Australian Government

Department of Education, Employment and Workplace Relations

RTE3603A Install drainage systems

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This competency standard covers the process of installing surface and/or subsurface drainage systems. It requires the ability to interpret site specifications and drainage system plans, set out drainage system works, measure materials, level and align earthworks, and use relevant equipment, tools and machinery. Installing surface and/or subsurface drainage systems requires knowledge of the purposes of drainage systems and the application of drainage system plans to the physical situation, drain types, components and installation techniques, 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 Prepare for drainage system installation activities	1.1 The construction site for the **drainage system** and construction method is identified according to the site and drainage system plans and **enterprise work procedures**.
	1.2 **Materials, tools, equipment and machinery** are selected according to drainage system design requirements and enterprise work procedures.
	1.3 Pre-operational and safety checks are carried out on tools, equipment and machinery according to manufacturers specifications and enterprise work procedures.
	1.4 **OHS hazards** are identified, risks assessed, controls implemented and reported to the supervisor.
	1.5 Suitable **safety** and **personal protective equipment (PPE)** are selected, used and maintained.
2 Co-ordinate installation work	2.1 Enterprise work team, contractors and design consultants are identified and work tasks are co-ordinated in a sequential, timely and effective manner in consultation with the supervisor.
	2.2 Installation of the drainage system is undertaken according to **OHS requirements** and with due consideration of the **environmental implications** and relevant legislation and regulations.
	2.3 A **clean and safe work area** is maintained throughout and on completion of work.
3 Prepare the site for installation of drainage system	3.1 Symbols and terminology are interpreted to ensure the concept of the drainage system plan is clearly understood according to industry practice.
	3.2 Layout of **services** is identified, depths checked against the site or drainage system plan and discrepancies are reported to the supervisor and the relevant authority.

		3.3 Survey, measurement and marking out of the site and confirmation of soil characteristics relevant to the planned drainage system are completed according to plan specifications and enterprise work procedures.
4	Undertake installation of drainage system	4.1 Excavations are completed without damage to services, facilities, features and established plants according to plan specifications and enterprise work procedures.
		4.2 The drainage system is installed according to the drainage system plan and enterprise work procedures.
		4.3 The drainage system is tested for configuration, flow rates and capacity consistent with the drainage system plan and according to enterprise work procedures.
		4.4 The supervisor is consulted and remedial action is taken when the drainage system operation does not meet the plan specifications.
5	Complete installation of drainage system	5.1 Earthworks are finished off to the plan specifications and enterprise work procedures.
		5.2 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.
		5.3 Tools, equipment and machinery are cleaned, maintained and stored according to enterprise work procedures.
		5.4 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 a drainage system requires evidence that a person is able to prepare for installation activities, set out, survey, test and excavate the installation site, install and test the drainage system, and clean up the installation site.

The skills and knowledge required to install a drainage system must be **transferable** to a different work environment. For example, this could include different types of drainage systems, 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:

the purposes of drainage systems and the application of drainage system plans to the physical situation

drain types, components and installation techniques

environmental impacts of irrigation and drainage 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:

communicate with work team members, supervisors, contractors and consultants

interpret site specifications and drainage system plans

set out drainage system works

measure materials

level and align earthworks

use equipment, tools and machinery

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 drainage 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 drainage installation.
6. How can **problem-solving skills** (**1**) be applied?	Dealing with problems imposed by site characteristics or when the 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 **drainage systems** may apply to this standard?	Drainage systems may include surface drains, culverts, mole drains, sand slit, sub-surface traps, pit and trap systems, dune and swale systems, reed beds, water-recycling pumps and baffles.
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 **materials** may be required to install a drainage system?	Materials may include drainage system components, glues, welds, construction materials for drain surfaces and slopes, 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 drainage system.
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 **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.
What **environmental implications** may be associated with the installation of drainage systems?	Restructuring and creation of slopes for drainage purposes may affect the run-off and flow rates of stormwater and excess irrigation water from the site, which may have beneficial or adverse impacts on the external environment. Drainage systems may also enable the enterprise to store and recycle storm and grey water for re-use within the enterprise, thereby reducing detrimental impacts on the external environment such as salinisation, waterlogging and erosion.
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 construction and removing them after activities are completed, and swiftly and efficiently removing and processing debris and waste from the work area.
What **services** may need to be located?	Services may include water supply, gas, power (electricity), telecommunications, irrigation, stormwater and drainage.

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.

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

Unit Sector(s)

Not applicable.