



Australian Government

CPCCWP5002 Design external above ground waterproofing

Release: 1

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Modification History

- Release 1 This version first released with CPC Construction, Plumbing and Services Training Package Release 9.0.
Newly created unit.

Application

This unit of competency specifies the skills and knowledge required to design external above ground waterproofing systems for buildings and structures.

The unit applies to Class 1 and 10 Buildings, and Class 2 to 9 Buildings.

The unit includes planning and preparing to design waterproofing, analysing risk, designing waterproofing systems, and evaluating the design of the waterproofing system solution.

The unit is suitable for builders, building designers, architects, building surveyors, waterproofing design specialists and consultants, engineers and other design specialists.

Licensing, legislative, regulatory or certification requirements may apply to this unit. Relevant work health and safety (WHS) state and territory regulatory authorities should be consulted to confirm jurisdictional requirements.

Pre-requisite Unit

Nil.

Unit Sector

Building and Construction

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe what needs to be done to demonstrate achievement of the element.				
1. Plan and prepare.	<table><tr><td>1.1</td><td>Identify above ground areas to be waterproofed and determine external site conditions, waterproofing brief, challenges, waterproofing system design requirements, including finishes in consultation with stakeholder needs and drawings and specifications.</td></tr><tr><td>1.2</td><td>Assess types of construction and their permeability to water and moisture, including concrete, masonry and</td></tr></table>	1.1	Identify above ground areas to be waterproofed and determine external site conditions, waterproofing brief, challenges, waterproofing system design requirements, including finishes in consultation with stakeholder needs and drawings and specifications.	1.2	Assess types of construction and their permeability to water and moisture, including concrete, masonry and
1.1	Identify above ground areas to be waterproofed and determine external site conditions, waterproofing brief, challenges, waterproofing system design requirements, including finishes in consultation with stakeholder needs and drawings and specifications.				
1.2	Assess types of construction and their permeability to water and moisture, including concrete, masonry and				

- framing to be managed and identify potential water ingress points for the construction.
- 1.3 Identify site conditions, including wind speed, climate zone, water catchment area, and outfalls and overflow effects to adjoining buildings and occupancies below.
 - 1.4 Analyse areas impacted by waterproofing system failure for their intended use.
 - 1.5 Determine the management of surface water movement to a drainage point and sub-surface water materials by capillarity.
2. Carry out risk analysis.
- 2.1 Assess risks to external wet areas for the purposes of providing designed systems, including service conditions, wind speed, climate zone, water catchment area, and outfall capacities and overflow effects.
 - 2.2 Assess risk of interstitial condensation within building elements as part of design.
 - 2.3 Determine ultraviolet (UV) exposure of materials and membranes.
 - 2.4 Determine effects of water and moisture on building elements.
 - 2.5 Assess consequence of defects in the waterproofing systems on identified impacted areas.
 - 2.6 Assess external wet area for provision of the proposed design of waterproofing.
3. Carry out waterproofing design.
- 3.1 Identify structural requirements, including wind speeds and climate zone, and the effects on the building envelope and waterproofing systems.
 - 3.2 Develop design requirements for level of risk to moisture and water exposure.
 - 3.3 Identify above ground waterproofing systems available to suit the design that are appropriate for the conditions.
 - 3.4 Analyse and select waterproofing systems suitable for and compatible with site conditions and substrate.

- 3.5 Provide a scope for the installation of the waterproofing system, including substrate considerations and compatibility with finishes, in accordance with principal design, stakeholder needs, compliance with relevant regulations, National Construction Code (NCC) performance requirements, Australian Standards, work health and safety (WHS), environmental requirements, manufacturers' specifications, and drawings and specifications.
 - 3.6 Provide quality assurance inspection protocols for waterproofing system installation, including substrate assessment for suitability, compliance of membrane installation with manufacturers' specifications, completion inspection processes, and repair and maintenance plan.
- 4. Evaluate waterproofing design.
 - 4.1 Assess effectiveness of waterproofing system design for suitability with site conditions and consequential affects where water bears at the maximum designed level, risk of moisture and condensation is present, defects are present in the waterproofing system and defects impact the usage of adjoining areas.
 - 4.2 Review repair and maintenance plan of waterproofing system.
 - 4.3 Record and report on compliant waterproofing design solutions to stakeholders in accordance with service conditions and manufacturers' specifications, Australian Standards, and NCC performance requirements.

Foundation Skills

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

Unit Mapping Information

No equivalent unit.

Links

Companion volumes to this training package are available at the VETNet website -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad>

Assessment Requirements for CPCCWP5002 Design external above ground waterproofing

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Performance Evidence

A person demonstrating competency in this unit must satisfy the requirements of the elements, performance criteria and foundation skills of this unit, in addition to the specific performance and knowledge evidence described below.

Candidates must:

- develop two (2) waterproofing designs.

In doing so, the candidate must:

- develop one (1) design of a roof top podium deck which must include:
 - a minimum 100 square meters
 - details of construction joints
 - an integrated planter box and drainage
 - penetration for services and fixings
 - cross-section design of the complete system, including:
 - strata layers
 - provision of falls
 - threshold detail
 - drainage termination detail
 - compatible finishes for intended use
- develop one (1) design for multi-level external decks which must include:
 - a semi-enclosed deck area
 - falls provided to multiple drainage out falls
 - where catchment areas and overflow affect lower bound levels requiring overflow provisions
 - cross-section design of the complete system, including:
 - strata layers
 - provision of falls
 - threshold detail
 - drainage termination detail

- compatible finishes for intended use
- provide evidence of compliance with design requirement with National Construction Code (NCC) performance requirements

The evidence of compliance report must detail:

- class of building
- wind speed
- climate zone
- water catchment area and outfalls
- overflow effects to adjoining and occupancies below
- compatibility chain of materials specified, including finishes
- provide a risk assessment report for the two required designs detailing:
 - waterproofing system solution for the condition
 - management of potential defects in the waterproofing system
 - consequences of water entering the relevant space
 - feasibility of repair of the waterproofing system.

Knowledge Evidence

To be competent in this unit, a candidate must demonstrate knowledge of:

- key principles of water movement, drainage and hydrostatic pressure/capillarity
- various types of construction and their permeability to water and moisture, including:
 - concrete
 - masonry
 - framed
- stakeholders:
 - architect
 - engineer
 - builder
 - building owner
 - consumer
 - design team
 - construction team
 - certifier
 - building surveyor
 - regulators
- use of space
- fit for purpose water proofing systems
- methods of damp-proofing and external above ground waterproofing appropriate to construction type
- compliance with required testing standards

- requirements of building codes and Australian Standards
- key design philosophies for above ground waterproofing, including:
 - wind loads and the effects on the building envelope and waterproofing systems
 - effects of loads on a material, deformation, stress/strain, especially flexural, compressive and tensile stresses
 - incorporation of acoustic systems
- energy efficiency, including:
 - insulated systems
 - green roofs
 - ventilation requirements in a building
- above ground waterproofing systems available and be able to select and design the appropriate system for the conditions, including:
 - bonded and unbonded sheet membranes
 - liquid applied membranes
 - drainage cells
 - isolation systems
 - sealants
- input and expertise of allied consultants
- compliant processes installation of specified waterproofing systems
- methods for calculating the quantities of components required to complete the waterproofing works specified
- advantages and disadvantages of the different systems, including:
 - combinations of different systems and their limitations
 - maintenance and aftercare requirements
 - the form and feasibility of remedial work
 - impact of different systems
- how membranes work
- building elements and integration, including:
 - product properties and compatibility with building elements
 - installation methods and practices
 - stages of installation and inspection benchmarks
 - waterproofing systems design and relationship with building design
 - permanent formwork
- a range of finishing systems, including decorative finishes
- maintenance of water management systems (drainage systems, sumps, pumps and channels)
- implications of dampness affecting timber in buildings, including:
 - identification of timbers that have been affected by water, decay fungi or wood consuming insects
 - providing suitable advice on the need for specialist assessment
- implications of dampness affecting structural steel in buildings

- properties of waterproofing systems available:
 - substrate assessment and preparation
 - combining components to form a system
 - component compatibility in a combined system
 - component properties for site conditions
- component installation practices
- system analysis for effectiveness
- assessment of complex water and moisture ingress situations:
 - moisture and water remedial system relationships
 - combination of systems to form multiple barriers
- environmental considerations and management
- relevant regulations and legislation.

Assessment Conditions

Assessors must meet the requirements for assessors contained in the Standards for Registered Training Organisations.

Assessment of performance must be undertaken in the workplace or simulated workplace environment. A simulated workplace is one that fully replicates the resources, environment and any time and productivity pressures that exist in the actual workplace, and which meets industry standards for safety and environmental practices.

Candidates must have access to:

- relevant task or design specifications
- Australian Standards, relevant building legislation, industry codes, NCC and requirements of workplace policies and procedures as required by Commonwealth, state and territory regulators
- relevant environmental requirements.

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