MECHANICAL SPECIFICATIONS

1. PROVIDE ALL HEATING, VENTILATION AND AIR CONDITIONING ITEMS INDICATED ON THE DRAWINGS, DESCRIBED IN THIS SPECIFICATION OR REQUIRED FOR A COMPLETE AND PROPER INSTALLATION.

2. COMPLY WITH ALL PERTINENT CODES, ORDINANCES AND REGULATIONS. REFER TO WEBSITE FOR DEPT. OF COMMUNITY AFFAIRS FOR CURRENT CODES EDITIONS.

3. THE CONTRACTOR SHALL NOT ATTEMPT TO PRECISELY SCALE DIMENSIONS FROM THESE DRAWINGS TO OBTAIN CONSTRUCTION DIMENSIONS AND CLEARANCES. THE CONTRACTOR SHALL VERIFY ALL ACTUAL DIMENSIONS AND CLEARANCES. ALTHOUGH THESE PLANS ARE DIAGRAMMATIC IN NATURE, THEY SHALL BE FOLLOWED AS CLOSELY AS SITE CONDITIONS, NEW CONSTRUCTION, AND WORK BY OTHER TRADES SHALL PERMIT. DEVIATIONS FROM THESE DRAWINGS, WHICH ARE REQUIRED TO CONFORM TO THE AVAILABLE SPACE OR THE ACTUAL BUILDING CONSTRUCTION, SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER.

4. FURNISH WITHOUT EXTRA CHARGE, ANY ADDITIONAL MATERIAL AND LABOR REQUIRED TO COMPLY WITH THE ABOVE CODES AND STANDARDS, EVEN THOUGH THE WORK MAY NOT BE DESCRIBED IN THE CONTRACT DOCUMENTS. WHERE THE REQUIREMENTS OF THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THE ABOVE CODES AND STANDARDS, THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE.
5. ALL EQUIPMENT AND MATERIAL SHALL BE NEW AND OF FIRST QUALITY. EQUIPMENT AND MATERIAL SHALL BE THE SAME OR EQUAL TO THE BASIS OF DESIGN LISTED ON THESE DRAWINGS AND SHALL BE UL LISTED.

6. COOPERATE AND COORDINATE WITH OTHER TRADES IN ORDER THAT ALL SYSTEMS IN THE WORK MAY BE INSTALLED IN THE BEST ARRANGEMENT.

7. EXAMINE THE AREAS AND CONDITIONS UNDER WHICH WORK OF THIS SECTION WILL BE INSTALLED. CORRECT CONDITIONS DETRIMENTAL TO THE PROPER AND TIMELY COMPLETION OF THE WORK. NOTIFY ARCHITECT OF ANY DISCREPANCIES. DO NOT PROCEED UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

8. AVOID INTERFERENCE WITH STRUCTURE, AND WITH WORK OF OTHER TRADES. INSTALL ALL EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS. INSTALL ACCESSIBLE PARTS, INCLUDING EQUIPMENT, COILS, VALVES, DAMPERS, CONTROLS, AND FILTERS WITH ADEQUATE CLEARANCE FOR INSPECTION, ADJUSTMENTS, REPAIR AND REPLACEMENT.

9. ALL OTHER MATERIALS NOT SPECIFICALLY DESCRIBED BUT REQUIRED FOR A COMPLETE AND PROPER INSTALLATION SHALL BE AS SELECTED BY THE CONTRACTOR SUBJECT TO ACCEPTANCE BY THE ENGINEER.

10. ALL DUCTWORK SHALL BE FABRICATED FROM GALVANIZED SHEET METAL DUCT AND CONFORM TO SMACNA "HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE. SEAL ALL JOINTS IN DUCTWORK WITH MASTIC SEALANT.

11. FLEXIBLE DUCT: FLEXMASTER; ATCO UPC#36(R-6.0); ATCO UPC#31 (R-8) OR THERMAFLEX, TYPE 3, INSULATED. 5'-0" MAXIMUM LENGTH UNLESS NOTED OTHERWISE. CLASS 1 RATING WITH R-VALUE OF 6.0 WHEN LOCATED INSIDE BUILDING INSULATION ENVELOPE AND R-8 WHEN LOCATED OUTSIDE BUILDING INSULATION ENVELOPE. INSTALL WITH NO MORE THAN 135 DEGREES MAXIMUM OF TOTAL BENDS PER RUN. MAXIMUM INDIVIDUAL BEND SHALL NOT EXCEED 45 DEGREES EACH. SUPPORT AT FIVE FEET ON CENTERS WITH HANGERS HAVING AT LEAST 2-INCHES OF WIDTH AT DUCT CONTACT POINTS. FLEXIBLE CONNECTORS SHALL NOT PASS THROUGH ANY WALL FLOOR OR CEILING WEATHER RATED OR NOT. PROVIDE 36-ONCHES OF METAL DUCT AT PENETRATION OF DRAFT STOPS, FIRE WALLS AND SMOKE WALLS.

12. DUCT LINER: OWENS CORNING AEROFLEX PLUS, OR EQUIVALENT. INCOMBUSTIBLE GLASS FIBER COMPLYING WITH ASTM C 1071; FLEXIBLE BLANKET; IMPREGNATED SURFACE AND EDGES COATED WITH ACRYLIC POLYMER SHOWN TO BE FUNGUS AND BACTERIA RESISTANT BY TESTING TO ASTM G 21. APPARENT THERMAL CONDUCTIVITY: MAXIMUM OF 0.31 AT 75 DEGREES F. SERVICE TEMPERATURE: 250 DEGREES F. DENSITY: 1.5 POUNDS/CUBIC FOOT. INSTALL USING ADHESIVE (50% COVERAGE) AND GALVANIZED STEEL FASTENERS WITH WELDED PRESS-ON HEAD THICKNESS: 1-INCH.

13. CONDENSATE DRAIN PIPING SHALL BE ASTM D2665 PVC WITH SOLVENT WELDED FITTINGS. DRAIN PIPING SHALL BE NO SMALLER THAN THE DRAIN CONNECTION SIZE ON EQUIPMENT. SLOPE AT 1/8 INCH PER FOOT CONTINUOUSLY TOWARD DRAINS. ALL INDOOR CONDENSATE DRAIN PIPING SHALL BE INSULATED WITH PREFORMED FLEXIBLE PLASTIC CELLULAR FOAM. ALL OUTDOOR CONDENSATE DRAIN PIPING SHALL BE PRIMED AND PAINTED WITH A COATING SYSTEM RECOMMENDED BY THE PIPING MANUFACTURER FOR PROTECTION AGAINST DETERIORATION FROM WEATHER AND UV-LIGHT EXPOSURE. ALL PIPING SHALL BE ADEQUATELY SUPPORTED TO MAINTAIN PROPER SLOPE AND AVOID SAGGING.

14. REFRIGERANT PIPING SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS AND INSTALLATION INSTRUCTIONS. REFRIGERANT PIPING SHALL BE ASTM B280 TYPE ACR OR ASTM B88 TYPE L DRAWN COPPER TUBING WITH WROUGHT COPPER FITTINGS. INSULATE SUCTION LINE WITH ½" THICK FLEXIBLE FOAMED PLASTIC CELLULAR FOAM (ARMAFLEX OR EQUIVALENT). ALL PIPING SHALL BE ADEQUATELY SUPPORTED. INSULATION INSTALLED OUTDOORS SHALL BE PAINTED WITH TWO COATS OF ARMACELL WB COATING OR EQUIVALENT. REFRIGERANT PIPES SHALL BE INSTALLED IN ACCORDANCE WITH ASHRAE STANDARD 15-2022 SECTION 9.12 AND SHALL BE TESTED IN ACCORDANCE WITH ASHRAE STANDARD 15-2022 SECTION 9.13. CONTRACTOR SHALL ISSUE A LETTER TO DESIGN TEAM STATING THAT REFRIGERANT PIPES HAS BEEN INSTALLED AND TESTED UNDER THE REFERENCED SECTIONS. CONTRACTOR SHALL REFER TO ASHRAE STANDARD 15-2022 SECTIONS 9.10 AND 9.11 FOR ADDITIONAL INFORMATION REGARDING REFRIGERANT PIPING. PENETRATION OF REFRIGERANT PIPES SHALL BE PROTECTED WITH A THROUGH PENETRATION PROTECTION MEANS. THE THROUGH PENETRATION PROTECTION SHALL BE THE SAME OR HIGHER RATING THAN THE ASSEMBLY.

15. THERMOSTATS: PROVIDE 24 VOLT, PROGRAMMABLE 24 HOUR, 7 DAY THERMOSTAT TO CONTROL HEATING STAGES IN SEQUENCE WITH DELAY BETWEEN STAGES AND SUPPLY FAN TO MAINTAIN TEMPERATURE SETTING. FOR HEAT PUMPS INCLUDE SYSTEM SELECTION SWITCH HEAT-OFF-COOL AND FAN CONTROL SWITCH (AUTO-ON), EMERGENCY HEAT SWITCH (AUXILIARY/EMERGENCY HEAT INDICATOR LIGHTS).

16. PROVIDE FIRE AND SMOKE RATED FLEXIBLE CONNECTIONS BETWEEN FANS AND DUCTS. MATERIAL SHALL COMPLY WITH NFPA 90A REQUIREMENTS FOR MATERIAL IN SUPPLY AIR STREAM.

17. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS INCLUDING CLEARANCES RECOMMENDED FOR PROPER OPERATION OR SERVICE. ALL FILTERS AND SERVICEABLE PARTS SHALL BE READILY ACCESSIBLE.

18. INDOOR DUCT INSULATION: FOIL-FACED FIBERGLASS, OWENS CORNING TYPE 75 OR EQUAL, 2.2" THICK(R-6), UNLESS THE INSULATED DUCT IS OUTSIDE BUILDING INSULATION ENVELOPE (ATTIC, CRAWLSPACE OR UNCONDITIONED SPACE) IN WHICH CASE THE DUCT INSULATION THICKNESS SHALL BE 3" THICK(R-8). DUCT SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND SMOKE DEVELOPED RATING OF NOT MORE THAN 50. GLASS-FIBER INSULATION: ALL SERVICE DUCT WRAP WITH FOIL SCRIM AND HAVING BACKING AND A K-VALUE OF 0.30 AT 75º F MEAN TEMPERATURE AND AN AVERAGE MAXIMUM DENSITY OF 0.75 LB/CU. FT.

19. ALL SUPPLY, RETURN AND OUTSIDE AIR DUCTS SHALL BE INSULATED. ALL BATHROOM EXHAUST DUCTS, KITCHEN EXHAUST DUCTS SHALL BE INSULATED. EXHAUST DUCTS SHALL BE INSTALLED WITH A 1/8" SLOPE TO OUTSIDE. INSTALL ACOUSTICAL DUCT LINER ON THE INTERIOR SURFACE OF THE FIRST FIVE (5) LINEAR FEET OF SUPPLY DUCT DOWNSTREAM AND THE LAST FIVE (5) LINEAR FEET OF RETURN DUCT UPSTREAM OF ALL AIR HANDLERS AND ROOFTOP UNITS. INSULATE THE CONCEALED TOPS OF ALL CEILING MOUNTED SUPPLY AIR DIFFUSERS WITH FOIL-FACED FIBERGLASS, 1.5#/CUBIC FOOT DENSITY, 2" THICK. SEAL EDGES TO CEILING GRID WITH FOIL FACED TAPE TO PROVIDE VAPOR TIGHT SEAL.

20. ALL LOW PRESSURE DUCT BRANCHES SHALL CONTAIN MANUAL BALANCING DAMPERS. MANUAL BALANCING DAMPERS SHALL ALSO BE INSTALLED IN THE CONTINUATION OF THE MAIN, IF THE MAIN DUCT IS SMALLER OR THE SAME SIZE AS THE BRANCH DUCT, OR IF THE CONTINUATION OF THE MAIN SERVES ONLY ONE DEVICE.

21. MAKE ALL DUCT ELBOWS RIGHT ANGLE TYPE WITH SINGLE -THICKNESS TURNING VANES OR CONSTRUCT WITH CENTERLINE RADIUS 1-1/2 TIMES THE DUCT WIDTH.

22. DUCT SIZES SHOWN ON PLANS ARE CLEAR, INTERIOR DIMENSIONS. DUCT SIZES SHOWN SHALL BE ENLARGE TO ALLOW FOR LINER AT LOCATIONS OF INTERIOR LINER.

23. DO NOT CUT INTO OR REDUCE THE SIZE OF ANY STRUCTURAL MEMBER WITHOUT THE PERMISSION OF THE ARCHITECT.

24. PROVIDE WEATHER-PROOF FLASHING AT ALL DUCT AND PIPE PENETRATIONS THROUGH THE BUILDING WALLS. AS A MINIMUM, FLASHINGS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH SMACNA STANDARDS. FLASHINGS SHALL BE GUARANTEED WEATHERPROOF.

25. SUPPORT ALL HVAC UNITS, DUCTWORK, PIPING AND OTHER APPURTENANCES FROM STRUCTURE, PROVIDE VIBRATION ISOLATION AT ALL FANS WHICH ARE NOT INTERNALLY ISOLATED. PROVIDE HANGER ROD WITH BUILT IN RUBBER-IN-SHEAR ISOLATOR. BETWEEN DRAIN PAN AND UNIT PROVIDE 4 EACH RUBBER-IN-SHEAR ISOLATOR. DO NOT ATTACH VIBRATION ISOLATOR TO DRAIN PAN. DO NOT SCREW OR DRIVE FASTENERS INTO NON-STRUCTURAL COMPONENTS SUCH AS ROOF DECKS OR NON-LOAD BEARING WALLS.

26. THOROUGHLY CLEAN ALL COMPONENTS AND REMOVE ALL DIRT, SCALE, OIL, AND OTHER FOREIGN SUBSTANCES. PROVIDE CLEAN AIR FILTERS FOR ALL EQUIPMENT.

27. PERFORM ALL TESTS NECESSARY TO DEMONSTRATE THE INTEGRITY OF THE COMPLETE INSTALLATION TO THE APPROVAL OF THE ENGINEER AND ALL OTHER AUTHORITIES HAVING JURISDICTION. MAKE ALL ADJUSTMENTS NECESSARY AND BALANCE THE COMPLETED SYSTEM IN ACCORDANCE WITH THE DATA SHOWN. BALANCE THE SYSTEMS IN ACCORDANCE WITH NEBB OR AABC STANDARDS. ACCEPTABLE TOLERANCES SHALL BE MINUS TEN PERCENT TO PLUS FIVE PERCENT OF ALL MEASUREMENTS. BALANCING SHALL BE DONE BY AN INDEPENDENT LICENSED (BY NEBB OR AABC) TAB CONTRACTOR. MAKE THE FOLLOWING TESTS AND SUBMIT REPORTS TO THE ARCHITECT:
    a. AIRFLOW RATE AT EACH SUPPLY, RETURN AND EXHAUST OUTLET OR INLET.
    b. TOTAL AIRFLOW RATE AND TOTAL STATIC PRESSURE FOR EACH SUPPLY AND EXHAUST FAN. TEST EXHAUST FANS WITH ROOM DOORS CLOSED.
    c. MOTOR SPEED, FOR MULTIPLE SPEED FANS (E.G. HIGH, MEDIUM, LOW).
    d. FOR DIRECT DRIVE FANS, PROVIDE SPEED SETTINGS AND ACTUAL RPM, INCLUDING ECM MOTOR DRIVEN FANS
    e. PROVIDE FAN AND MOTOR RPM FOR BELT DRIVEN FANS. PROVIDE SHEAVE SIZES.
    f. OUTSIDE AIRFLOW RATE TO EACH HVAC UNIT AND SUPPLY FAN.
    g. MOTOR CURRENT (AND COMPARE WITH NAMEPLATE DATA) AT ALL MOTORS.
    h. ENTERING AND LEAVING AIR DRY-BULB AND WET-BULB CONDITIONS AT ALL COOLING COILS.
    i. HEAT OUTPUT CAPACITY FOR UNIT HEATERS, HEATING DEVICES AND COILS (KW OR MBH).
    j. MANUFACTURER, MODEL AND SERIAL NUMBER FOR EACH PIECE OF HVAC EQUIPMENT SCHEDULED ON DRAWINGS.
    k. CALIBRATE THERMOSTATS TO BE WITHIN ONE DEGREE OF ACTUAL TEMPERATURE AT THERMOSTAT.
    l. VERIFY THAT ALL HVAC DEVICES OPERATE AS SCHEDULED OR INDICATED (I.E. ON-OFF, 2-STAGE, VARIABLE OUTPUT (SCR HEATERS), ETC.

28. THE ENTIRE SYSTEM SHALL BE WARRANTED FOR A PERIOD OF ONE (1) YEAR BEGINNING WITH OWNER'S ACCEPTANCE OF THE WORK. COMPRESSORS SHALL INCLUDE A MINIMUM OF FIVE (5) YEAR PARTS ONLY WARRANTY FROM THE MANUFACTURER. ALL LABOR AND MATERIALS NECESSARY TO REPAIR OR REPLACE THE SYSTEM OR PORTIONS THEREOF, DURING THAT TIME SHALL BE WARRANTED FOR A PERIOD OF ONE (1) YEAR FROM THE REPAIR OF REPLACEMENT.

29. THE UNITS SHALL HAVE THE FOLLOWING FUNCTIONS AS A MINIMUM:
    a. AN AUTOMATIC RESTART AFTER POWER FAILURE AT THE SAME OPERATING CONDITIONS AS AT FAILURE.
    b. A TIMER FUNCTION TO PROVIDE A MINIMUM 24-HOUR TIMER CYCLE FOR SYSTEM AUTO START/STOP.
    c. TEMPERATURE-SENSING CONTROLS SHALL SENSE RETURN AIR TEMPERATURE.
    d. INDOOR COIL FREEZE PROTECTION.
    e. WIRELESS INFRARED REMOTE CONTROL AND/OR WIRED REMOTE CONTROL TO ENTER SET POINTS AND OPERATING CONDITIONS.
    f. DEHUMIDIFICATION MODE SHALL PROVIDE INCREASED LATENT REMOVAL CAPABILITY BY MODULATING SYSTEM OPERATION AND SET POINT TEMPERATURE.
    g. FAN-ONLY OPERATION TO PROVIDE ROOM AIR CIRCULATION WHEN NO COOLING IS REQUIRED.
    h. DIAGNOSTICS SHALL PROVIDE CONTINUOUS CHECKS OF UNIT OPERATION AND WARN OF POSSIBLE MALFUNCTIONS. ERROR MESSAGES SHALL BE DISPLAYED AT THE UNIT.
    i. FAN SPEED CONTROL SHALL BE USER-SELECTABLE: HIGH, MEDIUM, LOW, OR MICROPROCESSOR CONTROLLED AUTOMATIC OPERATION DURING ALL OPERATING MODES.
    j. AUTOMATIC HEATING-TO-COOLING CHANGEOVER IN HEAT PUMP MODE. CONTROL SHALL INCLUDE DEAD BAND TO PREVENT RAPID MODE CYCLING BETWEEN HEATING AND COOLING.
    k. INDOOR COIL HIGH TEMPERATURE PROTECTION SHALL BE PROVIDED TO DETECT EXCESSIVE INDOOR DISCHARGE TEMPERATURE WHEN UNIT IS IN HEAT PUMP MODE.

30. SUBMITTALS AND SUBMITTAL PROCEDURES:
    a. CONTRACTOR SHALL REVIEW THE SUBMITTAL DATA AND CHECK FOR THE PURPOSE OF COMPLIANCE WITH SAFETY REQUIREMENTS, VERIFICATION OF DIMENSIONS, CONTRACT DOCUMENTS AND METHODS AND MEANS PRIOR TO SUBMITTING TO DESIGN PROFESSIONAL. CONTRACTOR SHALL INDICATE APPROVAL BY INDICATING SUCH ON THE SUBMITTAL.
    b. TRANSMIT EACH SUBMITTAL ELECTRONICALLY IN PDF FORMAT.
    c. SEQUENTIALLY NUMBER SUBMITTAL FILES AND TRANSMITTAL FORM. REVISE SUBMITTALS WITH ORIGINAL NUMBER AND A SEQUENTIAL ALPHABETIC SUFFIX. FILE NAMES SHALL DESCRIBE ITEM INCLUDED IN FILE.
    d. IDENTIFY PROJECT, THE CONTRACTOR, SUBCONTRACTOR OR SUPPLIER; PERTINENT DRAWING AND DETAIL NUMBER, AND SPECIFICATION SECTION NUMBER, AS APPROPRIATE ON EACH COPY. EACH FILE SHALL INCLUDE AN INDEX OF ITEMS INCLUDED IN FILE.
    e. APPLY THE CONTRACTOR'S STAMP, SIGNED OR INITIALED CERTIFYING THAT REVIEW, APPROVAL, VERIFICATION OF PRODUCTS REQUIRED, FIELD DIMENSIONS, ADJACENT CONSTRUCTION WORK, AND COORDINATION OF INFORMATION IS IN ACCORDANCE WITH THE REQUIREMENTS OF THE WORK AND CONTRACT DOCUMENTS.
    f. SUBMITTAL DATA FOR ALL ITEMS IN PROJECT SHALL BE SUBMITTED AT ONE TIME. SUBMITTAL SHALL BE DIVIDED INTO GROUPS WITH FILE SIZES NOT EXCEEDING 6 MB. IF THERE IS UNAVAILABLE DATA SUCH AS CONTROL SUBMITTAL, ETC., THESE MAY BE SUBMITTED LATER IF NOT DOING SO WOULD DELAY PROJECT PROGRESS. DATA SHALL INCLUDE CAPACITIES, COMPLETE INSTALLATION INSTRUCTIONS, DIMENSIONAL DATA AND ELECTRICAL DATA, BHP, MOTOR HP, OPERATING WEIGHTS AND LOAD DISTRIBUTION AT MOUNTING POINTS.
    g. DELIVER SUBMITTALS ELECTRONICALLY TO THE DESIGN PROFESSIONAL.
    h. SCHEDULE SUBMITTALS TO EXPEDITE THE PROJECT, AND COORDINATE SUBMISSION OF RELATED ITEMS.
    i. FOR EACH SUBMITTAL FOR REVIEW, ALLOW 15 DAYS EXCLUDING DELIVERY TIME TO AND FROM THE CONTRACTOR.
    j. IDENTIFY VARIATIONS FROM CONTRACT DOCUMENTS AND PRODUCT OR SYSTEM LIMITATIONS THAT MAY BE DETRIMENTAL TO SUCCESSFUL PERFORMANCE OF THE COMPLETED WORK.
    k. PROVIDE SPACE FOR THE CONTRACTOR AND THE ARCHITECT/ REVIEW STAMPS.
    l. WHEN REVISED FOR RESUBMISSION, IDENTIFY ALL CHANGES MADE SINCE PREVIOUS SUBMISSION.
    m. DISTRIBUTE COPIES OF REVIEWED SUBMITTALS AS APPROPRIATE. INSTRUCT PARTIES TO PROMPTLY REPORT ANY INABILITY TO COMPLY WITH REQUIREMENTS.
    n. SUBMITTALS NOT REQUESTED WILL NOT BE RECOGNIZED OR PROCESSED.
    o. PROVIDE FILES CONTAINING ONLY RELATED ITEMS (SUCH AS PIPING, EQUIPMENT, AIR DISTRIBUTION, ETC.)

31. INSTRUCT OWNER'S REPRESENTATIVE IN THE OPERATION OF THE SYSTEMS, USING THE OPERATION AND MAINTENANCE MANUAL AS A TEACHING AID.

32. PROVIDE AN OPERATION AND MAINTENANCE MANUAL. AS A MINIMUM, THE MANUAL SHALL CONTAIN:
    a. A COMPLETE LIST OF ALL EQUIPMENT AND APPURTENANCES WITH EQUIPMENT DESIGNATIONS (PER DRAWINGS), MANUFACTURERS, AND CATALOG NUMBERS.
    b. COPIES OF MANUFACTURERS' BROCHURES AND INSTRUCTIONS FOR OPERATION AND MAINTENANCE OF ALL MECHANICAL EQUIPMENT, INCLUDING REPLACEMENT PARTS LISTS.
    c. TYPED SYSTEM OPERATION AND MAINTENANCE INSTRUCTIONS, INCLUDING INSPECTION, LUBRICATION, AND SERVICE INSTRUCTIONS AND SCHEDULES.
    d. LIST OF NAMES, ADDRESSES AND PHONE NUMBERS OF DISTRIBUTORS OF ALL EQUIPMENT AND APPURTENANCES.
    e. MANUFACTURERS' WARRANTIES.

33. HORIZONTAL AIR HANDLER UNIT: INDOOR FAN-COIL UNIT SHALL BE DIRECT-EXPANSION HORIZONTAL HEAT PUMP AIR HANDLER WITH ELECTRIC STRIP HEAT SUSPENDED FROM STRUCTURE WITH AUXILIARY DRIP PAN AND CONDENSATE DRAIN. PROVIDE FLOAT SWITCH IN DRIP PAN TO SHUT DOWN UNIT IF PAN BEGINS TO FILL. UNIT SHALL BE COMPLETE WITH COOLING COIL, FAN, FAN MOTOR, PIPING CONNECTORS, ELECTRICAL CONTROLS, MICROPROCESSOR CONTROL SYSTEM, AND INTEGRAL TEMPERATURE SENSING. CABINET SHALL BE FULLY INSULATED FOR IMPROVED THERMAL AND ACOUSTIC PERFORMANCE. CONDENSATE PAN SHALL HAVE INTERNAL TRAP AND AUXILIARY DRIP PAN UNDER COIL HEADER. PROVIDE CONDENSATE TRAP RECOMMENDED BY MANUFACTURER. AIR FILTERS SHALL BE 1 INCH THICK GLASS FIBER, DISPOSABLE TYPE ARRANGED FOR EASY REPLACEMENT. PROVIDE NUMBER OF STAGES AS SCHEDULED. PROVIDE CONDENSATE OVERFLOW SWITCH (RECTORSEAL SAFE-T-SWITCH MODEL SS1 OR EQUIVALENT) WIRED TO SHUT UNIT DOWN IN CASE OF CONDENSATE OVERFLOW.

34. AIR SOURCE HEAT PUMPS (HP-1): OUTDOOR-MOUNTED, AIR-COOLED SPLIT SYSTEM OUTDOOR SECTION, CONSISTING OF A HERMETIC COMPRESSOR, AN AIR-COOLED COIL, PROPELLER-TYPE BLOW-THRU OUTDOOR FANS, ACCUMULATOR, FULL REFRIGERANT CHARGE, AND CONTROL BOX. UNIT SHALL FUNCTION AS THE OUTDOOR COMPONENT OF AN AIR-TO AIR COOLING SYSTEM AND USED IN A REFRIGERATION CIRCUIT MATCHED TO THE INDOOR UNIT. UNIT CONSTRUCTION SHALL COMPLY WITH ANSI/ASHRAE 15, LATEST REVISION, THE NEC, AND UL STANDARDS. PROVIDE RAIL SUPPORT SYSTEM COMPATIBLE WITH ROOFING SYSTEM. REFER TO SCHEDULE ON DRAWINGS FOR ADDITIONAL SPECIFICATIONS.

35. PROVIDE A DUCT SMOKE DETECTOR ON THE SUPPLY DUCT OF EACH AIR HANDLING UNIT WITH DESIGN AIRFLOWS EXCEEDING 2,000 CFM, AND WHERE SMALLER AIR HANDLING UNITS HAVE COMMON RETURN DUCTWORK OR PLENUM AND TOTAL AIR FLOW EXCEEDS 2,000 CFM. INSTALL DETECTOR IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE SECTION 606 SMOKE DETECTION CONTROL SYSTEM WITH GEORGIA AMENDMENTS 2018. DETECTORS SHALL BE PROVIDED BY THE ELECTRICAL/FIRE ALARM SUBCONTRACTOR AND SHALL BE INSTALLED BY THE MECHANICAL SUBCONTRACTOR. FOR OTHER FANS, SUCH AS EXHAUST FANS WITH DESIGN AIRFLOWS EXCEEDING 2,000 CFM, COORDINATE WITH THE ELECTRICAL/FIRE ALARM SUBCONTRACTOR TO PROVIDE ROOM OR DUCT SMOKE DETECTORS. WHERE NO FIRE ALARM SYSTEM IS INSTALLED IN BUILDING PROVIDE SMOKE DETECTOR, AUDIO VISUAL ANNUNCIATOR AND TROUBLE INDICATOR IN AN APPROVED LOCATION. DUCT SMOKE DETECTOR TROUBLE CONDITIONS SHALL ACTIVATE A VISIBLE OR AUDIBLE SIGNAL IN AN APPROVED LOCATION AND SHALL BE IDENTIFIED AS AIR DUCT DETECTOR TROUBLE. PROVIDE CONTACTS TO AUTOMATICALLY SHUT DOWN ALL SUCH FAN MOTORS WHEN SMOKE IS DETECTED, TO INDICATE DETECTOR STATUS TO THE FIRE ALARM SYSTEM, AND TO REQUIRE A MANUAL RESET OF THE SHUT-DOWN RELAY.

36. GRILLES, REGISTERS AND DIFFUSERS: GRILLES, REGISTERS, AND DIFFUSERS AS INDICATED ON THE DRAWINGS HAVE BEEN SELECTED FROM THE CATALOG OF THE MANUFACTURER NOTED AS THE BASIS OF DESIGN. SIZES, TYPES, AND PERFORMANCE OF THE DEVICES TO BE PROVIDED MUST BE COORDINATED TO INSURE CONFORMITY WITH DESIGN BASIS. SIDEWALL SUPPLY GRILLES AND REGISTERS SHALL HAVE VERTICAL FRONT BLADES; SIDEWALL RETURN GRILLES SHALL HAVE HORIZONTAL BLADES. GRILLES AND REGISTERS WITH BORDERS SHALL HAVE FELT OR RUBBER GASKETS CEMENTED TO THE BACK FACE AND HOLDING SCREWS NOT OVER 18 INCHES ON CENTERS AROUND THE PERIMETER. HOLDING SCREWS SHALL BE COUNTER-SUNK TO FIT FLUSH WITH FACE OF GRILLE OR REGISTER. GRILLES PASSING AIR THROUGH PARTITIONS SHALL BE AS DESCRIBED FOR WALL RETURN GRILLES, ONE FOR EACH SIDE OF PARTITION. REGISTER DAMPERS SHALL BE OF THE GANG-OPERATED, OPPOSED BLADE TYPE, OPERATED THROUGH THE FACE OF THE REGISTER. OPERATING MECHANISM SHALL NOT PROJECT THROUGH THE REGISTER FACE. MOUNTING FRAME SHALL BE COORDINATED WITH ARCHITECTURAL REFLECTED CEILING PLANS. CONSTRUCTION SHALL BE OF STEEL OR ALUMINUM AS SCHEDULED, WITH FRAME TYPE TO MATCH CEILING CONSTRUCTION. SIDEWALL SUPPLY GRILLES AND REGISTERS SHALL BE DOUBLE-DEFLECTION TYPE, WITH VERTICAL FRONT VANES. CONSTRUCTION SHALL BE OF STEEL, WITH 3/4 INCH BLADE SPACING. RETURN AIR GRILLES, RETURN AIR REGISTERS, EXHAUST GRILLES, EXHAUST REGISTERS AND TRANSFER AIR GRILLES LOCATED IN CEILINGS SHALL BE CONSTRUCTED OF ALUMINUM WITH "EGG-CRATE" DESIGN, WITH 1/2 INCH X 1/2 INCH X 1/2 INCH GRIDS. FRAME STYLE SHALL BE COMPATIBLE WITH CEILING CONSTRUCTION. INSTALL WALL GRILLES AND REGISTERS WITH HORIZONTAL EDGES PARALLEL TO CEILING. CONCENTRIC DIFFUSER ASSEMBLIES AT ROOF TOP UNITS SHALL HAVE PAINT-READY EXTERIOR FINISH AND 1-INCH LINED SUPPLY AND RETURN DUCTS THAT TRANSITION TO DIFFUSER SIZE WITHIN 24 INCHES VERTICALLY OF THE BOTTOM OF ROOF TOP UNIT CURB.

37. BASIC MOTOR REQUIREMENTS: BASIC REQUIREMENTS APPLY TO MECHANICAL EQUIPMENT MOTORS, UNLESS OTHERWISE INDICATED. MOTORS 1/2 HP AND LARGER: POLYPHASE, UNLESS OTHERWISE SCHEDULED. MOTORS SMALLER THAN 1/2 HP: SINGLE PHASE. FREQUENCY RATING: 60 HZ. SERVICE FACTOR: ACCORDING TO NEMA MG 1, GENERAL PURPOSE CONTINUOUS DUTY, DESIGN TYPE "B." ENCLOSURE: OPEN DRIP-PROOF, UNLESS OTHERWISE INDICATED. EFFICIENCY: MOTORS SHALL HAVE A HIGHER EFFICIENCY RATING THAN INDUSTRY STANDARD AVERAGE MOTOR AS DELINEATED IN IEEE STANDARD 112, TEST METHOD 13. THERMAL PROTECTION: WHERE INDICATED OR REQUIRED, INTERNAL PROTECTION AUTOMATICALLY OPENS POWER SUPPLY CIRCUIT TO MOTOR WHEN WINDING TEMPERATURE EXCEEDS A SAFE VALUE CALIBRATED TO TEMPERATURE RATING OF MOTOR INSULATION. THERMAL PROTECTION DEVICE AUTOMATICALLY RESETS WHEN MOTOR TEMPERATURE RETURNS TO NORMAL RANGE, UNLESS OTHERWISE INDICATED.

38. HANGERS AND SUPPORTS: BUILDING ATTACHMENTS: CONCRETE INSERTS OR STRUCTURAL-STEEL FASTENERS APPROPRIATE FOR BUILDING MATERIALS, AND BEAM CLAMPS. HANGER MATERIALS: GALVANIZED, SHEET STEEL OR ROUND, THREADED STEEL ROD. HANGERS INSTALLED IN CORROSIVE ATMOSPHERES: ELECTROGALVANIZED, ALL-THREAD ROD OR GALVANIZED RODS WITH THREADS PAINTED AFTER INSTALLATION. STRAPS AND ROD SIZES: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE" FOR SHEET STEEL WIDTH AND THICKNESS AND FOR STEEL ROD DIAMETERS. DUCT ATTACHMENTS: SHEET METAL SCREWS, BLIND RIVETS, OR SELF-TAPPING METAL SCREWS; COMPATIBLE WITH DUCT MATERIALS. TRAPEZE AND RISER SUPPORTS GALVANIZED STEEL SHAPES AND PLATES: STEEL SHAPES COMPLYING WITH ASTM A 36/A 36M.

39. SEALANT MATERIALS: JOINT AND SEAM SEALANTS, GENERAL: THE TERM "SEALANT" IS NOT LIMITED TO MATERIALS OF ADHESIVE OR MASTIC NATURE BUT INCLUDES TAPES AND COMBINATIONS OF OPEN-WEAVE FABRIC STRIPS AND MASTICS. JOINT AND SEAM TAPE: 2 INCHES WIDE; GLASS-FIBER FABRIC REINFORCED. JOINT AND SEAM SEALANT: ONE-PART, NONSAG, SOLVENT-RELEASE-CURING, POLYMERIZED BUTYL SEALANT, FORMULATED WITH A MINIMUM OF 75 PERCENT SOLIDS. FLANGED JOINT MASTICS: ONE-PART, ACID-CURING, SILICONE, ELASTOMERIC JOINT SEALANTS, COMPLYING WITH ASTM C 920, TYPE S, GRADE NS, CLASS 25, USE O.

40. ALL HVAC EQUIPMENT SUCH AS AH, CU, EF, AC, HP, AND RTU SHALL HAVE VISIBLE NAMEPLATES WITH THEIR ASSOCIATED MARKS ON THEM.

41. CEILING VENTILATOR SHALL HAVE CORROSION RESISTANT GALVANIZED STEEL HOUSING WITH FOUR-POINT MOUNTING CAPABILITY. IT SHALL BE DUCTED TO A CAP ON WALL OR ROOF USING ROUND DUCTWORK. BLOWER ASSEMBLY SHALL BE REMOVABLE, HAVE A CENTRIFUGAL-TYPE BLOWER WHEEL AND A PERMANENTLY LUBRICATED MOTOR DESIGNED FOR CONTINUOUS OPERATION. NON-METALLIC DAMPER/DUCT CONNECTOR SHALL BE INCLUDED. AIR DELIVERY SHALL BE NO LESS THAN SCHEDULED AND SOUND LEVEL NO GREATER THAN SCHEDULED. ALL AIR AND SOUND RATINGS SHALL BE CERTIFIED BY HVI. CEILING VENTILATOR SHALL BE ENERGY STAR® QUALIFIED AND HAVE AN ENERGY EFFICIENT PERMANENT SPLIT CAPACITOR MOTOR.

42. UNIT HEATERS-ELECTRIC: CABINET SHALL BE STEEL WITH BAKED-ENAMEL FINISH WITH MANUFACTURER'S CUSTOM PAINT FOR HARSH MOIST ENVIRONMENT, IN COLOR SELECTED BY ARCHITECT. PROVIDE VERTICAL UNIT, WITH MINIMUM 0.0677-INCH-THICK, GALVANIZED, SHEET STEEL, REMOVABLE PANELS WITH CHANNEL-FORMED EDGES SECURED WITH TAMPERPROOF CAM FASTENERS. ELECTRIC-RESISTANCE HEATING COIL SHALL BE NICKEL-CHROMIUM HEATING WIRE, FREE FROM EXPANSION NOISE AND HUM, MOUNTED IN CERAMIC INSERTS IN A GALVANIZED-STEEL HOUSING; WITH FUSES IN TERMINAL BOX FOR OVERCURRENT PROTECTION AND LIMIT CONTROLS FOR HIGH-TEMPERATURE PROTECTION. TERMINATE ELEMENTS IN STAINLESS-STEEL MACHINE-STAKED TERMINALS SECURED WITH STAINLESS-STEEL HARDWARE. PROPELLER FAN, DIRECTLY CONNECTED TO MOTOR, GALVANIZED-STEEL.

43. THE PROJECT SHALL BE CONSTRUCTED IN STRICT ADHERENCE TO DRAWINGS AND SPECIFICATIONS. CONSTRUCTABILITY QUESTIONS SHALL BE ADDRESSED, IN WRITING, TO THE ARCHITECT AND ENGINEER OF RECORD FOR RESOLUTION. ANY DEVIATIONS FROM THESE DRAWINGS AND SPECIFICATIONS DOCUMENTS WITHOUT WRITTEN CONSENT FROM THE ENGINEER OF RECORD SHALL BECOME THE RESPONSIBILITY OF THE PERSON OR ENTITY MAKING THE CHANGES. THAT PERSON OR ENTITY SHALL BECOME SOLELY RESPONSIBLE FOR ANY CLAIMS RESULTING FROM SUCH CHANGES.

44. WALL HOUSING, WHEEL, FAN SHAFT, BEARINGS, MOTOR AND DISCONNECT SWITCH, DRIVE ASSEMBLY, AND ACCESSORIES INCLUDING BUT NOT LIMITED TO ½" MESH BIRD SCREEN, FLANGED WALL DISCHARGE SHUTTER, AND OSHA GUARD. HOUSING SHALL BE HEAVY-GAGE, GALVANIZED STEEL OR PAINTED ALUMINUM, WITH A VENTURI INLET CONE.

45. LOUVERS: 4" DEEP, 12 GAUGE (0.081) ETCHED AND 30 MINUTE CLEAR ANODIZED EXTRUDED ALUMINUM, DRAINABLE BLADES AND FRAME; BACK MOUNTED 1/2" MESH 19 GAUGE SCREEN; FLANGE FRAME. LOUVER SHALL BE RATED FOR NO WATER CARRY-THROUGH AT 900 FACE VELOCITY, 0.15" MAXIMUM PRESSURE DROP FOR 4-FOOT SQUARE SAMPLE TESTED ACCORDING TO AMCA STANDARD 500, 1973. AMERICAN WARMING LE-33 (ALUM.); RUSKIN [ELF-6375D;LOUVERS & DAMPERS IEL-6; INDUSTRIAL LOUVERS 653 ALUM.; VENT PRODUCTS #4650; SHIPMAN LE-33 (ALUM.); ARROW UNITED EA615-D (ALUM.); GREENHECK ECD-603. PROVIDE ADAPTER TO MATCH CORRUGATIONS IN METAL PANEL.

46. ACCEPTABLE MANUFACTURERS ARE:

AIR HANDLERS & HEAT PUMPS, PACKAGED UNITS:	CARRIER, TRANE, YORK, LENNOX
GRILLES, REGISTERS & DIFFUSERS:	TITUS, NAILOR, PRICE, TUTTLE & BAILEY, KRUGER, METAL AIRE(COLOR SELECTION SUBMITTED TO ARCHITECT)
FANS:	TWIN-CITY, COOK, GREENHECK, PENNBARRY, ACME, AMERICAN COOLAIR, CAPTIVE AIR, SOLAR & PALAU
LOUVERS/DAMPERS:	UNITED ENERTECH, GREENHECK, RUSKIN, ARROW UNITED, LLOYD INDUSTRIES, AIR BALANCE (COLOR SELECTION SUBMITTED TO ARCHITECT)
ELECTRIC HEATERS:	MARKEL, Q-MARK, RAYWALL, INDEECO
CONTROLS-PROVIDED WITH UNIT:	PROVIDE THERMOSTATS BY SAME MANUFACTURER AS EQUIPMENT

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GEORGIA REGISTERED PROFESSIONAL ENGINEER No. PE036664 KRUNAL M PATEL
4-24-2026

PROJECT NUMBER: 25-040

REVISIONS
NO: DATE: ISSUE:

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WALTON COUNTY, GEORGIA

MECHANICAL SPECIFICATIONS

M-002

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