



Australian Government

CPCSUS4002 Use building science principles to construct energy efficient buildings

Release: 2

CPCSUS4002 Use building science principles to construct energy efficient buildings

Modification History

Release 2 Updated reference to general construction induction training program.

Release 1 This version first released with CPC Construction, Plumbing and Services Training Package Release 5.0.

Supersedes and equivalent to CPCSUS4002A Use building science principles to construct energy efficient buildings. Updated to meet the Standards for Training Packages 2012.

Application

This unit of competency specifies the skills and knowledge required to incorporate building science principles into the construction of energy efficient buildings. It includes the ability to research, use constructive thinking and problem-solving processes to identify appropriate sustainable solutions.

This unit of competency applies to those who apply building science principles to construction of energy efficient residential and commercial buildings.

This unit of competency is suitable for those using specialised knowledge to complete routine and non-routine tasks and using their own judgement to deal with predictable and sometimes unpredictable energy efficient building problems.

Completion of the general construction induction training program specified by the model Code of Practice for Construction Work is required for any person who is to carry out construction work. Achievement of *CPCWHS1001 Prepare to work safely in the construction industry* meets this requirement.

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

Pre-requisite Unit

Nil.

Unit Sector

Sustainability

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe what needs to be done to demonstrate achievement of the element.

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|---|--|
| 1 Determine the building envelope expectations. | 1.1 Identify type of use and energy efficiency expectations of the building. |
| | 1.2 Identify risks associated with occupants' indoor activities and health and safety considerations. |
| | 1.3 Determine environmental and climatic conditions that impact the resilience of building materials. |
| | 1.4 Identify construction methods that factor in durability of materials. |
| | 1.5 Consult relevant legislation, standards, regulations and codes to identify minimum energy efficient standards to be met. |
| | 1.6 Consult relevant domestic and international codes, standards and examples of best practice that meet or exceed current energy efficient standards. |
| 2 Assess energy efficiency construction. | 2.1 Research building science principles supporting energy efficiency. |
| | 2.2 Review embodied energy of the specified products or materials to evaluate the energy efficiency. |
| | 2.3 Research heating, ventilation and air conditioning (HVAC) systems to identify levels of energy efficiency, ventilation and indoor air quality. |
| | 2.4 Review mechanical ventilation systems and equipment to aid air flows for appropriateness and operational costs. |
| | 2.5 Research and identify durability and appropriateness of moisture and vapour barriers to gain high levels of energy efficiency. |
| 3 Decide on method of construction. | 3.1 Identify site location and building position to maximise energy efficiency relating to environmental factors, climatic conditions and use of building. |

- 3.2 Identify and assess energy efficiency of thermal energy, heating and cooling, air and moisture flows throughout the building.
- 3.3 Develop strategies to minimising unwanted air leakages.
- 3.4 Evaluate and select mechanical ventilation systems and equipment for appropriateness to the site and operational costs.
- 3.5 Evaluate and select materials for interior and exterior barriers for energy efficiency, durability and appropriateness for building site climate.

Foundation Skills

As well as the foundation skills explicit in the performance criteria of this unit, candidates require:

- technology skills to:
 - use digital tools and devices to communicate and collaborate effectively with others
 - use technology and programs to access and extract information and develop relevant documentation.

Unit Mapping Information

Supersedes and is equivalent to CPCSUS4002A Use building science principles to construct energy efficient buildings.

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 CPCSUS4002 Use building science principles to construct energy efficient buildings

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Performance Evidence

To demonstrate competency, a candidate must meet the elements and performance criteria of this unit by using building science principles in the development of recommendations for the use of energy efficient materials, products and construction methods for one residential construction project and one commercial construction project.

In doing this, the candidate must:

- incorporate building science principles for energy efficient materials and products used in the building envelope
- research and report on a range of energy efficient design and construction methods with a specific focus on:
 - energy efficient heating, cooling and ventilation
 - energy efficient construction methods and systems
 - effects of condensation, dampness, weatherproofing and waterproofing when preventative measures are incorrectly installed or ignored during construction.

Knowledge Evidence

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

- the National Construction Code (NCC)
- processes for the evaluation of energy efficiencies in buildings:
 - local and international research into building science methods
 - systems theory and analysis
 - manufacturer websites and technical data for energy efficient construction materials and systems
- theories and principles of efficient energy use of building and construction processes

- the impact on occupant's health and the adverse effect on material integrity and structural components by failing to meet design principles
- types, application and limitations of different construction materials when selecting construction materials and products for energy efficient buildings
- the role of embodied energy when selecting construction materials and products for energy efficient buildings
- general and environmental construction terminology
- effective energy efficient treatment of the building envelope:
 - gaps around ceiling downlights
 - gaps around insulating material
 - gaps under and around doors
 - openings for floor or ceiling ducts used to transmit heating or cooling
 - wall, floor or ceiling cracks
 - window seals
 - thermal mass
- extreme weather conditions impacting on a building:
 - cyclonic activity
 - extreme heat
 - risk of fire
 - heavy rain and flooding
 - storm weather
- work place safety requirements:
 - working with insulation
- digital tools and devices to communicate and collaborate effectively with others
- a range of digitally-based technology and applications for researching information.

Assessment Conditions

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

Assessment can be undertaken in the workplace or in a simulated workplace environment.

A simulated environment is one that realistically replicates workplace conditions, materials and equipment, interactions with others and workplace irregularities, and which meets industry standards for safety and environmental practices.

Candidates must have access to:

- relevant government building and construction legislation
- current building and construction codes and Australian Standards
- the NCC
- construction drawings and specifications, organisational policies, procedures and other quality documentation to undertake the performance criteria and assessment requirements

- digital technology to research information and devices, applications and software to develop and save documents electronically.

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