



Australian Government

AHCPER326 Install and maintain permaculture water management systems

Release: 1

AHCPER326 Install and maintain permaculture water management systems

Modification History

Release	Comments
Release 1	This version released with AHC Agriculture, Horticulture and Conservation and Land Management Training Package Version 9.0.

Application

This unit provides the skills and knowledge to install and maintain permaculture water capture, storage and distribution systems for a permaculture site.

The unit applies to individuals who work under broad direction and take responsibility for their own work, including limited responsibility for the work of others. They use discretion and judgement in the selection and use of available resources, and complete routine activities.

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

Pre-requisite Unit

Nil

Unit Sector

Permaculture (PER)

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Plan the installation of water management system	1.1 Identify site and water management components from permaculture water management plan 1.2 Estimate water demand for permaculture system and verify against water management plan specifications 1.3 Check source of water to ensure compatibility with system design and specifications

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.4 Verify compliance with legislative and regulatory requirements specified in water management plan 1.5 Report or rectify discrepancies in water system design according to workplace procedures 1.6 Identify hazards, assess risks and implement controls according to workplace health and safety procedures 1.7 Identify above and below ground services and implement controls to protect services
2. Prepare for water management system installation	2.1 Prepare site for installation works according to workplace health and safety procedures 2.2 Determine water management system components from water management design 2.3 Identify, select and prepare materials required to construct water management system according to design 2.4 Identify, select and prepare tools, equipment and machinery according to manufacturer instructions 2.5 Survey site and mark out location for water system components according to plans 2.6 Identify and locate on-site impediments to excavation works 2.7 Schedule and monitor work team according to planned activities
3. Install permaculture water systems	3.1 Conduct excavation works according to water management plan specifications 3.2 Install water capture system according to water management plan 3.3 Install water storage system according to water management plan 3.4 Install water distribution system according to water management plan 3.5 Install water treatment systems according to water management plan 3.6 Ensure installation works comply with legislative and regulatory requirements 3.7 Finalise site earthworks according to specifications
4. Complete installation work	4.1 Check configuration and capacity of system against plans and specification, and report or rectify discrepancies 4.2 Clean and restore site and dispose of waste according to workplace

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	environmental procedures 4.3 Clean, maintain and store tools, equipment and machinery
5. Commission permaculture water systems	5.1 Test water distribution system for adequate flow and pressure according to system design specification and manufacturer instructions 5.2 Identify and rectify operating faults according to manufacturer instructions 5.3 Test, calibrate and monitor equipment according to manufacturer specifications 5.4 Record or report work outcomes according to workplace procedures
6. Monitor and maintain permaculture water systems	6.1 Check permaculture water systems and monitor for optimum performance according to maintenance schedule 6.2 Repair and maintain permaculture water systems where optimum performance is lacking 6.3 Maintain water treatment, erosion and sediment controls according to system design and installed components

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential for performance in this unit of competency but are not explicit in the performance criteria.

Skill	Description
Reading	Interpret water management plans, specifications and other documentation, and consolidate information to determine requirements for installation and management of water system
Numeracy	- Take measurements of water usage and calculate estimates of water storage requirements - Make calculations appropriate for measuring and estimating materials for construction of water storage and distribution, including pipe sizing, flow rates and pressures
Oral communication	Clearly explain detailed information on installation of water system design to work team using appropriate language, tone and

Skill	Description
	pace

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
AHCPER326 Install and maintain permaculture water management systems	AHCPER309 Install and maintain permaculture water systems	Title change to clarify intent Changes to Application for clarity Restructured Elements and Performance Criteria and removed irrigation system installation to better reflect water management outcomes Changes to Performance Evidence, Knowledge Evidence and Assessment Conditions for clarity Addition of Foundation Skills	Not equivalent

Links

Companion Volumes, including Implementation Guides, are available at VETNet: -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72>

Assessment Requirements for AHCPER326 Install and maintain permaculture water management systems

Modification History

Release	Comments
Release 1	This version released with AHC Agriculture, Horticulture and Conservation and Land Management Training Package Version 9.0.

Performance Evidence

An individual demonstrating competency must satisfy all of the elements and performance criteria in this unit.

There must be evidence that the individual has:

- organised resources for installation work
- set out and prepared site
- installed permaculture water systems materials and components, excluding works requiring a licensed plumber
- installed a water capture system, which must include any one of the following:
 - swales
 - contour banks or terraces
 - mulch-pit paths
 - diversion channels or other passive installation
 - roof and gutter system
- installed and prepared access to a water storage system, which must include any one of the following:
 - dam
 - well or ground water
 - water tank or bladder
- installed and prepared access to a water distribution system, integrated with the storage system, which must include any one of the following:
 - pump
 - gravity or syphon system
 - channels
 - bores
 - hand distribution system
- installed water treatment system according to permaculture water system design

- adjusted water distribution system to deliver water according to system specifications and permaculture plan
- commissioned a permaculture water system
- monitored and maintained permaculture water systems.

Knowledge Evidence

An individual must be able to demonstrate the knowledge required to perform the tasks outlined in the elements and performance criteria of this unit. This includes knowledge of:

- permaculture practices regarding water, including natural flows, rainwater and wastewater, storage, movement and retention of water in the system
- permaculture water capture systems and their access or installation, including:
 - natural water supply, including rivers, streams, ground water and springs
 - swales
 - contour banks
 - terraces
 - mulch-pit paths
 - diversion channels and other passive installations
 - low pressure or gravity systems
 - guttering and first-flush diversion system
 - wicking beds
- permaculture water storage systems, including:
 - town mains water supply
 - water table and wells
 - dams
 - tanks and bladders
- permaculture water distribution systems:
 - pumps and pumping
 - gravity and syphon systems
 - above and below ground pipes
 - channels
 - bores
 - windmill
 - mains pressure
- contours and influence on water flow, percolation and erosion
- installation methods and techniques for permaculture water storage systems
- operation of pumps and water flow rates, including friction losses in pipes
- behaviour of water on varying terrain and soil types
- water quality and water filtration techniques, including:
 - coarse contaminants and debris
 - biological contaminants

- chemical contaminants
- basic desalination techniques
- calculations for installing permaculture water systems
- soil characteristics and water retention
- water legislative and regulatory requirements, including:
 - accessing natural water systems
 - connecting to mains water
 - installing dams or diverting water in catchments
 - water use and conservation
- local government and planning acts and codes, including:
 - building regulations
 - installing tanks
 - licencing for plumbing installations to town water
- environmental and biosecurity legislation and regulations, including:
 - permits for pruning or removal of large trees
 - earth movement and digging guidelines and legislation
 - land restoration codes
 - soil movement regulations
 - habitat and wildlife protection legislation
- workplace health and safety, including:
 - licences for operating specialised machinery
 - setting up traffic and pedestrian barriers
 - overhead services
 - digging near services, including phone, gas, power, water, sewerage and drains.

Assessment Conditions

Assessment of the skills in this unit of competency must take place under the following conditions:

- physical conditions:
 - skills must be demonstrated on a permaculture site or an environment that accurately represents workplace conditions
- resources, equipment and materials:
 - tools, equipment and machinery for permaculture water system installation and maintenance
 - personal protective equipment
 - materials and consumables for construction and installation works
- specifications:
 - workplace procedures
 - manufacturer operating instructions for equipment and machinery
 - installation instructions for components

- plan and design specifications
- specific legislation and regulations
- relationships:
 - stakeholders
 - work team.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

Companion Volumes, including Implementation Guides, are available at VETNet: -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72>