Australian Government

Department of Education, Employment and Workplace Relations

CPCCBC6013A Evaluate materials for multi-storey buildings

Release: 1

CPCCBC6013A Evaluate materials for multi-storey buildings

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit of competency specifies the outcomes required to evaluate and select appropriate materials for use in the construction of multi-storey buildings.

It considers a range of factors vital to the evaluation of materials, including the performance of concrete, the ability of materials to withstand fire and the environmental impact of certain materials in the building process.

Application of the Unit

Application of the unit

This unit of competency supports builders, project managers and related construction industry professionals responsible for ensuring the integrity of materials used in the construction of multi-storey buildings for commercial or residential purposes.

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. Assess the nature and performance of concrete for use in multi-storey buildings and other building types.	1.1. Plastic and hardened concrete properties are identified and recorded for ***building types***. 1.2. Sources of aggregate are listed and properties of each described. 1.3. Effects of impurities are described and recorded. 1.4. Manufacture and testing of concrete is conducted in accordance with relevant Australian standards.
2. Assess application of concrete used in multi-storey buildings.	2.1. Selection and distribution methods of concrete are determined following analysis of site access. 2.2. Correct distribution and placement methods of concrete are demonstrated and maintained. 2.3. Reasons and effects of compaction on both plastic and hardened concrete are identified. 2.4. Immersion, surface and form vibration are compared. 2.5. Accurate ***records*** relating to the application of concrete are maintained. 2.6. ***Types of curing methods*** and detrimental effects of poor or no curing are identified and recorded.
3. Evaluate methods undertaken to repair concrete.	3.1. Live and dormant cracks are identified. 3.2. Repair methods and causes of cracked concrete and concrete cancer are described and recorded in accordance with organisational procedures. 3.3. Faults in concrete are diagnosed and recorded in accordance with organisational procedures.
4. Evaluate effects of fire and heat on concrete used in multi-storey buildings.	4.1. ***Reinforced concrete*** is tested for effects of fire and heat. 4.2. Methods of fire protection for concrete elements are identified and applied.
5. Monitor environmental impacts of building materials used.	5.1. Concrete used in buildings complies with organisation's sustainability policies. 5.2. New technologies in concrete are monitored and applied in the construction of multi-storey buildings in accordance with organisational policies and guidelines. 5.3. ***Performance requirements*** of concrete in fire resistance construction are identified and applied in accordance with acceptable ***standard construction practices***.

ELEMENT	PERFORMANCE CRITERIA
	5.4. Cost-effectiveness of using recycled materials is identified in accordance with acceptable standard construction practices.

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 design concepts and principles
- application of measurements and calculations
- communication skills to:
  - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
  - read and interpret:
    - documentation from a variety of sources
    - specifications and drawings
  - use and interpret non-verbal communication
  - use language and concepts appropriate to cultural differences
  - written skills to record information and maintain records
- numeracy skills to apply calculations
- technological skills to facilitate use of the organisation's software and office equipment.

Required knowledge

Required knowledge for this unit is:

- application of Building Code of Australia (BCA) and Australian standards
- applications of structural principles in buildings
- design principles and behaviour of structural members undergoing stress, strain, compression, bending or combined actions
- grading process and grade markings used to categorise timber and timber products
- OHS requirements, legislative codes and practices
- types and nature of materials and effect of their performance, including properties and uses of cement and types of hydraulic cement
- work drawings and specifications.

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 applying correct processes for selecting and sizing materials for all structural components that form a complex building project.

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:

- comply with OHS and organisational quality procedures and processes
- apply and interpret relevant documentation and codes
- apply design principles relating to performance
- identify typical faults and problems and the action required to rectify such faults.

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, including design brief drawings, specifications, codes, design concepts, construction schedules and other necessary supporting documents
- research resources, including timber product information and samples
- access to relevant legislation, regulations and

EVIDENCE GUIDE

	codes of practice, including BCA, National Timber Framing Code and AS1684, AS4055 • relevant computer software package and suitable hardware. 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 and applied knowledge • all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence.

EVIDENCE GUIDE

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.

Building types include:

- bridge and pier construction
- buildings with concrete skeleton and slabs
- concrete column or wall 10 metres high
- slab on ground floor.

Records maintained include details regarding:

- causes of surface defects during concrete placement
- compaction of concrete
- finishing processes and surface treatments to slab concrete.

Types of curing methods include:

- accelerated curing
- continuously wetting concrete
- impermeable membrane curing.

Reinforced concrete includes:

- methods of pre-stressed concrete
- principles of reinforced concrete using steel, wire, fibres, etc.

Performance requirements include:

- characteristics, uses, maintenance and selection of materials and systems in terms of their:
  - alternative uses
  - cost effectiveness

RANGE STATEMENT

	• hazard potential and environmental safety • installation requirements • needs for use of cranes and hoists • recycling capacity • rubbish removal demands • transport problems and restrictions • cost • detail relating to materials • evaluation and assessment for new materials • milestones • nominated subcontractors • provision of site access/facilities • quality assurance • quality of work • standard procedures • standards of work • work schedules.
Standard construction practices include:	• BCA, including AS1684.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area