

**ELECTRICAL SPECIFICATIONS**

**GENERAL:**

CONTRACTOR SHALL PROVIDE ALL ITEMS OF MATERIALS AND LABOR TO MAKE A INSTALLATION OF ELECTRICAL WORK AS SHOWN ON DRAWINGS, AND SPECIFIED. POWER TO METER AND DISCONNECT SWITCH - FUTURE DISTRIBUTION BY OTHER.

**ELECTRICAL REQUIREMENTS:**

1. PERFORM WORK IN ACCORDANCE WITH LATEST EDITIONS, REVISIONS, AMENDMENTS, OR SUPPLEMENTS OF APPLICABLE STATUTES, ORDINANCES, CODES OR REGULATIONS OF FEDERAL, STATE, AND LOCAL AUTHORITIES HAVING JURISDICTION IN EFFECT ON THE DATE BIDS ARE RECEIVED.
2. RESOLVE ANY CODE VIOLATION DISCOVERED IN CONTRACT DOCUMENTS WITH THE A/E PRIOR TO AWARD OF THE CONTRACT. AFTER AWARD OF THE CONTRACT, MAKE ANY CORRECTION OR ADDITION NECESSARY FOR COMPLIANCE WITH APPLICABLE CODES AT NO ADDITIONAL COMPENSATION.
3. ARRANGE WITH LOCAL AND STATE AUTHORITIES AND UTILITY COMPANIES FOR PERMITS, FEES, AND SERVICE CONNECTIONS; VERIFY LOCATIONS AND PAY ALL CHARGES INCLUDING INSPECTIONS.
4. AFTER INSTALLATION, TEST CONDUCTORS FOR SHORTS AND GROUNDS BEFORE ENERGIZING.

**PROJECT/SITE CONDITIONS:**

SITE VISITATION: VISIT THE SITE OF THE PROPOSED CONSTRUCTION TO THOROUGHLY BECOME FAMILIAR WITH ALL DETAILS OF THE WORK AND WORKING CONDITIONS; VERIFY ALL DIMENSIONS IN THE FIELD, AND ADVISE A/E OF ANY DISCREPANCY BEFORE PERFORMING ANY WORK.

**SPACE REQUIREMENTS:**

1. IN SELECTION AND LOCATION OF EQUIPMENT OR MATERIALS, CONSIDER SPACE LIMITATIONS IMPOSED BY SIMULTANEOUS WORK OR OTHER EQUIPMENT.
2. PRIOR TO ACTUAL INSTALLATION, MAKE CHANGES IN EQUIPMENT LOCATION TO ALLOW FOR FIELD CONDITIONS, AS DIRECTED BY A/E AND AT NO ADDITIONAL COST.
3. SHOULD ANY OBSTRUCTION BE ENCOUNTERED, WHETHER SHOWN OR NOT, ALTER ROUTING OF NEW WORK, REROUTE EXISTING LINES, REMOVE OBSTRUCTION WHERE POSSIBLE, OR PERFORM WHATEVER WORK IS NECESSARY TO SATISFY THE PURPOSE OF THE NEW WORK AND LEAVE EXISTING SERVICES AND STRUCTURES IN A SATISFACTORY AND SERVICEABLE CONDITION.

**GUARANTEE:**

THE SUB CONTRACTOR SHALL FURNISH A WRITTEN CERTIFICATE GUARANTEEING ALL MATERIALS, EQUIPMENT, AND LABOR FURNISHED BY HIM TO BE FREE OF ALL DEFECTS FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF ELECTRICAL WORK BY THE OWNER. THE SUB CONTRACTOR SHALL FURTHER GUARANTEE THAT IF ANY DEFECTS APPEAR WITHIN THE STIPULATED GUARANTEED PERIOD, SUCH WORK SHALL BE REPLACED WITHOUT COST TO THE OWNER.

**FEEDERS, SWITCHES, AND METERING EQUIPMENT:**

MAKE ARRANGEMENTS WITH OWNER AND UTILITY COMPANY NECESSARY TO BRING IN FEEDERS FOR ELECTRICAL SERVICE AS SHOWN ON DRAWINGS AND PAY ALL CHARGES INVOLVED. FURNISH AND INSTALL FEEDER WIRE, CONDUIT, TRENCH, BACKFILL, AND REPAIRS TO OWNER'S DISTRIBUTION PANEL. PROVIDE METER AS SHOWN ON DRAWINGS AND IN COMPLIANCE WITH UTILITY COMPANY REQUIREMENTS.

**PANEL BOARD CONSTRUCTION:**

PANEL BOARDS SHALL CONSIST OF A CAN, FRONT, INTERIOR, AND CIRCUIT PROTECTIVE DEVICES AND SHALL BE MANUFACTURED IN ACCORDANCE WITH UNDERWRITERS LABORATORIES. THE GAUGE OF METAL USED AND THE GUTTER SPACE SHALL BE IN ACCORDANCE WITH APPLICABLE UL STANDARDS. EACH PANEL SHALL HAVE A DOOR MOUNTED ON SEMI-CONCEALED HINGES WITH A CYLINDER LOCK; ALL PANELS SHALL BE KEYPED ALIKE. EACH PANEL SHALL HAVE AN INDEX CARD HOLDER PROPERLY FILLED-IN AS TO CIRCUIT. ALL PANELS SHALL BE FINISHED WITH BAKED-ON GRAY ENAMEL OVER A RUST INHIBITOR COAT. PANEL BOARDS SHALL BE AS MANUFACTURED BY GE, SIEMENS, SQUARE "D", OR CUTLER-HAMMER.

**WIRING:**

1. ALL CONDUCTORS SHALL BE MADE OF SOFT-DRAWN ANNEALED COPPER WITH CONDUCTIVITY NOT LESS THAN THAT OF 90% PURE COPPER. ALL WIRE SIZE #10 AWG AND SMALLER SHALL BE SOLID CONDUCTOR TYPE. ALL WIRE SIZE #8 AWG AND LARGER SHALL BE STRANDED CONDUCTOR TYPE.
2. ALL CONDUCTORS SHALL HAVE TYPE "THHN" OR TYPE "THHW" INSULATION.
3. USE THE FOLLOWING COLOR CODES FOR 120/240V SYSTEMS:
 

PHASE A	BLACK
PHASE C	RED
NEUTRAL	WHITE
GROUND	GREEN
4. INSTALL CONDUCTORS IN CLEAN, DRY CONDUITS. USE UL APPROVED PULLING LUBRICANT WHERE REQUIRED.
5. USE #12 AS MINIMUM CONDUCTOR SIZE FOR POWER SYSTEMS.
6. MAKE CONNECTIONS, SPLICES, AND TAPS ONLY IN APPROVED BOXES AND FITTINGS. FOR SMALL BRANCH CIRCUIT CONDUCTORS, FIRST TWIST CONDUCTORS TOGETHER, THEN INSTALL A "SCOTCHLOK" OR EQUAL SPRING CONNECTOR OF PROPER SIZE. FOR LARGE CONDUCTORS, USE SPLIT BOLT OR HYDRAULICALLY COMPRESSED CONNECTIONS, THEN APPLY ENOUGH LAYERS OF VINYL ELECTRICAL TAPE TO EQUAL THE INSULATION VALUE OF THE CONDUCTOR INSULATION.
7. WHERE FACTORY COLOR CODED CONDUCTORS ARE NOT AVAILABLE, INSTALL BANDS OF COLORED VINYL PLASTIC TAPE AT EACH END OF EACH CONDUCTOR.

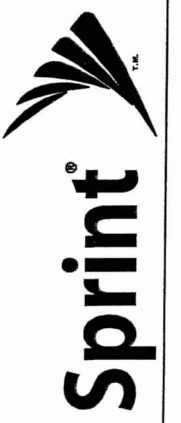
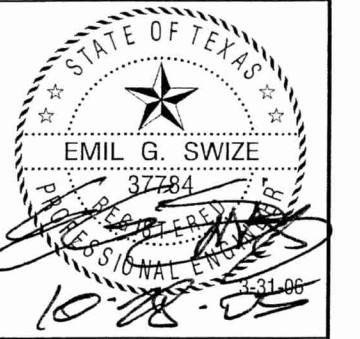
**CONDUIT:**

1. PROVIDE A COMPLETE ASSEMBLY OF CONDUIT OR TUBING WITH FITTINGS, INCLUDING BUT NOT NECESSARILY LIMITED TO, CONNECTORS, NIPPLES, COUPLINGS, LOCKNUTS, BUSHINGS, EXPANSION FITTINGS, AND OTHER COMPONENTS AND ACCESSORIES AS NEEDED.
2. FITTINGS SHALL BE DESIGNED AND APPROVED FOR THE SPECIFIC USE INTENDED. PROVIDE INSULATED THROATS OR BUSHINGS FOR ALL CONDUITS. GROUNDING BUSHINGS SHALL ALSO HAVE INSULATED THROATS.
3. MINIMUM CONDUIT SIZE IN ALL CASES SHALL BE 1/2" UNLESS STATED TO BE LARGER ELSEWHERE IN THE SPECIFICATIONS OR ON THE DRAWINGS.
4. RIGID STEEL CONDUIT SHALL BE HEAVY WALL STEEL TUBE WITH METALLIC CORROSION-RESISTANT COATING ON INTERIOR AND EXTERIOR, HOT-DIPPED GALVANIZED, FREE FROM DEFECTS, MANUFACTURED IN ACCORDANCE WITH ANSI STANDARDS, AND UL LISTED. USE THREADED COUPLINGS. USE RIGID GALVANIZED STEEL CONDUIT IN ABOVE GROUND LOCATIONS AND AS NOTED ON PLANS.

5. EMT SHALL BE WELDED STEEL TUBING FORMED OF LOW CARBON STEEL. TUBING SHALL BE ELECTRO-GALVANIZED EXTERIOR WITH THE INSIDE COATED WITH A THICK BAKED-THROUGH ELASTIC LOW FRICTION COATING OF ENAMEL. TUBING SHALL BE UL APPROVED. USE COMPRESSION-TYPE COUPLINGS; CRIMP OR SET SCREW CONNECTORS SHALL NOT BE ACCEPTED.
6. PVC CONDUIT AND FITTINGS SHALL BE IN ACCORDANCE WITH UL 651, AND SHALL BE USED FOR ALL UNDERGROUND APPLICATIONS. CONDUIT USED FOR FIBER OPTIC APPLICATIONS SHALL HAVE INNER DUCTS. USE PVC CONDUIT FOR ALL UNDERGROUND LOCATIONS.
7. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE UL LISTED. FITTINGS FOR LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE THE INSULATED TYPE. USE LIQUID TIGHT FLEXIBLE CONDUIT FOR ALL CONNECTIONS TO VIBRATING OR MOVABLE EQUIPMENT.
8. CONDUIT EXPOSED SHALL BE INSTALLED PARALLEL TO STRUCTURE LINES IN A NEAT AND WORKMANLIKE MANNER. LOCATION OF EXPOSED CONDUIT INSTALLATIONS SHALL BE SUBJECT TO THE LEASE HOLDERS APPROVAL. RACEWAY SYSTEMS SHALL BE INSTALLED HARMONIOUSLY WITH EACH OTHER.
9. AS A MINIMUM, CONDUIT SIZES SHALL BE IN ACCORDANCE WITH NEC CONDUIT FILL REQUIREMENTS, REGARDLESS OF SIZE SCHEDULED OR INDICATED. IF LARGER SIZE IS SCHEDULED OR INDICATED, THE LARGER SIZE SHALL BE USED.
10. INSTALLATION:
  - a. ANCHOR CONDUIT WITH HANGER, CONDUIT STRAPS, OR OTHER DEVICES SPECIFICALLY DESIGNED FOR THE PURPOSE. WIRE TIES ARE NOT PERMITTED. USE TRAPEZE HANGERS FOR MULTIPLE PARALLEL CONDUIT RUNS.
  - b. ALL CONCRETE INSERTS SHALL BE GALVANIZED. ALL STEEL BOLTS, NUTS, WASHERS, AND SCREWS SHALL BE GALVANIZED OR CADMIUM PLATED. INDIVIDUAL HANGERS, TRAPEZE HANGERS, AND RODS SHALL BE PRIME COATED.
  - c. INSTALL HORIZONTAL RUNS OF CONDUIT TO PROVIDE A NATURAL DRAIN TO PREVENT MOISTURE COLLECTING IN POCKETS OR TRAPS.
  - d. CAP CONDUIT ENDS UNTIL CONDUIT IS INSTALLED TO PREVENT FOREIGN OBJECTS FROM ENTERING CONDUIT.
  - e. INSTALL EXPANSION FITTINGS IN RIGID METAL CONDUIT AT ALL BUILDING EXPANSION JOINTS.
  - f. FITTINGS AND CONDUITS SHALL BE APPROVED FOR GROUNDING PURPOSES OR SHALL BE JUMPERED WITH A COPPER GROUNDING CONDUCTOR OF APPROPRIATE AMPACITY. LEAVE TERMINATION'S OF SUCH JUMPERS EXPOSED.
  - g. INSTALL 200 LB. NYLON PULL CORD IN ALL ROUGH-IN RACEWAYS, INCLUDING INNER DUCTS FOR FIBER OPTICS.
  - h. INSTALL OFFSETS, PULL BOXES, AND ELBOWS AS REQUIRED TO ACCOMPLISH A HARMONIOUS ROUTING OF THE SYSTEMS.



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SHEET TITLE  
**SPECIFICATIONS**

SHEET HISTORY  
DATE: 10/28/05

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- 2.
- 3.
- 4.

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SA055068

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JOB NO.: 05001"AI"

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