



NCCER Module 26101-20





Occupational Overview: The Electrical Industry





Section One

Identifying Sectors and Career Options in the Electrical Industry

Objectives

1. Identify the various sectors and trade options in the electrical industry.
 - a. Describe the typical components in a residential wiring system.
 - b. Describe the typical components in a commercial wiring system.
 - c. Describe the typical components in an industrial wiring system.
 - d. List various career paths and opportunities in the electrical trade.



Performance Task

There are no Performance Tasks associated with this section.



1.0.0 – 1.1.0 Primary Components of Residential Wiring

- The electrical field can be divided into three broad categories: residential, commercial, and industrial.
- Components of a residential electrical system include an electrical supply, **electrical service**, nonmetallic-sheathed cable, nail-on device boxes, panelboards, and fixtures.



(A) PAD-MOUNTED TRANSFORMER



(B) RESIDENTIAL ELECTRICAL SERVICE



(C) NAIL-ON DEVICE BOX



(D) NONMETALLIC-SHEATHED CABLE



(E) INTERIOR PANEL (SUBPANEL)



(F) LUMINAIRE (LIGHTING FIXTURE)

1.2.0 Commercial Wiring Systems

- Electrical installations in commercial structures, such as office buildings and stores, contain many of the same elements as residential installations.



(A) PAD-MOUNTED COMMERCIAL TRANSFORMER



(B) COMMERCIAL ELECTRICAL SERVICE



(C) CONDUIT SYSTEM



(D) FIRE ALARM SYSTEM



(E) OFFICE LIGHTING



(F) OUTDOOR LIGHTING

1.3.0 Industrial Wiring Systems

- Industrial electricians are generally split into two groups: installers and maintenance personnel.
- It is the responsibility of these electricians to install conduit systems, conductors, motors, and equipment.



(A) DISTRIBUTION SWITCHGEAR



(B) RIGID METALLIC CONDUIT (RMC) SYSTEM



(C) MOTOR CONTROL CENTER

1.4.0 – 1.4.1 Career Paths and Opportunities in the Electrical Field

- Skilled electricians are in high demand to install, maintain, and troubleshoot electrical systems and equipment.
- On-the-job learning (OJL) provides an opportunity to earn as you learn.
- Many trainees begin by installing residential wiring.



1.4.2 Commercial Electrician



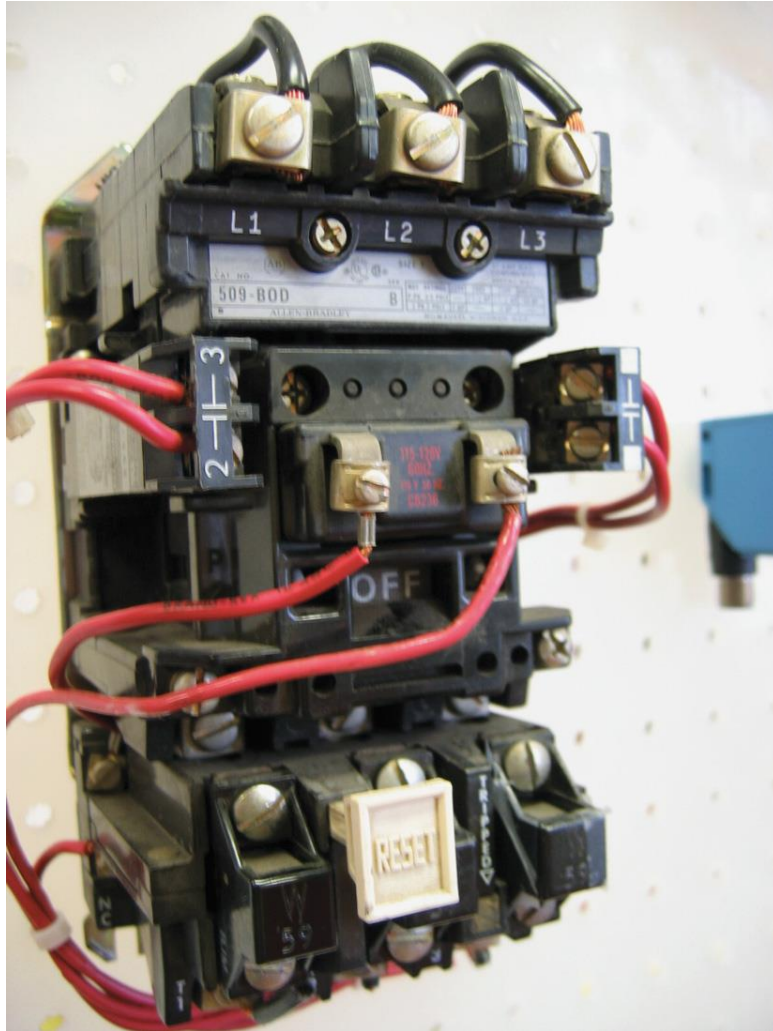
- Commercial electricians install wiring in apartment buildings, stores, offices, service stations, and hospitals.
- Commercial buildings are typically metal-frame construction.

1.4.3 – 1.4.5 Industrial Electrician

- Industrial electricians may require additional training in three-phase power, motors, motor control systems, and instrumentation.
- Industrial electricians may also work in hazardous locations.



1.4.6 – 1.4.8 *Electrical Maintenance Technician*



- Electrical maintenance technicians are typically employed by large facilities to service the electrical and instrumentation systems.
- Electrical maintenance personnel service and repair equipment such as magnetic motor starters.

Wrap Up – Trade Terms (1 of 2)

Electrical service: The electrical components that are used to connect the serving utility to the premises wiring system.

Raceway system: Enclosures that house the conductors in an electrical system (such as fittings, boxes, and conduit).

Rough-in: The beginning stage of wiring that involves the installation of the panelboard, raceway system, wiring, and boxes.



Wrap Up – Trade Terms (2 of 2)

Substation: An enclosed assembly of high-voltage equipment, including switches, circuit breakers, buses, and transformers, that connects the power generation facility to the grid and through which electrical energy is passed in order to change its characteristics, such as stepping voltage up or down, changing control frequency, or other characteristics.

Trim-out: The final stage of wiring that involves the installation and termination of devices and fixtures.



Next...

**Section 2.0.0
Training and Apprenticeship
Process for Electricians**



*Read Sections 2.0.0 through 2.2.3 and
complete the Section Review questions.*