



Australian Government

AHCDRG501 Design drainage systems

Release: 1

AHCDRG501 Design drainage systems

Modification History

Release	TP Version	Comment
1	AHCv1.0	Initial release

Application

This unit of competency describes the skills and knowledge required to identify design requirements, determining the specifications for drainage systems and designing the drainage system.

It applies to individuals who analyse information and exercise judgement to complete a range of skilled activities and demonstrate deep knowledge in a specific technical area. They have accountability for the work of others and analyse, design and communicate solutions to a range of complex problems. All work is carried out to comply with workplace procedures.

No occupational licensing, legislative or certification requirements are known to apply to this unit at the time of publication.

Pre-requisite Unit

Nil.

Unit Sector

Drainage (DRG)

Elements and Performance Criteria

Element	Performance criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Determine design requirements	1.1 Determine water transfer, recharge, reuse and harvesting system needs 1.2 Describe processes of collecting, disposing and storing drainage water to avoid degrading water quality 1.3 Investigate regional geology and geography to predict drainage parameters 1.4 Apply hydrological calculations to predict volumes and rates of

Element	Performance criteria
	surface run-off 1.5 Conduct site investigations to assess depth of clay, depth of ground water, soil and water salinity, and structural or chemical impediments so as to determine the most cost effective drainage system 1.6 Document predictions of leaching fractions and salt movements, and develop soil amelioration and drainage management plans 1.7 Determine the need for leachate interception and dewatering system and if required prepare construction specification for interception and collection, disposal, reuse or recycle 1.8 Confirm drains and structures are capable of carrying the design water volumes and intensities according to enterprise standards 1.9 Identify construction specifications required to make drainage systems in accordance with environmental and work health and safety requirements 1.10 Identify and protect environmentally sensitive areas according to local, state and federal legislation and regulations
2. Design a drainage system	2.1 Select systems, including relevant equipment, to move water efficiently to water storage or treatment and at the flow and pressure required in design specifications 2.2 Select system combinations that are efficient, reliable, functional, serviceable and flexible for the intended application 2.3 Determine energy requirements and check layout of electricity lines with local authority if electrical pumps and motors are used in the system 2.4 Select structures, pipes, valves and accessories and integrate into a functional system that can be monitored and maintained 2.5 Define the work required to make suitable drainage systems available to the enterprise in the design specifications 2.6 Confirm power supply design specification with power authorities if electrical pumps and motors are used in the system 2.7 Minimise damage from drainage system issues 2.8 Design output is checked by an appropriately experienced and qualified person
3. Determine capital expense budget	3.1 Estimate materials required from plans and specifications 3.2 Estimate labour requirements based on documented work schedule with reasonable allowance for variances in work schedules 3.3 Base costing for each component on quoted information from suppliers, or sound analysis of individual elements 3.4 Document design calculations, performance indicators and decisions and relevant information in plans, specifications and

Element	Performance criteria
	manuals 3.5 Budget output is checked by an appropriately experienced and qualified person
4. Determine operating expense budget	4.1 Optimise the relationship between capital and operational costs including a comparison of energy sources 4.2 Collate all operating expense applicable to the completed drainage system and calculate an operating expense budget

Foundation Skills

Foundation Skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Unit Mapping Information

This unit is equivalent to AHCDRG501A Design drainage systems.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72>

Assessment Requirements for AHCDRG501 Design drainage systems

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Performance Evidence

The candidate must be assessed on their ability to integrate and apply the performance requirements of this unit in a workplace setting. Performance must be demonstrated consistently over time and in a suitable range of contexts.

The candidate must provide evidence that they can:

- assess the requirements for pumping capacity in a drainage system and power requirements
- complete hydrological calculations
- develop budgets
- develop specifications for water transfer, recharge, reuse and harvesting systems
- identify adverse environmental impacts of drainage and appropriate remedial action
- identify design requirements
- identify performance indicators for the drainage system
- predict volumes and rates of surface run-off and system leakage

Knowledge Evidence

The candidate must demonstrate knowledge of:

- principles and practices of drainage design
 - budgeting, contractual development and obligations
 - developments in drainage technology
 - cost/benefit analysis
 - leachate interception and dewatering systems
 - leaching fractions and salt movements prediction
 - monitoring systems
 - the design processes
 - water transfer, recharge, reuse and harvesting systems
 - workplace health and safety and environmental protection legislation

Assessment Conditions

Assessors must satisfy current standards for RTOs.

Links

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