

NOTES

- ALL LIGHT FIXTURES SHALL BE SUPPORTED INDEPENDENTLY OF THE CEILING SYSTEM. 2x4 TROFFERS SHALL BE SUPPORTED WITH CABLE FROM ALL FOUR CORNERS.
- FOR HOME RUNS ON 20 AMP CIRCUITS EXCEEDING SEVENTY FIVE (75) FEET FROM THE PANEL BOARD, USE #10 AWG MIN.
- ALL MOUNTING HEIGHTS ARE GIVEN TO THE BOTTOM OF THE DEVICE UNLESS NOTED OTHERWISE.
- THE LOCATION OF ALL WALL MOUNTED DEVICES, INCLUDING MOUNTING HEIGHTS, SHALL BE FIELD VERIFIED WITH THE ARCHITECT PRIOR TO INSTALLATION.
- THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY DISCONNECTS, SWITCHES AND RECEPTACLES UNDER THE ELECTRICAL BID AND SHALL INCLUDE ALL NECESSARY CIRCUITS AND FINAL CONNECTIONS TO THE EQUIPMENT PROVIDED BY ALL SUPPLIERS, UNLESS NOTED OTHERWISE BY OTHER DISCIPLINES.
- ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED SO THAT ALL CODE REQUIRED AND MANUFACTURER RECOMMENDED SERVICING CLEARANCES ARE MAINTAINED.
- BIDDING CONTRACTORS MUST VISIT THE SITE, REVIEW ALL CONSTRUCTION DOCUMENTS, AND OBTAIN WRITTEN COPIES OF ALL REFERENCED CODES AND ORDINANCES PRIOR TO SUBMITTING BIDS. NO ALLOWANCE WILL BE MADE FOR ADVERSE CONDITIONS WHICH WERE ASCERTAINABLE PRIOR TO BID TIME.
- GROUND TELEPHONE EQUIPMENT TO THE ELECTRICAL SERVICE GROUNDING SYSTEM PER N.E.C.
- ALL CIRCUIT BREAKERS IN PANEL SHALL BE FULLY RATED
- THE ELECTRICAL CONTRACTOR SHALL COORDINATE AND VERIFY THE ELECTRICAL SERVICE ARRANGEMENTS WITH THE LOCAL POWER COMPANY AND WITH OWNER SUPPLIED SITE PLAN. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT FOR A COMPLETE INSTALLATION.
- CIRCUIT BREAKERS SHALL BE RATED TO WITHSTAND THE MAXIMUM AVAILABLE FAULT CURRENT AT THE SITE AS DETERMINED BY THE LOCAL UTILITY. E.C. SHALL COORDINATE WITH LOCAL UTILITY BEFORE STARTING WORK.
- ALL BUILDING SYSTEM GROUND RODS SHALL BE BONDED TOGETHER TO FORM A SINGLE GROUNDING SYSTEM. GROUNDING SYSTEM SHALL COMPLY WITH N.E.C. ARTICLE 250.
- THE WORD "PROVIDE" MEANS FURNISH AND INSTALL.
- MC CABLE IS ALLOWED AS A VE ALTERNATE.
- THE ELECTRICAL CONTRACTOR SHALL OBTAIN AND REVIEW THE MECHANICAL AND SPECIAL EQUIPMENT SUBMITTALS PRIOR TO SUBMITTING THE ELECTRICAL SUBMITTALS. ANY ELECTRICAL EQUIPMENT, CONDUIT, AND WIRE SIZE CHANGES RESULTING FROM THIS REVIEW SHALL ALSO BE SUBMITTED FOR APPROVAL.
- ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL FITTINGS AND NECESSARY EQUIPMENT FOR LIGHT FIXTURE MOUNTING, AND INSTALLATION.
- ALL FIRE BARRIER PENETRATIONS SHALL BE SEALED WITH APPROVED FIRE SEALANT. COORDINATE WITH ARCHITECTURAL PLANS FOR ALL RATED WALLS AND CEILINGS PRIOR TO BID FOR AN UNDERSTANDING OF NUMBER OF SEALS REQUIRED, AND DETERMINE METHOD FOR MINIMIZING THE SEAL REQUIREMENTS.

LEGEND

- DUPLEX RECEPTACLE - 20 AMP, 125V. HUBBELL MODEL HBL5362, MTD. @ 16" A.F.F. UNLESS NOTED, WITH MATCHING FACEPLATE.
- DUPLEX RECEPTACLE - HUBBELL MODEL GF5362, WITH GROUND FAULT INTERRUPT, MTD. @ 16" A.F.F. UNLESS NOTED, WITH WEATHER-PROOF CAST ALUMINUM COVER.
- DUPLEX RECEPTACLE - HUBBELL MODEL GF5362, WITH GROUND FAULT INTERRUPT, MTD. @ 16" A.F.F. UNLESS NOTED, WITH MATCHING FACEPLATE.
- DOUBLE DUPLEX RECEPTACLE - HUBBELL MODEL HBL5362, MTD. @ 16" A.F.F. UNLESS NOTED OTHERWISE AND MATCHING FACEPLATE.
- DUPLEX RECEPTACLE MOUNTED IN FLOOR BOX. HUBBELL MODEL HBL-5362, WITH MATCHING FACEPLATE.
- 20A 250V RECEPTACLE - MATCH TO PLUG ON SUPPLIED APPLIANCE. MTD. AS REQUIRED FOR EQUIPMENT BEING SERVED, WITH MATCHING FACEPLATE.
- 30A 250V RECEPTACLE - MATCH TO PLUG ON SUPPLIED APPLIANCE. MTD. AS REQUIRED FOR EQUIPMENT BEING SERVED, WITH MATCHING FACEPLATE.
- 20A-1P TOGGLE SWITCH, HEAVY DUTY, HUBBELL MODEL HBL1221. WHITE COLOR, MOUNTED @ 48" A.F.F. W/ MATCHING FACEPLATE.
- 20 AMP THREE WAY TOGGLE SWITCH, HEAVY DUTY, HUBBELL MODEL HBL1223. WHITE COLOR, MOUNTED @ 48" A.F.F. W/ MATCHING FACEPLATE.
- 1000W 120V AC SLIDE DIMMER. WHITE COLOR, MOUNTED @ 48" A.F.F. W/ MATCHING FACEPLATE.
- DUAL TECHNOLOGY OCCUPANCY SWITCH, WHITE COLOR MOUNTED @ 48" A.F.F. W/ MATCHING FACEPLATE.
- MOTOR STARTER SWITCH, NON FUSED 20A 2P. MOUNTED AS REQUIRED BY EQUIPMENT BEING SERVED.
- LED LIGHTING POWER SUPPLY
- VOICE/DATA OUTLET, MOUNTED @ 16" A.F.F. (NULESS NOTED OTHERWISE) IN 2-GANG BOX WITH SINGLE GANG MUD RING. PROVIDE (2) JACKS AND MATCHING FACEPLATE. RUN (2) CAT 6 CABLE FROM OUTLET TO BACKBOARD ON MEZZANINE
- CABLE TV OUTLET BOX MTD. @ 16" A.F.F. UNLESS NOTED, FLUSH MOUNTED 1 GANG WALL BOX. CONTRACTOR TO RUN CO-AX FROM OUTLET TO BACKBOARD ON MEZZANINE.
- VOICE/DATA OUTLET, MOUNTED IN FLOORBOX. PROVIDE (2) JACKS AND MATCHING FACEPLATE. RUN (2) CAT 6 CABLE FROM OUTLET TO BACKBOARD ON MEZZANINE
- EXHAUST FAN
- LIGHTING FIXTURE. SEE FIXTURE SCHEDULE
- JUNCTION BOX LOCATION MOUNTED AS NOTED ON DRAWING, SIZED AS REQUIRED BY EQUIPMENT BEING SERVED.
- DISCONNECT SWITCH, SIZE AND TYPE AS NOTED.
- HOME RUN CONDUIT. CIRCUIT NUMBER AS INDICATED ON DRAWINGS. HASHMARKS INDICATE HOT NEUTRAL AND GROUND.
- CONDUIT RUN IN FLOOR OR SLAB.
- CONDUIT RUN IN WALLS OR CEILING.
- LOW VOLTAGE WIRING

NOTE:

ALL DEVICE COLORS SHALL BE CHOSEN BY ARCHITECT.

ELECTRICAL SPECIFICATIONS

DIVISION 16 - ELECTRICAL SPECIFICATIONS

PART I. GENERAL PROVISIONS

- SCOPE: PROVIDE ALL LABOR, MATERIAL, AND EQUIPMENT IN ACCORDANCE WITH THESE SPECIFICATIONS, AND THE ACCOMPANYING DRAWINGS TO PROVIDE A COMPLETE AND PROPERLY OPERATING ELECTRICAL SYSTEM FOR THE BUILDING.
- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL OF THE FOLLOWING MATERIAL AND EQUIPMENT UNDER THIS DIVISION OF THE SPECIFICATIONS, UNLESS NOTED OTHERWISE: PANELBOARDS; LIGHTING FIXTURES; LAMPS; RACEWAYS; 600 VOLT WIRE AND CABLE; WIRING DEVICES; DEVICE PLATES; DEVICE, PULL, AND JUNCTION BOXES; SAFETY SWITCHES; MOTOR STARTERS; LIGHTING CONTROLS; CIRCUIT BREAKERS; FUSES; TIME CLOCKS; EQUIPMENT IDENTIFICATION (NAMEPLATES AND DIRECTORIES); WIRE AND CABLE TERMINATIONS, AND TEMPORARY POWER.
 - GENERAL REQUIREMENTS: ALL WORK SHALL BE PERFORMED BY SKILLED LICENSED ELECTRICIANS IN ACCORDANCE WITH THE BEST PRACTICES OF THE TRADE, MEETING THE REQUIREMENTS OF THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, APPLICABLE FEDERAL, STATE AND LOCAL CODES, AND THE REQUIREMENTS OF THE ELECTRICAL UTILITY COMPANY FURNISHING THE SERVICES. ALL NECESSARY CONSTRUCTION PERMITS AND CERTIFICATES OF INSPECTION SHALL BE PURCHASED AND OBTAINED UNDER THIS CONTRACT.
 - SERVICE VOLTAGE: THESE DRAWINGS ARE FOR A METERED, UNDERGROUND BUILDING SERVICE OF 120/240 VOLT, SINGLE PHASE, THREE WIRE, 60 HERTZ. ALL EQUIPMENT HAS BEEN DESIGNED AND PURCHASED FOR USE ON THIS ELECTRICAL SYSTEM. THE CONTRACTOR SHALL CONTACT THE ELECTRICAL UTILITY AND VERIFY ALL OF THE ABOVE SERVICE CHARACTERISTICS, AND THE AVAILABLE FAULT CURRENT.

PART II. MATERIALS

- MATERIALS: ALL MATERIALS SHALL BE NEW AND OF THE QUALITY INDICATED BY THE SPECIFIED BRAND NAMES. SUBSTITUTIONS OF MATERIAL OF EQUAL QUALITY BY OTHER MAJOR MANUFACTURERS OF COMMERCIAL EQUIPMENT MAY BE ACCEPTABLE PROVIDED A LIST OF SUCH SUBSTITUTIONS IS APPROVED.
- PANELBOARDS: PANELBOARDS SHALL BE BOLT-TIGHT CIRCUIT BREAKER TYPE, AS SHOWN ON THE PLANS. PANELS SHALL BE OF PANELBOARD CONSTRUCTION, 1/2" THICK (MINIMUM), 5-3/4" TO 6-1/2" DEEP, UL LISTED, AND MEET UL 67, UL 50, AND FEDERAL SPECIFICATION 48B AS TYPE 1, CLASS 1, WITH BOLT-TIGHT CIRCUIT BREAKERS, COPPER BUS BARS, NEUTRAL BUS, GROUND BUS, A HINGED LATCH DOOR, CABINETS SHALL BE CODE GAUGED, GALVANIZED STEEL, MOUNTED AS SHOWN, PROVIDE TYPEWRITTEN IDENTIFICATION DIRECTORIES WITH CLEAR PLASTIC PROTECTORS IN ALL PANELS. ALL WIRES SHALL BE TYPED WITH PANEL AND CIRCUIT NUMBERS. PANEL "MDP" SHALL BE IDENTIFIED AND LABELED AS SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT. APPROVED MANUFACTURERS PANELS ARE RECOMMENDED, CUTLER-HAMMER, GENERAL ELECTRIC AND WESTINGHOUSE.

- LIGHTING FIXTURES: ALL LIGHTING FIXTURES SHALL BE UL LISTED, COMMERCIAL QUALITY.
- WIRING DEVICES: ALL WIRING DEVICES SHALL BE UL LISTED, COMMERCIAL SPECIFICATION GRADE. SWITCHES SHALL BE RATED 20 AMPS AT 120/277 VOLTS, AC. STANDARD RECEPTACLES SHALL BE 20 AMP, DUPLEX, GROUNDING TYPE, IN NEMA CONFIGURATIONS, UNLESS NOTED OTHERWISE. SWITCHES IN THE SAME LOCATION SHALL BE GANGED BEHIND A SINGLE PLATE. DEVICE PLATES SHALL BE METAL, ALUMINUM OR STAINLESS STEEL. APPROVED MANUFACTURERS OF SWITCHES AND RECEPTACLES ARE HUBBELL, LEVITON, PASS & SEYMOUR, OR EQUAL

- ALL WIRING SHALL BE INSTALLED IN CONDUIT, EXCEPT WHERE SPECIFICALLY SHOWN ON THE DRAWINGS. NON-METALLIC SHEATHED (TYPE NM) CABLE IS NOT PERMITTED.
- ALL BRANCH CIRCUIT, COMMUNICATION, SIGNALING, AND CONTROL WIRING, FIRE PROTECTION, AND OTHER EQUIPMENT SHALL BE ROUTED ABOVE THE CEILING. VERIFY WHETHER OR NOT THE SPACE ABOVE THE CEILING IS USED AS A SPACE FOR RETURN AIR FOR THE ENVIRONMENTAL AIR SYSTEM. IF IT IS USED FOR RETURN AIR, PROVIDE APPROVED RACEWAYS FOR ALL OVER-HEAD WIRING PER NEC ARTICLE 300-22(B). IF IT IS NOT "OTHER SPACE USED FOR ENVIRONMENTAL AIR", APPROVED LOW VOLTAGE CABLES MEETING THE REQUIREMENTS OF NEC ARTICLES 725 AND 760 MAY BE RUN WITHOUT RACEWAYS. UNO. ALL SAFETY CONTROL WIRING FOR PROTECTION SYSTEMS, SHUNT TRIPS, ETC., SHALL BE RUN IN A RACEWAY IN ACCORDANCE WITH NEC ARTICLES 725.25 AND 725.28.

- SWITCHES:
 - SINGLE POLE: HUBBELL HBL1221-W, OR EQUAL.
 - THREE WAY: HUBBELL HBL1223-W, OR EQUAL.
- RECEPTACLES:
 - NEMA 5-20R: HUBBELL 5362-W, OR EQUAL.
 - NEMA 5-20R-IG: HUBBELL IG-5362, OR EQUAL.
 - NEMA 5-20R-IG/SS: HUBBELL IG-5362-OS, OR EQUAL.
 - NEMA 5-20R-GFCI: HUBBELL GF5362-W, OR EQUAL.
 - NEMA 6-20R: HUBBELL 5462-W, OR EQUAL.
 - OTHERS: COMMERCIAL OR INDUSTRIAL GRADE, UL LISTED, FEDERAL SPECIFICATION WC596F.
- WP PLATES: WEATHERPROOF COVERS ARE PERMITTED UNDER NEC ARTICLE 406.8(B)(1).
- EXCAVATIONS: PERFORM ALL NECESSARY EXCAVATING AND BACK-FILLING REQUIRED FOR THE INSTALLATION. ALL EXCAVATIONS BELOW THE BOTTOM OF FOOTINGS SHALL BE BACKFILLED WITH 3000 PSI CONCRETE. WHERE DITCHES ARE CUT FOR OUTSIDE RIMS OF CONDUIT, RACEWAY AND TUBS, THE EARTH IN 12" LAYER, AND LEAVE THE GROUND LEVEL AND EQUAL TO ITS ORIGINAL CONDITION.
- CONDUIT AND FITTINGS: CONDUIT PERMITTED: (A) RIGID GALVANIZED STEEL RIGS, (B) EMT, (C) PVC, AND (D) ENT. TYPES UTILIZED SHALL BE ONLY AS PERMITTED PER CODE. ALL WIRING SHALL BE RIGID CONDUIT. CONDUIT PLACED IN CONCRETE OR RUN UNDERGROUND SHALL BE RIGID GALVANIZED CONDUIT OR PVC. IF PVC IS USED, ALL ELBOWS, SWEEPS AND TUB-UPS SHALL BE RGS. CONDUIT EXPOSED OR RUN IN MASONRY WALLS ABOVE GRADE MAY BE PVC OR EMT WHERE ALLOWED BY LOCAL CODES. IF EMT IS NOT PERMITTED, RIGID GALVANIZED GALVANIZED PIPE CONDUIT AND FITTINGS SHALL BE USED. IF SHIELDED CABLE IS REQUIRED FOR CONTROL CIRCUITRY, IT SHALL BE TAN, GREY OR ANY NEUTRAL COLOR OTHER THAN THAT AS SPECIFIED FOR POWER DISTRIBUTION. NO CONDUIT SMALLER THAN 3/4" SHALL BE INSTALLED EXCEPT FOR TWO-WIRE SWITCH LEGS. ALL CONDUIT BENDS SHALL BE FREE FROM DENTS AND KINKS. ALL CONDUITS SHALL BE ELECTRICALLY CONTINUOUS FROM THE SERVICE EQUIPMENT TO ALL OUTLETS, AND SHALL BE SECURED TO ALL METAL BOXES WITH ONE LOCK NUT OUTSIDE, AND ONE INSIDE THE BOX WITH A REINFORCED BAKELITE BUSHING. IF PVC, OR ENT, IS USED, THEN APPROPRIATE SIZED, ELECTRICALLY CONTINUOUS BOND WIRES SHALL BE RUN FROM THE SERVICE EQUIPMENT TO ALL OUTLETS, AND SHALL BE SECURED TO EACH WIRING DEVICE PER THE NATIONAL ELECTRICAL CODE. WHERE CONNECTIONS ARE TO BE MADE BETWEEN CONDUIT TERMINATIONS AND MOTORS, EQUIPMENT, OR APPARATUS NECESSITATING FLEXIBLE CONNECTIONS, APPROVED FLEXIBLE CONDUIT SHALL BE USED. OUTDOOR CONNECTIONS TO FANS, HVAC UNITS, OR ROTATING EQUIPMENT SHALL BE MADE WITH HELICAL WOUND, LIQUIDTIGHT, FLEXIBLE STEEL CONDUIT. EXPOSED CONDUIT SHALL BE SUITABLY SUPPORTED AT INTERVALS NOT TO EXCEED FIVE (5) FEET. DURING CONSTRUCTION, CONDUIT SHALL BE KEPT FREE OF ALL FOREIGN MATTER BY USE OF CAPPED BUSHINGS ON ALL TURNED UP ENDS. PAPER OR WOOD PLUGS ARE NOT ACCEPTABLE FOR THIS PURPOSE.

OTHER WIRING:

- FURNISH AND INSTALL ALL POWER WIRING AND CONDUIT AS INDICATED ON THE DRAWINGS. DISCONNECT SWITCHES SHALL BE FURNISHED AND INSTALLED FOR EACH UNIT OF HVAC EQUIPMENT, AND FOR OTHER EQUIPMENT WITHOUT A CORD AND PLUG. BEFORE ENERGIZING ANY EQUIPMENT, VERIFY THAT THE CORRECT POWER SUPPLY VOLTAGE, AMPACITY, AND PHASING HAS BEEN PROVIDED AT THE LOAD SIDE OF THE DISCONNECT.
- EMPTY CONDUIT: LEAVE A #12 AWG PULL WIRE IN ALL EMPTY CONDUITS.
- BOXES AND WIREWAYS: ALL JUNCTION BOXES, PULL BOXES, WIREWAYS, ETC. SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.
- EQUIPMENT IDENTIFICATION: PROVIDE NAMEPLATES FOR ALL PANELBOARDS, CONTROLS, AND OTHER ELECTRICAL EQUIPMENT. EQUIPMENT VISIBLE TO THE PUBLIC SHALL BE IDENTIFIED WITH ENGRAVED LAMINATED NAMEPLATES ATTACHED WITH STAINLESS STEEL FASTENERS. ELECTRICAL EQUIPMENT NOT VISIBLE TO THE PUBLIC MAY BE NEATLY IDENTIFIED WITH BLACK PERMANENT MARKERS.

PART III. EXECUTION

- TESTS: MAKE ALL TESTS NECESSARY TO ENSURE THAT THE ENTIRE INSTALLATION IS FREE FROM IMPROPER GROUNDS, AND FROM SHORTED AND/OR OPEN CONDUCTORS. VOLTAGE, CURRENT, AND ROTATION TESTS SHALL BE MADE BEFORE ANY MOTORS ARE PLACED IN OPERATION. ALL LOADS SHALL BE BALANCED ACROSS PHASES. CHECK TO SEE THAT ALL LIGHTS WORK, AND ARE CONTROLLED BY SWITCHES INDICATED ON DRAWINGS, OR CIRCUIT BREAKERS SO INDICATED ON PANEL SCHEDULE.
- GUARANTEE: FURNISH A GUARANTEE IN WRITING TO THE OWNER THAT ALL WORK EXECUTED UNDER THIS SECTION IS FREE FROM DEFECTS OF MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM DATE OF FINAL ACCEPTANCE. IN ADDITION, DURING THE TERM OF THIS GUARANTEE, THE REPAIR AND/OR REPLACEMENT OF ANY DEFECTIVE WORK, AND ALL RESULTING DAMAGES SHALL BE MADE AT NO ADDITIONAL EXPENSE TO THE OWNER.
- TEMPORARY POWER: AT THE PROJECT SITE, PROVIDE A 100 AMP, 120/240 VOLT, SINGLE PHASE, SERVICE WITH POWER OUTLETS ADEQUATE FOR TEMPORARY CONSTRUCTION POWER. TEMPORARY LIGHTING SHALL BE MAINTAINED IN ALL AREAS OF THE BUILDING UNTIL PERMANENT POWER SOURCES HAVE BEEN ENERGIZED. TEMPORARY SERVICE SHALL BE PROVIDED UNDER SECTION 1A OF THESE SPECIFICATIONS.
- CLEAN-UP: LEAVE THE ELECTRICAL PORTION OF THE WORK IN A CLEAN AND FINISHED CONDITION.
- SHOP DRAWINGS: PROVIDE SHOP DRAWINGS FOR THE FOLLOWING ITEMS: PANELBOARDS, LIGHTING FIXTURES.
- AS-BUILT DRAWINGS: MAINTAIN AS-BUILT DRAWINGS, UPDATED DAILY DURING CONSTRUCTION, AND PRESENT THE OWNER WITH ONE SET UPON COMPLETION. PROVIDE THE OWNER'S PERSONNEL WITH ON-SITE INSTRUCTION IN THE OPERATION AND MAINTENANCE OF THE COMPLETED ELECTRICAL SYSTEM.



Express Oil Change & Tire Engineers
Single Building Right Hand Oil Change
Augusta, GA

FINAL

No.	Description	Date

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LEGENDS AND NOTES

Project number	16031
Date	03/29/2017
Drawn by	MAH
Checked by	ATV

E001

Scale 12" = 1'-0"

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