Australian Government

Department of Education, Employment and Workplace Relations

CPPBDN5013A Develop and collaborate on building information models for small-scale building design projects

Release: 1

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Modification History

New unit

Unit Descriptor

This unit of competency specifies the outcomes required to develop three-dimensional (3-D) models of small-scale building design projects covered by the Building Code of Australia (BCA), except construction Type A buildings, into true building information models (BIM).

It also covers adding and adjusting values of components of building designs, collaborating with consultants and contractors from other disciplines, working live within the model alongside other disciplines and creating project documentation using modelling software programs.

Application of the Unit

This unit of competency supports building designers who create and use BIMs to optimise productivity and enhance streamlining of the construction process through improved communication and collaboration with consultants and contractors involved in the construction life cycle.

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

1	Develop BIM project documentation	1.1	BIM project processes and schedules are planned and finalised in consultation with relevant project stakeholders.
		1.2	Procedures to provide accurate and reliable exchange of project models are developed according to ***organisational and project requirements***.
		1.3	Project documentation is generated according to organisational and project requirements using outputs of appropriate functions of design technology tools.
2	Develop a BIM project	2.1	Information **relating to *small-scale building design projects*** is analysed and applied to plans for BIM development.
		2.2	3-D models are created according to organisational and project requirements and software operation instructions using appropriate ***design technology tools***.
		2.3	***Building design data*** is embedded in project model ***objects*** to allow collaboration, integration and generation of required project documentation.
		2.4	BIM is checked and tested according to organisational and project requirements to confirm accuracy and functionality.
3	Exchange and collaborate on project models	3.1	Transfer of BIM files is tested according to organisational procedures to ensure integrity of format and data is retained on receipt.
		3.2	BIMs are provided to other consultants or contractors for addition of specialist data according to project

requirements and data sharing protocols.

3.3 BIMs or BIM data provided by other consultants or contractors are imported or linked and checked for integrity according to project and organisational requirements.

3.4 BIMs are amended and manipulated live in collaboration with other contractors and consultants operating within the same model.

Required Skills and Knowledge

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

Required skills

- administration and management skills to:
  - develop process map, task list and schedule for BIM implementation
  - implement and manage standards
  - manage projects and documents
  - manage time, including planning and prioritising work
- analytical and problem-solving skills to:
  - develop innovative ideas and designs
  - select cost-effective products and materials that contribute to sustainable development
  - 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 and hand drawings
  - apply compliance requirements, including drawing standards
  - design from a brief
  - plan and carry out design, including visualising spaces, form, shapes and light
- technology skills to use information technology, BIM technologies and relevant software

Required knowledge

- architectural styles and terminology
- basic principles of structural engineering
- building designers' duty of care to ensure quality and safety of designs
- benefits and challenges of adopting a BIM approach to design production and documentation
- 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
- design technology's built-in tools and networking tools required to maintain two or more disciplines in a single project model within a local area network (LAN)
- tools required to manage a project with two or more disciplines across a wide area network (WAN)
- hazards of site, materials, construction practices and building use over life cycle
- key features of building life cycles
- 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 integrated project delivery
- principles of sustainable design
- project management strategies
- scientific and social principles of human interactions with the built environment
- tools required to create a realistic BIM implementation plan that responds to specific staff, financial and schedule constraints

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	A person should demonstrate the ability to:
	• produce interactive BIM projects for a range of small-scale building design projects in consultation with project team
	• collaborate on BIM projects with a range of stakeholders, including:
	  • integration of imported data
	  • live interoperations.

Context of and specific resources for assessment	Assessment of this unit: • 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

	skills
	• must meet relevant compliance requirements.
	Resource implications for assessment include:
	• access to:
	  • suitable assessment venue and equipment
	  • suitable simulated or real opportunities and resources to demonstrate competence
	• assessment instruments.

Method of assessment	Assessment for this unit must verify the practical application of the required skills and knowledge, using one or more of the following methods: • 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	This unit could be assessed on its own or in combination with other units relevant to the job function. Where applicable, physical resources should include equipment modified for people with disabilities. Access must be provided to appropriate learning and/or assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the language and literacy capacity of the candidate and the work being performed.

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.

Organisational and project requirements may include:	• communications protocols • file exchange formats • reporting requirements • schedule.

Small-scale building design projects:	• include buildings covered by the BCA, except construction Type A buildings
	• may be residential projects, such as:
	  • additions and renovations
	  • heritage restoration

	• new buildings • may be commercial or industrial projects, such as: • factories • motels • offices • restaurants • retail and service outlets • warehouses.
Design technology tools may include:	• proprietary 3, 4 and 5-D modelling software, such as: • Autodesk Architectural Desktop • Autodesk Revit • Bentley Architecture • Graphisoft ArchiCAD • VectorWorks ARCHITECT.
Building design data may include:	• details of compliance requirements, including those specified in: • Australian standards • client requirements • design specifications • legislation and regulations • manufacturer specifications • dimensions • labour costs • material costs • material properties, such as: • acoustic values • energy efficiency • fire resistance • R-value and U-value • strength.
Objects may include:	• customised imports • imports from online object libraries • new objects created by the designer.

Unit Sector(s)

Building design

Custom Content Section

Not applicable.