



## ***PHCC EDUCATIONAL FOUNDATION CERTIFICATION ASSESSMENT BLUEPRINT***

### **PHCC Educational Foundation Plumbing Year 3**

**Test Code: 7663**

**Version: 01**

#### ***Specific Competencies and Skills Tested in this Assessment:***

##### **Mathematics**

Measure and calculate linear distances, circles, angles, and radii  
Identify common geometric shapes and compute volumes using basic geometry  
Measure water weight, volume, and pressure  
Calculate end-to-end and center-to-center measurements  
Solve multi-step problems using basic applied formulas  
Calculate grade, percent grade, drop, and run of piping

##### **Communication Skills**

Communicate with other trades and professionals  
Written Communication  
Display professionalism

##### **Related Science**

Define goals of plumbing, water sources and waste disposal  
Understand and apply basic principles of heat transfer and combustion

##### **General Safety Procedures**

Understand and apply OSHA regulations that cover plumbing practices  
Apply PPE including safety glasses, electrical protection, shoes, hardhat, and other practices

##### **Tools and Equipment**

Level, transit, elevations, and grade

##### **Join Pipe and Connections**

Describe and apply proper procedures for measuring, fabricating, and testing flexible gas pipe  
Explain factors that affect the selection of proper fittings or valves for a specific installation

##### **Plumbing Drawings, Plans and Charts**

Interpret symbols, dimensions and placement of plumbing fixtures and piping on isometric drawing  
Sketch plan view and isometric drawings using standard plumbing fixture and piping symbols  
Read plan view and isometric drawings using standard plumbing fixture and piping symbols

## ***Plumbing Year 3 continued***

### **Install Drainage, Waste, and Vent Systems**

Layout and size the drainage systems  
Excavation and grade  
Install building drains  
Change of directions/fitting uses  
Soil and waste stacks, vent stacks, and stack vents  
Fixture venting  
Traps, cleanouts, and interceptors  
Floor drains  
Fixture supports  
Testing drainage systems  
Building sewer and public tie-ins (at curb)  
Storm and secondary drainage systems  
Foundation drains  
Diagnosing and repairing drainage and vent systems

### **Install Water Supply and Distribution Systems**

Sizing the water supply systems  
Roughing-in for water supply and distribution systems  
Cross connections  
Water hammer arrestors  
Water and hydrostatic pressure testing  
Diagnosing and repairing water distribution systems

### **Fixtures, Appliances, and Equipment**

Fixture rough-in  
Faucets  
Tubs and showers  
Strainers and port openings or pop-ups  
Water closets, urinals, and bidets  
Dishwashers  
Laundry tubs  
Trap and faucet connections  
Ejector systems  
Sump pumps  
Handicapped-accessible fixtures  
Lavatories  
Institutional fixtures and systems  
Emergency showers and eye wash stations  
Commission fixture appliances and equipment  
Diagnosing and repairing fixtures and appliances

### **Install Domestic Water Heaters**

Domestic water heater components and operation  
Gas water heaters  
Electric water heaters  
Oil water heaters  
Point-Of-Use water heaters  
Tankless water heaters and systems  
Solar water heaters  
Domestic hot water boilers  
Indirect fired water heaters

### **Hot Water Distribution Systems**

Mixing and tempering valves  
Diagnosing and repairing domestic water heating systems

## ***Plumbing Year 3 continued***

### **Hydronic Systems**

Principles of hydronic systems  
Install hydronic heating systems  
Hydronic heating systems startup  
Geothermal piping systems  
Hydronic cooling systems

### **Fuel Gas**

Demonstrate knowledge of fuel gas code, materials and types of fuel gases  
Define fuel gas pipe sizing  
Define fuel gas piping, fittings, and connections  
Fuel gas piping, corrosion, and corrosion protection  
Diagnosing and repairing fuel gas systems

### **Code**

Administration and basic principles, plumbing code definitions and general regulations  
Materials  
Joints and connections, fittings and appurtenances  
Plumbing fixtures and minimum fixture requirements  
Hangers and supports, indirect waste piping and special waste  
Water supply and distribution  
DWV and storm drain systems  
Tests and maintenance  
Individual sewage disposal systems  
Potable water supply systems

### **Electrical**

Demonstrate knowledge of basic electricity, electric current and electric motors  
Demonstrate knowledge of electric circuits, circuit protection, and electrical safety  
Electric circuit troubleshooting  
Control wiring

### **Backflow**

Define backflow  
Describe mechanical equipment for cross-connection control

### **Productivity**

Identify factors that enhance productivity

## *Plumbing Year 3 continued*

### **Written Assessment:**

Administration Time: 3 hours

Number of Questions: 187

#### ***Areas Covered:***

9%	Mathematics
3%	Communication Skills
3%	Related Science
2%	General Safety Procedures
1%	Tools and Equipment
2%	Join Pipe and Connections
4%	Plumbing Drawings, Plans, and Charts
12%	Install Drainage, Waste, and Vent Systems
6%	Install Water Supply & Distribution Systems
16%	Fixtures, Appliances, and Equipment
9%	Install Domestic Water Heaters
2%	Hot Water Distribution System
4%	Hydronic Systems
10%	Fuel Gas
10%	Code
3%	Electrical
3%	Backflow
1%	Productivity

#### ***Sample Questions:***

The weight of a cubic foot of water is

- A. 6.24 pounds
- B. 8.33 pounds
- C. 27 pounds
- D. 62.4 pounds

A type of fitting that has no make-up is a

- A. galvanized fitting
- B. copper fitting
- C. hubless fitting
- D. cast iron bell and spigot

How many installed pumps are in a duplex sewage pumping system?

- A. 1
- B. 2
- C. 4
- D. 5

A gas cock is a \_\_\_\_\_ valve.

- A. ball
- B. globe
- C. relief
- D. check

Which of the following locations requires a cleanout?

- A. base of stack
- B. beginning of branch
- C. end of battery
- D. intersection of branches