



Australian Government

Department of Education, Employment and Workplace Relations

CPCBC4020A Build thermally efficient and sustainable structures

Release: 1

CPCBC4020A Build thermally efficient and sustainable structures

Modification History

Not Applicable

Unit Descriptor

Unit descriptor This unit of competency specifies the outcomes required to apply sound principles of thermal efficiency as part of the implementation of sustainable building and construction processes. The range of legislative and council planning requirements are addressed in this unit, in addition to the need to respond to growing consumer demand for sustainable buildings and environmentally friendly developments.

Application of the Unit

Application of the unit This unit of competency supports the needs of builders, site managers and forepersons, and estimators in the building and construction industry.

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. Apply legislative and planning requirements for thermal efficiency to the building process.	<p>1.1. Current relevant state, territory and council <i>requirements for building thermally efficient structures</i> are identified.</p> <p>1.2. Factors that contribute to the construction of a five-star rated dwelling identified within the Building Code of Australia (BCA) are identified and the impact of <i>regional climate differences</i> is assessed.</p> <p>1.3. Client needs and expectations for the design and construction of thermally efficient structures are identified and negotiated.</p> <p>1.4. Expert design and other advice is gathered as part of the planning and construction process.</p> <p>1.5. Relevant Australian standards are consulted to identify the implications for the conduct of the building project.</p>
2. Review design solutions for effectiveness and compliance.	<p>2.1. Impact of radiation, convection, conduction and evaporation on the thermal comfort of residents is identified.</p> <p>2.2. Orientation of the building, location and size of glazing, and use of thermal mass as design features are evaluated for effectiveness and compliance with planning and other regulatory requirements.</p> <p>2.3. Effective strategy for insulating the structure is evaluated, costed and communicated to the client.</p> <p>2.4. Building designs are assessed for their compliance with the energy efficiency requirements of the BCA's five-star rating system.</p> <p>2.5. Designers and clients are consulted to ensure final construction plans are effective, efficient and compliant.</p>
3. Manage the building process to ensure an effective outcome.	<p>3.1. Effective communications are established between designers, architects and clients to ensure effective thermal performance is embedded from the design to construction phase.</p> <p>3.2. Effective quality assurance processes are confirmed as in place to evaluate and implement the building of a five-star dwelling.</p> <p>3.3. Cost effective strategies to achieve desired level of thermal performance are assessed and communicated to client.</p> <p>3.4. Life cycle costs of various construction approaches</p>

ELEMENT**PERFORMANCE CRITERIA**

are assessed and negotiated with the client.

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:

- application of Australian standards and manufacturer specifications
- application of BCA Part 3.12
- communication skills to:
 - communicate information to client
 - consult designers
 - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
 - identify and negotiate client requirements
 - read and interpret legislative and planning requirements
 - seek advice
 - use and interpret non-verbal communication
 - use language and concepts appropriate to cultural differences
- evaluation of the thermal efficiency of building design solutions
- apply numeracy skills to workplace requirements.

Required knowledge

Required knowledge for this unit is:

- building and construction industry processes for building sustainability
- relevant state or territory building and construction codes, standards and government regulations
- underlying mathematics related to the calculation of thermal efficiency
- workplace safety requirements.

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 by the effective application of mechanical principles and concepts to construction of a thermally efficient and sustainable building structure.

This unit of competency can 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:

- source and analyse legislative and planning requirements for thermal efficiency in the building process
- calculate costs and savings of implementing alternative thermally efficient systems
- apply principles of thermal efficiency to planning of a building project
- produce work plans that reflect effective thermal efficiency.

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:

- documentation that should normally be available in either a building or construction office
- relevant codes, standards and government regulations

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- office equipment, including calculators, photocopiers and telephone systems
- computers with appropriate software to view 2-D CAD drawings, run costing programs and print copies
- a technical reference library with current publications on measurement, design, building construction and manufacturers' product literature
- a suitable work area appropriate to the construction process.

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

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confidence in the person's demonstrated ability 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.

Requirements for building thermally efficient structures include:

- appropriate use of thermal mass (noting impact of climatic conditions)
- glazing size and orientation
- insulation
- orientation of building
- use of relevant construction methods.

Regional climate differences and the impact on effective design solutions include areas with:

- cooling climates
- hot arid climates
- hot humid climates
- mixed climates.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area