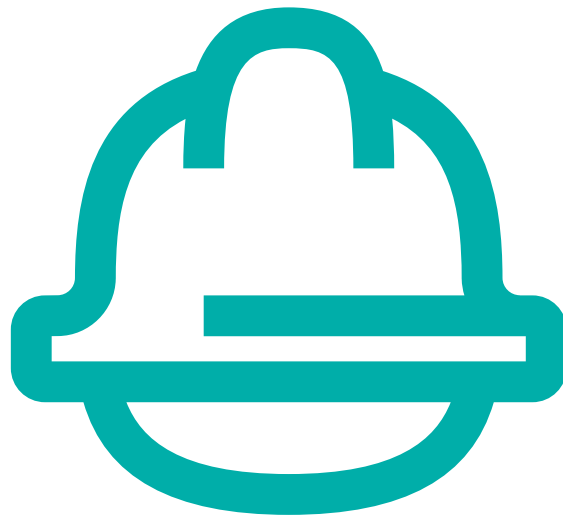




**NOCTI**  
State Customized  
Credential Blueprint



---

# **Electrical Power and Transmission Installers (PA)**

Code: 7747 / Version: 01  
Copyright © 2012. All Rights Reserved.

## General Assessment Information

### Blueprint Contents

General Assessment Information	Sample Written Items
Written Assessment Information	Performance Assessment Information
Specific Competencies Covered in the Test	Sample Performance Job

**Test Type:** The Electrical Power and Transmission Installers assessment was developed based on a Pennsylvania statewide competency task list and contains a multiple-choice and performance component. This assessment is meant to measure technical skills at the occupational level and includes items which gauge factual and theoretical knowledge.

**Revision Team:** The assessment content is based on input from Pennsylvania educators who teach in approved career and technical education programs.



46.0399- Electrical and  
Power Transmission  
Installers, Other



Career Cluster - Architecture &  
Construction

## Written Assessment

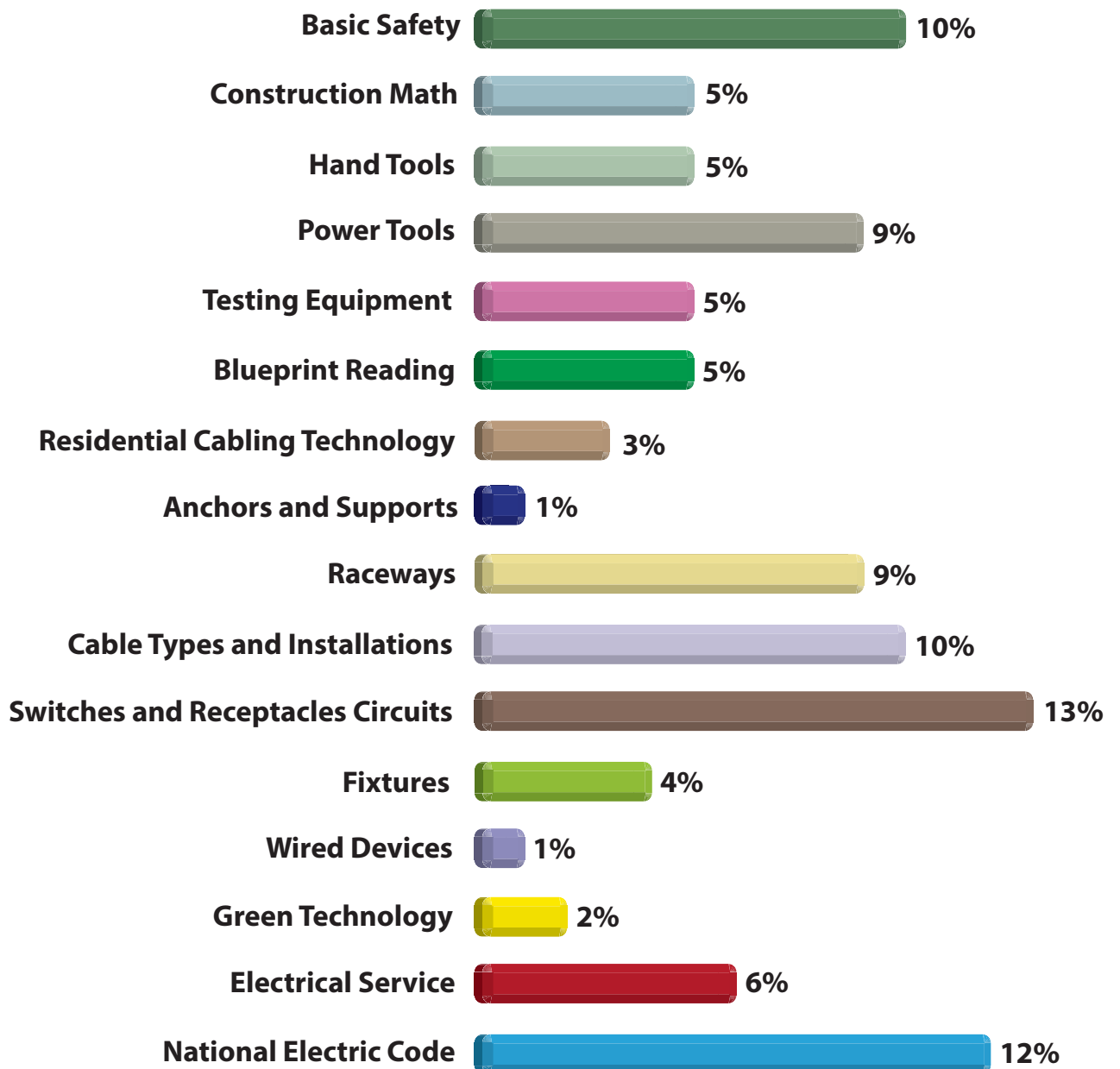
NOCTI written assessments consist of questions to measure an individual’s factual theoretical knowledge.

**Administration Time:** 3 hours

**Number of Questions:** 198

**Number of Sessions:** This assessment may be administered in one, two, or three sessions.

### Areas Covered



## Specific Standards and Competencies Included in this Assessment

### Basic Safety

- Identify career and training opportunities
- Identify causes of job site accidents
- Identify job site hazards
- Working safely with job hazards
- Identify safe methods and equipment of aerial work
- Demonstrate basic fire safety
- Demonstrate basic electrical safety
- Perform Lock-out/Tag-out
- Demonstrate scaffold and ladder safety

### Construction Math

- Problem solving using whole numbers
- Problem solving using fractions
- Problem solving using decimal numbers
- Convert decimals, fractions, and percents
- Problem solving using the metric system
- Calculate basic construction problems using geometry formulas
- Calculate basic construction problems using algebraic formulas

### Hand Tools

- Recognize, identify, and safely use hammers and screwdrivers
- Recognize, identify, and safely use pliers and wire cutters
- Recognize, identify, and safely use saws and chisels
- Identify and safely use hydraulic tool systems

(Continued on the following page)

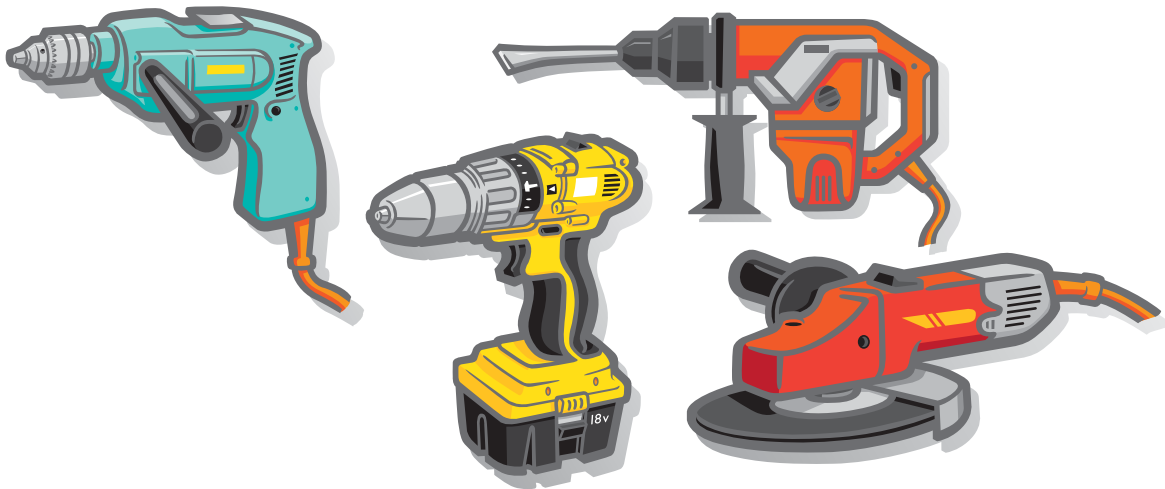
## Specific Standards and Competencies (continued)

### Power Tools

- Recognize, identify, and safely use drills and saws
- Identify and safely use an electric hammer drill
- Identify and safely use a reciprocating saw
- Identify and safely use a portable hand-held band saw
- Identify and safely use a circular saw
- Identify and safely use an electric/cordless drill
- Identify and safely use a portable jig saw

### Testing Equipment

- Identify and safely use a multimeter
- Identify and safely use a continuity tester
- Identify and safely use a plug-in circuit tester
- Identify and safely use a clamp-on ammeter



(Continued on the following page)

## Specific Standards and Competencies (continued)

### Blueprint Reading

- Identify types of blueprint plans
- Identify blueprint symbols
- Interpret blueprint plans
- Plan branch circuits for blueprint development
- Incorporate electrical details to residential blueprint

### Residential Cabling Technology

- Define residential networks
- Identify structured media-systems
- Design and plan layout of low voltage circuits services

### Anchors and Supports

- Identify and install various types of anchors and supports

### Raceways

- Install Electrical Metallic Tubing (EMT)
- Install Poly-Vinyl Chloride conduit (PVC)
- Identify surface metal and non-metal raceways (Wiremold®)
- Identify flexible raceway
- Demonstrate the five bends (90, offset, 3-point saddle, 4-point saddle, kick) used for conduit raceways

(Continued on the following page)

## Specific Standards and Competencies (continued)

### Cable Types and Installations

- Install Non-Metallic (NM) cable for connection to an electrical device
- Install metal-clad cable (MC)
- Install telecommunications (Category 5e, 6, 7 cabling) cable
- Install a telephone circuit
- Install a television circuit
- Install rough wiring in a residence
- Install finish wiring

### Switches and Receptacles Circuits

- Install a duplex receptacle
- Install a single pole switch
- Install a 3-way switch
- Install a 4-way switch
- Install a split-wired duplex receptacle
- Install a Ground Fault Circuit Interrupter (GFCI) receptacle
- Install an Arc Fault Circuit Interrupter (AFCI)
- Install a timer circuit
- Install various special switches and receptacles

### Fixtures

- Install surface-mounted lighting fixtures
- Install recessed lighting fixtures

(Continued on the following page)

## Specific Standards and Competencies (continued)

### Wired Devices

- Install a hard-wired smoke detector

### Green Technology

- Identify renewable energy resources
- Identify and safely use energy saving devices

### Electrical Service

- Install a 100-amp overhead service
- Identify a 100-amp underground service

### National Electrical Code

- Identify NEC publisher
- Identify code cycle
- Identify purpose of NEC
- Identify layout of NEC





## Sample Questions

**OSHA is a federal agency governing**

- A. occupational safety
- B. housing for the poor
- C. minimum wages
- D. zoning laws

**When using power tools, proper ground fault protection prevents**

- A. excessive noise
- B. electrical shock
- C. losing grip
- D. cutting into electrical wires

**What symbol is normally used for duplex receptacles?**

- A. circle with two parallel lines drawn through it
- B. circle with one line drawn through it
- C. square box with an X drawn inside
- D. square box with the letter R next to it

**The standard length for sections of electrical tubing or conduit is**

- A. 6 feet
- B. 8 feet
- C. 10 feet
- D. 12 feet

**The "S" symbol is represents what type of switch?**

- A. single pole
- B. four-way
- C. three-way
- D. dimmer

(Continued on the following page)

Sample Questions (continued)

**If the lighting requirement is 3 volt-amperes per square foot and a room is 20 feet by 30 feet, the required volt-ampere for lighting is**

- A. 600 volt-amperes
- B. 1000 volt-amperes
- C. 1800 volt-amperes
- D. 3600 volt-amperes

**Of the following hammers, which one is the most commonly used?**

- A. dowel
- B. bell
- C. claw
- D. wedge

**Check \_\_\_\_\_ with an ohmmeter.**

- A. voltage
- B. current
- C. resistance
- D. power factor

**What type of cable transmits data using light pulses?**

- A. Ethernet
- B. multi-conductor
- C. fiber optic
- D. coaxial

**Support flexible metal conduit every**

- A. 4-1/2 feet
- B. 9 feet
- C. 10-1/2 feet
- D. 15 feet

## Performance Assessment

NOCTI performance assessments allow individuals to demonstrate their acquired skills by completing actual jobs using the tools, materials, machines, and equipment related to the technical area.

**Administration Time:** 3 hours

**Number of Jobs:** 2

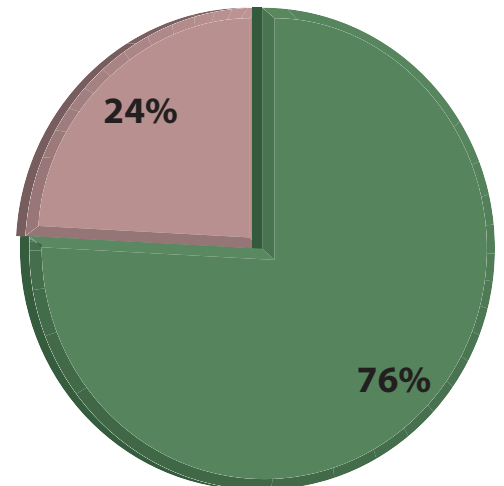
### Areas Covered:

#### **76% Switch Controls, Conduit Bending, and GFCI Receptacles**

Participants will draw a product wiring diagram, select appropriate material, install boxes, use correct wiring methods, install device which functions properly, complete conduit offset measurement, use proper bending and cutting techniques, install conductors, and GFCI, and use proper safety and workmanship.

#### **24% Doorbell Circuit**

Participants will identify, select, and install components for a functioning doorbell.



(Continued on the following page)

## Sample Job

### Doorbell Circuit

**Maximum Time:** 40 minutes

**Participant Activity:** Participant will select the necessary tools, equipment, instruments, and materials; follow the Job 2 overview provided; complete all installations in accordance with the NEC; installations should be consistent with electrical codes.

