



Australian Government

Department of Education, Employment and Workplace Relations

CPCCSV5013A Apply principles of energy efficient design to buildings

Release: 1

CPCCSV5013A Apply principles of energy efficient design to buildings

Modification History

Not Applicable

Unit Descriptor

Unit descriptor This unit of competency specifies the outcomes required to apply energy efficient design to buildings.

It includes the evaluation of building designs to establish suitable forms of construction and the identification of appropriate energy consumption practices for incorporation into design briefs.

Application of the Unit

Application of the unit This unit of competency supports the attainment of the understanding and skills to apply principles of energy efficient design to buildings within the context of relevant legislation, the Building Code of Australia (BCA) and Australian standards.

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units Nil

Employability Skills Information

Employability skills This unit contains employability skills.

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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify the significance of the macro and micro climates in the construction process.	1.1. Climate zones and their characteristics are identified and recorded for <i>design projects requiring review of energy efficiencies</i>. 1.2. Methods for establishing characteristics of specific climates are established and documented. 1.3. Construction materials and methods suited to specific climates are determined.
2. Assess design criteria for energy efficient construction.	2.1. Characteristics and location-specific requirements to establish a design are identified and listed. 2.2. Appropriate form of construction is selected and documented according to established specifications. 2.3. Prevailing hot and cool wind directions are identified and recorded. 2.4. Sun path for the location is identified and documented. 2.5. Building orientation is established and documented.
3. Assess building designs.	3.1. Accommodation within the building is assessed and recorded. 3.2. Effective zoning within the building is established. 3.3. Floor plan is sketched and recorded. 3.4. Suitability of design in relation to cross-ventilation and shadow lines is determined and recorded. 3.5. Impacts of <i>energy efficiency design principles</i> are identified and recorded for architectural and services design in accordance with state and territory legislation and the BCA.
4. Identify that energy consumption practices are incorporated into design briefs.	4.1. Energy appliances of the building and their consumption are established and recorded. 4.2. Recommended best practice to conserve energy is identified and documented in energy audits. 4.3. Selection and use of energy efficient fittings and services are determined and included in design brief. 4.4. Energy budget principles for building fabric and services are identified and applied in accordance with standard industry practice.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills for this unit are:

- ability to respond to change and contribute to workplace responsibilities, such as current work site environmental and sustainability frameworks or management systems
- communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
 - read and interpret:
 - BCA
 - legislation
 - other relevant documentation
 - use language and concepts appropriate to cultural differences
 - use and interpret non-verbal communication
 - written skills to:
 - develop recommendations and strategies for the implementation of energy efficient design principles
 - report data and findings
- planning and organisational skills to collect, organise and analyse information
- technological skills to:
 - complete documentation and calculations
 - enable information gathering and analysis.

Required knowledge

Required knowledge for this unit is:

- authorities and powers of a building surveyor
- effects of fossil fuels on the atmosphere
- energy consumption relative to construction processes
- greenhouse gas emissions
- impact of construction process on the atmosphere
- impacts of national greenhouse strategy and Kyoto protocol on construction
- macro and micro climates
- nature of materials and effect on performance
- ozone depletion theories
- processes for the administration and preparation of documentation
- processes for the interpretation of reports, working drawings and specifications
- R values (overall thermal resistance) for construction material

REQUIRED SKILLS AND KNOWLEDGE

- relevant federal, state or territory legislation and local government policy and procedures
- services design concepts
- site topography.

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

This unit of competency could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate construction workplace conditions, materials, activities, responsibilities and procedures.

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

A person who demonstrates competency in this unit must be able to provide evidence of the ability to:

- comply with OHS regulations applicable to workplace operations
- apply organisational management policies and procedures, including quality assurance requirements where appropriate
- evaluate and report on data, findings, recommendations and strategies for the implementation of energy efficient design principles for at least one building development project and in compliance with the applicable local government authority, relevant legislation and the BCA
- provide reports to appropriate body/individual as determined by the project brief.

Context of and specific resources for assessment

This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints.

Assessment of essential underpinning knowledge will usually be conducted in an off-site context.

Assessment is to comply with relevant regulatory or Australian standards' requirements.

Resource implications for assessment include:

- an induction procedure and requirement
- realistic tasks or simulated tasks covering the mandatory task requirements
- relevant specifications and work instructions

EVIDENCE GUIDE

- tools and equipment appropriate to applying safe work practices
- support materials appropriate to activity
- workplace instructions relating to safe work practices and addressing hazards and emergencies
- material safety data sheets
- research resources, including industry related systems information.

Reasonable adjustments for people with disabilities must be made to assessment processes where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Method of assessment

Assessment methods must:

- satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package
- include direct observation of tasks in real or simulated work conditions, with questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application
- reinforce the integration of employability skills with workplace tasks and job roles
- confirm that competency is verified and able to be transferred to other circumstances and environments.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice, with a decision on competency only taken at the point when the assessor has complete confidence in the person's demonstrated ability

EVIDENCE GUIDE

and applied knowledge

- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence.

Assessment processes and techniques should as far as is practical take into account the language, literacy and numeracy capacity of the candidate in relation to the competency being assessed.

Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

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.

Design projects requiring review of energy efficiencies include:

Energy efficiency design principles include:

- evaluation of building designs for the purposes of applying appropriate construction methods to reduce energy consumption.
- application and assessment of BCA performance-based solutions
- best practice to conserve energy:
 - appliance usage
 - building location and orientation
 - choice and product performance
 - compliance with legislation pertinent to conserving energy
 - living practices that maximise benefit
- climate conditions:
 - climate zones in Australia specified in BCA

RANGE STATEMENT

- micro climates associated with a specific area
- energy consumption:
 - low energy lighting
 - solar hot water systems
 - star rated appliances
 - utilities and showerhead restriction fittings
 - window coverings and glazing
- energy efficient construction:
 - construction methods
 - efficient design briefs
 - geography and topography of site
 - location
 - materials used
 - method of application
- star rating systems:
 - Building Energy Rating Scheme (BERS) computer model
 - First Rate computer model
 - National Housing Energy Rating Scheme (NatHERS) computer model.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area