROM THE WALL-MOUNTED THERMOSTAT (70 DEG F, ADJUSTABLE), FAN AND ELECTRIC HEATING ELEMENT SHALL BE ENERGIZED UNTIL THE CALL FOR HEAT IS SATISFIED.



SEQUENCES OF OPERATION AS FOLLOWS:
ENERGY RECOVERY VENTILATOR:
1. ERV SUPPLY AND EXHAUST FANS SHALL OPERATE CONTINUOUSLY DURING BUILDING OCCUPIED HOURS TO MAINTAIN CONSTANT AIR VOLUME.
2. OUTDOOR AIR AND EXHAUST AIR MOTOR-OPERATED DAMPERS SHALL BE INTERLOCKED WITH ERV TO OPEN WHENEVER ERV FANS OPERATE.
3. PACKAGED CONTROLLER SHALL OPERATE HEAT EXCHANGER BYPASS DAMPER TO ALLOW FOR ECONOMIZER COOLING WHEN OUTDOOR AIR CONDITIONS ALLOW.
4. DURING BUILDING UNOCCUPIED HOURS, ERV SHALL BE DISABLED AND OUTDOOR AIR AND EXHAUST AIR DAMPERS SHALL CLOSE.
5. ELECTRIC DUCT COIL (HC-1) SHALL MODULATE TO MAINTAIN SUPPLY AIR TEMPERATURE AT 70°F, ADJUSTABLE.
6. ELECTRIC DUCT COIL SHALL BE DISABLED AT OUTDOOR AIR TEMPERATURE ABOVE 50°F, ADJUSTABLE.



NOTE: INSTALL ELECTRIC DUCT COIL 4 FEET (MINIMUM) DOWNSTREAM OF ERV.

GENERAL NOTE:

SEE M-001 FOR LEGEND AND ABBREVIATIONS.

REV	DESCRIPTION	DATE
0	PERMIT SET	7-1-16

PERMIT SET
7-1-16
CURRENT ISSUE STATUS:

PROJECT NORTH:

STATE OF MAINE
CALEB J. MILLIKEN
No. 12274
LICENSED PROFESSIONAL ENGINEER
7/1/16

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HVAC SPECIFICATIONS

SHEET TITLE:

SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	16087
A/E OF RECORD:	CJH		
JOB CAPTAIN:	SHK		
DRAWN BY:	CWF		
SMRT FILE:	M-002-16087	SHEET No.	M-002

22x34