

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 at <http://www.dca.state.ga.us/development/constructioncodes/programs/codes2.asp> 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) 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.
- 12) 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 1/2" 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 Armaclad WB coating or equivalent.
- 13) 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).
- 14) Provide fire and smoke rated flexible connections between fans and ducts. Material shall comply with NFPA 90A requirements for material in supply air stream.
- 15) 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 available.
- 16) Indoor duct insulation: Foil-faced fiberglass, Owens Corning type 75 or equal, 2" thick, 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. 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 75° F mean temperature and an average maximum density of 0.75 lb/cu. ft.
- 17) All supply air ducts shall be insulated. 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.
- 18) Make all duct elbows right angle type with single thickness turning vanes or construct with centerline radius 1-1/2 times the duct width.
- 19) Duct sizes shown on plans are clear, interior dimensions.
- 20) Do not cut into or reduce the size of any structural member without the permission of the Architect.
- 21) Provide weather-proof flashing at all duct and pipe penetrations through the building walls and roof. As a minimum, flashings shall be designed and installed in accordance with SMACNA standards. Flashings shall be guaranteed weatherproof for the duration of the guarantee.
- 22) 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 fasten fasteners into non-structural components such as roof decks or non-load bearing walls.
- 23) Thoroughly clean all components and remove all dirt, scale, oil, and other foreign substances. Provide clean air filters for all equipment.
- 24) 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) of 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 (HW 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.
- 25) 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 parts 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 or replacement.
- 26) 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 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. Bill of material shall include 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 changes 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.)
- 27) Instruct Owner's representative in the operation of the systems, using the operation and maintenance manual and teaching aid.
- 28) 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 (oper listings), 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 the equipment and appurtenances.
 - e. Manufacturers' warranties.
- 29) Small Split Air Handler unit: Indoor unit shall be direct-expansion, suspended and ducted fan coil. Unit shall be complete with cooling coil, fan, fan motor, piping connectors, electrical controls, microprocessor control system, and integral temperature sensing. Unit shall be furnished with integral suspension hangers and mounting hardware. Units shall have rear piping inlet. Cabinet shall be fully insulated for thermal performance. Unit shall have a drip pan under the coil with built-in condensate pump necessary to remove condensate. Condensate pan shall have internal trap and auxiliary drip pan under coil header. Refer to Schedule on Drawings for additional specifications.
- 30) Small Split Air Handler (4 WAY): The unit shall be a four-way cassette style indoor unit that recesses into the ceiling with a ceiling grille. The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function and a test run mode. Indoor unit and refrigerant piping shall be charged with dehydrated air before shipment from the factory. The unit shall be provided with an integral condensate lift mechanism that will be able to raise drain water 19-3/4" inches above the condensate pan. Both refrigerant lines to the indoor units shall be insulated with 1/2" closed cell foam plastic Armaflex. Refer to Schedule on Drawings for additional specifications.
- 31) Small Split Condensing unit: Casing: House components in welded steel frame with galvanized steel panels with weather resistant, baked enamel finish. Mount contactors and controls in weatherproof panel provided with full opening access doors. Provide removable access doors or panels with quick fasteners. Compressor: Hermetically sealed, 3600 rpm maximum, resiliently mounted with positive lubrication and internal motor protection. Compressor: Hermetic reciprocating type or Hermetic scroll type. Condenser coils: Aluminum fins mechanically bonded to seamless copper tubing or oil aluminum fins and tube. Air test under water to 425 psig, and vacuum dehydrate. Seal with holding charge of refrigerant. Coil Guard: Louvered or PVC coat steel wire. Fans and motors: Direct driven propeller type condenser fans with fan guard on discharge. Weatherproof motors suitable for outdoor use, single phase permanent split capacitor with permanent lubricated ball bearings and built in thermal overload protection. Fan Guard: PVC coat steel wire. Refrigerant circuit: For each refrigerant circuit, provide: Filter dryer liquid line. Suction accumulator. Suction and liquid line service valves and gage ports. Charging valve. Condenser pressure relief mechanism. Factory wired with single point power connection. Factory wired controls shall include contactor, high and low pressure cutouts, internal winding thermostat for compressor, control circuit transformer, non-cycling reset relay. Provide a surge protector and lightning arrester in unit cabinet for protection from power surges due to lightning and switching transients. Provide controls to permit operation down to 0 degrees F ambient temperature where scheduled to include: Crankcase heater with thermostat. Head pressure switch to cycle fan motors in response to refrigerant condensing pressure. Solid state control to vary speed of one condenser fan motor in response to refrigerant condensing pressure. Refer to Schedule on Drawings for additional specifications.
- 32) Grilles, Registers and Diffusers: As scheduled.
- 33) 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, thermal 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.

- 34) 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.
- 35) 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, non-sag, solvent-release-curing, polymerized butyl sealant, formulated with a minimum of 75 percent solids. Flanged joint mastic: one-part, acid-curing, silicone, elastomeric joint sealants, complying with ASTM C 920, type S, grade NS, class 25, use 0.
- 36) All HVAC equipment such as AH, CU, EF, AC, HP, and RTU shall have visible nameplates with their associated marks on them.
- 37) Ceiling Ventilator shall have corrosion resistant galvanized steel housing with four-point mounting capability. It shall be ducted to a cap on wall using 6" 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 0.3 sones. 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.
- 38) Air Cooled Condensing unit (CU-1): Outdoor-mounted, air-cooled, split-system air conditioner unit suitable for ground installation. Unit consists of a hermetic compressor, an air-cooled coil, propeller-type condenser fan, and a control box. Unit shall discharge supply air upward as shown on contract drawings. Unit shall be used in a refrigeration circuit to match up to a packaged fan coil or coil unit. Unit shall be rated in accordance with the latest edition of AHRI Standard 210. Unit shall be certified for capacity and efficiency, and listed in the latest AHRI directory. Unit construction shall comply with latest edition of ANSI/ASHRAE and with NEC. Unit shall be constructed in accordance with UL standards and will carry the UL label of approval. Unit shall have UL us approval. Air-cooled condenser coils shall be leak tested at 150psig and pressure tested at 450 psig. Unit shall be stored and handled per unit manufacturer's recommendations. Unit shall be factory assembled, single piece, air-cooled air conditioner unit. Contained within the unit enclosure is all factory wiring, piping, controls, compressor, refrigerant charge Puron (R-410A), and special features. Unit shall be stored prior to field start up. Unit cabinet will be constructed of galvanized steel, bonderized, and coated with powder coat paint. Condenser fan shall be direct-drive propeller type, discharging air upward. Condenser fan motors shall be totally enclosed, with class B insulation and permanently lubricated bearings. Shafts shall be corrosion resistant. Fan blades shall be statically and dynamically balanced. Condenser fan openings shall be equipped with coated steel wire safety cage. Compressor shall be hermetically sealed. Compressor shall be mounted on rubber vibration isolators. Condenser coil shall be air cooled. Coil shall be constructed of aluminum fins mechanically bonded to copper tubes which are then painted, galvanized, or coated. Refrigeration circuit components shall include liquid line shutoff valve with sweat connections, vapor line shutoff valve with sweat connections, system charge of Puron (R-410A) refrigerant, and compressor oil. Unit shall be equipped with high pressure switch, low pressure switch and filter drier for Puron refrigerant. Refer to Schedule on Drawings for additional specifications.

39) Acceptable Manufacturers are:

Small Split Units:	Mitsubishi, Daikin, Sanyo, Toshiba.
Grilles, Registers & Diffusers:	Titus, Naylor, Price, Tuttle & Bailey (Color selection submitted to Architect)
Fans:	Twin-City, Cook, Greenheck, Permco, Home, American Cooling
Controls-provided with unit	Provide thermostats by same manufacturer as equipment

AIR DEVICE SCHEDULE									
MARK	SERVICE	FACE SIZE	MATERIAL	TYPE	PATTERN	MOUNTING TYPE	LAYOUT BASIS	NOTES	
EF-1	SUPPLY	SEE PLANS NECK SIZE + 1-1/4"	STEEL	STAMPED FACE REGISTER	3-WAY	SURFACE	METAL-FAB MFCROW3	1:2:3:4	
1. PROVIDE WHITE ENAMEL FINISH. 2. INSULATE BACK OF DEVICE. 3. BALANCE AIRFLOW TO QUANTITY SHOWN. 4. NOT TO PROVIDE ALUMINIZED FACE OPERATED DAMPER.									

FAN SCHEDULE									
MARK	CFM	EXT. SP IN W.G.	DRIVE TYPE	MOTOR WATTS	MAX FAN (RPM)	MAX SONES	POWER/PHASE	BASIS OF DESIGN	NOTES
EF-1	70	0.25	DIRECT	20 W	690	1.3	115/1	GREENHECK SP-B90	1:2:3:4
1. CENTRIFUGAL CEILING MOUNTED FAN. PROVIDE MANUFACTURER'S CEILING GRILL. 2. VERIFY ELECTRIC POWER REQUIREMENTS WITH ELECTRICAL PLANS WHICH TAKE PRECEDENCE OVER THIS INFORMATION. 3. INTERLOCK FAN WITH LIGHT. PROVIDE 15 MINUTE TIME DELAY. PROVIDE MANUFACTURER'S FAN SPEED CONTROLLER. 4. PROVIDE MOTOR WITH THERMAL OVERLOAD, BACK DRAFT DAMPER AND SOLID STATE SPEED CONTROLLER.									

DUCTLESS SPLIT AIR CONDITIONING SYSTEM SCHEDULE								
INDOOR UNIT MARK	OUTDOOR UNIT MARK	SERVICE	COOLING CAPACITY (BTU/HR.)	HEATING CAPACITY @ 47° (BTU/HR.)	SUPPLY CFM LO-MD-HI	VOLT.-PH.-CY.	MANUFACTURER & MODEL INDOOR UNIT/OUTDOOR UNIT	NOTES
AC-1	CU-1	IT	12,000	---	188-238-305	208/230-1-60	CARRIER 40MHC12-3/38MHC12A-3	1:2:3:4
ACU-1	HPU-1	OFFICE	18,000	18,000	450-500-600	208/230-1-60	TOSHIBA CARRIER RAV-SP180UT-UL/RAV-SP180AT2-UL	1:2:3:5
1. VERIFY ELECTRICAL POWER REQUIREMENTS WITH ELECTRICAL PLANS WHICH TAKES PRECEDENCE OVER THIS INFORMATION. 2. PROVIDE THERMOSTAT, DISCONNECT AND ELECTRICAL CONNECTION TO OUTDOOR UNIT PER MANUFACTURER'S INSTRUCTIONS. 3. ROUTE CONDENSATE DRAIN AS SHOWN ON PLANS. PROVIDE MANUFACTURER'S INTEGRAL CONDENSATE PUMP. 4. WALL MOUNT AIR-CONDITIONING UNIT. PROVIDE MANUFACTURER'S WIRED THERMOSTAT KSACN0401AAA. ROUTE CONDENSATE TO OUTSIDE AS SHOWN ON PLANS. 5. 4-WAY CEILING CASSETTE. PROVIDE BRANCH DUCT TO BATHROOM AS SHOWN ON PLAN. PROVIDE MANUFACTURER'S WIRED REMOTE CONTROLLER.								



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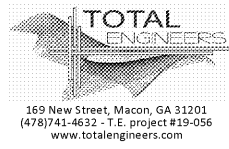
**A NEW GATE HOUSE
 AT TOBESOFKEE PARKS
 FOR MACON-BIBB COUNTY**

MACON, GEORGIA

Revisions:

Sheet Title:
 GATEHOUSE
 MECHANICAL
 SPECIFICATIONS &
 SCHEDULES

Project #: 1819 Date: 12/23/19



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