

## INSTALL WATER PIPES AND ANCILLARY APPLIANCES

**UNIT CODE:** CON/OS/PL/CR/01/4/A

### UNIT DESCRIPTION

This unit covers the competencies required to install water pipes and ancillary appliances in buildings. It involves interpreting working drawings, quantifying piping materials, supplies and ancillary appliances, preparing and assembling pipe works, installing water pipe works, testing the piping system and carrying out housekeeping practices.

This standard applies in the construction industry.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b> These describe the <b>key outcomes</b> which make up <b>workplace function</b> .	<b>PERFORMANCE CRITERIA</b> These are <b>assessable</b> statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Interpret working drawing	1.1 Working drawing are interpreted based on technical drawings standards. 1.2 The scale of the drawing is read based on the legend 1.3 Imperial measurements are converted into metric measurements based on conversion table. 1.4 Symbols are identified based on technical drawings standards 1.5 Reference points are identified on the ground based on the site drawing.
2. Quantify piping materials and supplies	2.1 Materials required for piping are identified based on the working drawings and specifications. 2.2 <i><b>Materials and supplies</b></i> required are quantified based on working drawings and specifications. 2.3 A schedule of materials is created based on the working drawings and details.
3. Prepare and assemble pipe work	3.1 Occupational health and safety precautions are observed as per legal requirements. 3.2 Pipes are threaded based on best practices. 3.3 <b>Pipes</b> are <i><b>joined</b></i> in accordance with best practices and manufacturer's instructions.

	<p>3.4 Pipes are cut based on type, drawing specifications and job requirements.</p> <p>3.5 Pipe <b>bending</b> is done based on type, drawing specifications and requirements of the job.</p>
4. Install water pipe works and ancillary appliances	<p>4.1 Water supply system components are identified based on the working drawings.</p> <p>4.2 Pipes works are prepared and fitted based on type and drawing <b>specifications</b>.</p>
5. Test water supply system	<p>5.1 <b>Functionality tests</b> are conducted based on set standards.</p> <p>5.2 <b>Faults</b> in functionality are corrected based on set standards.</p>
6. Carry out housekeeping activities	<p>6.1 Wastes are segregated and disposed of in line with environment protection guidelines.</p> <p>6.2 Tools and equipment are cleaned, maintained and stored as per manufacturers' instructions.</p> <p>6.3 Surplus materials and supplies are stored as per manufacturers' instructions.</p> <p>6.4 Records are kept as per workplace policy procedure.</p>

### **RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

<b>Variables</b>	<b>Range</b>
1. Materials and Supplies may include but not limited to:	<ul style="list-style-type: none"> <li>• Various types of pipes</li> <li>• Various types and sizes of fittings</li> <li>• Caulking supplies</li> <li>• Various types of pipe supports</li> <li>• Threading oil</li> <li>• Thread tape</li> </ul>

	<ul style="list-style-type: none"> <li>• Electric heater</li> <li>• Cisterns</li> <li>• Pumps</li> <li>• Solar water heater</li> <li>• Various types of valves</li> <li>• Water tanks</li> </ul>
2. Specifications may include but not limited to:	<ul style="list-style-type: none"> <li>• Gradient</li> <li>• Level</li> <li>• Plumpness</li> </ul>
3. Functionality tests may include but not limited to:	<ul style="list-style-type: none"> <li>• Smoke test</li> <li>• Water test</li> <li>• Air test</li> <li>• Pressure test</li> </ul>
4. Pipes may include but not limited to:	<ul style="list-style-type: none"> <li>• PPR</li> <li>• PVC</li> <li>• CPVC</li> <li>• GI</li> <li>• UPVC</li> <li>• HDPE</li> </ul>
5. Joining methods may include but not limited to:	<ul style="list-style-type: none"> <li>• Electrofusion</li> <li>• Welding</li> <li>• Adhesives</li> <li>• Threading</li> </ul>
6. Bending methods may include but not limited to:	<ul style="list-style-type: none"> <li>• Bending machines for GI and PVC pipes</li> <li>• Burning for PVC pipes</li> <li>• Sanding for PVC pipes</li> </ul>
7. Faults in pipe work may include but not limited to:	<ul style="list-style-type: none"> <li>• Leakages</li> <li>• Air lock</li> <li>• Water hammer</li> <li>• Blockages</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required Skills

The individual needs to demonstrate the following skills:

- Interpersonal skills
- Communication skills
- Sketching skills
- Interpretation skills
- Problem-solving skills
- Organizing skills
- Measuring skills
- Numeracy skills
- Cutting skills
- Threading skills
- Bending skills
- Entrepreneurial skills

### Required Knowledge

The individual needs to demonstrate knowledge of:

- Interpretation of symbols
- Conversion of units
- Types of pipes
- Piping materials and supplies
- Piping tools and equipment
- Joining and jointing of pipes
- Bending
- Mensuration
- Piping systems
- Faults in pipe work
- Functionality tests

### EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Interpreted the working drawings correctly.</li> <li>1.2 Used piping tools and equipment appropriately.</li> <li>1.3 Quantified required supplies and materials accurately.</li> <li>1.4 Fitted pipes based on drawing specifications.</li> <li>1.5 Installed water supply systems correctly.</li> <li>1.6 Tested water supply system and work correctly.</li> <li>1.7 Conducted housekeeping of work area appropriately.</li> </ul>
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	1.8 Observed health and safety practices.
2. Resource Implications	The following resources must be provided: 2.1 A functional workshop with basic plumbing tools, equipment, materials and supplies. 2.2 References and manuals including construction working drawings 2.3 Personal protective equipment
3. Methods of Assessment	Competency may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Written 3.4 Third party report 3.5 Interviewing 3.6 Portfolio
4. Context of Assessment	Assessment may be done: 4.1 On-the-job, 4.2 Off-the-job or 4.3 During Work placement.
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.