

# ELECTRICAL WORK PROCESSES

## Work Processes Description:

## Approximate Hours:

- A. Preliminary Work** **500**
- Learning the names, uses and safe operation of the equipment used in the trade, such as kind, size and use of cable, wire, boxes, conduits, fittings, switches, receptacles, service switches, cutouts, etc
  - Learning names, uses and safe operation of the various tools used in assembling this material, care of these tools, and other instructions necessary to familiarize the apprentice with the material and tools of the trade
  - Material Handling, storage and management, loading and unloading material and equipment on the job.
  - Conservation and recycling practices
  - Planning and initiating a project
- B. Residential and Commercial Rough Wiring** **2000**
- Laying out the various outlets, switches, receptacles, and other details of the job from blueprints or by direct supervision
  - Laying out the system with material to be used, where they are to be placed and other details as to how they shall be run
  - Cutting wire, conduit and raceway; including threading, reaming, conduit boring and cutting chases under supervision.
  - Assist with establishing temporary power for the project
  - Assist with establishing the grounding system for the project
  - Site Work
  - Installing various kinds of wire, cables and conduits
  - Assisting journey person in preparing to pull wire
  - Installing service equipment and loadcenters
  - Assisting in preparing lists of materials used, including names, number of pieces, or number of feet, etc
  - Loading unused material and cleaning up job area
  - Laying out and installing branch wiring
  - Conduit bending
  - Planning and initiating a project
  - Safety/OSHA compliance
  - Installing and maintaining alternative energy generation systems
  - Installing energy-efficient lighting and equipment control systems
- C. Residential and Commercial Finish Work** **1000**
- Connecting conductors to switches, receptacles or appliances with proper methods of splicing and taping
  - Connecting and setting switches, receptacles, plates, etc
  - Installing proper size and types of circuit breakers and/or fuses for each circuit
  - Installing and connecting various kinds of fixtures
  - Terminating wire in panels
  - Wire molds
  - Safety/OSHA Compliance
  - Installing and maintaining alternative energy generation systems
  - Planning and installing raceway systems
  - Installing energy-efficient lighting and equipment control systems
  - Installing and maintaining emergency power generation equipment
- D. Industrial Lighting and Service Installation** **1800**
- Installing and bending rigid conduit, EMT IMC and PVC coated conduit
  - Understand and safely install explosion proof devices
  - Wiring all types (gas, oil, stoker, etc) of heating equipment
  - Installing wiring and controls for air conditioning
  - Understanding hands on schematic drawings, layout, routing, connection and usage
  - Understanding and applying safe practices for voltages above 600V
  - Installation of switchgear
  - Installation of meter stacks
  - Service feeders
  - Installation of transformers, panelboards etc
  - Installation of UPS Systems
  - Safety/OSHA Compliance
  - Planning and installing raceway systems
  - Install lighting fixtures
  - Installing indoor and outdoor receptacles, lighting circuits and fixtures

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- Installing energy-efficient lighting and equipment control systems
- Installing and maintaining emergency power generation equipment

### **E. Troubleshooting** **1000**

- Repairing all kinds of electrical work
- Checking out system faults and making repairs under supervision of a journey person
- Hot checking devices
- Fixing punchlist items
- Tracing the polarity of conductors.
- Testing the circuit for ground, shorts, locating and correcting job defects
- Testing
- Analyzing motor circuits and troubleshooting.
- Checking and/or replacing defective equipment
- Understanding and applying the NEC Code to all applications of electrical work
- Safety/OSHA Compliance
- Installing and maintaining alternative energy generation systems

### **F. Motor Installation and control** **400**

- Installing over current devices
- Checking for proper installation and rotation
- Installing replacement motors
- Installing generators, UPS and ATS
- Installing push buttons, pilot lights, relays, timing devices and interlocking controls
- Installing and terminating motor control centers
- Safety/OSHA Compliance

### **G. Instrumentation and Industrial Electronic Communications** **1300**

- Repair, calibrate and install instruments
- Handling, pulling, connecting equipment for application of data and communication cabling
- Install, connect and repair pneumatic and electronic systems
- Install voice and data systems
- Run cable, connect, splice and layout TV and antenna systems
- Assist and install programmable logic controllers
- Understand and connect systems which improve usage and efficiency in power management
- Other work as it applies to cleanroom technology and energy management
- Install security, including card readers and cameras
- Fire alarm
- Carbon monoxide systems
- Installing fiber optics
- Install clock and speaker systems
- Install data wiring
- Install mass notification systems
- Install nurse call systems
- Install photocells, motor controls, timeclocks and timers
- Install all other control systems
- Safety/OSHA Compliance
- Planning and installing raceway systems

**TOTAL HOURS** **8000**