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D	<div>HEATING, VENTILATING AND AIR CONDITIONING</div> <div>SECTION 231123 - FACILITY NATURAL-GAS PIPING</div> <div>1.1 SUMMARY</div> <div>A. NATURAL-GAS PIPING WITHIN THE BUILDING AND DISTRIBUTION ON THE PROJECT SITE.</div> <div>1.2 PERFORMANCE REQUIREMENTS</div> <div>A. MINIMUM OPERATING-PRESSURE RATINGS:</div> <div>1. PIPING AND VALVES: 100 PSIG (890 KPA) MINIMUM UNLESS OTHERWISE INDICATED.</div> <div>2. SERVICE REGULATORS: 65 PSIG (450 KPA) MINIMUM UNLESS OTHERWISE INDICATED.</div> <div>3. MINIMUM OPERATING PRESSURE OF SERVICE METER: 5 PSIG (34.5 KPA).</div> <div>B. NATURAL-GAS SYSTEM PRESSURES WITHIN BUILDINGS: 0.5 PSIG (3.45 KPA) OR LESS.</div> <div>1.3 MATERIALS</div> <div>A. PIPING SPECIALTIES:</div> <div>1. APPLIANCE FLEXIBLE CONNECTORS LISTED WITH CAPACITY MEETING OR EXCEEDING APPLIANCE RATING.</div> <div>2. QUICK-DISCONNECT DEVICES.</div> <div>3. Y-PATTERN STRAINERS.</div> <div>4. WEATHERPROOF VENT CAP.</div> <div>B. MANUAL GAS SHUTOFF VALVES:</div> <div>1. TWO-PIECE, FULL-PORT BRONZE BALL VALVES WITH BRONZE TRIM.</div> <div>2. BRONZE PLUG VALVES.</div> <div>3. CAST-IRON, NONLUBRICATED PLUG VALVES.</div> <div>4. PE BALL VALVES.</div> <div>5. VALVE BOXES.</div> <div>C. PRESSURE REGULATORS:</div> <div>1. LINE PRESSURE REGULATORS.</div> <div>2. APPLIANCE PRESSURE REGULATORS.</div> <div>D. DIELECTRIC FITTINGS: DIELECTRIC UNIONS.</div> <div>E. DETECTABLE WARNING TAPE FOR UNDERGROUND PIPING.</div> <div>1.4 OUTDOOR PIPING SCHEDULE</div> <div>A. UNDERGROUND PIPING: STEEL PIPE WITH WELDED JOINTS.</div> <div>B. ABOVEGROUND PIPING: STEEL PIPE WITH THREADED JOINTS.</div> <div>C. BRANCH PIPING IN CAST-IN-PLACE CONCRETE: ANNEALED-TEMPER COPPER TUBE WITH BRAZED JOINTS.</div> <div>D. CONTAINMENT CONDUIT: STEEL PIPE WITH WELDED JOINTS.</div> <div>1.5 INDOOR PIPING SCHEDULE FOR PRESSURES LESS THAN 0.5 PSIG (3.45 KPA)</div> <div>A. ABOVEGROUND BRANCH PIPING NPS 1 (DN 25) AND SMALLER: STEEL PIPE WITH THREADED JOINTS.</div> <div>B. ABOVEGROUND DISTRIBUTION PIPING: STEEL PIPE WITH THREADED JOINTS.</div> <div>C. UNDERGROUND PIPING: STEEL PIPE WITH WELDED JOINTS.</div> <div>D. CONTAINMENT CONDUIT AND VENT PIPING: STEEL PIPE WITH WELDED JOINTS.</div> <div>END OF SECTION 231123</div>				
	<div>HEATING, VENTILATING AND AIR CONDITIONING</div> <div>SECTION 233113 - METAL DUCTS</div> <div>1.1 MATERIALS</div> <div>A. SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.</div> <div>B. SHEET METAL MATERIALS:</div> <div>1. GALVANIZED SHEET STEEL.</div> <div>C. DUCT LINER:</div> <div>1. FIBROUS GLASS, TYPE I, FLEXIBLE.</div> <div>a. WATER-BASED LINER ADHESIVE: VOC CONTENT OF 80 G/L OR LESS FOR INTERIOR APPLICATIONS.</div> <div>E. SEALANT MATERIALS:</div> <div>1. WATER-BASED JOINT AND SEAM SEALANT: VOC CONTENT OF 250 G/L OR LESS FOR INTERIOR APPLICATIONS.</div> <div>2. FLANGED JOINT SEALANT: VOC CONTENT OF 250 G/L OR LESS FOR INTERIOR APPLICATIONS.</div> <div>3. FLANGE GASKETS.</div> <div>1.2 SEISMIC-RESTRAINT DEVICES</div> <div>A. HANGER ROD STIFFENER: STEEL TUBE OR STEEL SLOTTED-SUPPORT-SYSTEM SLEEVE WITH INTERNALLY BOLTED CONNECTIONS TO HANGER ROD.</div> <div>1.3 DUCT SCHEDULE</div> <div>A. ALL DUCTS SHALL BE GALVANIZED STEEL.</div> <div>1.5 HANGERS AND SUPPORT</div> <div>A. HANGER RODS: ELECTROGALVANIZED, ALL-THREAD RODS OR GALVANIZED RODS WITH THREADS PAINTED WITH ZINC-CHROMATE PRIMER AFTER INSTALLATION.</div> <div>B. STRAP AND ROD SIZES: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," TABLE 5-1 (TABLE 5-1M), "RECTANGULAR DUCT HANGERS MINIMUM SIZE," AND TABLE 5-2, "MINIMUM HANGER SIZES FOR ROUND DUCT."</div> <div>C. DUCT ATTACHMENTS: SHEET METAL SCREWS, BLIND RIVETS, OR SELF-TAPPING METAL SCREWS; COMPATIBLE WITH DUCT MATERIALS.</div> <div>END OF SECTION 233113</div>				
	<div>HEATING, VENTILATING AND AIR CONDITIONING</div> <div>SECTION 233423 - HVAC POWER VENTILATORS</div> <div>1.1 QUALITY ASSURANCE</div> <div>A. AMCA-CERTIFIED RATINGS SEAL.</div> <div>1.2 CENTRIFUGAL ROOF VENTILATORS</div> <div>A. DIRECT-DRIVE OR BELT-DRIVEN CENTRIFUGAL TYPE, WITH SPUN-ALUMINUM HOUSING.</div> <div>1. VARIABLE-SPEED CONTROLLER.</div> <div>2. DISCONNECT SWITCH INSIDE FAN HOUSING.</div> <div>3. BIRD SCREENS.</div> <div>4. BACKDRAFT DAMPERS.</div> <div>5. MOTORIZED DAMPERS.</div> <div>END OF SECTION 233423</div>				
B	<div>HEATING, VENTILATING AND AIR CONDITIONING</div> <div>SECTION 237413 - PACKAGED, OUTDOOR, CENTRAL-STATION AIR-HANDLING UNITS</div> <div>1.1 MANUFACTURED UNITS</div> <div>A. CASING:</div> <div>1. GALVANIZED STEEL PAINTED WITH BAKED ENAMEL.</div> <div>2. GALVANIZED-STEEL LINER.</div> <div>3. INSULATED WITH FIBERGLASS.</div> <div>4. GALVANIZED-STEEL DRAIN PAN WITH DRAIN CONNECTION ON BOTH SIDES.</div> <div>B. SUPPLY-AIR FAN: BELT-DRIVEN, FORWARD CURVED, CENTRIFUGAL.</div> <div>C. CONDENSER-COIL FAN: DIRECT-DRIVEN PROPELLER.</div> <div>D. SUPPLY-AIR REFRIGERANT COIL:</div> <div>1. ALUMINUM-PLATE FINS AND SEAMLESS COPPER TUBE.</div> <div>E. OUTDOOR-AIR REFRIGERANT COIL:</div> <div>1. ALUMINUM-PLATE FINS AND SEAMLESS COPPER TUBE.</div> <div>F. REFRIGERANT CIRCUIT COMPONENTS:</div> <div>1. NUMBER OF REFRIGERANT CIRCUITS: NUMBER AS SCHEDULED.</div> <div>2. COMPRESSOR: HERMETIC SCROLL.</div> <div>3. REFRIGERANT: R-407C OR R-410A.</div> <div>4. LOW-AMBIENT KIT.</div> <div>G. FILTERS: DISPOSABLE, MINIMUM 90 PERCENT ARRESTANCE, AND MINIMUM MERV 6.</div> <div>H. GAS FURNACE:</div> <div>1. HEAT EXCHANGER AND DRAIN PAN: ALUMINIZED STEEL.</div> <div>2. FUEL: NATURAL.</div> <div>3. IGNITION: ELECTRONIC.</div> <div>4. GRAVITY VENT.</div> <div>5. TWO-STAGE MODULATING GAS CONTROL VALVE.</div> <div>I. OUTDOOR- AND RETURN-AIR MIXING DAMPERS: 0 TO 100 PERCENT ECONOMIZER WITH MOTORIZED DAMPERS AND HOOD.</div> <div>J. ELECTRICAL POWER CONNECTION: SINGLE WITH UNIT-MOUNTED DISCONNECT.</div> <div>K. BASIC UNIT CONTROLS:</div> <div>1. CONTROL BOARD TO BE COMPATIBLE WITH CONTROL SYSTEM (EMS, STANDARD AND DCV CONTROLS).</div> <div>2. WALL-MOUNTED HUMIDISTAT OR SENSOR WITH EXPOSED SET POINT AND EXPOSED INDICATION.</div> <div>3. REMOTE WALL-MOUNTED ANNUNCIATOR PANEL.</div> <div>L. ELECTRONIC CONTROLLERS:</div> <div>1. SAFETY CONTROLS.</div> <div>2. SCHEDULED CONTROLS.</div> <div>3. UNOCCUPIED PERIOD CONTROLS.</div> <div>4. SUPPLY FAN CONTROLS.</div> <div>5. REFRIGERANT CIRCUIT CONTROLS.</div> <div>6. GAS FURNACE CONTROLS.</div> <div>7. FIXED MINIMUM OUTDOOR-AIR CONTROLS.</div> <div>8. ECONOMIZER ENTHALPY-BASED CONTROLS.</div> <div>9. CARBON DIOXIDE SENSOR INPUT CONTROLS FOR DEMAND CONTROLLED VENTILATION.</div> <div>M. ACCESSORIES:</div> <div>1. GAS BURNER COMPARTMENT HEATER.</div> <div>2. DUPLEX ELECTRICAL OUTLET.</div> <div>3. LOW-AMBIENT KIT.</div> <div>4. FILTER DIFFERENTIAL PRESSURE SWITCH.</div> <div>5. HAIL GUARDS.</div> <div>6. CONCENTRIC DIFFUSER.</div> <div>N. ROOF CURB:</div> <div>1. VIBRATION ISOLATORS.</div> <div>2. WIND RESTRAINTS.</div> <div>3. SEISMIC RESTRAINTS.</div> <div>END OF SECTION 237413</div>				
	<div>ELECTRICAL</div> <div>SECTION 260519 - LOW-VOLTAGE (600V OR LESS) ELECTRICAL POWER CONDUCTORS AND CABLES</div> <div>1.1 MATERIALS</div> <div>A. CONDUCTORS AND CABLES:</div> <div>1. CONDUCTORS: COPPER.</div> <div>2. CONDUCTOR INSULATION: TYPE THHN/THWN-2, TYPE XHHW-2, TYPE USE AND TYPE SO.</div> <div>3. MULTICONDUCTOR CABLE: METAL-CLAD CABLE, TYPE MC WITH GROUND WIRE. (IF ALLOWED BY LOCAL JURISDICTION).</div> <div>1.2 CONDUCTOR MATERIAL APPLICATIONS</div> <div>A. FEEDERS: COPPER, SOLID FOR NO. 10 AWG AND SMALLER; STRANDED FOR NO. 8 AWG AND LARGER.</div> <div>B. BRANCH CIRCUITS: COPPER, SOLID FOR NO. 12 AWG AND SMALLER; STRANDED FOR NO. 10 AWG AND LARGER, EXCEPT VFC CABLE, WHICH SHALL BE EXTRA FLEXIBLE STRANDED.</div> <div>1.3 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS</div> <div>A. SERVICE ENTRANCE: TYPE THHN/THWN-2, SINGLE CONDUCTORS IN RACEWAY.</div> <div>B. EXPOSED FEEDERS: TYPE THHN/THWN-2, SINGLE CONDUCTORS IN RACEWAY.</div> <div>C. FEEDERS CONCEALED IN CEILINGS, WALLS, PARTITIONS, AND CRAWLSPACES: TYPE THHN/THWN-2, SINGLE CONDUCTORS IN RACEWAY.</div> <div>D. FEEDERS CONCEALED IN CONCRETE, BELOW SLABS-ON-GRADE, AND UNDERGROUND: TYPE THHN/THWN-2, SINGLE CONDUCTORS IN RACEWAY.</div> <div>E. EXPOSED BRANCH CIRCUITS, INCLUDING IN CRAWLSPACES: TYPE THHN/THWN-2, SINGLE CONDUCTORS IN RACEWAY.</div> <div>F. BRANCH CIRCUITS CONCEALED IN CEILINGS, WALLS, AND PARTITIONS: TYPE THHN/THWN-2, SINGLE CONDUCTORS IN RACEWAY.</div> <div>G. BRANCH CIRCUITS CONCEALED IN CONCRETE, BELOW SLABS-ON-GRADE, AND UNDERGROUND: TYPE THHN/THWN-2, SINGLE CONDUCTORS IN RACEWAY.</div> <div>H. CORD DROPS AND PORTABLE APPLIANCE CONNECTIONS: TYPE SO, HARD SERVICE CORD WITH STAINLESS-STEEL, WIRE-MESH, STRAIN RELIEF DEVICE AT TERMINATIONS TO SUIT APPLICATION.</div> <div>1.4 FIELD QUALITY CONTROL</div> <div>A. TESTING: BY CONTRACTOR.</div> <div>END OF SECTION 260519</div>				
C	<div>ELECTRICAL</div> <div>SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS</div> <div>1.1 QUALITY ASSURANCE</div> <div>A. QUALITY STANDARD FOR GROUNDING AND BONDING MATERIALS AND EQUIPMENT: UL 467.</div> <div>1.2 PRODUCTS</div> <div>A. INSULATED CONDUCTORS: COPPER WIRE OR CABLE.</div> <div>B. BARE COPPER CONDUCTORS:</div> <div>1. SOLID CONDUCTORS.</div> <div>2. STRANDED CONDUCTORS.</div> <div>3. TINNED CONDUCTORS.</div> <div>4. STRANDED BONDING CONDUCTORS.</div> <div>5. COPPER TAPE BRAIDED BONDING JUMPERS.</div> <div>6. TINNED-COPPER BRAIDED BONDING JUMPERS.</div> <div>C. CONNECTORS: BOLTED AND EXOTHERMIC-WELDED TYPE.</div> <div>D. GROUNDING ELECTRODES:</div> <div>1. GROUND RODS: COPPER-CLAD STEEL, SECTIONAL TYPE WITH GROUND WELL AND COVER.</div> <div>1.3 FIELD QUALITY CONTROL</div> <div>A. GROUND RESISTANCE TESTING: BY CONTRACTOR-ENGAGED AGENCY.</div> <div>END OF SECTION 260526</div>				
	<div>ELECTRICAL</div> <div>SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS</div> <div>PART 1 - GENERAL</div> <div>1.1 MATERIALS</div> <div>A. METAL CONDUITS, TUBING, AND FITTINGS:</div> <div>1. GRC.</div> <div>2. EMT.</div> <div>3. FMC: ZINC-COATED STEEL.</div> <div>4. LFMC.</div> <div>5. FITTINGS:</div> <div>a. EMT: STEEL, SETSCREW OR COMPRESSION TYPE.</div> <div>b. EXPANSION FITTINGS.</div> <div>B. NONMETALLIC CONDUITS, TUBING, AND FITTINGS:</div> <div>1. RNC.</div> <div>2. FITTINGS: MATCH CONDUIT.</div> <div>3. SOLVENT CEMENTS AND ADHESIVE PRIMERS SHALL HAVE A VOC CONTENT OF 510 AND 550 G/L OR LESS, RESPECTIVELY.</div> <div>C. METAL WIREWAYS AND AUXILIARY GUTTERS: SHEET METAL WITH SCREW COVERS.</div> <div>D. SURFACE METAL RACEWAYS: METAL, GALVANIZED STEEL, WITH SNAP-ON COVERS.</div> <div>E. BOXES, ENCLOSURES, AND CABINETS:</div> <div>1. METAL OUTLET AND DEVICE BOXES: ALUMINUM.</div> <div>2. METAL FLOOR BOXES: CAST METAL OR SHEET METAL, FULLY ADJUSTABLE.</div> <div>3. LUMINAIRE OUTLET BOXES: NONADJUSTABLE, DESIGNED FOR ATTACHMENT OF LUMINAIRE WEIGHING 50 LB (23 KG).</div> <div>4. SMALL SHEET METAL PULL AND JUNCTION BOXES.</div> <div>5. CAST-METAL ACCESS, PULL, AND JUNCTION BOXES.</div> <div>6. BOX EXTENSIONS.</div> <div>7. HINGED-COVER ENCLOSURES: METAL.</div> <div>8. CABINETS: GALVANIZED STEEL.</div> <div>1.2 RACEWAY APPLICATION</div> <div>A. OUTDOORS:</div> <div>1. EXPOSED: GRC.</div> <div>2. CONCEALED, ABOVEGROUND: RNC, TYPE EPC-40-PVC.</div> <div>3. UNDERGROUND: RNC, TYPE EPC-40-PVC, DIRECT BURIED.</div> <div>4. CONNECTION TO VIBRATING EQUIPMENT: LFMC.</div> <div>5. BOXES AND ENCLOSURES, ABOVEGROUND: TYPE 3R OR TYPE 4.</div> <div>B. INDOORS:</div> <div>1. EXPOSED, NOT SUBJECT TO PHYSICAL DAMAGE: EMT.</div> <div>2. EXPOSED, NOT SUBJECT TO SEVERE PHYSICAL DAMAGE: EMT.</div> <div>3. CONCEALED: EMT.</div> <div>4. CONNECTION TO VIBRATING EQUIPMENT: FMC, EXCEPT LFMC IN DAMP OR WET LOCATIONS.</div> <div>5. DAMP OR WET LOCATIONS: GRC.</div> <div>6. BOXES AND ENCLOSURES: TYPE 1, EXCEPT TYPE 4 NONMETALLIC IN DAMP OR WET LOCATIONS.</div> <div>C. MINIMUM RACEWAY SIZE: 3/4-INCH (21-MM) TRADE SIZE.</div> <div>D. RACEWAY FITTINGS: COMPATIBLE WITH RACEWAYS AND SUITABLE FOR USE AND LOCATION.</div> <div>1. RIGID AND INTERMEDIATE STEEL CONDUIT: THREADED RIGID STEEL CONDUIT FITTINGS.</div> <div>2. PVC EXTERNALLY COATED, RIGID STEEL CONDUITS: FITTINGS LISTED FOR USE WITH THIS TYPE OF CONDUIT.</div> <div>3. EMT: SETSCREW, STEEL FITTINGS.</div> <div>4. FLEXIBLE CONDUIT: FITTINGS LISTED FOR USE WITH FLEXIBLE CONDUIT.</div> <div>END OF SECTION 260533</div>				
A	<div>ELECTRICAL</div> <div>SECTION 260536 - CABLE TRAYS FOR ELECTRICAL SYSTEMS</div> <div>1.1 CABLE TRAY TYPES</div> <div>A. LADDER.</div> <div>B. SINGLE RAIL.</div> <div>C. TROUGH.</div> <div>1.2 MATERIALS</div> <div>A. CABLE TRAYS, FITTINGS, AND ACCESSORIES: STEEL.</div> <div>1. FACTORY-STANDARD PRIMER: WITH CHROMIUM-ZINC-PLATED HARDWARE.</div> <div>2. MILL GALVANIZED BEFORE FABRICATION; WITH GALVANIZED HARDWARE.</div> <div>3. ELECTROGALVANIZED BEFORE FABRICATION; WITH GALVANIZED HARDWARE.</div> <div>4. HOT-DIP GALVANIZED AFTER FABRICATION; WITH CHROMIUM-ZINC-PLATED HARDWARE.</div> <div>5. POWDER-COAT ENAMEL PAINT; WITH CHROMIUM-ZINC-PLATED HARDWARE.</div> <div>6. BLACK OXIDE FINISH FOR SUPPORT ACCESSORIES AND MISCELLANEOUS HARDWARE.</div> <div>B. CABLE TRAYS, FITTINGS, AND ACCESSORIES: ALUMINUM; WITH STAINLESS-STEEL HARDWARE.</div> <div>C. CABLE TRAY ACCESSORIES:</div> <div>1. COVERS: LOUVERED-TYPE.</div> <div>2. BARRIER STRIPS.</div> <div>3. CABLE TRAY SUPPORTS AND CONNECTORS.</div> <div>D. WARNING SIGNS: 1-1/2-INCH- (40-MM-) HIGH, BLACK LETTERS ON YELLOW BACKGROUND WITH LEGEND "WARNING! NOT TO BE USED AS WALKWAY, LADDER, OR SUPPORT FOR LADDERS OR PERSONNEL".</div> <div>1.3 SOURCE QUALITY CONTROL</div> <div>A. TESTED ACCORDING TO NEMA VE 1.</div> <div>END OF SECTION 260536</div>				
	<div>ELECTRICAL</div> <div>SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABBING</div> <div>1.1 MATERIALS</div> <div>A. SLEEVES:</div> <div>1. SCHEDULE 40 STEEL PIPE.</div> <div>2. CAST-IRON PIPE.</div> <div>3. GALVANIZED-STEEL SHEET FOR CONDUITS PENETRATING NON-FIRE-RATED GYPSUM-BOARD ASSEMBLIES.</div> <div>4. MOLDED-PE OR -PP PIPE.</div> <div>5. GALVANIZED-STEEL SHEET FOR RECTANGULAR OPENINGS.</div> <div>B. SLEEVE-SEALS:</div> <div>1. EPDM RUBBER SEALING ELEMENTS.</div> <div>2. CARBON-STEEL PRESSURE PLATES.</div> <div>3. CARBON-STEEL, WITH CORROSION-RESISTANT COATING CONNECTING BOLTS AND NUTS.</div> <div>C. HYDRAULIC-CEMENT GROUT.</div> <div>D. SILICONE SEALANTS:</div> <div>1. SINGLE-COMPONENT, SILICONE-BASED, NEUTRAL-CURING ELASTOMERIC SEALANT.</div> <div>2. MULTICOMPONENT, SILICONE-BASED LIQUID ELASTOMERIC NONSHRINKING FOAM.</div> <div>3. VOC CONTENT OF 250 G/L OR LESS.</div> <div>END OF SECTION 260544</div>				



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DESCRIPTION

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REV.

WHITSETT  
6405 BURLINGTON RD  
WHITSETT, NC 27377

SPECIFICATIONS

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PERMIT	--/--/----
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RECORD	--/--/----

PROJECT MANAGER	DESIGNER
AK	DB

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