



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

***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.