



**Pembroke/ Hopkins Park Community Outreach Program**

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**Competencies / Objectives**

**Level One**

**MODULE 28101-04 - INTRODUCTION TO MASONRY (20 Hours)**

1. Discuss the history of masonry.
2. Describe modern masonry materials and methods.
3. Explain career ladders and advancement possibilities in masonry work.
4. Describe the skills, attitudes, and abilities needed to work as a mason.
5. State the safety precautions that must be practiced at a work site, including the following:
  - Safety practices
  - Fall-protection procedures
  - Forklift-safety operations
6. Perform the following basic bricklaying procedures:
  - Mixing of mortar
  - Laying a mortar bed
  - Laying bricks
7. Put on eye protection, respiratory protection, and a safety harness.
8. Use the correct procedures for fueling and starting a gasoline-powered tool.

**MODULE 28102-04 - MASONRY TOOLS AND EQUIPMENT (12.5 Hours)**

1. Identify and name the tools used in performing masonry work.
2. Identify and name the equipment used in performing masonry work.
3. Describe how each tool is used.
4. Describe how the equipment is used.
5. Associate trade terms with the appropriate tools and equipment.
6. Demonstrate the correct procedures for assembling and disassembling scaffolding according to federal safety regulations, under the supervision of a competent person.

**MODULE 28103-04 - MEASUREMENTS, DRAWINGS, AND SPECIFICATIONS (10 Hours)**

1. Work with denominate numbers.
2. Read a mason's measure.



3. Convert measurements in the U.S. Customary (English) system into their metric equivalents.
4. Recognize, identify, and calculate areas, circumferences, and volumes of basic geometric shapes.
5. Identify the basic parts of a set of drawings.
6. Discuss the different types of specifications used in the building industry and the sections that pertain to masonry.

#### **MODULE 28104-04 – MORTAR (10 Hours)**

1. Name and describe the primary ingredients in mortar and their properties.
2. Identify the various types of mortar used in masonry work.
3. Describe the common admixtures and their uses.
4. Identify the common problems found in mortar application and their solutions.
5. Properly set up the mortar mixing area.
6. Properly mix mortar by hand.
7. Properly mix mortar with a mechanical mixer.

#### **MODULE 28105-04 - MASONRY UNITS AND INSTALLATION TECHNIQUES (60 Hours)**

1. Describe the most common types of masonry units.
2. Describe and demonstrate how to set up a wall.
3. Lay a dry bond.
4. Spread and furrow a bed joint, and butter masonry units.
5. Describe the different types of masonry bonds.
6. Cut brick and block accurately.
7. Lay masonry units in a true course.

#### **Level Two**

#### **MODULE 28201-05 – RESIDENTIAL PLANS AND DRAWING INTERPRETATION (12.5 Hours)**

1. Explain the organization of residential plans and drawings.
2. Interpret dimensions and scales on drawings.
3. Interpret information on residential plans.
4. Estimate material quantities from plans and drawings.

#### **MODULE 28202-05 – RESIDENTIAL MASONRY (25 Hours)**

1. Explain the requirements for construction of various types of residential foundations.



2. Identify and explain the characteristics, uses, and installation techniques for brick pavers.
3. Lay out and build steps, patios, and decks made from masonry units.
4. Lay out and build chimneys and fireplaces.

#### **MODULE 28203-05 – GROUT AND OTHER REINFORCEMENT (15 Hours)**

1. Name and describe the primary ingredients in grout and their properties.
2. Identify the different types of grout used in masonry work.
3. Describe the common admixtures and their uses.
4. Describe the use of steel bar reinforcement in masonry construction.
5. Apply grout in low and high lifts using the proper techniques.
6. Place grout in a hollow block wall and rod it into place.

#### **MODULE 28204-05 – METAL WORK IN MASONRY (15 Hours)**

1. Describe the uses and installation of vertical reinforcement.
2. Describe the uses and installation of different types of horizontal joint reinforcements and ties.
3. Describe the uses and installation of different anchors, fasteners, and embedded items.
4. Install hollow metal frames.
5. Describe the functions of sills and lintels.
6. Install sills and lintels.
7. Install metal hardware.

#### **MODULE 28205-05 – ADVANCED LAYING TECHNIQUES (50 Hours)**

1. Recognize the structural principles and fundamental uses of basic types of walls.
2. Recognize the requirement for, and function of, control joints and expansion joints.
3. Build various types of walls using proper reinforcement, jointing, and bonding techniques.
4. Lay out specialty structures such as maintenance holes, segmented block walls, and screens.
5. Identify and explain the different types of masonry arches used today.
6. Lay out a semicircular arch and a jack arch.

#### **MODULE 28206-05 – CONSTRUCTION TECHNIQUES AND MOISTURE CONTROL (20 Hours)**

1. Explain and demonstrate techniques for constructing masonry around windows, doors, and other openings.



2. Explain the requirements for wall bracing, and demonstrate the techniques used to construct pilasters and other types of bracing.
3. Identify the various types of insulation used in conjunction with masonry construction, and explain installation techniques.
4. Identify the need for moisture control in various types of masonry construction, and demonstrate the techniques used to eliminate moisture problems.
5. Construct corbeling in a double-wythe wall.
6. Join intersecting walls.
7. Install flashing.

### **MODULE 28207-05 – CONSTRUCTION INSPECTION AND QUALITY CONTROL (15 Hours)**

1. Describe industry standards for quality control.
2. Describe how to build masonry sample panels and prisms.
3. Perform a slump test.
4. Describe and perform field inspections.

### **Level Three**

### **MODULE 28301-05 – MASONRY IN HIGH-RISE CONSTRUCTION (17.5 Hours)**

1. Recognize and explain the use of high-rise construction equipment.
2. Identify construction sequence in high-rise construction.
3. State the safety procedures in high-rise construction.
4. Safely work with materials handling equipment in high-rise construction.
5. Properly put on a safety harness, lanyard, and lifeline.
6. Demonstrate hand signals used for lifting materials.

### **MODULE 28302-05 – SPECIALIZED MATERIALS AND TECHNIQUES (60 Hours)**

1. Explain the various techniques used to provide adequate protection during hot- and cold-weather masonry construction.
2. Describe all-weather construction techniques.
3. Describe techniques for surface-bonding mortar.
4. Demonstrate techniques for construction of stone walls and other stone building surfaces.
5. Demonstrate basic knowledge of various building materials such as glass block and refractory brick.

### **MODULE 28303-05 – REPAIR AND RESTORATION (15 Hours)**

1. Recognize signs of deterioration in masonry structures.



2. Describe the causes of efflorescence, cracking, and faulty mortar joints.
3. Describe the procedures for preventing and correcting efflorescence, cracking, and faulty mortar joints.
4. Describe the procedures for preventing and correcting water damage in basements.
5. Describe the procedures for rebuilding fireplaces.
6. Replace a damaged brick in a wall.
7. Repair mortar joints.

#### **MODULE 28304-05 – COMMERCIAL DRAWINGS (12.5 Hours)**

1. Recognize the difference between commercial and residential construction drawings.
2. Identify the basic keys, abbreviations, and other references contained in a set of commercial drawings.
3. Accurately read a set of commercial drawings.
4. Explain basic construction details and concepts employed in commercial construction.

#### **MODULE 28305-05 – ESTIMATING (25 Hours)**

1. Explain and apply basic materials estimating procedures for concrete block and brick construction.
2. Explain and apply basic estimating procedures for reinforcements, ties, and other materials.
3. Explain and apply procedures for estimating quantities of mortar and mortar materials.

#### **MODULE 28306-05 – SITE LAYOUT—DISTANCE MEASUREMENT AND LEVELING (22.5 Elective Hours)**

1. Describe the major responsibilities of the mason relative to site layout.
2. Convert measurements stated in feet and inches to equivalent measurements stated in decimal feet, and vice versa.
3. Use and properly maintain tools and equipment associated with taping.
4. Use taping and/or chaining equipment and procedures to make distance measurements and perform site layout tasks.
5. Determine approximate distances by pacing.
6. Recognize, use, and properly care for tools and equipment associated with differential leveling.
7. Use a builder's level or transit and differential leveling procedures to determine site and building elevations.
8. Record site layout data and information in field notes using accepted practices.
9. Check and/or establish 90-degree angles using the 3–4–5 rule.



**MODULE 28307-05 – INTRODUCTORY SKILLS FOR THE CREW LEADER (16 Hours)**

1. Discuss current issues and organizational structure in the construction industry today.
2. Understand and incorporate leadership skills into work habits, including communication, motivation, team building, problem solving, and decision-making skills.
3. Demonstrate an awareness of safety issues, including the cost of accidents and safety regulations.
4. Identify a supervisor's typical safety responsibilities.
5. Show a basic understanding of the planning process, scheduling, and cost and resource control.