



Australian Government

Department of Education, Employment and Workplace Relations

CPCPIG2011A Design domestic urban irrigation systems

Release: 1

CPCPIG2011A Design domestic urban irrigation systems

Modification History

Not Applicable

Unit Descriptor

Unit descriptor This unit of competency specifies the outcomes required to prepare basic designs and irrigation drawings for domestic and small commercial projects.

Application of the Unit

Application of the unit Work is normally undertaken in a drafting office environment. Location for drawing and design 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 Nil

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.	<p>1.1. Site survey is conducted of proposed irrigation area in accordance with client requirements.</p> <p>1.2. Safety (OHS) requirements associated with design of domestic irrigation systems, and workplace environmental requirements, are adhered to throughout the work.</p> <p>1.3. Quality assurance requirements are identified and adhered to in accordance with workplace requirements.</p> <p>1.4. Tasks are planned and sequenced in conjunction with others involved in or affected by the work and statutory and regulatory authority requirements.</p> <p>1.5. Tools and equipment for preparing basic irrigation designs and drawings, including personal protective equipment, are selected and checked for serviceability.</p> <p>1.6. Work area is prepared to support efficient design of domestic irrigation systems.</p>
2. Identify drawing requirements.	<p>2.1. Areas requiring irrigation and system design components are identified.</p> <p>2.2. Information is obtained on the soil type, ground slope, contours and prevailing wind.</p> <p>2.3. Underground cables and services, buildings, paths and other permanent structures are located and noted.</p> <p>2.4. Water supply is located and its influence on design requirements is determined.</p> <p>2.5. Appropriate emitters are selected to suit function and design requirements.</p>
3. Install and commission irrigation system.	<p>3.1. Site plan is drawn to include structures, paths and property boundaries.</p> <p>3.2. Garden areas are sketched to include locations of lawns, garden beds, trees, vegetable patches or ferneries.</p> <p>3.3. Pipe runs and water emitters are sketched to design requirements.</p> <p>3.4. Sizes of pipes are calculated using standard data and information is recorded in required format.</p> <p>3.5. List of materials is compiled to include number and type of water emitters, control valves, quantities of pipes, fittings and components.</p> <p>3.6. Drawing and design are submitted to client for</p>

ELEMENT**PERFORMANCE CRITERIA**

ELEMENT	PERFORMANCE CRITERIA
	approval and adjusted.
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
 - 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
- designing and drawing a domestic urban irrigation system, including:
 - identifying material requirements

REQUIRED SKILLS AND KNOWLEDGE

- selecting and locating components
- site layout
- site requirements and structures
- identifying and accurately reporting to appropriate personnel any faults in tools, equipment or materials
- 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
- job safety analysis (JSA) and safe work method statements (SWMS)
- process and workplace requirements for basic irrigation design
- properties of water, including pressure and flow rates
- relevant statutory and authority requirements related to drawing and installing irrigation systems
- SI system of measurement
- specifications of the range of irrigation products available
- standards applicable to the installation
- technologies for irrigation measurement and drawings
- 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 the design of domestic 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 site plan and customer requirements for the irrigation of a 500m² garden (of lawn, shrubs, trees and flowers), design and prepare a drawing of the system, incorporating automatic timers and controls, varying sprinkler heads and zones, and indicating the materials required (by number and type), ensuring:
 - correct identification of location, design and details of proposed system
 - 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

EVIDENCE GUIDE

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 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

EVIDENCE GUIDE

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

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, including hazardous materials and substances
- hazard control
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and practices
- use of firefighting equipment

RANGE STATEMENT

<p><i>Environmental requirements</i> cover water quality management and may include:</p>	<ul style="list-style-type: none"> • use of first aid equipment • use of tools and equipment • workplace environment and safety. • clean-up protection • stormwater protection • waste management.
<p><i>Quality assurance</i> requirements may include:</p>	<ul style="list-style-type: none"> • Environment Protection Authority (EPA) • internal company quality assurance policy and risk management strategy • International Standards Organisation • site safety plan • workplace operations and procedures. • state or territory statutory authority • statutory plumbing authority.
<p><i>Statutory and regulatory authorities</i> include:</p>	<ul style="list-style-type: none"> • calculator • computer design software • drawing and drafting equipment • laser measuring devices • measuring equipment.
<p><i>Tools and equipment</i> may include:</p>	<ul style="list-style-type: none"> • backflow prevention devices • controls • pipework • valves • water emitters, which may include: <ul style="list-style-type: none"> • hear drive • impact • in-line turbo drippers • mist sprays • oscillating • pop up (full circle, half, quarter) • pulsating • selection of water emitters, based on: <ul style="list-style-type: none"> • automatic control systems • manufacturer specifications • physical site conditions • site requirements • types of plants requiring irrigated water.
<p><i>System design components</i> include:</p>	<ul style="list-style-type: none"> • charts and hand drawings
<p><i>Information</i> may include:</p>	

RANGE STATEMENT

- diagrams or sketches
- instructions issued by authorised organisational or external personnel
- job drawings
- manufacturer specifications and instructions
- material safety data sheets (MSDS)
- memos
- maps
- 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 the design of domestic irrigation systems
- signage
- verbal, written and graphical instructions
- work bulletins
- work schedules, plans and specifications.
- drafting and drawing materials
- plans.

Materials may include:

Unit Sector(s)

Unit sector Plumbing and services

Co-requisite units

Co-requisite units Nil

Functional area

Functional area