Install and Connect a Branch Circuit in a Panelboard

Program: Electrician Technician

Course: EL140 – Residential Applications

Objectives: Under the supervision of your instructor, you should be able to do the following:

- Select the proper wiring methods for several types of residences
- Explain the purpose of ground fault circuit interrupters and tell where they must be installed
- Explain how wiring devices are selected and installed

Lab Equipment:

- N/A

Required Tools:

- 1 – Screwdriver set
- 1 – Channel Locks pliers
- 1 – Torpedo level
- 1 – Hammer
- 1 – Pair of Diagonal cutters
- 1 – Pair of Wire strippers

Materials:

- 10’ – 14/2 AWG NM cable with ground (Romex®)
- 1 – 1⁄2” NM cable fittings, 2 screw connectors
- 1 – Single gang plastic side nail box
- 1 – Duplex receptacle
- 1 – Duplex receptacle plate cover
- 1 – Single-pole, 15 ampere GFCI circuit breaker (compatible with branch circuit panel)
- 2 – 4 – NM cable staples as required

Safety (PPE):

- Safety glasses
- Hard hat if working in bays

Resources- N/A

Time Required: 120 Minutes

Shop Maintenance:

- All work will cease 20 minutes prior to the end of class.
- All work areas must be cleaned.
- Tools and equipment must be cleaned and returned to the designated areas (cage, tool room, cabinets etc.)
- Any broken or missing tools must be reported immediately.
- Tools and equipment are the student's responsibility

Procedures: *(Eye protection must always be worn)*

This performance project requires you to select and install a surface-mounted NEMA 1 branch circuit panel enclosure and branch circuit conductors supplying a duplex receptacle installed in a surface-mounted handy box. 14/2 AWG NM cable with ground will be used as the branch circuit conductors. The circuit will be protected by a 15-ampere, single-pole GFCI circuit breaker installed in the branch circuit panel.

1. Select and install a branch circuit panel enclosure and handy box on the lab board.
2. Prepare the panel enclosure with a 1/2" NM connector
3. Mount the single gang box
4. Install 14/2 AWG NM cable with ground between the branch circuit panel enclosure and the single gang box, securing the NM cable according to the requirements of ***NEC Article 334***.
5. Cut, strip, and prepare the NM cable conductors at the outlet end to receive a duplex receptacle.
6. Install a duplex receptacle and cover plate at the outlet.
7. Cut, strip, and prepare the NM cable conductors at the panel end for termination.
8. Connect the circuit's equipment grounding conductor to the grounding bus in the panel.
9. Select and install a single-pole, 15-ampere GFCI circuit breaker in the panel enclosure (*Figure 1*). Turn the circuit breaker to the OFF position.
10. Terminate the neutral pigtail from the GFCI circuit breaker on the neutral bus bar in the panel.
11. Terminate the grounded (neutral) circuit conductor on the GFCI circuit breaker.
12. Terminate the ungrounded circuit conductor on the GFCI circuit breaker.
13. Have your instructor check your work.

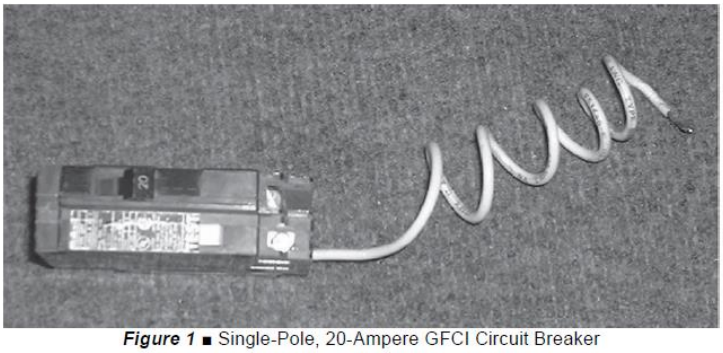

Figure 1 ■ Single-Pole, 20-Ampere GFCI Circuit Breaker