



Australian Government

Assessment Requirements for CPCPPS5027 Design irrigation systems

Release: 1

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Modification History

Release 1 This version first released with CPC Construction, Plumbing and Services Training Package Release 5.0.

Supersedes and is equivalent to CPCPPS5027A Design irrigation 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 layout details of an irrigation system including specification for a:
 - sports oval incorporating stormwater collection and use, with a mains pressure drinking water top-up and with chemical additives
 - a landscaped area for a mixed development site connected to a main pressure recycled (non-drinking) water main
- evaluating and documenting design parameters to relevant Australian Standards and codes, and regulatory, client and manufacturer requirements
- planning and detailing system components that include:
 - backflow prevention devices
 - irrigation management-control system
 - pumping requirements
 - water delivery outlets
 - piping requirements
- designing and sizing two irrigation systems, using appropriate calculations and computer software for specific applications.

Knowledge Evidence

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

- statutory and regulatory requirements related to designing irrigation systems including:
 - Commonwealth government
 - state or territory governments
 - local authorities
 - AS/NZS 3500 National plumbing and drainage
 - AS2200 Design charts for water supply and sewerage

- National Construction Code (NCC)
- state or territory health departments
- common terminology and definitions used in the design of irrigation systems
- design requirements including:
 - architectural plans
 - backflow requirements
 - interpretation and application of irrigation services, drawings and symbols
 - irrigation management system
 - owner requirements
 - precipitation and evaporation rates
 - pumping requirements
 - required water application to establish and maintain plant life
 - source of irrigation water
 - sprinkler head systems
 - system requirements
 - water storage requirements
- cost-benefit analysis comparing the range of suitable materials and system choices available to enable cost-effective choices without compromising the integrity of the project
- manufacturer requirements including:
 - irrigation management system
 - material specification
 - pump tables
 - sprinkler head performance
 - sub-surface irrigation
 - technical and trade manuals
- nature of materials used and effects of performance under various conditions including:
 - composite pipework
 - copper (Cu)
 - cross-linked polyethylene (PE-X)
 - polypropylene (PP)
 - polybutylene (PB)
 - polyvinyl chloride (PVC)
- characteristics and application of different backflow prevention devices including:
 - double-check valve assembly (DCV)
 - dual-check valve with intermediate vent (DuCV)
 - pressure type vacuum breaker (PVB)
 - reduced pressure zone device (RPZD)
 - registered air gap (RAG)
 - registered break tank (RBT)

- reduced pressure detector assembly (RPDA)
- reduced pressure zone device (RPZD)
- other approved backflow prevention devices
- layout of pipework systems including:
 - distribution
 - dual feed systems
 - range pipes
 - ring main
 - single pipe
 - control stations
- sections and components of the irrigation systems including:
 - irrigation stations
 - manifold systems
 - sensors
 - automatic controls
 - sprinklers, drippers and irrigators
 - sprinkler patterns
- testing and commissioning schedule requirements including:
 - defect inspection
 - hydrostatic
 - mains pressure
 - performance
 - quality assurance (QA) audit
 - system certification
 - flow test
 - leak check
 - pressure test
 - system defect
 - system functions as per design
 - valve and system operation
- operation and maintenance manual requirements including:
 - as installed drawings
 - results of commissioning test
 - certification documentation
 - maintenance schedules
 - manufacturer brochures and technical information
 - operational procedures
 - valve function
- installation requirements including:
 - pipe connection

- bedding and backfilling
- corrosion
- cover
- ground stability
- impact
- level of workmanship
- manufacturer recommendations
- pipe support
- provision for pipe movement
- serviceability and access
- delivery systems and layout requirements including:
 - main delivery
 - number and design control
 - design:
 - avoiding obstacles
 - irregular shapes
 - minimising water wastage
 - range of irrigation applications
 - range pipes
 - ring mains
 - size and water delivery of sprinklers
 - sprinkler head patterns and placement
- plans and specification requirements including:
 - plans:
 - axonometrics
 - cross-sections
 - details
 - elevations
 - isometrics
 - schematics
 - sections
 - specifications:
 - bedding
 - flow requirements
 - irrigation management control system
 - jointing
 - manufacturer requirements
 - materials
 - pumps
 - residual pressures

- work health and safety (WHS)
- specialised components
- sprinkler head selection
- storage tanks
- support
- testing
- valve selection
- water treatment
- workmanship
- principles of technology used in the design of irrigation systems for a range of applications
- characteristics of different soil types and the impact on the irrigation systems design
- characteristics and application of different fittings, valves and controls
- characteristics and application of different jointing methods
- flow and pressure testing procedures
- information required to undertake a desktop study to outline design parameters
- pipe support design requirements
- sustainability principles and concepts including:
 - selecting appropriate material to ensure minimal environmental impact
 - efficient use of material
 - efficient energy usage/capital outlay comparison
 - water efficiency
 - re-use of water, such as rainwater, grey water and recycled non-drinking water
 - consideration of the Green Building Council of Australia rating scheme.

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>