



## ***CUSTOMIZED TEACHER ASSESSMENT BLUEPRINT***

### **BUILDING/PROPERTY MAINTENANCE**

**Test Code: 5923**

**Version: 01**

#### ***Specific competencies and skills tested in this assessment:***

##### **Safety and Knowledge of Building and Property Maintenance**

Wear appropriate personal protective clothing

Wear eye protection, hearing protection, and respiratory protection each time it is required in the lab

Demonstrate knowledge of the Occupational Safety and Health Act (OSHA) and state its purposes

Demonstrate how to lift and carry heavy objects safely

Demonstrate knowledge of Material Safety Data Sheets (MSDS) and where to find them in the  
Building and Property Maintenance (BPM) lab

Demonstrate knowledge of building and property maintenance lab rules for behavior

Follow safety rules for tools, machines, and processes

Identify BPM lab tools and equipment

Demonstrate problem-solving skills in completing shop projects

Accurately demonstrate the ability to use measuring devices

Demonstrate how to estimate quantities of materials needed for a job

##### **Portable and Stationary Power Tools**

State and follow all safety rules and precautions for using portable power tools

Operate portable electric and battery operated drills

Operate a portable jigsaw and reciprocating saw

Operate a router

Operate disc grinders

State and follow all safety rules and precautions for using a table saw

State and follow all safety rules and precautions for using a drill press

State and follow all safety rules and precautions for using a compound miter saw

Cut stock to length on a miter saw

Cut angles on a miter saw

State and follow all safety rules and precautions for using a bench grinder

Sharpen cutting tools on a bench grinder

State and follow all safety rules and precautions for using a portable circular saw

Rip stock with a portable circular saw

Cut wood stock across its grain using a portable circular saw

Cut miters with a portable circular saw

## ***Building/Property Maintenance (continued)***

### **Basic Carpentry**

- Identify common building materials
- Read and interpret building plans
- Lay out stock
- Lay out angles
- Use a sliding T-bevel to transfer an angle
- Transfer a cut line using a marking gauge
- Test a level for accuracy in the vertical and horizontal positions
- Test a horizontal surface using a level
- Test a vertical surface using a level
- Snap a chalk line
- Bore a hole with an auger bit
- Bore holes with a portable electric drill
- Identify and select various nails for a specific job
- Drive and remove nails using a claw hammer
- Set finish nails with a nail set
- Assemble miter joints by nailing
- Select and drive screw-type fasteners by hand
- Identify bolts, nuts, and washers for a specific repair job
- Identify anchors for masonry repair jobs
- Identify screws for specific repair jobs
- Drive/remove screws with a portable electric drill
- Cut a gain for butt hinges and install butt hinges

### **Regular Tool and Machine Maintenance**

- Identify broken tools and replace or repair immediately
- Examine power tool and extension cords for damage; replace or repair
- Lubricate moving parts of power tools as recommended by the manufacturer
- Replace saw blades and other cutting tool accessories when they become dull
- Sharpen hand tools, chisels, and drilling or boring bits when they become dull
- Practice safety while working on/with machines
- Clean mechanical devices
- Make machine adjustments for jobs
- Define and discuss friction and lubrication
- Troubleshoot machine problems

## ***Building/Property Maintenance (continued)***

### **Structural Carpentry**

Identify floor members  
Install joist hangers  
Install or replace bridging between joists  
Repair plywood sub-flooring on joists  
Identify roof members  
Identify roof types  
Remove and replace a damaged shingle  
Demonstrate proper application of sealing compounds and caulking  
Repair stair risers and treads  
Install or repair a stair railing

### **Masonry Skills**

Practice safety while performing masonry work  
Identify common masonry tools  
Identify masonry supplies  
Identify safety hazards to masonry workers  
Mix mortar for block work  
Identify and describe uses of block types  
Check work for straightness  
Strike off a block wall  
Clean mortar from block and brick work  
Mix mortar for brick work  
Identify standard brick bonds  
Identify and describe types of brick and their uses  
Cut brick and block with a brickset  
Build forms for a concrete slab  
Mix concrete to a 1-2-3 proportion  
Cast a concrete slab  
Float concrete  
Finish concrete  
Patch steps and walkways

***Building/Property Maintenance (continued)***

**Interior and Exterior Building Components**

Cut drywall with a utility knife  
Install metal corners prior to finishing drywall  
Tape and smooth drywall  
Cope an inside corner  
Miter an outside corner  
Repair suspended ceiling grids and tiles  
Estimate the quantity of tile needed for a repair  
Discuss tile terminology and applications  
Identify adhesives and mortars  
List, identify, and explain tile tools and equipment  
Install a new exterior lock set  
Hang an interior door  
Cut and install molding  
Trim a door jamb and/or a window unit  
Trim a window, stool, apron, casing, and extension jambs  
Identify, repair, or replace siding components  
Identify, repair, and clean gutter spouting components

## ***Building/Property Maintenance (continued)***

### **Electrical Circuits**

- Identify and use electrical tools
- Identify wire sizes and ampacities
- Identify wire types
- Use connectors/wire nuts to connect or splice wire
- Discuss proper disposal of fluorescent bulbs
- Replace extension cord ends – male/female
- Install a ground fault circuit interrupting outlet
- Install a junction box
- Install adjustable bar hanger
- Install a light fixture
- Install a duplex receptacle
- Install a single pole switch
- Install a split wire duplex receptacle
- Install a 220-volt circuit
- Install a recessed light
- Bore holes for wire run
- Install Romex<sup>®</sup> to boxes
- Staple Romex<sup>®</sup> (non-metallic cable) according to code
- Install a three-way switch
- Install BX cable to boxes
- Install conduit to boxes
- Install rework boxes
- Check and replace a 24-volt transformer
- Install a GFCI circuit breaker
- Demonstrate proper grounding techniques
- Replace a faulty circuit breaker
- Install low-voltage wiring
- Install coaxial cable for television reception
- Install cabling for computer workstations
- Replace or install a ceiling fan

## ***Building/Property Maintenance (continued)***

### **Plumbing Systems**

Demonstrate knowledge of basic code regulations for water supply systems  
Demonstrate knowledge of basic plumbing code regulations for waste systems  
Identify plumbing symbols  
Interpret plumbing drawings  
Identify types of pipes  
Identify plumbing pipe fittings  
Measure and cut steel pipe  
Thread steel pipe  
Install a supply line with steel pipe and fittings  
Sweat solder copper pipe and fitting using propane, MAPP™, or Prestolite gas  
Install and replace copper pipe and fittings  
Solvent weld PVC (polyvinyl chloride) plastic pipe  
Install and repair PVC plastic pipe and fittings  
Repair waste water drains  
Install, replace, and repair commodes  
Install lavatories and sinks  
Hook up water supply lines and waste water lines to a bathtub  
Install or replace a garbage disposal unit  
Clean and/or replace waste water traps and pipes  
Replace and repair a faucet set  
Identify and replace valves

### **Finishing Materials**

Demonstrate methods for protecting furniture, materials, and surrounding surfaces from overspray and paint spatter  
Demonstrate procedures for taping door and window trim to protect them from finishing materials being applied  
Demonstrate how to prepare a surface prior to applying a finish  
Stain wood surfaces with wiping oil stains  
Apply a finish material with a brush and a roller  
Apply a finishing material with a suction-type spray gun  
Apply oil-based paints  
Apply acrylic-based paints  
Apply a spray finish  
Demonstrate proper procedures for cleaning paint brushes and rollers

### **Environmental Control Systems**

Identify the scales on a thermometer  
Describe atmospheric pressure and how it is measured  
Define BTU (British Thermal Unit)  
Describe types of heat transfer  
Identify the components of a gas fuel heating system  
Identify the components of an oil fuel heating system

***Building/Property Maintenance (continued)***

**Written Assessment:**

Administration Time: 3 hours  
Number of Questions: 196

***Areas Covered:***

7%	Safety and Knowledge of Building and Property Maintenance
8%	Portable and Stationary Power Tools
15%	Basic Carpentry
5%	Regular Tool and Machine Maintenance
5%	Structural Carpentry
10%	Masonry Skills
10%	Interior and Exterior Building Components
15%	Electrical Circuits
15%	Plumbing Systems
5%	Finishing Materials
5%	Environmental Control Systems

**Sample Questions:**

Which of the following statements is true when operating a compound miter saw?

- A. Allow motor to reach full speed before cutting.
- B. Start saw with the blade on the stock.
- C. Remove scrap while blade is moving.
- D. Lift guard to adjust angle.

What type of bolt has a round, smooth head?

- A. stove bolt
- B. carriage bolt
- C. flathead bolt
- D. hex bolt

What type of nail is used to build concrete formwork?

- A. common
- B. duplex
- C. masonry
- D. cut

Which tab is removed when installing a split-wire duplex receptacle?

- A. hot
- B. neutral
- C. top
- D. bottom

***Building/Property Maintenance (continued)***

What type of trap is prohibited for use in a plumbing system?

- A. grease trap
- B. p-trap
- C. hair trap
- D. s-trap

**Performance Assessment:**

Administration Time: 3 hours and 30 minutes

Number of Jobs: 6

***Areas Covered:***

- |     |  |
|-----|--|
| 27% | <p><b><u>Carpentry: Construct Frame</u></b><br/><i>Selection and use of tools, cutting, techniques for assembly, accuracy of board measurements, and accuracy of frame measurements.</i></p> |
| 18% | <p><b><u>Plumbing: Sweat Piping</u></b><br/><i>Use of tools, joining and soldering techniques, accuracy of measurements, piping support, and leak testing.</i></p>                           |
| 14% | <p><b><u>Electricity: Rough Wiring</u></b><br/><i>Mount electrical boxes, install nonmetallic cable, and preparation of wires in box.</i></p>  |
| 18% | <p><b><u>Drywall</u></b><br/><i>Accuracy of measurements and cuts, installation of drywall, and finishing techniques.</i></p>  |
| 14% | <p><b><u>Electricity: Finish Wiring</u></b><br/><i>Installation of switching device, installation of light fixture, and testing of installation.</i></p>                                     |
| 9%  | <p><b><u>Carpentry: Mortise Hinge</u></b><br/><i>Selection and use of tools, and fit and appearance of installed hinge.</i></p>  |

***Sample Job:*** Carpentry: Construct Frame

***Maximum Job Time:*** 45 minutes

***Participant Activity:*** Two pieces of 2-inch by 4-inch by 8-foot lumber are provided. Using the diagram provided, cut materials to length, construct miter joint as shown, construct butt joints as shown, cut and install center stud, and secure frame to workbench/table with clamps.