



Australian Government

CPCPIG3021A Set out, install and commission irrigation systems

Release 1

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Modification History

Prerequisite unit updated

Changes to performance criteria, required skills and knowledge, range statement and critical aspects

Not equivalent to CPCPIG3011A

Unit Descriptor

This unit of competency specifies the outcomes required to set out, install and commission irrigation systems.

Application of the Unit

Site location for work application may be either domestic or 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

CPCPCM2043A Carry out WHS requirements

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

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|---|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Prepare for work. | 1.1 Plans and specifications are obtained. |
| | | 1.2 Work health and safety (WHS) and environmental requirements associated with setting out, installing and commissioning irrigation systems are adhered to throughout the work. |
| | | 1.3 Quality assurance requirements are identified and adhered to according to workplace requirements. |
| | | 1.4 Tasks are planned and sequenced in conjunction with others involved in or affected by the work and statutory and regulatory authorities' requirements. |
| | | 1.5 Tools and equipment for setting out, installing and commissioning irrigation systems, including personal protective equipment, are selected and checked for serviceability. |
| | | 1.6 Work area is prepared to support efficient setting out, installation and commissioning of irrigation systems. |
| 2 | Identify installation requirements. | 2.1 Irrigation system requirements are identified from plans, specifications and relevant information . |
| | | 2.2 Underground services are located and identified. |
| | | 2.3 Flow rate and water pressure are checked for compliance with plans and specifications. |
| | | 2.4 Piping and system components are selected to comply with standards, plans and specifications. |
| | | 2.5 Materials and equipment are identified, ordered and collected according to workplace procedures. |
| | | 2.6 Materials and equipment are checked for compliance with standards, docket and order form, and for acceptable condition. |

- 3 Install and commission irrigation system
 - 3.1 Irrigation pipes are set out according to plans, specifications and site requirements.
 - 3.2 Pipe trenches are excavated according to plans and specifications.
 - 3.3 Pipe system is installed according to plans, specifications, site requirements, manufacturer recommendations and standards, and *sustainability principles and concepts*.
 - 3.4 Pipelines are flushed of air and foreign matter to installation standard.
 - 3.5 Backflow prevention device is installed according to standards.
 - 3.6 Water emitters are installed and adjusted to produce required spray pattern.
 - 3.7 Control valves are installed, operated and adjusted to achieve specified flow rate.
 - 3.8 Installation is tested to comply with standards and authorities' requirements, and is adjusted.
 - 3.9 Trenches are backfilled according to plans and specifications and ground surface is reinstated.
- 4 Clean up.
 - 4.1 Work area is cleared and materials disposed of, reused or recycled according to legislation, regulations, codes of practice and job specification.
 - 4.2 Tools and equipment are cleaned, checked, maintained and stored according to manufacturer recommendations and workplace procedures.
 - 4.3 Documentation 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
 - determine requirements
 - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
 - follow instructions
 - 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:
 - compile list of materials
 - complete workplace documentation and record information
 - read and interpret:
 - documentation from a variety of sources
 - plans and specifications
- numeracy skills to apply measurements and calculations
- planning and organising skills to:
 - plan 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 install pipework, controls, valves, backflow prevention devices and water emitters for an irrigation system and its commissioning
- technology skills to:
 - access and understand site-specific instructions in a variety of media
 - use mobile communication technology

Required knowledge

- characteristics and application of different pipes and fittings, including fixing and joining techniques and methods
- job safety analysis (JSA) and safe work method statements (SWMS)
- process of setting out, installing and commissioning irrigation systems

- processes for accessing information and for calculating material requirements
- properties of water, including pressure and flow rates
- protection of drinking water supplies
- relevant statutory and authority requirements related to installing and commissioning irrigation systems
- SI system of measurement
- standards applicable to the installation
- various types of irrigation systems, including types of materials and components used
- 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, standards and specifications to set out, install and commission irrigation systems
- applying safety requirements throughout the work sequence, including applying equipotential bonding procedures and using personal protective clothing and equipment
- given the plans or specifications, determining the system requirements, setting out, installing and commissioning an irrigation system sourced from an isolating valve to supply four water emitters of varying type and requiring a solenoid valve, ensuring:
 - application of sustainability concepts and principles
 - correct identification of location, design and details of proposed installation
 - correct selection and use of appropriate processes, tools and equipment
 - completing all work to specification
 - compliance with regulations, 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.

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:
 - dirt mounds
 - hazardous materials and substances
 - identifying and testing for electrical hazards
 - other machines
 - pits
 - poles
 - recently filled trenches

- surrounding structure and facilities
- traffic control
- trees
- trip hazards
- underground services
- uneven and unstable terrain
- use of tools and equipment
- work site visitors and the public
- 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.

Quality assurance requirements may include:

- Environment Protection Authority (EPA)
- internal company quality assurance policy and risk management strategy
- International Standards Organisation
- site safety plan
- workplace operations and procedures.
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Statutory and regulatory authorities include:

- commonwealth, state or territory, and local authorities administering applicable Acts, regulations and codes of practice.

Tools and equipment may include:

- chain blocks
- forklifts
- hand and power tools
- hand excavation equipment
- hand trolleys
- hoists and jacks
- ladders
- lifting and load shifting equipment
- mechanical excavation equipment
- rollers
- trench shoring equipment
- water flow and water test equipment.

Information may include:

- charts and hand drawings
- instructions issued by authorised organisational or external personnel
- job drawings
- manufacturer specifications and instructions
- maps
- material safety data sheets (MSDS)
- memos
- organisation work specifications and requirements
- plans and sketches
- regulatory and legislative requirements, particularly those pertaining to:
 - building codes
 - WHS and environmental requirements
 - plumbing regulations
- relevant Australian standards
- safe work procedures relating to setting out, installing and commissioning irrigation systems
- signage
- verbal, written and graphical instructions
- work bulletins
- work schedules, plans and specifications.

Materials may include:

- copper tube, polyethylene, stainless steel and PVC-U pipes
- joints and components
- system components, including:
 - automatic controls
 - back flow prevention devices
 - low voltage solenoid valves
 - water emitters
- water emitters, which may include:
 - drip emitters
 - hear drive
 - impact
 - in-line turbo drippers
 - mist sprays
 - oscillating
 - pop up
 - pulsating
- selection of water emitters, based on:

- automatic control systems
- manufacturer specifications
- physical site conditions
- site requirements
- sub-soil systems
- types of plants requiring irrigated water.

Sustainability principles and concepts:

- cover the current and future social, economic and environmental use of resources
- may include:
 - efficient use of material
 - minimising water wastage
 - considering usage of alternative water supply
 - protection of drinking water supply
 - selecting appropriate components and material to ensure minimal environmental impact.

Unit Sector(s)

Functional area

Unit sector Plumbing and services

Custom Content Section

Not applicable.