DIVISION 13 - ELECTRIC (SUBJECT TO DIVISION 1)

13.A. GENERAL

1. All products supplied shall conform to the requirements of the appropriate National Electric Code, amendments, and UL or equivalent. All work performed shall be to the local code.

2. When 100 ampere service is required by the Bid Document, it shall be the responsibility of the electrical contractor to split the load into not less than eight circuits for a two-story, single-family dwelling, and twelve circuits for a three-story, single-family dwelling.

3. In multi-family dwellings, the requirements for splitting the load shall be not less than four circuits per dwelling unit. Each dwelling unit shall have a breaker box accessible to each tenant.

4. All replacement duplex receptacles installed shall be of a grounded type. Where a grounding means does not exist in the receptacle enclosure, a GFI shall be used.

5. Kitchen outlets shall be placed on grounded individual circuits with GFI within 6 feet of edge of sink.

6. Basements shall have one duplex outlet per 200 square feet or fraction thereof. If unfinished, the outlets shall be GFI.

7. The electrical contractor shall be responsible for all permits and inspections required for his work.

8. All bathrooms shall have GFI outlets installed.

13.B. EXISTING EQUIPMENT

Existing electrical equipment throughout the building which is not required and becomes superfluous shall be disconnected and removed.

Existing materials found to be in good condition and complying with the appropriate City Electrical Code may be left in service.

13.C. MATERIALS

1. Wiring

   a. Service and Feeders - shall be in a metal raceway.

   b. Branch Circuits - shall be installed as per City Code and N.E.C.

2. Minimum wire size shall be No. 14 A.W.G. for branch circuits.

3. Minimum wire size shall be No. 12 A.W.G. for small appliance circuits.

4. Junction boxes and outlet boxes shall be Underwriter labeled, and shall be installed according to N.E.C. requirements.

5. Duplex receptacles, switches, and all electrical appurtenances shall be U.L. or equivalent lab approved, and installed according to N.E.C. and City Code requirements.

6. Panel boxes shall be U.L. or equivalent listed, and installed according to local code.

7. The contractor shall provide all lighting fixtures, complete with lamps, glassware, mounting hardware, frames, trim, stems, ballasts, and sockets, to provide a complete operating fixture as called for under work description, and shall be listed by U.L. or equivalent.

13.D. INSTALLATION

1. **ENTRY SERVICE** - Remove existing entry service and install new entry service according to utility company's requirements. Service supplied shall be 100 amp 120/240 volt, single phase, 3 wire grounded system.

   a. When total square footage, including basement, is 2,500 square feet or more, it shall be a 200 amp service.

2. **PANEL BOARD** - Disconnect and remove existing service panel boards and replace with new 100 amp, 16 circuit breaker panel with main breaker and ground. Existing circuits are to be disconnected and rewired in such manner that owner will not be left without any power. New panel board shall be mounted on a new 24" x 24" x 5/8" painted plywood board mounted securely to basement wall. Height of panel board shall be so set that height of operating handle does not exceed six (6) feet from the floor. Breakers shall be plug-in type with single pole breakers being of full module size. Two pole breakers shall not be installed in a single module. Multiple breakers shall be common trip type and shall have a single operating handle. All work to be in accordance with N.E.C. and local code requirements.

3. **WIRING** - All conductors are to be of copper and shall be U.L. or equivalent listed. In no case will aluminum conductors be acceptable in any part of the work. Wire color coding shall be in accordance with N.E.C. and shall be uniform throughout the building. Wiring shall be run concealed in all rooms of first and second floors, and/or living, bedroom, bathroom and kitchen areas. All wiring shall be installed in accordance with N.E.C. and code requirements.

4. **OUTLET BOXES AND JUNCTION BOXES** - Where called for and required by N.E.C. and local code requirements, shall be U.L. listed or equivalent.

5. **SWITCHES** - Shall be medium grade U.L. or equivalent listed. Where more than one switch occurs at a given point, the switches shall be installed under a common gang plate.

   Switches shall be located as follows:

   1. Single pole switches located at the entry to each area and 48' above finished floor.

   2. Three (3) way switches located at the top and bottom of stairs and 48' above finished floor.

6. **CONVENIENCE OUTLETS** - Duplex receptacles shall be rated 15 amps - 120 volts except for kitchen, dining and laundry areas which shall be rated at 20 amps. Each duplex receptacle shall be of the grounding type. Each receptacle shall have contacts enclosed in a high heat resistant, non-flammable molded case with provisions for back or side wiring. All receptacles to be U.L. or equivalent listed.

   If no ceiling light fixture exists, at least one split duplex receptacle shall be installed in the living room and bedrooms, with the top receptacle controlled from a wall switch located at the room entrance.

A ground fault interrupted receptacle shall be installed in bathroom, garage, exterior receptacles, kitchens, unfinished basements, and wherever required by applicable codes. All ground fault receptacles shall be circuited separately.

Exterior outlets shall have an exterior weather-proof face plate.

Outlet boxes in walls shall be located 18" above the finished floor line, and 48" above floor line at countertops.

A suitable cover plate shall be provided, either brass or plastic, for each receptacle.

7. **SEPARATE CIRCUITS** - shall be furnished and installed for the following equipment. (Select those required.)

   a. Exhaust fan in kitchen and/or bathroom where required.
   b. Domestic electric hot water heater.
   c. Furnace system (as required).
   d. Electric range.
   e. Electric dryer.
   f. Electric dishwasher.
   g. Air conditioner.
   h. Microwave.

   All circuits to be installed according to N.E.C. and local code requirements.

8. **GROUNDING** - of all junction boxes, equipment panel boxes and the neutral conductors shall be grounded in accordance with N.E.C., utility company and local code requirements.

9. **LIGHT FIXTURES** - The contractor shall provide all lighting fixtures complete with lamps, glassware, mounting hardware, frames and trim, stems, ballasts, sockets, etc., to provide a complete operating fixture at each location, as called for in the Work write-up. A lighting fixture allowance of $25.00 per fixture shall be incorporated into the electrical bid. Fixtures shall be approved by the property owner prior to installation. If the property owner desires a fixture costing over the allocated amount, he shall bear the excess cost.

   NOTE: Bathroom lighting fixture may be omitted if furnished integrally with the medicine cabinet and cabinet light is so located so as to provide uniform lighting to the entire bathroom.

   A. Globe - Furnish and install all labor and materials necessary to install new globe on existing light fixture base. Electrician to ensure fixture is wired correctly, and is in good physical condition.

   B. Fan/Light - Furnish and install all labor and materials necessary to install new three-speed/reversible fan with light. Light to be switched at room entrance and be UL-approved. Owner to pick out manufacturer/style.

   C. All exterior light fixtures shall be weather-proof.

10. **DOORBELL SYSTEM** - in single-family, two family and more occupancies furnish and install a complete and operable doorbell system. The doorbell system shall consist of push button, chime or bell, 120/240 volt transformer and bell 24 volt wire. System shall be installed complete with wiring concealed and in accordance with manufacturer's directions. System shall be Nutone or approved equal.

11. **SMOKE DETECTORS** - A UL approved direct wired battery backup smoke detector shall be installed on each level of the house and be interconnected. One shall be located in the basement area, and one in the hallway of each upper level of the house. Where practical, a direct wired smoke detector shall be installed in each bedroom. If not practical, a UL approved battery smoke detector shall be installed in each bedroom. Smoke detectors shall be located in each room according to the directions supplied with the unit. The homeowner shall be supplied with the directions of each unit, and shall be instructed in the proper care and maintenance of each unit, including battery replacement.

12. **GARAGE LINE** - To be installed complete with garage porcelain socket lights, two (2), three (3) garage outlets GFI protected (one each wall), and three-way switches (at house and garage).

13. **CUTTING, FITTING & PATCHING** - of all walls, ceilings, partitions and paneling for the passage of electrical work, including the removal of all debris caused thereby shall be performed by the contractor performing the electrical work, and shall be coordinated with all other work prior to installation of new ceilings and finishes. All patching repair of walls and ceiling shall be done by the General Contractor.

14. **REMOVE OLD EXPOSED WIRING** - and all old and unsafe receptacles, switches and fixtures throughout the residence and replace with new where replacement will meet N.E.C. and local code requirements.

15. **REPAIRS OR REMOVAL** - Where repairs and/or removal are required to the existing electrical system, repairs and/or removal are to be made to conform to N.E.C. and local code requirements.

16. **VENT FANS** - Where vent fans are required because of lack of natural ventilation, they shall be installed in accordance with the National Electric Code (NEC), and provide a minimum of two air exchanges per hour. The exhaust from this fan shall not be discharged into an attic or crawlspace, but discharge directly to the exterior through an appropriate roof vent with a back draft damper.

17. **CONDUIT** - Furnish and install conduit, wiring, and hardware necessary to place all exposed wiring in basement inside conduit.