



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **CPCPPS5009A Analyse and report on technical plumbing systems**

**Release: 1**

## **CPCPPS5009A Analyse and report on technical plumbing systems**

### **Modification History**

Not Applicable

### **Unit Descriptor**

#### **Unit descriptor**

This unit of competency specifies the outcomes required to analyse and report on technical aspects of plumbing systems. It entails analysis of plumbing systems, processes, legislation, practices, materials, installation methods, and safety procedures and impacts. It covers the preparation and publishing of plumbing and services technical reports.

### **Application of the Unit**

#### **Application of the unit**

This unit of competency supports development of skills and knowledge required for competent workplace performance in a consultancy or supervisory capacity in relation to plumbing services and hydraulics.

### **Licensing/Regulatory Information**

Not Applicable

### **Pre-Requisites**

#### **Prerequisite units**

Nil

## Employability Skills Information

**Employability skills**      This unit contains employability skills.

## Elements and Performance Criteria Pre-Content

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Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Select and analyse a plumbing system or aspect of a plumbing system.	<p>1.1. <b>Plumbing system</b> or <b>aspect of a plumbing system</b> is selected with a view to improve or better understand the system or aspect of the system.</p> <p>1.2. Detailed and comprehensive <b>analysis</b> is made of the plumbing and hydraulic system or aspect of the system and impacts are identified and documented.</p>
2. Research and trial the system.	<p>2.1. Appropriate comprehensive <b>literature review and research</b> are undertaken.</p> <p>2.2. Alternative solutions are trialled and evaluated for suitability.</p> <p>2.3. Results from <b>evaluations</b> are documented.</p>
3. Evaluate and report on the system or aspect of the system.	<p>3.1. System or aspect of the system is evaluated, identifying <b>alternatives and redundancies</b>.</p> <p>3.2. <b>Conclusions</b> are drawn and changes <b>recommended</b>.</p> <p>3.3. Comprehensive and professional <b>report</b> is produced.</p> <p>3.4. Report is <b>published</b> to increase the body of knowledge within the plumbing and hydraulic field.</p>

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

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

#### Required skills

Required skills for this unit are:

- carry out research to develop own learning and capabilities in relevant field of plumbing and hydraulics
- communication skills to:
  - communicate with others to ensure safe and effective work practices
  - confirm job specifications and client requirements
  - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
  - read and interpret:
    - plans, specifications, drawings and design briefs
    - standards and manufacturer requirements and manuals

## **REQUIRED SKILLS AND KNOWLEDGE**

- statutory and regulatory requirements
- use language and concepts appropriate to cultural differences
- use and interpret non-verbal communication, such as hand signals
- written skills to prepare documentation, including:
  - operation and maintenance manual
  - plans, specifications and schedules
- hazard identification skills, including the ability to identify hazard categories according to Australian and New Zealand standards, legislation and manufacturer specifications
- planning and organisational skills to collect, organise and analyse information
- problem solving skills to analyse information and check integrity of data
- teamwork skills to work with others to action tasks and relate to people from a range of cultural and ethnic backgrounds and with varying physical and mental abilities
- technological skills to use technology and the internet to identify and access relevant information.

### **Required knowledge**

Required knowledge for this unit is:

- design principles relating to performance of plumbing systems and their components
- plumbing systems, including plumbing system components and impact of various components
- workplace and equipment safety requirements, including relevant statutory regulations, codes and standards.

# Evidence Guide

## EVIDENCE GUIDE

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The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

### Overview of assessment

This unit of competency could be assessed in the workplace or a close simulation of the workplace environment providing that simulated or project-based assessment techniques fully replicate plumbing and services workplace conditions, materials, activities, responsibilities and procedures.

### Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of:

- analysing and evaluating plumbing systems
- trialling and evaluating alternative solutions
- complying with OHS regulations applicable to workplace operations
- applying organisational quality procedures and processes within context of analysing and reporting on technical plumbing systems
- writing a report to professional standards
- making appropriate supported recommendations
- using appropriate techniques to publish reports
- interactive communication with others to ensure safe and effective work site operations.

### Context of and specific resources for assessment

This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints.

Assessment of essential underpinning knowledge will usually be conducted in an off-site context.

Assessment is to comply with relevant regulatory or Australian standards' requirements.

Resource implications for assessment include:

- an induction procedure and requirement
- realistic tasks or simulated tasks covering the minimum task requirements
- relevant specifications and work instructions, including design brief drawings,

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specifications, codes, design concepts and construction schedules

- tools and equipment appropriate to applying safe work practices, including computers, software and calculators
- workplace instructions relating to safe working practices and addressing hazards and emergencies
- material safety data sheets
- research resources, including industry related systems information.

Reasonable adjustments for people with disabilities must be made to assessment processes where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

### Method of assessment

Assessment methods must:

- satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package
- include direct observation of tasks in real or simulated work conditions, with questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application
- reinforce the integration of employability skills with workplace tasks and job roles
- confirm that competency is verified and able to be transferred to other circumstances and environments.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice, with a decision on competency only taken at

## EVIDENCE GUIDE

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the point when the assessor has complete confidence in the person's demonstrated ability and applied knowledge

- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence.

Assessment processes and techniques should as far as is practical take into account the language, literacy and numeracy capacity of the candidate in relation to the competency being assessed.

Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

## Range Statement

### RANGE STATEMENT

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The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

***Plumbing system*** may include:

- air conditioning
- compressed air
- hose reels
- hydrants
- roofing
- sanitary plumbing and drainage
- sprinklers
- steam
- stormwater
- trade waste
- ventilation
- wastewater
- water supply.

## RANGE STATEMENT

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- Aspect of a plumbing system*** may include:
- backflow prevention
  - flows
  - materials
  - solar heating
  - trapping
  - valves
  - ventilation
  - water heating.
- Analysis*** may include:
- durability, longevity and practicality
  - health issues and concerns
  - impacts, including:
    - environmental
    - financial
    - health
    - personal
    - system processes or aspect of the system
  - legislation
  - materials
  - needs or desired outcomes
  - practices and work or installation methods
  - safety systems and practices
  - sustainability.
- Literature review and research*** may include:
- industry personnel
  - internet
  - journals
  - legislation and standards
  - manufacturers' literature
  - textbooks
  - trade publications.
- Evaluations*** should:
- draw together key aspects of the project
  - identify interrelationships of elements identified through the analysis.
- Alternatives and redundancies*** may include:
- changes in community expectations
  - changes in legislation
  - duplication of tasks and processes
  - new work practices
  - outdated practices and systems, for example systems and processes replaced by new technologies.

## RANGE STATEMENT

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- Conclusions** may be drawn:
- on any or all aspects of the project but must be supported by analysis and research.
- Recommendations** should point to future directions and may include:
- changes in materials to reduce impacts on cost, health, safety and the environment
  - changes in work practices
  - deletion of old systems and procedures
  - legislation changes
  - new systems and procedures.
- Report:**
- should cover:
    - outline of the project
    - research and literature review
    - analysis
    - evaluation
    - alternative solutions
    - conclusions
    - recommendations
  - may be in any recognised and professional format
  - must be appropriately referenced.
- Report may be **published**:
- in journals
  - in textbooks
  - in trade publications
  - on the internet.

## Unit Sector(s)

**Unit sector** Plumbing and services

## Co-requisite units

**Co-requisite units** Nil

## **Functional area**

**Functional area**