



**Australian Government**

# **CPCPDR4011B Design and size sanitary drainage systems**

**Release 1**

## **CPCPDR4011B Design and size sanitary drainage systems**

### **Modification History**

Minor editorial changes to performance criteria, required skills and knowledge, range statement and critical aspects  
Equivalent to CPCPDR4011A

### **Unit Descriptor**

This unit of competency specifies the outcomes required to design, size and document the layout of sanitary drainage systems for unit developments.  
It covers the preparation for the work, the identification and confirmation of system specifications and requirements, the planning of the system layout, and work finalisation processes, including records and documentation.

### **Application of the Unit**

Site location for application of the plan will be residential and commercial, and may be a new work site or an existing structure being renovated, extended, restored or maintained.

### **Licensing/Regulatory Information**

In some jurisdictions, this unit of competency may form part of accreditation, licensing, legislative, regulatory or certification requirements.

### **Pre-Requisites**

Nil

### **Employability Skills Information**

This unit contains employability skills.

## Elements and Performance Criteria Pre-Content

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

- |   |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Prepare for planning.         | <p>1.1 Nature and scope of planning task are identified and confirmed.</p> <p>1.2 <b><i>Work health and safety</i></b> (WHS) and <b><i>environmental requirements</i></b> associated with the installation of sanitary drainage systems are adhered to throughout the work.</p> <p>1.3 Work is organised and sequenced in conjunction with others involved in or affected by work.</p> <p>1.4 <b><i>Tools and equipment</i></b> required for planning, sizing and documenting the layout of sanitary drainage systems, including personal protective equipment, are selected and checked for serviceability.</p> <p>1.5 Work area in which the planning process is to be conducted is prepared.</p> |
| 2 | Identify system requirements. | <p>2.1 <b><i>Information</i></b> and specifications for the required work are obtained and confirmed, if necessary by site inspection.</p> <p>2.2 Regulations and Australian standards relevant to the work are consulted and applied to all aspects of the work.</p> <p>2.3 Quantity, location and type of take-off points and <b><i>legal points of discharge</i></b> are determined from development drawings, plans and specifications.</p> <p>2.4 System is sized according to relevant Australian standards and <b><i>statutory and regulatory authorities</i></b>' and workplace requirements.</p> <p>2.5 <b><i>Sustainability principles and concepts</i></b> are observed</p>              |

when preparing for and undertaking work process.

- |   |                       |     |                                                                                                                                              |
|---|-----------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | Design system layout. | 3.1 | Sanitary drainage system is designed according to development plans, specifications, relevant Australian standards and workplace procedures. |
|   |                       | 3.2 | <b>Materials</b> required are specified and optimised from proposed design according to relevant Australian standards.                       |
|   |                       | 3.3 | Plans are recorded according to regulatory authorities' and workplace requirements.                                                          |
| 4 | Restore work area.    | 4.1 | Work area is restored according to workplace procedures.                                                                                     |
|   |                       | 4.2 | Tools and equipment used in the process are refurbished and left according to workplace procedures.                                          |
|   |                       | 4.3 | Information is accessed and documentation, including work backup, is completed according to workplace requirements.                          |

## Required Skills and Knowledge

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

### Required skills

- communication skills to:
  - access information
  - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
  - follow instructions
  - identify requirements, including system requirements
  - use language and concepts appropriate to cultural differences
  - use and interpret non-verbal communication, such as hand signals
- initiative and enterprise skills to identify and report to appropriate personnel any faults in tools, equipment or materials
- literacy skills to:
  - complete workplace documentation, including recording written plans and completing other relevant workplace documentation, such as work backups
  - read and interpret:
    - documentation from a variety of sources
    - plans and specifications
    - regulations and relevant Australian standards
- numeracy skills to apply measurements and calculations
- planning and organising skills to:
  - organise and sequence tasks with others
  - plan and set out work
- 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
- technical skills to interpret plans and specifications of a multi-unit development to plan, size and document layout of required sanitary drainage system
- technology skills to:
  - access and understand site-specific instructions in a variety of media
  - use mobile communication technology

### Required knowledge

- Australian standards applicable to sanitary drainage systems
- characteristics and application of different pipe systems, including their fittings and fixture supports and fixing and joining techniques

- computer use, including computer-aided design software for plumbing and construction systems
- design concepts and performance measures for sanitary drainage systems
- handling of hazardous waste
- how to find and access necessary specifications and related information
- infectious diseases relevant to working with plumbing systems
- job safety analysis (JSA) and safe work method statements (SWMS)
- principles of drainage
- process of planning, sizing and documenting layout of sanitary drainage systems
- process of treating trade waste to acceptable levels for discharge
- properties and characteristics of sewage, including temperature implications, trade waste requirements and discharge levels
- relevant statutory requirements related to planning, sizing and documenting sanitary drainage systems
- SI system of measurements
- workplace and equipment safety requirements

## Evidence Guide

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:

- locating, interpreting and applying relevant information, Australian standards and specifications to planning, sizing and documenting the layout of a sanitary drainage system
- applying safety requirements throughout the work sequence, including electrical safety requirements and the use of personal protective clothing and equipment
- given the development plans and specification, designing, sizing and documenting the layout details of a sanitary drainage system for a residential unit development comprising at least five two-storey (Class 1) units; and a commercial (Class 6) building, incorporating trade waste to an approved point of discharge or on-site disposal system, ensuring:
  - application of sustainability principles and concepts
  - correct identification of details of the plan
  - correct selection and use of appropriate processes, tools and equipment
  - completion of all work to specification
  - compliance with regulations, relevant Australian standards, and organisational quality procedures and processes
  - correct identification of trade waste and appropriate treatment processes
  - communicating and working effectively and safely with others.

### Context of and specific

This competency is to be assessed using standard and

**resources for assessment**

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
- tools and equipment appropriate to applying safe work practices
- support materials appropriate to activity
- workplace instructions relating to safe work 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 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

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.

***Workplace health and safety*** is to be according to commonwealth, state and territory legislation and regulations and may include:

- handling of materials
- hazard control
- hazardous materials and substances
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and practices
- safe operating procedures, including recognising and preventing hazards associated with:
  - electricity
  - other machines
  - surrounding structure and facilities
  - trip hazards
  - underground services
  - use of tools and equipment
  - work site visitors and the public
  - working at heights

- working in confined spaces
- working in proximity to others
- use of firefighting equipment
- use of first aid equipment
- workplace environment and safety.

**Environmental requirements**  
cover water quality  
management and may include:

- clean-up protection
- stormwater protection
- waste management.

**Tools and equipment** may  
include:

- computer-aided design (CAD) software
- drawing instruments
- measuring equipment.

**Information** may include:

- charts and hand drawings
- job drawings
- material safety data sheets (MSDS)
- memos
- plans and sketches
- regulatory and legislative requirements, particularly those pertaining to:
  - National Construction Code
  - WHS and environmental requirements
  - plumbing regulations
- relevant Australian standards, including AS/NZS3500 National plumbing and drainage: Part 2 Sanitary plumbing and drainage – Acceptable solutions
- safe work procedures relating to planning, sizing and documenting the layout of sanitary drainage systems
- signage
- verbal, written and graphical instructions
- work bulletins
- work schedules, plans and specifications.

**Legal points of discharge**  
may include:

- gravitational sewer
- on-site disposal system
- vacuum sewer.

**Statutory and regulatory**

- commonwealth, state or territory, and local authorities

**authorities** include: administering applicable Acts, regulations and codes of practice.

**Sustainability principles and concepts:**

- cover the social, economic and environmental use of resources to meet current and future needs
- may include:
  - correctly handling hazardous materials
  - incorporating efficient use of material into the design, including recycling material
  - using efficient design principles throughout to minimal environmental impact
  - using energy and water efficiently.

**Materials** may include:

- drafting materials
- relevant development plans and specifications.

## Unit Sector(s)

**Competency field** Drainage

**Unit sector** Plumbing and services

## Custom Content Section

Not applicable.