



Australian Government

Department of Education, Employment and Workplace Relations

CPCPIG3011A Set out, install and commission irrigation systems

Release: 1

CPCPIG3011A Set out, install and commission irrigation systems

Modification History

Not Applicable

Unit Descriptor

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

Application of the Unit

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

Not Applicable

Pre-Requisites

Prerequisite units

CPCPCM2023A	Carry out OHS requirements
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Employability Skills Information

Employability skills 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

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Plans and specifications are obtained. 1.2. Safety (OHS) requirements associated with setting out, installing and commissioning irrigation systems, and workplace environmental requirements, are adhered to throughout the work. 1.3. Quality assurance requirements are identified and adhered to in accordance with workplace requirements. 1.4. Tasks are planned and sequenced in conjunction with others involved in or affected by the work and statutory and regulatory authority 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 cables, pipes and other existing services are located and allowed for. 2.3. Flow rate is correctly measured from water meter or other available source. 2.4. Water pressure (static head) is determined at source of supply. 2.5. Piping and system components are selected to comply with standards, plans and specifications. 2.6. Materials and equipment are identified, ordered and collected in accordance with workplace procedures. 2.7. 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 in accordance with plans, specifications and site requirements. 3.2. Pipe trenches are excavated in accordance with plans and specifications. 3.3. Pipe system is installed in accordance with plans, specifications, site requirements, manufacturer recommendations and standards. 3.4. Pipelines are flushed of air and foreign matter to

ELEMENT	PERFORMANCE CRITERIA
	installation standard. 3.5. Backflow prevention device is installed in accordance with 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 in accordance with plans and specifications and ground surface is reinstated.
4. Clean up.	4.1. Work area is cleared and materials disposed of or recycled in accordance with state and territory legislation and workplace procedures. 4.2. Tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturer recommendations and workplace procedures. 4.3. Documentation is completed in accordance with workplace requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills for this unit are:

- 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
 - plan and sequence tasks with others
 - read and interpret:
 - documentation from a variety of sources

REQUIRED SKILLS AND KNOWLEDGE

- drawings and specifications
- use language and concepts appropriate to cultural differences
- use and interpret non-verbal communication, such as hand signals
- written skills to:
 - compile list of materials
 - complete workplace documentation
 - record information
- identifying and accurately reporting to appropriate personnel any faults in tools, equipment or materials
- installing pipework, controls, valves, backflow prevention devices and water emitters for an irrigation system and its commissioning
- numeracy skills to apply measurements and calculations
- organisational skills, including the ability to 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
- technological skills to:
 - access and understand site-specific instructions in a variety of media
 - use mobile communication technology.

Required knowledge

Required knowledge for this unit is:

- accessing information and the processes for calculating material requirements
- 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
- properties of water, including pressure and flow rates
- protection of potable 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

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 the use of personal protective clothing and equipment
- as a minimum the ability to, given the plans or specifications determine the system requirements, set out, install and commission an irrigation system sourced from an isolating valve to supply four water emitters of varying type and requiring a solenoid valve, ensuring:
 - 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.

EVIDENCE GUIDE

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 working 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

EVIDENCE GUIDE

- 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

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.

Safety (OHS) is to be in accordance with 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:

RANGE STATEMENT

	• dirt mounds • hazardous materials and substances • 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.
<i>Environmental requirements</i> cover water quality management and may include:	• clean-up protection • stormwater protection • waste management.
<i>Quality assurance</i> 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.
<i>Statutory and regulatory authorities</i> include:	• state or territory statutory authority • statutory plumbing authority.
<i>Tools and equipment</i> 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

RANGE STATEMENT

Information may include:

- rollers
- trench shoring equipment
- water flow and water test equipment.
- charts and hand drawings
- diagrams or sketches
- 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
- regulatory and legislative requirements, particularly those pertaining to:
 - building codes
 - OHS 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 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:
 - hear drive
 - impact
 - in-line turbo drippers
 - mist sprays

RANGE STATEMENT

- oscillating
- pop up (full circle, half, quarter)
- pulsating
- selection of water emitters, based on:
 - automatic control systems
 - manufacturer specifications
 - physical site conditions
 - site requirements
 - types of plants requiring irrigated water.

Unit Sector(s)

Unit sector Plumbing and services

Co-requisite units

Co-requisite units Nil

Functional area

Functional area