



Australian Government

Department of Education, Employment and Workplace Relations

CPPBDN8007A Manage the design of Type A constructions

Release: 1

CPPBDN8007A Manage the design of Type A constructions

Modification History

New unit

Unit Descriptor

This unit of competency specifies the outcomes required to manage the design of Type A constructions defined by the Building Code of Australia (BCA). It covers negotiation and liaison with clients, team members and other professional involved in the development of the project. The unit addresses the preparation of design solutions and drawings, and the presentation of documentation for approval by planning authorities.

Type A buildings and their design may frequently be complex and include constructions of 3 storeys for BCA classes 2, 3 and 9 and 4 or more storeys for BCA classes 5, 6, 7 and 8. Increased and specified fire resistance requirements and appropriate building construction methods must be understood and applied.

The unit also covers the application of creative design skills, knowledge of human lifestyles and cycles, and knowledge of safe and sustainable construction materials and methods. It includes consultation and collaboration with technical experts, such as structural engineers, fire system designers, mechanical services engineers and experts in the industry for which the building will be used.

Application of the Unit

This unit of competency supports building designers who produce design drawings that meet client and compliance requirements for Type A constructions defined within the BCA.

Licensing/Regulatory Information

Work in this area must be completed according to relevant legislative, industry and organisational requirements, including occupational health and safety (OHS) policies and procedures.

Different states and territories may have regulatory mechanisms that apply to this unit. Users are advised to check for regulatory limitations.

Pre-Requisites

Not applicable.

Employability Skills Information

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

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| 1 | Analyse the requirements for Type A constructions | 1.1 | BCA requirements for <i>Type A constructions</i> are identified and evaluated. |
| | | 1.2 | <i>Scope and nature</i> of the proposed construction are analysed to identify the impact on the BCA's performance requirements for the proposed Type A design solution. |
| | | 1.3 | Analysis is undertaken to determine whether the construction will be designed to meet the performance requirement of the BCA by the use of an alternative solution, a deemed-to-satisfy solution or a blend of solutions. |
| | | 1.4 | Performance characteristics of construction materials and methods are reviewed to ensure conformance with Type A constructions. |
| 2 | Produce initial design drawings | 2.1 | <i>Design drawings</i> required in planning approval application documentation are confirmed with <i>relevant authorities</i> . |
| | | 2.2 | <i>Compliance requirements</i> to be addressed in design drawings are confirmed with relevant authorities. |
| | | 2.3 | Timelines and methodologies for producing final design drawings are established and followed. |
| | | 2.4 | Design drawings are set up, named and filed according to workplace procedures. |

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| 3 | Integrate expert input to inform the design | 3.1 | <i>Professionals and technical experts</i> required to provide input into and develop components of the design solution are sourced and briefed, and work is commissioned. |
| | | 3.2 | Consultations are facilitated between technical experts and the building design team to ensure cross-impacts of the solution are understood and conform to required performance standards. |
| | | 3.3 | Technical input, specifications and drawings developed by technical experts are prepared for <i>integration</i> into overall documentation. |
| 4 | Refine spatial, structural and technical elements of building designs | 4.1 | <i>Factors contributing to spatial requirements and relationships</i> are analysed and incorporated into building designs. |
| | | 4.2 | Checks are conducted to ensure relevant standards for the required components of the construction have been adhered to and documented. |
| | | 4.3 | Structural systems for Type A constructions are reviewed, in consultation with technical experts as required, and appropriate systems are incorporated into building designs. |
| | | 4.4 | Construction and technical elements for Type A buildings are reviewed, in consultation with technical experts as required, and appropriate elements are incorporated into building designs. |
| | | 4.5 | Aesthetic fusion of design elements is visualised, analysed and refined in building designs. |
| 5 | Address health and safety issues in building designs | 5.1 | Obligations of building designers for health and safety during construction and use of Type A constructions are identified and analysed. |
| | | 5.2 | Health and safety issues specific to design team, construction team and <i>users</i> are researched, in consultation with client and stakeholders, and analysed. |
| | | 5.3 | Risk analyses of construction and use of Type A constructions are conducted and appropriate controls |

- selected and applied to design drawings.
- 5.4 ***Health and safety documentation for the building*** is created, processed and communicated to relevant personnel according to workplace procedures.
- 6 Refine sustainable design elements of building designs
- 6.1 ***Optimum sustainable construction materials and methods*** are selected and incorporated into building designs.
- 6.2 ***Systems for sustainable water use*** are reviewed and suitable systems are incorporated into building designs.
- 6.3 ***Energy-efficient design principles and renewable energy sources*** are reviewed and suitable solutions are incorporated into building designs.
- 7 Review design for conformance with standards and approval processes
- 7.1 Design drawings are reviewed in preparation for finalisation.
- 7.2 Tests and analyses are conducted to ensure design documentation will meet the ***assessment methods*** used by the planning authority to ensure conformity with the BCA.
- 8 Obtain client approval of final design drawings and supporting information
- 8.1 Design drawings are assessed against client and compliance requirements and anomalies are addressed.
- 8.2 ***Supporting information*** to the plans and specifications is compiled, checked and finalised.
- 8.3 Design drawings are presented and explained to client and relevant stakeholders according to workplace procedures.
- 8.4 Detailed client and stakeholder feedback is encouraged and discussed, and required amendments are negotiated.
- 8.5 Design drawings and documentation are amended as required, and client approval is obtained, documented and processed according to workplace procedures.

Required Skills and Knowledge

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

Required skills

- administration and management skills to:
 - manage documents
 - lead the building of design team and related project professionals
 - manage time, including planning and prioritising work
 - coordinate work across a range of disciplines
- analytical and problem-solving skills to:
 - develop innovative ideas and designs
 - select cost-effective products and materials that contribute to sustainable development
 - test and analyse compliance of design solutions with performance standards
 - work out optimum compliant and cost-effective design solutions
- interpersonal skills to interact with clients and other stakeholders, including planning and regulatory personnel and technical experts
- language, literacy and numeracy skills to:
 - communicate with clients and contacts
 - estimate costs
 - interpret and apply complex information, including legislation, regulations, and codes and standards
 - present design options to clients
- technical skills to:
 - produce accurate design documentation
 - apply compliance requirements, including drawing standards
 - use hand drawing techniques
 - design from a brief
 - plan and carry out design, including visualising spaces, form, shapes and light
 - use design tools
- technology skills to use information technology and relevant software

Required knowledge

- architectural styles and terminology
- BCA requirements that apply to Type A constructions
- basic principles of structural engineering
- building designers' duty of care to ensure quality and safety of designs

- building life cycles, including hazards of site, materials, construction practices and building use over time
- contextual and site constraints
- conventional and sustainable construction materials and methods, including their application, behaviour, characteristics, performance and interactions with other materials
- design development and approval processes and implications of changes to design at each stage
- design drawing and representation methods
- legislation, codes and standards relevant to sustainable design requirements for small-scale building design projects
- organisational scope of business, service levels and fees
- planning processes and requirements
- pricing of resources
- principles of sustainable design
- scientific and social principles of human interactions with the built environment
- use of design software and systems that may include application of 3-D modelling

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.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person should demonstrate the ability to:</p> <ul style="list-style-type: none"> • plan and organise the production of design drawings to meet planning approval requirements • integrate expert and specialist input from related professionals engaged to inform the development of the drawings • produce sets of building design drawings and supporting information for at least three different Type A projects that meet quality requirements and are completed within given timelines • consult with clients, including: <ul style="list-style-type: none"> • gaining feedback • negotiating and finalising adjustments.
Context of and specific resources for assessment	<p>Assessment of this unit:</p> <ul style="list-style-type: none"> • must be in the context of the work environment • may be conducted in an off-site context, provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment

	<p>skills</p> <ul style="list-style-type: none"> • must meet relevant compliance requirements. <p>Resource implications for assessment include:</p> <ul style="list-style-type: none"> • access to: <ul style="list-style-type: none"> • suitable assessment venue and equipment • suitable simulated or real opportunities and resources to demonstrate competence • assessment instruments.
Method of assessment	<p>Assessment for this unit must verify the practical application of the required skills and knowledge, using one or more of the following methods:</p> <ul style="list-style-type: none"> • written and/or oral assessment of the candidates required knowledge for the unit • observed, documented and/or firsthand testimonial evidence of the candidates • implementation of appropriate procedures and techniques for the safe, effective and efficient achievement of the required outcomes • identification of the relevant information and scope of the work required to meet the required outcomes • identification of viable options and the selection of options that best meet the required outcomes • consistently achieving the required outcomes.
Guidance information for assessment	<p>This unit could be assessed on its own or in combination with other units relevant to the job function.</p> <p>Where applicable, physical resources should include equipment modified for people with disabilities.</p> <p>Access must be provided to appropriate learning and/or assessment support when required.</p> <p>Assessment processes and techniques must be culturally appropriate, and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

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.

<p><i>Type A constructions</i> defined by the BCA are projects that are:</p>	<ul style="list-style-type: none"> • of 3 storeys for Class 2, 3 and 9 buildings • of 4 or more storeys for Class 5, 6, 7 and 8 buildings. <p>Note: It is essential to refer to current BCA documentation to ensure accuracy of definitions and scopes.</p>
<p><i>Scope and nature</i> may include:</p>	<ul style="list-style-type: none"> • residential projects, such as: <ul style="list-style-type: none"> • additions and renovations • heritage restoration • new buildings • commercial and industrial projects, such as: <ul style="list-style-type: none"> • car parks • factories • laboratories • motels • offices • restaurants • retail and service outlets • warehouses.
<p><i>Design drawings</i> may include:</p>	<ul style="list-style-type: none"> • drawings produced by building designers and technical experts • elevations • plans, including: <ul style="list-style-type: none"> • contour • demolition • floor • framing • roof • sections • site analyses • landscape designs • services layout • use 3-D drawing technologies.
<p><i>Relevant authorities</i> may include:</p>	<ul style="list-style-type: none"> • local council planning department • federal, state or territory government departments for: <ul style="list-style-type: none"> • energy • environment • heritage • infrastructure • services

<p><i>Compliance requirements</i> may include:</p>	<ul style="list-style-type: none"> • regulatory authorities in country of project location. • Australian standards • BCA • codes and standards applicable: <ul style="list-style-type: none"> • at project locations • in particular conditions • legislation, regulations and local by-laws relating to: <ul style="list-style-type: none"> • conservation • construction materials and methods • energy • environment • fire resistance • heritage • OHS • planning • water • local authority planning schemes.
<p><i>Professionals and technical experts</i> may include:</p>	<ul style="list-style-type: none"> • access consultants • acoustics engineers and professionals • bushfire management professionals • construction contractors • civil engineers • energy efficiency experts • fire systems designers and engineers • hydraulic engineers • landscape designers • lighting specialists • mechanical services engineers • OHS experts • plumbing and drainage professionals • quantity surveyors • service contractors • soil testing or geo-technical engineers and experts • structural engineers • surveyors.
<p><i>Integration</i> of input across disciplines and by differing professionals and team members may be:</p>	<ul style="list-style-type: none"> • achieved by a range of techniques, including: <ul style="list-style-type: none"> • team meetings • sharing of paper-based drawings and specifications • sharing and updating of drawings using building information models (BIM) technology.

<i>Factors contributing to spatial requirements and relationships</i> may include:	<ul style="list-style-type: none"> • air circulation and user movement patterns • anthropometrics • building occupancy and functions • ergonomics • landscaping • massing • scale transition.
<i>Users</i> may include:	<ul style="list-style-type: none"> • maintenance and service personnel • occupants • visitors • users in subsequent life cycle stages of buildings.
<i>Health and safety documentation for the building</i> may include:	<ul style="list-style-type: none"> • residual risk register • information relating to: <ul style="list-style-type: none"> • construction materials and methods • location of services and machinery • warranties.
<i>Optimum sustainable construction materials and methods</i> may include:	<ul style="list-style-type: none"> • cost-effective sustainable design solutions • latest sustainable design technologies • locally available sustainable construction materials.
<i>Systems for sustainable water use</i> may include:	<ul style="list-style-type: none"> • black water systems • bladder storage • filter beds • grey water systems • rainwater tanks • run-off retention.
<i>Energy-efficient design principles</i> may include:	<ul style="list-style-type: none"> • appliance selection • building location and orientation • low energy lighting • solar hot water systems • star rated appliances • window coverings and glazing.
<i>Renewable energy sources</i> may include:	<ul style="list-style-type: none"> • biomass energy • geothermal energy • hydroelectric energy • solar energy • wind energy.
<i>Assessment methods</i> used by the planning authority to ensure compliance with the BCA	<ul style="list-style-type: none"> • application of A2.2 of the BCA, which allows the following evidence (in some cases subject to conditions) to be submitted in support of a proposal that a material, form of construction or design meets a performance requirement or a

may include:	<p>deemed-to-satisfy provision:</p> <ul style="list-style-type: none"> • a report from a registered testing authority • a current certificate of accreditation or certificate of conformity • a certificate from a professional engineer • a current certificate issued by a product certification body that has been accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) • any other form of documentary evidence that adequately demonstrates suitability for use • verification methods that may include: <ul style="list-style-type: none"> • calculations using analytical methods or mathematical models • tests using a technical operation either on site or in a laboratory to directly measure one or more performance criteria of a given solution.
Supporting information to supplement the plans and specifications may include:	<ul style="list-style-type: none"> • alternative solutions for performance requirements of the BCA • copies of compliance certificates relied upon • copies of other documentary evidence relied upon • fire safety measures and their fire resistance levels and ratings • full details of the assessment methods used to establish compliance with the performance requirements.

Unit Sector(s)

Building design

Custom Content Section

Not applicable.