Australian Government

CPCPDR4013B Design and size domestic treatment plant disposal systems

Release 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

CPCPDR4013B Design and size domestic treatment plant disposal systems

Modification History

Minor editorial changes to performance criteria, required skills and knowledge, range statement and critical aspects
Equivalent to CPCPDR4013A

Unit Descriptor

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

Application of the Unit

Site location for work application will be domestic, 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.	1.1	Nature and ***scope of planning task*** are identified and confirmed.
		1.2	***Work health and safety*** (WHS) and ***environmental requirements*** associated with installation of domestic treatment plant disposal systems are adhered to throughout the work.
		1.3	Work is organised and sequenced in conjunction with others involved in or affected by the work.
		1.4	***Tools and equipment*** required for planning, sizing and documenting layout of domestic treatment plant disposal systems, including personal protective equipment, are selected and checked for serviceability.
		1.5	Work area in which the planning process is to be conducted is prepared.
2	Identify system requirements.	2.1	***Information*** and specifications for required work are obtained and confirmed, if necessary, by site inspection.
		2.2	Regulations and Australian standards relevant to work are consulted and applied to all aspects of the work.
		2.3	System requirements, including capacity, method of disposal, types of system, treatment system performance requirements and processes are determined from specifications.
		2.4	Information on the assessment of land capability for on-site land application of effluent are obtained and confirmed.

		2.5	Information for a suitable location for the land application area and reserve area is obtained and confirmed.
		2.6	System is sized according to relevant Australian standards, regulatory authorities and workplace requirements.
3	Design system layout.	3.1	Disposal system is planned according to specifications, Environment Protection Authority (EPA) and regulatory authorities' requirements, relevant Australian standards and workplace procedures.
		3.2	Plans are developed to accord with relevant Australian standards, regulatory authorities' requirements, maintenance, site topography and landscape application areas.
		3.3	***Sustainability principles and concepts*** are observed when preparing for and undertaking work process.
		3.4	***Materials*** required are specified and optimised according to relevant Australian standards from proposed design.
		3.5	Plans are recorded according to ***statutory and 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 relevant workplace documentation, including work backups
  - read and interpret:
    - documentation from a variety of sources
    - plans, specifications and drawings
    - regulations and relevant Australian standards
  - record written plans
- 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 to design layout and operational details of a domestic treatment plant disposal 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 the treatment system
- design concepts and performance measures for domestic treatment plant disposal systems

- handling of hazardous waste
- infectious diseases
- job safety analysis (JSA) and safe work method statements (SWMS)
- principles of the assessment of land capability for application of effluent
- principles, techniques and characteristics of effluent treatment and disposal
- process of designing domestic treatment plant disposal systems
- properties and characteristics of landscape application areas with suitable plants and vegetation, including:
  - hardiness
  - high and low water requirements
  - maintenance requirements
  - native to the local area implications
  - phosphorus tolerance
- properties and characteristics of soil, including:
  - percentages of sand, silt and clay
  - absorption capacity implications
- relevant statutory and authorities' requirements related to designing domestic treatment plant disposal systems
- SI system of measurements
- sources of information
- use of computers and relevant computer-aided design (CAD) software
- 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 the design of domestic treatment plant disposal systems
- 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 of a treatment system for a domestic dwelling, which is compliant with current and relevant environmental and legislative requirements, ensuring:
    - identification, evaluation and incorporation of sustainability principles and concepts into the design
    - correct identification of plan details
    - 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
    - communicating and working effectively and safely with others.

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
- 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.

Scope of planning task:

- absorption may be by absorption trenches or transpiration beds
- disposal may be by absorption, spray or recycling
- process may be anaerobic or aerobic.

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

- handling of materials
- hazard control
- 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

- hazardous materials and substances
- 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:

- CAD software
- drawing instruments
- measuring equipment.

Information may include:

- charts and hand drawings
- instructions issued by authorised organisational or external personnel
- job drawings
- manufacturer specifications and instructions
- material safety data sheets (MSDS)
- memos
- organisation work specifications and requirements
- 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
  - AS/NZ1547 On-site domestic wastewater

	management • safe work procedures relating to the design of domestic treatment plant disposal systems • signage • verbal, written and graphical instructions • work bulletins • work schedules, plans and specifications.

Sustainability principles and concepts:	• cover the social, economic and environmental use of resources to meet current and future needs
	• may include:
	  • efficient design principles used throughout to minimal environmental impact
	  • no environmental contamination
	  • efficient use of material incorporated into the design, including recycling of material
	  • efficient energy and water use
	  • correct handling of hazardous materials
	  • disposing of waste material to ensure minimal environmental impact.

Materials may include:	• drafting materials • relevant plans and specifications.
Statutory and regulatory authorities include:	• commonwealth, state or territory, and local authorities administering applicable Acts, regulations and codes of practice.

Unit Sector(s)

Functional area

Unit sector Plumbing and services

Custom Content Section

Not applicable.