Draft 0.1

This is our work-in-progress update to CPCSUS4002A Use building science principles to construct energy efficient buildings: https://training.gov.au/Training/Details/CPCSUS4002A.

We are working with industry experts to ensure the updated unit:

- meets current and anticipated industry needs
- complies with current Standards for Training Packages
- is written in clear understandable English.

Information on our training package review and development process is available here: http://www.artibus.com.au/project-stage.

Summary of changes from current endorsed unit

Re-templated to meet Standards for Training Packages 2012.

Sequenced Elements and Performance Criteria.

Specified what and how performance is demonstrated in Performance Evidence.

Captured critical Range Statement items and included industry relevant knowledge in Knowledge Evidence.

Stated mandatory conditions and specific requirements for assessment.

CPCSUS4002
Use building science principles to construct energy efficient buildings

Application

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

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

This unit 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.

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

Prerequisite Unit

Nil.

Unit Sector

Construction.

Elements and Performance Criteria

1. Determine the building envelope expectations.	1.1	Identify type of use and energy efficiency expectations of the building.
	1.2	Identify occupants' indoor activities and health and safety considerations.
	1.3	Determine environmental and climatic conditions and extreme weather conditions that impact the resilience of building materials.
	1.4	Identify construction methods that factor is 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 product 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 heat, air and moisture flows throughout the building.
	3.3	Develop strategies for sealing cavities and minimising unwanted air leakages.
	3.4	Evaluate and select mechanical ventilation systems and equipment for appropriateness to the site and operational costs.
	3.6	Evaluate and select materials for interior and exterior barriers for energy efficiency, durability and appropriateness for building site.

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 equipment and programs to access, extract information and develop relevant documentation

Unit Mapping Information

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

Links

Companion Volume Implementation Guide: to be added.

Assessment Requirements for CPCSUS4002 Use building science principles to construct energy efficient buildings

Performance Evidence

To demonstrate competency, a candidate must meet the performance criteria of this unit by developing two recommendations for the use of energy efficient materials and products. One must be for a residential and one for a commercial construction project.

In doing this, the candidate must:

- incorporate building science principles for energy efficient materials and products used in the building envelope and within the structure of the building
- research and report on a range of energy efficient design and construction methods with a specific focus on:
    - energy efficient heating, ventilation and air conditioning systems
    - energy efficient construction methods

Knowledge Evidence

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

- National Construction Code
- 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 energy efficiency applied to buildings and construction processes
- the impact of failing to meet design principles and the adverse effect on material integrity, structural components and occupant's health
- types, application and limitations of different construction materials and 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 down lights
    - 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
- impacts of different climate zones and environmental conditions on the built environment:
    - cyclonic activity

    - extreme heat
    - risk of fire
    - heavy rain and flooding
    - storm weather
- work place safety requirements

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 in a simulated workplace environment.

Candidates must be provided with:

- relevant government regulations, codes and standards
- current project plans, specifications and manufacturer's product information
- environmental and sustainability requirements
- organisational quality assurance documents
- sufficient materials and equipment to use building science principles to construct energy efficient buildings.

Links

Companion Volume Implementation Guide: to be added.