



Australian Government

Department of Education, Employment and Workplace Relations

RTE3601A Install irrigation systems

Release: 1

RTE3601A Install irrigation systems

Modification History

Not applicable.

Unit Descriptor

This competency standard covers the process of installing pressurised irrigation systems. It requires the ability to organise resources for installation work, set out and prepare site, install irrigation components, complete installation work, commission irrigation systems and communicate with work team members, supervisors, contractors and consultants. Installing irrigation systems requires knowledge of methods and techniques of irrigation, components of an irrigation system, behaviour of water on varying terrain and soil types, soil water retention testing techniques and soil characteristics, and enterprise OHS procedures.

Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria
1 Organise resources for installation work	1.1 Materials, tools, equipment and machinery are selected according to the irrigation system design requirements and enterprise work procedures. 1.2 The construction site for the irrigation system and construction method is identified according to the site and irrigation system plans and enterprise work procedures. 1.3 Parts and equipment delivered to site are checked according to system drawings and specifications. 1.4 Pre-operational and safety checks are carried out on tools, equipment and machinery according to manufacturers specifications and enterprise work procedures. 1.5 OHS hazards are identified, risks assessed, controls implemented and reported to the supervisor. 1.6 Suitable safety and personal protective equipment (PPE) are selected, used and maintained. 1.7 Water supply is checked to ensure that it is compatible with system specifications.
2 Set out and prepare site	2.1 Measurement and marking out of irrigation lines are consistent with the plan. 2.2 Trenches where constructed are at the specified depth without damage to services, facilities, features and established plants. 2.3 Equipment operation and work practices conform to enterprise and legislative OHS requirements. 2.4 Regulations and legislation relevant to the situation are observed. 2.5 Work practices reflect sustainable horticulture principles and respond to local community

requirements.

- | | | |
|---|-------------------------------|--|
| 3 | Install irrigation components | 3.1 Plan is interpreted and where applicable, contractors are supervised and work is monitored to conform to the plan. |
| | | 3.2 Components are assembled and connected according to the plan, joints are completed and tested according to manufacturers specifications. |
| | | 3.3 Fittings and valves are fitted and adjusted to the requirements of the installation plan, and all joints are secured according to enterprise guidelines. |
| | | 3.4 A clean and safe work area is maintained while installation work is carried out. |
| | | 3.5 Tools appropriate to the task being undertaken are chosen and used according to guidelines and safe working practices are employed. |
| 4 | Complete installation work | 4.1 Earthworks are finished off to plan specifications and enterprise work procedures. |
| | | 4.2 The system configuration and capacity matches the installation plan. |
| | | 4.3 The site is restored and waste material is removed from the site and disposed of in an environmentally aware and safe manner according to enterprise work procedures. |
| | | 4.4 Tools, equipment and machinery are cleaned, maintained and stored according to enterprise work procedures |
| 5 | Commission irrigation system | 5.1 Start-up sequence is in accordance with operations manual. |
| | | 5.2 System is flushed as required. |
| | | 5.3 Operating faults are identified and corrective actions taken according to the operations manual. |
| | | 5.4 Testing and monitoring equipment are calibrated to manufacturers specifications. |
| | | 5.5 Work outcomes are recorded or reported to the supervisor according to enterprise work procedures. |

Required Skills and Knowledge

Not applicable.

Evidence Guide

What evidence is required to demonstrate competence for this standard as a whole?

Competence in installing an irrigation system requires evidence that a person is able to prepare for installation, set out the installation works, install and test the irrigation system, and clean up the site.

The skills and knowledge required to install an irrigation system must be **transferable** to a different work environment. For example, this could include different types of irrigation systems and components, water supplies, soil types and enterprises.

What specific knowledge is needed to achieve the performance criteria?

Knowledge and understanding are essential to apply this standard in the workplace, to transfer the skills to other contexts, and to deal with unplanned events. The knowledge requirements for this competency standard are listed below:

- methods and techniques of irrigation
- components of an irrigation system
- characteristics and operation of joints, valves and sprinkler components
- operation of pumps and water flow rates
- behaviour of water on varying terrain and soil types
- soil water retention testing techniques
- water quality and water filtration techniques
- calculations for installing irrigation systems
- soil characteristics
- enterprise OHS procedures.

What specific skills are needed to achieve the performance criteria?

To achieve the performance criteria, appropriate literacy and numeracy levels as well as some complementary skills are required. These include the ability to:

- organise resources for installation work
- set-out and prepare site
- install irrigation components
- complete installation work
- commission irrigation system
- communicate with work team members, supervisors, contractors and consultants
- implement and follow relevant enterprise OHS and environmental policies and procedures.

What processes should be applied to this competency standard?

There are a number of processes that are learnt throughout work and life, which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this competency standard. Following each question a number in brackets indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process and 3 = perform, administer and design the process.

- | | |
|--|---|
| 1. How can communication of ideas and information (1) be applied? | Written, oral and telecommunication of ideas and information with the work group, supervisor, contractors or consultants relating to installation activities and problems. |
| 2. How can information be collected, analysed and organised (1) ? | Enterprise work procedures and site and irrigation system plans should be consulted, interpreted and applied to co-ordinate installation activities with further clarification sought from the supervisor when necessary. |
| 3. How are activities planned and organised (1) ? | Co-ordinating work activities for the work group, contractors and self, prior to and during the installation program. |
| 4. How can team work (1) be applied? | Facilitating and leading work group members to complete the installation to specification. |
| 5. How can the use of mathematical ideas and techniques (1) be applied? | Measuring materials and interpreting specifications for the irrigation installation. |
| 6. How can problem-solving skills (1) be applied? | Dealing with problems imposed by site characteristics or when system operation doesn't meet specifications. |
| 7. How can the use of technology (1) be applied? | Applying design specifications, communicating and keeping records. |

Are there other competency standards that could be assessed with this one?

This competency standard **could** be assessed on its own or in combination with other competencies relevant to the job function.

There is essential information about **assessing this competency standard for consistent performance** and **where and how it may be assessed**, in the Assessment Guidelines for this Training Package. All users of these competency standards must have **access** to the **Assessment Guidelines**. Further advice may also be sought from the relevant **sector booklet**.

Range Statement

Range of Variables

The Range of Variables explains the contexts within which the performance and knowledge requirements of this standard may be assessed. The scope of variables chosen in training and assessment requirements may depend on the work situations available

What **materials** may be required to install a drainage system?

Materials may include irrigation system components, glues, welds, and construction and backfill materials.

What **tools, equipment and machinery** may be required?

Tools, equipment and machinery may include surveying and levelling equipment such as automatic level, laser level, dumpy level, Cowley level, staff, boning rods, pegs, notebook, pencil and calculator; hand tools such as rakes, shovels, spades, rollers, wheelbarrows, hoses and hose fittings; machinery such as bobcats, ditch witches, backhoes, front-end loaders, graders, mechanical rollers, trucks, hydraulic trailers, and tractors and 3-point linkage equipment, pumps and pump fittings, and fitting and welding tools appropriate to the irrigation system.

What **irrigation systems** may apply to this standard?

Irrigation systems may include mains pressure, low pressure, below ground, above ground, spray systems, dripper, and capillary systems.

What **enterprise work procedures** may apply to this standard?

Work procedures may include supervisors oral or written instructions, installation program, enterprise standard operating procedures (SOPs), specifications, routine maintenance schedules, work notes, product labels and Material Safety Data Sheets (MSDS), manufacturers service specifications and operators manuals, waste disposal, recycling and re-use guidelines, and OHS procedures.

What **irrigation equipment** may apply to this standard?

Irrigation equipment may include pumps, motors, delivery equipment, sprays, system controllers, injectors, tensiometers, probe tubes, flow meter, pressure gauge, computer and/or other scheduling devices, recycling equipment, and spray equipment.

What OHS hazards may be associated with the installation of drainage systems?	Hazards may include disturbance or interruption of services, solar radiation, dust, noise, soil and waterborne micro-organisms, chemicals and hazardous substances, manual handling, moving vehicles, machinery and machinery parts, uneven surfaces and flying and falling objects.
What safety equipment may be required?	Safety equipment may include signage and barriers.
What PPE may be required to install drainage systems?	PPE may include hat, boots, overalls, gloves, goggles, respirator or face mask, face guard, hearing protection, sunscreen lotion and hard hat.
What types of water supplies are covered by this standard?	Water supplies may be underground, mains or surface storage including fixtures such as dams, bores, windmills, tanks, and channels.
What OHS requirements may be relevant to this standard?	OHS requirements may include identifying hazards, assessing risks and implementing controls, cleaning, maintaining and storing tools, equipment and machinery; appropriate use of PPE including sun protection, safe operation of tools, equipment and machinery, safe handling, use and storage of chemicals and hazardous substances, correct manual handling, basic first aid, personal hygiene and reporting problems to supervisors.
How may a clean and safe work area be maintained?	Tasks may include disabling unused tools, equipment and machinery and storing neatly out of the way of installation activities, safely storing materials on site, using signage and safety barriers during and removing after construction activities are completed, and swiftly and efficiently removing and processing debris and waste from the work area.
What waste material may be relevant to this standard?	Waste material may include unused construction and excavated materials, and plant debris, litter and broken components. Plant-based material may be mulched or composted, plastic, metal, paper-based materials may be recycled, re-used, returned to the manufacturer or disposed of according

to enterprise work procedures.

Waste may be removed to designated areas for recycling, reuse, return to the manufacturer or disposal.

What **testing equipment** may be relevant to this standard?

Testing equipment may include pressure gauges and flow meters.

For more information on contexts, environmental implications and variables for training and assessment, refer to the Sector Booklet.

Unit Sector(s)

Not applicable.