



Australian Government

Department of Education, Employment and Workplace Relations

ACMCAS403A Design, construct and maintain aquascapes

Revision Number: 1

ACMCAS403A Design, construct and maintain aquascapes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the process of designing, constructing and maintaining aquascapes for a range of aquaria, including ponds, waterfalls and water features. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
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Application of the Unit

Application of the unit	This unit is applicable to those working in the companion animal industry sector where aquascapes are designed, constructed and maintained for clients to house aquatic animals, such as fish, amphibians and some reptiles. In addition to legal and ethical responsibilities, all units of competency in the ACM10 Animal Care and Management Training Package have the requirement for animals to be handled gently and calmly. The individual is required to exhibit appropriate care for animals so that stress and discomfort is minimised.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify client needs	1.1. Types of aquaria and proposed species to be housed are established. 1.2. Proposed location and climatic conditions affecting design are identified. 1.3. Special installation and/or maintenance requirements are confirmed with client. 1.4. Advice on suitability of species and location is provided to client.
2. Prepare aquascape design	2.1. Appropriate heating, lighting and filtration requirements are identified and selected according to the design parameters. 2.2. Plants, features and substrate materials are selected according to the design parameters. 2.3. Aquascape design is prepared in accordance with industry best practice and client needs.
3. Establish aquascape	3.1. Tools, equipment and materials appropriate to the job and occupational health and safety (OHS) requirements are selected and used, including personal protective equipment. 3.2. Substrate is established, using appropriate materials in accordance with the design. 3.3. Aquascape features and plants are installed and secured in accordance with the design and industry standards. 3.4. Installation, testing and commissioning of lighting, heating and filtration systems are conducted in accordance with manufacturers' requirements. 3.5. Ongoing maintenance requirements are discussed with client in preparation for handover. 3.6. Waste from construction and installation is collected, treated and disposed of or recycled in accordance with organisational and environmental requirements. 3.7. Worksite, tools and equipment are cleaned, returned to operating order and stored according to OHS and organisational requirements.
4. Maintain aquascapes	4.1. Water sampling and testing are conducted in accordance with species type and environmental requirements. 4.2. Isolation of electrical equipment prior to maintenance is proven using appropriate techniques,

ELEMENT	PERFORMANCE CRITERIA
	procedures and equipment. 4.3. <i>Service and repairs</i> are carried out according to manufacturers' specifications and organisational requirements. 4.4. Health of aquaria and plants is monitored and reported. 4.5. <i>Complex faults</i> are identified and referred for specialist advice and/or remedial action in accordance with organisational requirements. 4.6. Accurate records are maintained in accordance with industry requirements and organisational policies and procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- adjust water quality and conditions to suit aquascape and species requirements
- collect and test water samples using appropriate equipment correctly
- construct advanced aquascapes
- employ safe and environmentally responsible organisational systems and procedures when working with and handling aquatic animals
- maintain the highest standards of hygiene and infection control at all times to reduce the risk of infection and cross-infection
- maintain records and write workplace documents
- recognise behaviours and conditions that could be indicative of possible aquatic animal health problems
- literacy skills to read and follow organisation policies and procedures, including OHS and waste management procedures and other organisational policies and procedures; follow sequenced written instructions including treatment instructions; record accurately and legibly information collected; and select and apply procedures to a range of defined tasks
- oral communication skills/language to fulfil the job role as specified by the organisation, including questioning techniques, active listening and asking for clarification
- numeracy skills to estimate, calculate and record routine and more complex workplace measures and data
- interpersonal skills to work with others and relate to people from a range of cultural, social and religious backgrounds and with a range of physical and mental abilities
- problem-solving skills to use available resources and prioritise daily tasks
- use safe manual handling techniques and/or equipment
- use safe waste handling and disposal procedures.

Required knowledge

- aquatic animal biology related to the care and wellbeing of commonly held species
- aquaria water chemistry including water quality adjustment procedures and chemicals used to correct water conditions of aquascapes
- appropriate aquaria heating, lighting and filtration systems
- environmental requirements for commonly held species
- general maintenance and cleaning of aquaria
- load-bearing capacity of architectural structures
- normal and abnormal behaviour of aquatic species
- organisation policies, procedures and requirements, including OHS and emergency

REQUIRED SKILLS AND KNOWLEDGE

- procedures
- plants, features and substrate materials suitable for aquascapes
- principles of animal ethics and welfare
- relevant OHS and animal welfare legislative requirements and codes of practice, including environmental regulations
- relevant recordkeeping systems
- safe aquatic animal handling techniques and procedures
- safe work practices
- signs of common aquatic animal diseases and parasitic infestations and their transmission between aquatic animals
- water sampling, testing and analysis procedures and techniques
- ideal water conditions and quality for a range of aquatic animals, including Ph, nitrate, nitrite, ammonia, salinity, calcium and hardness
- workplace hygiene standards, disinfectants, cleaning agents, cleaning techniques and cleaning equipment and materials
- zoonotic diseases associated with animal care and methods of prevention and control.

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The evidence required to demonstrate competency in this unit must be relevant to workplace operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit. Assessors should ensure that candidates can:

- identify client's needs and produce a range of aquascape designs that provides a suitable environment for the selected species and desired features
- construct aquascapes in accordance with OHS and organisation policies and procedures
- identify cause and effect of environmental problems and implement corrective action
- apply correct cleaning and maintenance techniques
- maintain records and required documentation.

The skills and knowledge required to design, construct and maintain aquascapes must be transferable to a range of work environments and contexts and include the ability to deal with unplanned events.

Context of and specific resources for assessment

Assessment of this unit is to be practical in nature and will be most appropriately assessed in companion animal workplaces that design, construct and maintain aquascapes for clients or in a situation that reproduces normal work conditions.

There must be access to a range of aquatic species or breeds as well as the relevant information, materials and documentation.

Method of assessment

To ensure consistency in one's performance, competency should be demonstrated, to industry defined standards, on more than one occasion over a period of time in order to cover a variety of circumstances, cases and responsibilities, and over a number of assessment

EVIDENCE GUIDE	
	activities. The assessment strategies must include practical skills assessment. Suggested strategies for this unit are: • written and/or oral assessment of candidate's required knowledge • observed, documented and firsthand testimonial evidence of candidate's application of practical tasks • simulation exercises that reproduce normal work conditions • workplace documentation (e.g. aquascape design plans) • third-party evidence • portfolio. This unit may be assessed in a holistic way with other units of competency relevant to the industry sector, workplace and job role.
Guidance information for assessment	Assessment methods should reflect workplace demands (e.g. literacy and numeracy demands) and the needs of particular target groups (e.g. people with disabilities, Aboriginal and Torres Strait Islander people, women, people with a language background other than English, youth and people from low socioeconomic backgrounds).

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.	
<i>Aquaria</i> may include:	fresh and marine aquaria, pools and water features.
<i>Aquascape design</i> may include:	- air pumps and water pumps - lighting - mechanical and electrical devices - natural and artificial features - substrate material.
<i>Heating, lighting and filtration equipment</i> used in an aquascape may include:	- advanced systems, including ultraviolet (UV) and ozone - energy requirements of pumping system and its suitability for aquaria selected - heating systems, including gas, electric and solar - infrastructure, including seepage pits and permaculture considerations - lighting systems, including UV, fluorescent, incandescent, metal halide and mercury vapour - mechanical, chemical and biological filtration systems.
<i>Plants and features</i> may include:	natural and artificial plants.
<i>Tools and equipment</i> may include:	- surveying and levelling equipment: - levels and pegs - notebook, pencil and calculator - tools: - hammers - hose and hose fittings - rakes - rollers - shovels and spades - wheelbarrows
<i>OHS</i> hazards associated with the installation and maintenance of	- disturbance of utilities and services - hazards from the use of hired equipment

RANGE STATEMENT	
aquascape systems may include:	• moving machinery, powered equipment and hand tools • solar radiation, dust and noise • uneven surfaces and holes • working in confined spaces and water hazards.
Personal protective equipment may include:	• animal handling gauntlets • gloves • overalls • hard hats • hearing or eye protection • respirators or face masks • sun hats and sunscreen lotion • work boots.
Water sampling and testing may include:	• tests for pH, salinity, chlorine, electro-conductivity, chloride, calcium carbonate, iron, turbidity and biological oxygen demand.
Service and repairs may include:	• cleaning a range of aquaria surfaces, including glass, concrete and plastic • maintaining a range of filtration, pumping and heating systems • maintaining seepage pits and permaculture environments • salinity control, pH correction and chlorine neutralisers • water stabilizers.
Complex faults may include:	• problems that are beyond the scope of service personnel and require the services of a licensed electrical tradesperson: • construction issues • power supply issues • plumbing issues • water quality issues.

Unit Sector(s)

Unit sector	Companion animal services
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		