



Australian Government

CPPBDN4001 Research and evaluate construction materials and methods for building design projects

Release: 1

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Modification History

Release 1. New unit.

This version first released with CPP Property Services Training Package Version 1.

Application

This unit of competency specifies the outcomes required to research and evaluate existing and emerging construction materials and methods for residential, commercial and industrial buildings, as defined in the Building Code of Australia (BCA), including for new buildings, additions and renovations to existing structures, and heritage restorations.

Research and evaluation are undertaken to develop an understanding of the range of contemporary construction materials and methods available; and their application, performance and interaction.

The unit supports drafters who work under the supervision and instruction of architects and building designers, ensuring that accurate and current information and data on construction materials and methods are identified and applied across building design projects.

Licensing, legislative, regulatory or certification requirements apply to building design drafting in some states. Relevant state and territory regulatory authorities should be consulted to confirm those requirements

Pre-requisite Unit

Nil

Competency Field

Drafting

Unit Sector

Building design

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions.

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|----|----------------|------|---|
| 1. | Review project | 1.1. | Project brief is reviewed and information relating to |
|----|----------------|------|---|

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| | | <p>brief and determine requirements.</p> <p>work requirements, BCA class, and type of building to be researched is identified.</p> |
| | 1.2. | Requirements for research are confirmed, as required, with architect or building designer. |
| | 1.3. | Compliance requirements relevant to project building class and type and research scope are identified. |
| 2. Research materials and methods for structural elements of specified building. | 2.1. | Features and applications of materials used for structural elements are researched and evaluated. |
| | 2.2. | Compliance requirements for materials used for structural elements are researched and interpreted. |
| | 2.3. | Construction methods and systems for structural elements are researched and evaluated. |
| 3. Research materials and methods for building envelope of specified building. | 3.1. | Characteristics and applications of materials used for building envelope are researched and evaluated. |
| | 3.2. | Construction methods for building envelope and their compliance requirements are researched and interpreted. |
| 4. Research systems and components for services of specified building. | 4.1. | Features of systems and components for services are evaluated for costs and benefits according to client requirements for the building project. |
| | 4.2. | Compliance requirements for services are researched and interpreted. |
| | 4.3. | Installation methods for services are researched in relation to different types of systems and components. |
| 5. Document and maintain research findings. | 5.1. | Draft research findings with collated data, recommendations and supporting evidence are produced. |
| | 5.2. | Input into draft research findings is sought according to agreed procedures. |
| | 5.3. | Research findings are finalised and distributed to appropriate stakeholders. |
| | 5.4. | Research findings are updated as required. |

Foundation Skills

This section describes core skills that are essential to performance and not explicit in the performance criteria. Employment skills essential to performance are explicit in the performance criteria of this unit of competency.

Skill	Performance feature
Learning skills to:	• evaluate the validity and reliability of information relating to existing and emerging building materials and methods • independently navigate and find specific information in the National Construction Code (NCC) • use systems for ordering, classifying and storing familiar reference materials and research information for easy retrieval.
Numeracy skills to:	• extract and interpret numerical information relating to building materials and methods, including: • fractions, decimals and percentages, ratio, rates and proportions • routine formulas and building design mathematical representations and conventions • two-dimensional and three-dimensional shapes, including compound shapes • statistical data in complex tables, spreadsheets and graphs • measure, estimate and calculate in order to recommend cost-effective solutions for building design projects.
Oral communication skills to:	• listen to and clarify instructions and information relating to building materials and methods received from architect, building designer or manufacturer • consider audience when arguing for or against specific building materials and methods being used in a building project • respond to specific enquiries regarding own research findings, and clarify as necessary.
Reading skills to:	• use different reading strategies to locate at times complex information about material characteristics and construction methods • understand specialised NCC terminology.
Writing skills to:	• record data about building materials in text, table and diagram format • integrate information and ideas from a range of sources and

Skill

Performance feature

document associated recommendations, using support materials such as photographs, diagrams and graphs.

Range of Conditions

This section specifies work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included. Bold italicised wording, if used in the performance criteria, is detailed below.

Compliance requirements must include:

- current Australian standards applicable to the building design
- federal, state or territory, and local authority legislation and regulations applicable to the building design
- NCC.

Features must include:

- acoustic properties
- aesthetic properties
- availability
- cost
- defects
- durability
- energy efficiency
- fire resistance properties
- health and safety issues
- interaction with other materials
- limitations due to manufacturing process
- maintenance requirements
- structural safety
- sustainability features
- thermal properties
- tolerance.

Applications of materials used for structural elements must include:

- coatings required
- compatibility with other elements
- fixings required
- structural application
- substructural application
- use in specific construction methods or systems.

Materials used for structural elements must include three or more of the

- existing and emerging materials
- bricks
- clay
- composite materials

following:

- concrete
- glass
- glass blocks
- metals
- stone
- timber and timber products.

Structural elements must include:

- footings
- floors
- slabs
- walls
- roofs.

Materials used for building envelope must include three or more of the following:

- existing and emerging materials
- bricks
- clay
- composite materials
- concrete
- glass
- glass blocks
- metals
- stone
- timber and timber products.

Services must include:

- energy
- fire suppression
- heating, ventilation and air conditioning (HVAC)
- telecommunications
- water

Unit Mapping Information

No equivalent unit.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=6f3f9672-30e8-4835-b348-205dfcf13d9b>

Assessment Requirements for CPPBDN4001 Research and evaluate construction materials and methods for building design projects

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Performance Evidence

A person demonstrating competency in this unit must satisfy all of the elements, performance criteria and foundation skills of this unit. The person must also be able to provide evidence of the ability to develop and maintain current research findings to support the building design process for the following three different types of building design projects, as defined in the Building Code of Australia (BCA). At least one of the building design projects must include a Class 10 component:

- one Class 1 building
- one Class 2 building
- one building selected from Classes 3 to 9.

At least one of the above building projects must be two storeys and one building project must be three storeys or more.

The person must produce research findings, with recommendations and supporting evidence for each of the above buildings, based on an evaluation of:

- features and applications of a range of at least three materials suitable for the structural elements and building envelope of each building project
- different construction methods and systems applicable to structural elements and building envelope for each building project
- systems and components for services, having considered:
 - relevant compliance requirements for each building project
 - installation methods for each building project.

The person must also be able to demonstrate a process for:

- seeking feedback on and distributing findings from each of the building projects
- maintaining the currency of research findings.

Knowledge Evidence

A person demonstrating competency in this unit must be able to demonstrate knowledge of the sections of the BCA relevant to the classes and types of buildings specified in the performance evidence, including knowledge of the following:

- performance features of building materials detailed in the range of conditions, and the cost benefits of their application
- building construction methods used for different materials that form structural elements and the building envelope
- construction and design terminology to describe the features and applications of materials and construction methods used.

In addition, evidence of the following knowledge must be demonstrated relevant to the classes and types of buildings specified in the performance evidence:

- sources of reliable information on existing and emerging uses of construction materials and methods
- workplace procedures for handling, storing and retrieving research information and outcomes.

Assessment Conditions

Assessment must be conducted in the workplace or a close simulation of the workplace.

Suitable assessment of performance requires:

- equipment:
 - computer with internet access and software currently used in architectural and building design practices
 - telephone
- relationships with team members and supervisor:
 - tasks may be completed as an individual and as a team member, under the direction of an architect, building designer or other relevant person
- specifications – access to:
 - BCA and Australian standards applicable to the buildings specified in the performance evidence
 - manufacturer specifications relating to construction materials and methods used in the buildings specified in the performance evidence.

Assessor requirements

As a minimum, assessors must satisfy SNR/AQTF assessor requirements.

Links

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