



Australian Government

Assessment Requirements for CPCPPS5025 Design grey water re-use systems

Release: 2

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Modification History

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| Release 2 | This version first released with CPC Construction, Plumbing and Services Training Package Release 5.1.

Typographical error corrected in Element 1.7. |
| Release 1 | This version first released with CPC Construction, Plumbing and Services Training Package Release 5.0.

Supersedes and is equivalent to CPCPPS5025A Design grey water re-use systems. Updated to meet the Standards for Training Packages 2012. |

Performance Evidence

To demonstrate competency, a candidate must meet the performance criteria for this unit by:

- designing, sizing and documenting the layout details of a greywater re-use system for a high-rise mixed development building and a wide span project, including:
 - a specification for both
 - planning and detailing systems components, including:
 - storage tanks
 - system overflow
 - treatment systems
 - piping systems
 - plumbing systems
 - usage systems
- designing and sizing a grey water re-use system.

Knowledge Evidence

To be competent in this unit, a candidate must demonstrate knowledge of:

- approved installation methods
- hazards associated with devices and systems used in the hydraulic sector
- nature of materials and effect of their performance in a variety of conditions
- organisational quality procedures and processes
- principles of technology in the design of grey water re-use systems for residential, commercial and industrial applications to include water treatment and backflow protection of drinking and non-drinking water supply systems

- terminology and definitions used in hydraulic design
- work drawings and specifications
- work health and safety (WHS) requirements, including relevant statutory regulations, codes and standards
- scope of work:
 - interpretation of plans and specifications
 - sizing and documenting layout of grey water re-use systems for residential, commercial and industrial applications to include water treatment and backflow protection of drinking and non-drinking water supply systems
- design requirement:
 - architectural plans
 - building specifications
 - owner requirements
 - pipework identification
 - sizing of pipework
 - backflow protection of drinking and non-drinking water supply systems
 - water treatment
 - specialist water use applications
- health risks:
 - abdominal pain
 - acute enteritis
 - bacillary dysentery
 - chest pain
 - cholera
 - common colds
 - coughing
 - diarrhoea
 - digestive and nutritional disturbances
 - dysentery
 - fever
 - gastroenteritis
 - giardiasis
 - helminthes, including flukes and worms
 - hepatitis
 - hookworm disease
 - infectious hepatitis
 - meningitis
 - muscle aches
 - neurological symptoms, including nervousness and insomnia
 - poliomyelitis

- respiratory infections, such as pneumonia
- restlessness
- salmonellosis (food poisoning)
- taeniasis
- toxoplasmosis
- typhoid fever
- vomiting
- weight loss
- environmental risks:
 - algal blooms
 - excess nutrient loads
 - fish kills
 - oxygen depletion
- measures to protect public health:
 - auditing
 - contact avoidance
 - contact minimisation
 - disinfection and sterilisation
 - education
 - legislation
 - licensing
 - maintenance
 - separation barriers
 - set back distances
 - timing discharges
 - wet weather storage
- cost-benefit analysis comparing:
 - the range of suitable materials and system choices available to enable cost-effective choices to be made without compromising integrity of project
 - water savings and environmental benefits against initial and ongoing maintenance costs
- national water programs, statutory and regulatory requirements, relevant Australian Standards, and codes:
 - AS/NZS 1546 On-site domestic wastewater treatment units
 - AS/NZS 1547 On-site domestic wastewater management
 - AS/NZS 3500 Plumbing and drainage set
 - AS 2200 Design charts for water supply and sewerage
 - National Construction Code (NCC)
 - Commonwealth, state or territory government policies, including health departments
- manufacturer requirements:

- material specifications
- grey water treatment systems
- pump installation
- pipe sizing
- storage systems
- technical and trade manuals
- information gathered during desktop to support design purposes:
 - architectural and building plans
 - developer plans
 - manufacturer data
 - building applications
 - brochures
 - forms
 - policies
 - reports
- performance requirements including compliance limits for:
 - bacteria levels
 - chlorine levels
 - nutrients
 - pH
 - phosphates
- performance requirements established using relevant Australian Standards, codes and local authority plans:
 - cover
 - discharge
 - flow conditions
 - pipe grades
- layout of pipework systems:
 - drainage systems
 - elevated pipework systems
 - gravity systems
 - pumped and rising mains
 - requirements for irrigation systems
 - requirements for flushing water systems
- stack systems:
 - fully vented
 - fully vented modified
 - single stack
 - single stack modified
 - waste stack

- two-pipe system
- reduced velocity aerator system
- layout of pipe work system design:
 - designing pipework systems to not unduly affect building integrity and aesthetic appeal
 - location of pipework (fire rating of enclosure)
 - demonstrating principles of economy, serviceability, durability and fit for use
- fittings, valves and controls:
 - backflow prevention devices
 - irrigation control systems
 - isolating valves
 - level indicators
 - pump controls
- land application options:
 - surface irrigation
 - subsurface irrigation
 - spray irrigation
- storage tanks:
 - connections
 - containment
 - location
 - material
 - overflow provision
 - pumps
 - sizing
 - support
 - switches
 - valves
 - vermin control
- pipe size and pump duty calculations:
 - calculating pipe sizing
 - calculating pressure and flow requirements
 - determining flow and fixture loadings
 - interpreting design charts and tables
- pump well, pump and pump control requirements:
 - automatic controls
 - capacity
 - corrosion-resistant materials
 - detailing
 - high and low-level water controls and alarms

- inlet and outlet design requirements
- installation and mounting requirements
- macerator requirements
- pump sizing
- pump well sizing
- selection of pump type
- valve requirements
- warning system
- materials:
 - copper (Cu)
 - polypropylene (PP)
 - polybutylene (PB)
 - polyethylene (PE)
 - unplasticised polyvinyl chloride (uPVC)
 - other approved material
- jointing methods:
 - brazing
 - compression joints
 - electrofusion welding
 - mechanical joints
 - solvent cement
 - threading
 - other approved jointing methods
- pipe supports:
 - anchors
 - bedding
 - bracket spacing
 - concrete support
 - corrosion protection
 - manufacturer-recommended specific fixings
 - material requirements
 - provision for expansion
 - saddles
- installation requirements:
 - pipe protection such as:
 - cover
 - corrosion
 - impact
 - fire rating
 - level of workmanship

- manufacturer-recommended specific fixings
- pipe support
- provision for expansion
- serviceability and access
- methods for applying sustainability principles and concepts:
 - selecting appropriate material to ensure minimal environmental impact
 - efficient use of material
 - efficient energy usage/capital outlay comparison
 - local environment consideration
 - water efficiency
 - re-use of greywater
 - consideration of the Green Building Council of Australia rating scheme
- types of plans:
 - axonometrics
 - cross-sections
 - details
 - elevations
 - isometrics
 - sections
 - schematics produced using:
 - computer generation
 - drawing equipment
- specification:
 - backflow prevention
 - flow requirements
 - jointing
 - manufacturer requirements
 - materials
 - residual pressures
 - work health and safety (WHS)
 - specialised components
 - storage
 - support
 - testing
 - valve selection
 - water treatment
 - workmanship
- testing for:
 - air pressure
 - backflow protection

- defect inspection
- drainage inspection
- hydrostatic
- performance:
 - flow
 - pressure
- water quality
- quality assurance (QA) audit
- commissioning schedule information:
 - balancing disposal system
 - flow and pressure adjustments
 - leak check
 - pump settings
 - pressure test
 - safety requirements
 - system certification
 - system flushing
 - system defects
 - system functions as per design
 - system purge
 - valve operation
 - ventilation
 - vermin control
- operation and maintenance manual information:
 - as installed drawings
 - certification documentation
 - land application compliance checks
 - maintenance schedules
 - manufacturer brochures
 - ongoing maintenance requirements
 - pump maintenance
 - regular inspections
 - results of commissioning test
 - safety management system
 - surface ponding checks
 - system detail, setting and operations
 - valve function
 - system operational parameter adjustments and checks:
 - chlorine levels
 - dissolved oxygen

- nitrates
- pH
- phosphates
- suspended solids
- water quality.

Assessment Conditions

Assessors must meet the requirements for assessors contained in the Standards for Registered Training Organisations.

This unit must be assessed in the workplace or a close simulation using realistic workplace conditions, materials, activities, responsibilities, procedures, safety requirements and environmental considerations.

Links

Companion volumes to this training package are available at the VETNet website - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad>