22477VIC Advanced Diploma of Building Design (Architectural)

This course has been accredited under Part 4.4 of the Education and Training Reform Act 2006.

Accreditation period: 1 January 2019 to 31 December 2023

Version 1.1





Education and Training Version 1.1 Changes to mapping table for BSBPMG415 Apply project risk management techniques

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Section A: Copyright and course classification information

1. Copyright owner of the course	Copyright of this course is held by the Department of Education and Training, Victoria.	
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3. Type of submission	Reaccreditation	
4. Copyright acknowledgement	Copyright of the following units of competency from nationally endorsed training packages is administered by the Commonwealth of Australia and can be accessed from training.gov.au at <www.training.gov.au>.</www.training.gov.au>	
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	The following unit of competency:	
	CPCCWHS1001 Prepare to work safely in the construction industry	
	is from the CPC Construction Plumbing and Services Training Package.	
	The following units of competency:	
	BSBPMG415 Apply project risk management techniques	
	BSBSMB404 Undertake small business planning	
	are from the BSB Business Services Training Package.	

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	Executive Director Industry Engagement and VET Systems Higher Education and Skills Group Department of Education and Training Email: course.enquiry@edumail.vic.gov.au
	Copies of this publication can be downloaded free of charge from the DET website <http: page<br="" providers="" rto="" training="" www.education.vic.gov.au="">s/courses.aspx>.</http:>
6. Course accrediting body	Victorian Registration and Qualifications Authority (VRQA)
7. AVETMISS information	ANZSCO code – 6 digit
	Australian and New Zealand Standard Classification of Occupations
	232000 Architects, Designers, Planners and Surveyors
	ASCED Code – 4 digit
	Field of Education
	0401 Architecture and Urban Environment
	National course code
	22477VIC
8. Period of accreditation	1 January 2019 – 31 December 2023

Section B: Course information

1. Nomenclature	Standard 1 AQTF Standards for Accredited Courses
1.1 Name of the qualification	Advanced Diploma of Building Design (Architectural)
1.2 Nominal duration of the course	2086 hours
2. Vocational or educational outcomes	Standard 1 AQTF Standards for Accredited Courses
2.1 Purpose of the course	The 22477VIC Advanced Diploma of Building Design (Architectural) provides an accredited training program and vocational outcomes for a person to be employed as a building designer or draftsperson.
	On completion of the 22477VIC Advanced Diploma of Building Design (Architectural) participants will have the skills and knowledge to design and develop architectural working drawings for the construction of residential, commercial and industrial buildings, thereby enabling them to:
	interpret client needs through sketch and design
	 Interpret building legislation utilise technology to develop plans and documentation for construction methods and specifications liaise with building surveyors and builders
	negotiate with local council
	understand probable cost comparisons
3. Development of the course	Standards 1 and 2 AQTF Standards for Accredited Courses
3.1 Industry/enterprise/ community needs	Background The first Victorian accredited course for this vocation was developed and accredited on 1 January 2009 in response to the reduced capacity of the (then) South Australian curriculum to meet building industry developments within Victoria. Over time, the accredited course has evolved in parallel with industry and societal needs and is now undergoing its third reaccreditation with the VRQA.

Graduates of the 22477VIC Advanced Diploma of Building Design (Architectural) are likely to be employed as building designers, architectural assistants, building design assistants or architectural draftspersons. They may work in small and large building design, architectural and construction businesses, and apply their skill to residential and non- residential developments. Employment growth is also occurring within niche areas, such as commercial kitchen design.
Graduates may apply for registration to become registered building practitioners by the Victorian Building Authority (VBA), subject to meeting specified criteria. This qualification is the only qualification recognised by the VBA that leads to a registered outcome for this occupation and is cited within the Building Interim Regulations 2017.
Eligibility of the expired accredited course (22268VIC) within the VET Student Loans program implemented in 2017, evidences Federal Government support for the qualification, recognising the vocational outcome as having a high national priority, meeting industry need and aligning with real employment outcomes. It is assumed that Federal Government support for this accredited course will continue.
Registration
The VBA requires the attainment of the Advanced Diploma of Building Design (Architectural) as the minimum educational requirement for satisfying the knowledge required for registration as a draftsperson within the building design (architectural) category ¹ . Evidence of at least two years of appropriate practical experience must also be demonstrated to satisfy the skill required for registration, as part of the Building Interim Regulations 2017 of Victoria ² . At the time of document development, the proposed accredited course will sustain and facilitate a registered outcome for graduates seeking to practice in Victoria.
Community
Building safety underpins the National Construction Code (NCC) and is of paramount importance to the community. Building designers have a seminal role in establishing building safety at the initial stage of the building supply chain. The unit <i>VU22459 Design safe buildings</i> is unique to this qualification and has been developed to address the application of safe design principles to control occupational health and safety (OHS)/work health and safety (WHS) risk during building design, construction and use.

 $^{^1}$ VBA Practitioner Guide, VBA, Dec 2017 p.3 2 VBA Practitioner Guide, VBA, Dec 2017 p.4

	An emerging issue and important aspect of building related safety is material substitution compliance and knowledge of how to source information concerning materials performance.
	A number of incidents related to material substitution have been cited in recent times that pose serious health and safety risks to the general public.
	A Senate inquiry, initiated on 23 June 2015 in response to the Lacrosse apartment fire at Melbourne's docklands (November 2014), drew attention to the use of combustible non-compliant external cladding and the role it played in contributing to the rapid vertical spread of fire ³ . Federal and State Governments have responded with a number of initiatives to ensure product and fire related safety issues are appropriately addressed.
	The risks associated with material substitution and the use of non-conforming/non-compliant building products are high, and therefore it is vital that students understand how to locate and interpret product compliance information. It was decided to address this expressly as a 'learning skill' within the units, <i>VU22457 Comply with relevant legislation in the design of residential buildings</i> and <i>VU22458 Comply with relevant legislation in the design of required</i> knowledge' (refer to the nature of construction materials, including emerging technologies, and their effect on performance) within the unit, <i>VU22464 Select construction materials for building projects.</i>
	Ministerial queries were received by the Victorian Department of Education and Training in late 2016 in response to a number of incidents reported by the media of deficient 'protection work' causing damage to adjoining properties during construction projects. A focused review of this practice was therefore undertaken as part of the reaccreditation process. The project steering committee (PSC) concluded that 'protection work' is sufficiently addressed within existing units as part of 'siting requirements', and noted that the topic is part of the building surveyor's role in the planning phase of a construction project.
	Limited land supply has intensified competition for residential housing and influenced the use of building design skills toward renovation and multi-storey development. Guidelines, such as the Liveable Housing Guidelines 2012 and the Better Apartment Design Standards 2017, have been introduced to ensure living standards are not compromised. All planning schemes in Victoria were amended regarding minimum standards in March 2017. Relevant units have been amended to include the use of Australian Standards within their respective range statements.

³ Non-confirming building products-interim report: aluminium composite cladding, Economics References Committee, Sep 2017,Ch2, p.5.

Industry
Over the last five years macro-economic factors, such as low interest rates, subdued wages growth and a rising population have combined to drive expansion of the construction industry and consequent demand for architectural and drafting services.
Australian Bureau of Statistics (ABS) data reveals the value of non-residential building approvals has trended upwards over the past five years.
Housing Industry Australia (HIA) reported record highs across Australia in 2016 for new home building ⁴ . For the first time ever, more apartments were built than houses in the December 2016 quarter.
Latest reports ⁵ suggest the supply of housing is now closer to meeting demand, and that building activity will soften slightly in 2018, in the high rise living space, as a consequence. Overall demand for housing is still expected to remain at elevated levels however, as population growth continues to be buoyed by strong overseas migration.
Building activity related to established dwellings continues to be robust, with the value of renovation investment anticipated to reach \$32.5 billion in 2018 ⁶ . This unprecedented building activity, coupled with relatively static enrolment figures, has created significant levels of competition for experienced draftspersons by architectural firms.
Recruitment difficulties have been reported in the states of Victoria and South Australia for architectural draftspersons, particularly for vacancies related to residential design projects ⁷ . In April 2017, a national shortage was reported for the related occupation of 'architect' (a traditional employer of architectural draftspersons) and added to the Skill Shortage List Australia from 18 August 2017.
The future of the domestic construction industry is strong in the short to medium term, with positive employment projections reported across all ANZSIC construction employment categories for five years to May 2022 ⁸ . The employment category of architectural, building and surveying technicians is expected to rise by 10% to 72,900 during that period ⁹ .

⁴ HIA Media Release, 28 May 2017

⁵ HIA National Outlook – A quarterly outlook on the housing and renovation industry, Summer Edition 2018.

- ⁶ HIA Media Release Australia's \$31.4 billion home renovations market, 7 Oct 2016.
- ⁷ Labour Economics Office Victoria Department of Employment Victoria, Jan 2017 ANZSCO 312111 SA 'Labour Market Report. 3121-11'.

⁹ 2017 Occupational Projections – five years to May 2022, Department of Employment.

⁸ 2017 Industry Employment Projections – five years to May 2022, Department of Employment.

As these professions represent the beginning of the supply chain for construction activity, qualified and experienced personnel are required to adequately resource the workforce to avoid project delays and meet industry demand. Due to the supply of domestic graduates not fulfilling current industry demand, the occupation of architectural draftsperson (312111) was added to the Skilled Occupation List 2017-2018 by the Department of Immigration as part of their migrant visa programs.
Qualification review
A suite of three building design qualifications were first developed within the CPP07 Property Services Training Package (release 9.0) in February 2012, at the Diploma, Graduate Certificate and Graduate Diploma levels. A fourth qualification at the Certificate IV level was introduced in March 2015, after the Victorian accredited course was developed in June 2014.
At the time of the accredited course development, the Skills Forecast that informs the National Schedule of Projects related to training package development for the property services industry (developed by Artibus Innovation – Skills Service Organisation) did not include the development of a new national qualification for building designers at Australian Qualifications Framework (AQF) level 6.
Review of the national register on VET in Australia's website <https: training.gov.au=""></https:> , confirms there is no AQF level 6 qualification in building design within the CPP Property Services Training Package (release 5.0) or the CPP07 Property Services Training Package (release 14.5).
The accredited course is the only Advanced Diploma of Building Design (Architectural) available in Australia. It is also the only qualification recognised by the VBA that provides the minimum registration requirements to operate as 'draftsperson (architectural)' for the State of Victoria.
Target group for the course
A diverse range of participants undertake this course, they may include:
 qualified tradespeople from related trades in the building and construction industry
 existing workers in building design who wish to upgrade their current qualifications or apply for registration to become a registered building practitioner
 students who have completed their Victorian Certificate of Education
mature age students seeking career change.

Course enrolments

Course enrolment data from 2014 to 2017 is displayed in Table 1.

Source: HESG, Department of Education and Training Victoria.

Table 1: Course enrolments

Year	Government subsidised enrolments	Fee paying enrolments	Total enrolments
2014	262 *1327	129	1718
2015	1261	364	1625
2016	1492	354	1846
2017	1388	325	1713

*Denotes enrolment figures for equivalent (superseded) accredited course, 21953VIC.

Ongoing demand for the course

Artibus Innovation projects employment growth of 9% in the five years to 2019 for architectural, building and surveying technicians. As building design represents the beginning of the supply chain for construction activity, qualified and experienced personnel are required to adequately resource the workforce to avoid project delays and meet industry demand. This qualification assists in providing the required labour supply.

Course consultation and validation process

PSC members represent the major stakeholders invested in the accredited course (refer to PSC composition). Trainers and assessors of the RTO network group, i.e. the Victorian Advanced Building Studies Network (VABSN) were represented by one PSC member. Building designers in industry were represented through the executive and PSC member from the Building Design Association of Victoria (BDAV). Key individual enterprises also held positions, from regional and metropolitan areas characterising businesses in terms of size, subject area specialty, and geographic region.

Consultation with the group involved:

- email and telephone consultation to form the PSC and confirm draft content
- a review of the skills and knowledge profile of an architectural draftsperson

•	three PSC meetings held on 13 June 2017, 31 October 2017 and a teleconference on the 21 March 2018, to review and evaluate the course structure and content in reference to contemporary architectural drafting practices and the AQTF Standards for Accredited Courses 2007
•	one workshop with members of the VABSN to confirm draft unit amendments
•	two meetings with subject matter experts within the VABSN to review relevant draft unit amendments.
R re n re	eview of course content was circulated via the PSC member epresentatives (both network and industry) to ensure naximum participation and input to potential course nodification. Feedback was evaluated and included, where equired.
L S U C	esktop reviews of current building and construction industry tatistics and related building design research was also ndertaken to support the development of the accredited ourse.
P	roject steering committee
Т с	he reaccreditation of the course was guided by a PSC omprised of the following members:
•	Susan Gaylor, Victorian Building Authority
•	Kate Bell, Building Design Association of Victoria
•	Catherine Ciaverella, Victorian Advanced Building Studies Network
•	Alex Cornall, Cornall Building Design
•	Tim Ellis, GLOW Design Group
•	Geoff Hoare, Graaph Design
•	Rhys Davies, Supernatural Group
•	Jane Clancy, Swinburne University
•	Wayne Ketchen, The Gordon
l Ir	n attendance:
•	Ms Teresa Signorello, Curriculum Maintenance Manager (CMM), Building and Construction, Holmesglen Institute
•	Ms Susan Fechner, Project Officer, Building and Construction, Holmesglen Institute
T O te	he role of the PSC was to evaluate, confirm and validate the utcomes of the course review. The members also provided echnical information throughout the project.
T C re	he outcomes of several national units were carefully onsidered by the PSC with respect to their potential elevance and application to the course context.

	This course:	
	 does not duplicate, by title or coverage, the outcomes of an endorsed training package qualification 	
	 is not a subset of a single training package qualification that could be recognised through one or more statements of attainment or a skill set 	
	 does not include units of competency additional to those in a training package qualification that could be recognised through statements of attainment in addition to the qualification 	
	 does not comprise units that duplicate units of competency of a training package qualification. 	
3.2 Review for	Course monitoring and evaluation	
reaccreditation	A mid cycle review of the accredited course was undertaken from March to May 2016 to determine the relevance and currency of its outcomes to industry since reaccreditation in mid 2014. Data considered for analysis included course enrolments and survey responses from key user groups i.e. graduates, trainers and assessors and existing students of the course. A fourth survey was also distributed to industry via the BDAV.	
	Desktop research of trending information was also considered in the course review process, consisting of industry report evaluation, appraisal of current affairs issues and monitoring of employment advertisement skill needs.	
	Based on these findings, the PSC considered a number of areas for potential course improvement and determined the following:	
	 the topics of architectural history, communication and negotiation, modular elements/prefabrication and small subdivisions and multi-dwelling development were represented within the curriculum at the appropriate standard and required no change 	
	 minor amendments were required to existing/relevant units to emphasise the topics of new building materials, the use of specification writing as a form of risk mitigation, and Building Information Modeling (BIM) 	
	 VU21599 Provide design solutions for residential and commercial buildings should be updated to recognise the use of emerging materials and technologies, the application of town planning controls and BIM. 	
	Changes in societal and community need compelled amendment to a range of units. Refer to section 3.1 for details.	

The issue of introducing a work experience component within the course structure to enhance skill development was discussed at the first PSC meeting. It was unanimously agreed that cementing work experience within the course presented disadvantage to the student cohort.
Transition arrangements
The 22477VIC Advanced Diploma of Building Design (Architectural) replaces and is equivalent to the 22268VIC Advanced Diploma of Building Design (Architectural). There can be no new enrolments in the 22268VIC Advanced Diploma of Building Design (Architectural) after 31 December 2018.
Transition arrangements, tabled below (Table 2), map the units from the previous course to units from the current course.

Table 2. Transition arrangements	Table	2:	Transition	arrangements
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22268VIC Advanced Diploma of Building Design (Architectural)		New course 22477VIC Advanced Diploma of Building Design (Architectural)		Comment/ Relationship
Unit code	Unit title	Unit code	Unit title	
VU21587	Undertake site survey and analysis to inform design process	VU22454	Undertake site survey and analysis to inform design process	Equivalent
VU21588	Apply structural and construction technology to the design of residential buildings	VU22455	Apply structural and construction technology to the design of residential buildings	Equivalent
VU21589	Apply structural and construction technology to the design of commercial buildings	VU22456	Apply structural and construction technology to the design of commercial buildings	Equivalent
VU21590	Comply with relevant legislation in the design of residential buildings	VU22457	Comply with relevant legislation in the design of residential buildings	Equivalent
VU21591	Comply with relevant legislation in the design of commercial buildings	VU22458	Comply with relevant legislation in the design of commercial buildings	Equivalent

22268VIC Advanced Diploma of Building Design (Architectural)		New course 22477VIC Advanced Diploma of Building Design (Architectural)		Comment/ Relationship
Unit code	Unit title	Unit code	Unit title	
VU21592	Design safe buildings	VU22459	Design safe buildings	Equivalent
VU21593	Design sustainable buildings	VU22460	Design sustainable buildings	Equivalent
VU21594	Integrate services layout into design documentation	VU22461	Integrate services layout into design documentation	Equivalent
VU21596	Produce preliminary and working drawings for residential buildings	VU22462	Produce preliminary and working drawings for residential buildings	Equivalent
VU21597	Produce working drawings for commercial buildings	VU22463	Produce preliminary and working drawings for commercial buildings	Equivalent
VU21598	Select construction materials for building projects	VU22464	Select construction materials for building projects	Equivalent
VU21599	Provide design solutions for residential and commercial buildings	VU22465	Provide design solutions for residential and commercial buildings	Equivalent
VU21600	Integrate digital applications into architectural workflows	VU22466	Integrate digital applications into architectural workflows	Equivalent
VU21601	Present architectural designs	VU22467	Present architectural designs	Equivalent
VU21602	Manage architectural project administration	VU22468	Manage architectural project administration	Equivalent
VU21603	Undertake complex architectural projects	VU22469	Undertake complex architectural projects	Equivalent
CPCCOHS1001A	Work safely in the construction industry	CPCCWHS1001	Prepare to work safely in the construction industry	Equivalent

22268VIC Advanced Diploma of Building Design (Architectural)		New course 22477VIC Advanced Diploma of Building Design (Architectural)		Comment/ Relationship
Unit code	Unit title	Unit code	Unit title	
BSBSMB404A	Undertake small business planning	BSBSMB404	Undertake small business planning	Equivalent
BSBPMG415A	Apply risk management techniques	BSBPMG415	Apply project risk management techniques	Equivalent
VU21604	Conduct a Bushfire Attack Level (BAL) assessment	VU22470	Conduct, interpret and apply a Bushfire Attack Level (BAL) assessment	Not Equivalent
VU21605	Apply Bushfire Attack Level (BAL) assessment to the design and construction process	VU22470	Conduct, interpret and apply a Bushfire Attack Level (BAL) assessment	Not Equivalent

4. Course outcomes	Standards 1, 2, 3 and 4 AQTF Standards for Accredited Courses
4.1 Qualification level	Reference: Standards 1, 2 and 3 AQTF Standards for Accredited Courses
	The outcomes of the 22477VIC Advanced Diploma of Building Design (Architectural) comply with the criteria of the AQF Advanced Diploma qualification type descriptor as defined by the AQF, Second Edition, January 2013.
	Knowledge
	Graduates of the 22477VIC Advanced Diploma of Building Design (Architectural) will have specialised and integrated technical and theoretical knowledge with depth within one or more fields of work and learning, such as:
	 demonstrating an understanding of specialised knowledge of structural and construction technology
	 employing a range of applications required in architectural workflows
	 applying the principles of sustainability and safety to building design, including the technical knowledge of selecting suitable construction materials.

Skills
Graduates of 22477VIC Advanced Diploma of Building Design (Architectural) will have a wide range of cognitive and communication skills, and specialised technical, creative or conceptual skills to select and apply methods and technologies to:
 identify, analyse, synthesis and act on information from a range of sources, such as the NCC and relevant legislation
 transfer specialised skills and knowledge to others, including clients, colleagues, architects and local council employees
 formulate responses to complex problems to produce innovative and compliant design outcomes
 express ideas and perspectives to promote shared understandings of project design, process and timeline requirements.
Application of skills and knowledge
Graduates of 22477VIC Advanced Diploma of Building Design (Architectural) will demonstrate the application of skills and knowledge:
 with depth in areas of building legislation in changing residential, commercial and industrial sector contexts
 with initiative and judgement in planning, design, technical or management functions related to building design projects
• to adapt a range of fundamental construction principles and complex drafting techniques to established and new building design concepts
• across a broad range of technical or management functions with accountability for personal outputs and personal and team outcomes within broad parameters, such as communicating and clarifying complex structures and layouts to a range of key stakeholders to gain building permit approval.
Volume of learning
The volume of learning for this qualification is typically $1.5 - 2$ years and incorporates structured and unstructured learning activities. Structured activities may include reading text material, completing projects and assignments. Unstructured activities may include research, discussion with trainers and peers and investigating pathway options to independently develop and implement a learning plan appropriate to the achievement of desired learning goals.

4.2 Employability Skills	Reference: Standard 4 AQTF Standards for Accredited Courses
	This course has been mapped to national Employability Skills. Refer to Appendix A for Employability Skills summary for this qualification.
4.3 Recognition given to the course (if applicable)	Reference: Standard 5 AQTF Standards for Accredited Courses
	Graduates seeking to register as a building practitioner and practice as a sole practitioner in Victoria must satisfy the requirements set out by the VBA for the category of Building Design DP-AD (Architectural).
	Current registration requirements: <http: building-<br="" practitioners="" www.vba.vic.gov.au="">registrations/draftsperson>.</http:>
	Professional development
	Participants undertaking this qualification, or part thereof, are expected to continue to develop their professional skills and knowledge through partaking in relevant and contemporary formal/informal training activities. Membership of relevant professional associations could also assist in enhancing professional practice.
4.4 Licensing/ regulatory	Reference: Standard 5 AQTF Standards for Accredited Courses
requirements (if applicable)	Participants who visit a construction site will require a Construction Induction Card (CIC) issued by WorkSafe Victoria.
	Further information: <http: www.worksafe.vic.gov.au=""></http:> .
	There are no other licensing requirements for this course.
5. Course rules	Standards 2, 6, 7 and 9 AQTF Standards for Accredited Courses

5.1 Course structure

To be awarded the 22477VIC Advanced Diploma of Building Design (Architectural) all 20 units of competency must be achieved.

All units are **core** to provide a consistent outcome for graduates with skills that allow for broad employment opportunities.

Participants who exit the program without completing all of the required units will receive a statement of attainment identifying those units that they have achieved.

Unit of competency code	Field of Education code (six-digit)	Unit of competency title	Pre- requisite	Nominal hours
Core units				
VU22454	040199	Undertake site survey and analysis to inform design process	Nil	40
VU22455	040199	Apply structural and construction technology to the design of residential buildings	Nil	180
VU22456	040199	Apply structural and construction technology to the design of commercial buildings	Nil	120
VU22457	040199	Comply with relevant legislation in the design of residential buildings	Nil	50
VU22458	040199	Comply with relevant legislation in the design of commercial buildings	Nil	60
VU22459	040199	Design safe buildings	Nil	40
VU22460	040199	Design sustainable buildings	Nil	90
VU22461	040199	Integrate services layout into design documentation	Nil	40
VU22462	040199	Produce preliminary and working drawings for residential buildings	Nil	180
VU22463	040199	Produce preliminary and working drawings for commercial buildings	Nil	180
VU22464	040199	Select construction materials for building projects	Nil	60
VU22465	040199	Provide design solutions for residential and commercial buildings	Nil	200
VU22466	040199	Integrate digital applications into architectural workflows	Nil	240
VU22467	040199	Present architectural	Nil	120

Unit of competency code	Field of Education code (six-digit)	Unit of competency title	Pre- requisite	Nominal hours
		designs		

Unit of competency code	Field of Education code (six-digit)	Unit of competency title	Pre- requisite	Nominal hours
VU22468	040199	Manage architectural project administration	Nil	60
VU22469	040199	Undertake complex architectural projects	Nil	280
VU22470	040199	Conduct, interpret and apply a Bushfire Attack Level (BAL) assessment	Nil	50
CPCCWHS1001	061301	Prepare to work safely in the construction industry	Nil	6
BSBSMB404	080301	Undertake small business planning	Nil	50
BSBPMG415	080315	Apply project risk management techniques	Nil	40
Total nominal hours				

5.2 Entry requirements	Reference: Standard 9 AQTF Standards for Accredited Courses
	There are no entry requirements for the 22477VIC Advanced Diploma of Building Design (Architectural).
	The following is a general guide to the learning, reading, writing, oral communication and numeracy skills of learners aligned to the Australian Core Skills Framework (ACSF), details of which can be accessed from: <https: acsf<br="" doc="" docs.education.gov.au="" files="" other="" system="">_document.pdf>.</https:>
	Applicants for the 22477VIC Advanced Diploma of Building Design (Architectural) are best equipped to successfully undertake the qualification if they have a demonstrated capacity in learning, reading, writing, oral communication and numeracy to level 3 of the ACSF. Learners with language, literacy and numeracy skills at lower levels than those suggested will require additional support to successfully undertake the qualification.

6. Assessment	Standards 10 and 12 AQTF Standards for Accredited Courses	
6.1 Assessment strategy	Reference: Standard 10 AQTF Standards for Accredited Courses	
	All assessment, including recognition of prior learning (RPL), must be compliant with the requirements of:	
	• Standard 1 of the AQTF: Essential Conditions and Standards for Initial/Continuing Registration and Guidelines 4.1 and 4.2 of the VRQA Guidelines for VET Providers, OR	
	the Standards for Registered Training Organisations 2015 (SRTOs), OR	
	• the relevant standards and guidelines for RTOs at the time of assessment.	
	These standards ensure that the assessment strategies meet the requirement of the course.	
	Assessment must be consistent with the conditions and method of assessment specified in each unit.	
	Assessment methods and collection of evidence will involve application of skills and knowledge to building design/drafting workplaces or simulated environments.	
	All assessment activities will be related to a building design context.	
	It is recommended that the assessment strategy for the 22477VIC Advanced Diploma of Building Design (Architectural) include a range of assessment methods, such as:	
	 observation of tasks in real or simulated work conditions, with questioning to confirm knowledge of building specifications and required documentation 	
	direct questioning	
	research projects	
	 practical assessment in the development of a set of working drawings 	
	 sketches and digitally generated images for the presentation of a design concept 	
	• portfolio of documentation for an architectural project, including preliminary drawings and design images.	
	Assessment strategies for imported units from training packages should be consistent with the assessment requirements/evidence guides for the relevant training packages.	
	While there is no compulsory workplace assessment for the qualification, assessment for the unit VU22470 Conduct, interpret and apply a Bushfire Attack Level (BAL) assessment, is required to be conducted 'on-site'.	

6.2 Assessor competencies	Reference: Standard 12 AQTF Standards for Accredited Courses	
	Assessment must be undertaken by a person or persons in accordance with:	
	 Standard 1.4 of the AQTF: Essential Conditions and Standards for Initial/Continuing Registration and Guideline 3 of the VRQA Guidelines for VET Providers, OR 	
	• the SRTOs 2015, OR	
	 the relevant standards and guidelines for RTOs at the time of assessment. 	
	All assessment of units imported from training packages must reflect the requirements for assessors specified in the relevant training packages.	
7. Delivery	Standards 11 and 12 AQTF Standards for Accredited Courses	
7.1 Delivery modes	Reference: Standard 11 AQTF Standards for Accredited Courses	
	The course may be offered on a full or part-time basis. Participants should be exposed to real-work environments and examples/case studies where possible. OHS/WHS and environmental factors must be incorporated and reinforced at every opportunity.	
	Delivery strategies should recognise the nature of the units and the learning styles of the participants. Some units may address common content, therefore integration may be appropriate.	
	The objective of the course is to develop practical competencies within an industry context. Practical demonstrations in the form of realistic, holistic projects that provide participants with a sense of 'real-work' experience are considered most suitable to achieving this aim. Exercises and assignments are also deemed suitable.	
	Delivery of units of competency may involve a blended delivery mode, including:	
	workshops	
	individual assignments	
	team-based assignments	
	 applied learning in the workplace or simulated building design/drafting environment. 	

	 Learners may be supported through: online (internet, social media, email and telephony) face-to-face conferencing, mentoring and interviews ad hoc arrangements, and regular progress monitoring, particularly for practical work. Delivery of units of competency imported from training packages should be contextualised to the building design/drafting environment, whilst ensuring that the 	
	delivery guidelines are adhered to.	
7.2 Resources	Reference: Standard 12 AQTF Standards for Accredited Courses	
	Training must be undertaken by a person or persons in accordance with:	
	 Standard 1.4 of the AQTF: Essential Conditions and Standards for Initial/Continuing Registration and Guideline 3 of the VRQA Guidelines for VET Providers, OR 	
	the SRTOs 2015, OR	
	• the relevant standards and guidelines for RTOs at the time of assessment.	
	Resources include:	
	hardware devices, such as:	
	- computers	
	– scanners	
	– digitisers	
	 printers/plotters 	
	 digital projectors/display devices 	
	 external storage devices 	
	 workstation platform. 	
	digital software, which could include:	
	 BIM and integrated BIM software applications 	
	 design documentation software 	
	 graphic development and/or editing software 	
	 internet and network communication platforms 	
	 multimedia, animation and rendering software. 	
	 basic surveying equipment, including levels 	
	hand sketching materials	
	materials for model building	
	internet access	
	• relevant legislation as defined in the range statement.	

8. Pathways and articulation	Standard 8 AQTF Standards for Accredited Courses	
	 This qualification comprises three nationally endorsed units of competency from the following training packages: BSB Business Services CPC Construction, Plumbing and Services. Participants who successfully complete any of these units 	
	will gain credit transfer in relation to qualifications that contain them.	
	There are no formal articulation arrangements in place at the time of accreditation.	
9. Ongoing monitoring and	Standard 13 AQTF Standards for Accredited Courses	
evaluation		
evaluation	The Curriculum Maintenance Manager, Building Industries is responsible for the ongoing monitoring and evaluation of the 22477VIC Advanced Diploma of Building Design (Architectural).	
evaluation	The Curriculum Maintenance Manager, Building Industries is responsible for the ongoing monitoring and evaluation of the 22477VIC Advanced Diploma of Building Design (Architectural). Formal course evaluations will be undertaken halfway through the accreditation period.	

Section C – Units of competency

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VU22470 Conduct, interpret and apply a Bushfire Attack Level (BAL) assessment	151

The following is a list of imported units of competency for this course, which can be downloaded from the national register, ">https://training.gov.au/>:

- CPCCWHS1001 Prepare to work safely in the construction industry
- BSBSMB404 Undertake small business planning
- BSBPMG415 Apply project risk management techniques

Un	it code and title	VU22454 Undertake site survey and analysis to inform design process		
Unit descriptor		This unit specifies the outcomes required to undertake a site survey and a site analysis for residential and commercial building projects.		
		It includes the use of basic surveying equipment, recording and interpretation of data, and evaluation of, and compliance with relevant legislation.		
		No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.		
		However, this unit forms part of a minimum qualification requirement for registration with the Victorian Building Authority as a building designer (architectural).		
Employability Skills		This	unit contains Employability Skills.	
Application of the unit		This unit supports the attainment of the skills and knowledge required by building designers to undertake a basic site survey and a site analysis for building projects within the context of relevant legislation.		
ELEMENT		PERFORMANCE CRITERIA		
Elements describe the essential outcomes of a unit of competency.		Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.		
1	Prepare to carry out a measured survey	1.1	Relevant information and documentation is collected prior to undertaking survey.	
		1.2	On-site occupational health and safety (OHS)/work health and safety (WHS) hazards are identified, controls implemented and appropriate documentation completed, according to workplace safety procedures.	
		1.3	Levelling equipment is identified and inspected for damage, wear and serviceability.	
2	Undertake a site analysis and record site and building information	2.1	Relationship of site to adjoining properties and <i>surrounding environment</i> is identified and recorded to establish the context of the development.	
		2.2	<i>Physical characteristics</i> and <i>local climate</i> <i>conditions</i> of the site are noted and recorded for consideration in the design of the building.	

ELEMENT		PERFORMANCE CRITERIA		
		2.3	Field sketches are produced which accurately record site and building elements in plan, elevation and section.	
		2.4	Field sketch data is transferable to accurate, scaled measured drawing format.	
		2.5	Digital images of relevant site and building elements are taken, where required, to assist in the development of accurate scaled measured drawings.	
3 Measure and record linear distances on-site using basic surveying equipment	3.1	Distances are measured accurately using <i>basic surveying equipment</i> .		
	equipment	3.2	Overall distances are accurately calculated from field data.	
4 Inte fror det ver	Interpret and apply data from a site survey to	4.1	Collate site analysis data to determine site features, existing conditions and levels.	
	vertical angles	4.2	Preliminary levels are determined both horizontal and vertical angles to inform initial design processes.	
		4.3	Results are recorded according to workplace procedures.	
5	Plot contours and cut and fill	5.1	Spot level values are used to interpolate contour lines, which are plotted accurately in plan.	
		5.2	Cut and fill batters are calculated and accurately plotted in plan and section.	
6	Produce measured drawings and documentation for existing conditions	6.1	Measured drawings and site details are developed from site survey and site analysis data.	
		6.2	Measured drawings and site details are produced to scale, accurately depicting site and building elements, and within accepted time frames and to industry standards.	
		6.3	Documentation is completed in compliance with the <i>relevant legislation</i> and guidelines.	

REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements and share information with internal and external personnel, where required
 - read and interpret:
 - o field data/geo digital databases
 - o reports
 - o site plan
 - o land title
 - specifications
 - o working drawings
 - o project requirements
 - o organisational procedures
 - use language and concepts appropriate to industry conventions
- Written skills to:
 - accurately record and interpret site measurements and other data to industry standards
 - produce field sketches
- · Numeracy skills to apply measurements and calculations
- Problem solving skills to interpret reports, working drawings and specifications
- Planning and organisational skills to:
 - collect, organise and analyse information for site analysis
 - prepare equipment for site survey
- Technological skills to:
 - complete documentation and calculations
 - use basic survey equipment
- Work safely in a design drafting working environment and on a site according to relevant legislation and workplace policies and procedures

Required knowledge:

- Specifications and capabilities of basic surveying equipment and application
- Australian Drawing Standards/other industry standards related to the production of measured drawings
- Process for the administration and preparation of working drawings, specifications and other relevant documentation
- Workplace OHS/WHS procedures and documentation

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 in the Performance Criteria is detailed below. Add any 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.

Relevant information and documentation includes:	 planning scheme: environmental heritage field/geo digital data maps site plan title project requirements organisational procedures.
Occupational health and safety (OHS)/work health and safety (WHS) hazards include:	 existing vegetation manual handling surveying equipment underground services uneven ground.
Workplace safety procedures include:	 safe work method statement construction induction card hazard identification and control procedures.
<i>Surrounding environment</i> includes:	 building levels built form and character of adjacent development heritage characteristics location and height of walls built to the site boundary location and use of adjacent buildings/fenestration and other features significant trees and vegetation on adjoining properties and in the public realm street frontage features, such as service poles, street trees, kerb crossovers, bus stops and other services views, private open spaces and solar access of neighbouring properties.

<i>Physical characteristics</i> include:	 access and connection points contours and geotechnical conditions, where appropriate drainage and services existing buildings fences, boundaries and easements noise sources orientation views from the site.
Local climate conditions include:	 aspect wind direction topography micro climates.
<i>Basic surveying</i> <i>equipment</i> includes:	 dumpy levels tilting level automatic level total stations chains and tapes theodolites Global Positioning System (GPS).
<i>Relevant legislation</i> may include:	 Acts and ordinance Regulations NCC series: Building Code of Australia (BCA), Volume 1 and 2 Plumbing Code of Australia, Volume 3 Australian Standards practice and technical notes.

EVIDENCE GUIDE			
The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.			
Overview of assessment	 This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design workplace conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended. 		
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 organisational policies and procedures, including OHS/WHS undertake a basic site survey and a detailed site analysis for residential building and/or commercial building projects, in compliance with the applicable local government authority and relevant legislation produce measured drawings and other documentation detailing site information and building elements as determined by the project requirements, organisational procedures and in compliance with the applicable local government authority. 		
Context of and specific resources for assessment	 Assessment of essential required knowledge will usually be conducted in an off-site context. Assessment is to comply with relevant legislation and guidelines. Resource implications for assessment include: realistic tasks or simulated tasks covering the mandatory task requirements relevant specifications and documentation, including land title, site plan, working drawings and specifications measuring and levelling equipment the BCA and relevant Australian Standards. 		

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Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.		
	Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.		
	Evidence should:		
	 reinforce the integration of Employability Skills with workplace tasks and job roles 		
	• be transferable to other circumstances and environments		
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role. 		

Un	it code and title	VU22455 Apply structural and construction technology to the design of residential buildings		
Un	it descriptor	This struc resic	unit specifies the outcomes required to apply ctural and construction technology to the design of lential buildings.	
		It requires compliance with state legislation and the provisions for Building Code of Australia (BCA) Classes 1 and 10 and relevant Australian Standards as they apply to the structural and construction components of a residential building.		
		No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.		
		However, this unit forms part of a minimum qualification requirement for registration with the Victorian Building Authority as a building designer (architectural).		
Em	ployability Skills	This unit contains Employability Skills.		
Ар	plication of the unit	This unit supports the attainment of the skills and knowledge required to apply structural and construction technology to the design of residential buildings, which comply with current legal responsibilities of building designers for construction methods. The outcomes of this unit do not cover the required skills and knowledge for the application of structural and construction technology to the design of commercial buildings, which are addressed in the unit, <i>VU22456 Apply structural and construction technology to the design of commercial buildings</i> .		
ELEMENT		PERFORMANCE CRITERIA		
Elei oute	ments describe the essential comes of a unit of competency.	Perfo demo used, and/o consi	Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.	
1	Apply the legislative requirements for the design of residential	1.1	Relevant state legislation impacting on design and construction is investigated and interpreted for a residential building.	
	buildings	1.2	Relevant sections of the BCA and Australian Standards are researched and applied to the <i>structural and construction principles</i> of residential buildings.	
		1.3	Local government planning and construction regulations are investigated and interpreted for the design and construction of a residential building.	

ELEMENT		PERFORMANCE CRITERIA	
2	Investigate site	2.1	Site is investigated to plan <i>site preparation,</i> which incorporates design intent and statutory requirements.
		2.2	<i>Existing site conditions and design and construction elements</i> are analysed to establish site impact on structural elements.
		2.3	Termite risk management is assessed and implemented according to the <i>relevant legislation</i> .
		2.4	Specifications for footing and slab construction design are specified and recorded in all supporting documentation, in compliance with current standards.
3	Analyse and apply construction techniques and/or methodologies	3.1	<i>Structural systems</i> are analysed and construction methodologies are applied to solve construction system and design issues.
		3.2	Structural principles are integrated into the building fabric to accommodate materials and finishes, according to relevant standards and design intent.
		3.3	Alternative approaches to the construction of residential buildings are considered to accommodate special conditions and in accordance with relevant standards and design intent.
		3.4	Construction sequencing and attendance of trades is identified to ensure efficient building processes.
		3.5	Design solutions are developed and sketched and/or documented using performance-based solutions.
4	Specify requirements for framing	4.1	<i>Timber wall, floor and roof framing</i> systems are designed and detailed in accordance with timber framing code and with consultation with engineer, if required.
		4.2	Bracing and tie-down system is designed and detailed to meet structural requirements.
		4.3	Steel framing systems are identified and detailed in accordance with construction practices.
		4.4	Framing requirements, including all fixings and materials are specified and details documented.
ELEMENT		PER	FORMANCE CRITERIA
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5	Specify requirements for masonry	5.1	Unreinforced and reinforced masonry systems are identified and detailed for the construction of internal and external walls in compliance with the relevant legislation.
		5.2	Details of <i>weatherproofing</i> are indicated to meet relevant Australian Standards.
6 Specify requirements fo safety, health and amenity	Specify requirements for safety, health and amenity	6.1	Statutory requirements for fire separation are researched and incorporated into design to provide separation and means of escape, in compliance with the relevant legislation.
		6.2	Wet area materials and sealing of wall and flooring junctions are specified and details documented.
		6.3	Facilities and room heights are designed and documented in accordance with the relevant legislation.
		6.4	Opportunities for natural light and ventilation are considered and mechanical air handling systems for heating, cooling and ventilation are selected on the basis of efficiency and performance.
		6.5	Sound insulation materials are selected for sound transmission for walls and penetrations and in accordance with the relevant legislation.
		6.6	The provisions for safe movement and access , including disabled access, are designed in accordance with the relevant legislation.
		6.7	Building insulation levels, glazing requirements and ventilation are analysed to determine energy usage.
7	Specify requirements for finishes and services	7.1	Details for claddings, linings, finishes and coatings are specified in accordance with the relevant legislation.
		7.2	<i>Joinery fabrication and installations</i> are selected and details of materials and finishes are documented.
		7.3	Provisions for the installation and connection of services are specified in accordance with the relevant legislation.

This describes the essential skills and knowledge and their level, required for this unit.

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements and share information with internal and external personnel, where required
 - read and interpret:
 - construction drawings and specifications
 - state regulatory authority requirements
 - Australian Standards
 - o relevant sections of the BCA
 - o relevant legislation
 - use language, terminology and concepts appropriate to industry conventions
- Written skills to:
 - accurately document construction specifications
 - prepare documentation to an accepted industry standard
 - document construction specifications to mitigate project risks
- Numeracy skills to apply measurements and calculations to construction systems
- Problem solving skills to:
 - interpret relevant legislation for the design and construction of a residential building
 - apply construction techniques and methodologies to the intent of the design
 - specify requirements for construction standards and practices
 - select structural members according to project or specification requirements
- Initiative and enterprise skills to:
 - combine materials into workable construction systems
 - analyse site conditions to establish specifications
 - resolve construction and design issues with regard to structural systems
 - work with relevant consultants/consultant documentation
- Planning and organisational skills to collect, organise and analyse information for:
 - the interpretation of legislation
 - the development of building design and specifications
- Technological skills to complete documentation and calculations
- Self management skills to enable construction specifications to be completed within designated time frame
- Teamwork skills during consultation with, and coordination of, internal and external personnel
- Work safely in a design drafting working environment and on a site according to legislation and workplace policies and procedures

- Structural components and construction methodologies and related terminology
- The application of the principles of construction of residential buildings
- The characteristics, performance and application of construction materials
- Working drawings and specifications for the design of residential buildings
- Effects of legislative requirements for residential buildings on the design approval process
- Integration of services in a residential building design
- Statutory requirements for fire separation
- Specifications for a residential building providing optimum safety, health and amenity for users

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 in the Performance Criteria is detailed below. Add any 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.				
Structural and construction principles includes:	 construction methods, standards and services in compliance with relevant legislation and design specifications, such as: compatibility of structural elements differential movement effects of deflection effects of shrinkage effects of wind integration of elements and/or systems principles of beams and column design solution of force systems behaviour of structural materials thermal expansion and contraction timber framing design connection details 			
Local government planning and construction regulations includes:	 occupational health and safety (OHS)/work health and safety (WHS) relevant Australian Standards town planning Victorian Code for Residential Development. 			

<i>Site preparation</i> includes:	 access batter/gradients earthworks and/or cut and fill existing services interpretation of topographical features orientation platforms retaining walls soil classification stormwater surface and subsoil drainage termite risk management trenches.
Existing site conditions and design and construction elements include:	 adjacent property building design construction systems integration with building fabric properties of concrete and steel reinforcing set out soil conditions structural adequacy topography.
<i>Relevant legislation</i> may include:	 Acts and ordinance Regulations National Construction Code series: BCA, Volume 1 and 2 Plumbing Code of Australia, Volume 3 Australian Standards practice and technical notes.
<i>Structural systems</i> may include, but are not limited to:	 bracing and tie-down columns, beams and lintels composite structures concrete footing and slab systems suspended floors connection methods and systems masonry (solid and cavity) reinforcement types and placement timber floor, wall and roof framing.

Structural principles	• forces	
include:	loads	
	stresses and strains.	
Special conditions include:	alpine conditions	
	altitude	
	bushfire hazards	
	cyclone categories	
	local wind loads	
	other conditions relevant to specific local conditions	
	seismic activity.	
<i>Timber wall, floor and roof framing</i> includes:	 composition of natural and manufactured timber products 	
	 connection principles and methodologies 	
	floor framing	
	design of floor framing layouts	
	 provision for and inclusion of bracing and tie-down and services 	
	roof framing:	
	 connections 	
	 conventional roofing systems 	
	 truss design 	
	 truss layout 	
	stress grading	
	wall framing:	
	 allowance for linings and finishes 	
	 calculation of sizes 	
	 configuration of composite timber structures 	
	 jointing systems 	
	 wind loads. 	
Bracing and tie-down	 calculation of bracing requirements 	
includes:	calculation of tie-down requirements	
	calculation of wind loads	
	 creation of bracing schedules in accordance with accepted industry standards 	
	creation of tie-down schedules	
	 provision of tie-down requirements and construction systems 	
	 selection of suitable bracing to meet requirements and construction system(s). 	

Steel framing systems include:	basic portal framecold formed steel framing systems
	hot rolled steel members, e.g. columns, beams.
Unreinforced and reinforced masonry systems include:	 aerated autoclaved concrete articulation blockwork brick or block veneers expansion joints and proprietary items jointing load bearing brickwork non-loading brickwork mortars piers shrinkage ventilation bonding.
Weatherproofing includes:	 damp proof courses and flashings drainage sub-floor ventilation agricultural drainage waterproof retaining walls ventilation width of cavity.
Statutory requirements for fire separation includes:	 class of building concrete, blockwork, brickwork AAC, lightweight construction, e.g. plasterboard fire resistance levels fire source features fire stairs and isolated stairs housing in bushfire areas according to regional regulations multi-residential timber-framed construction non-combustible materials paths of travel protection of openings sole occupancy units.

Safe movement and access	access for maintenance, including:		
include:	 roof access 		
	 built-in provision of roof hatch ladders 		
	 walk platforms 		
	 roof mounted services 		
	 fall arrest systems 		
	 adequate lighting for daily use and emergencies 		
	balustrade		
	handrailsstair tread nosings		
	stairs construction		
	swimming pool fencing		
	tactile indicators.		
Joinery fabrication and	• cupboards		
installations include:	kitchen benching		
	window and door frames.		
Services include:	air-conditioning/climate control		
	communication systems		
	electricity		
	• gas		
	mechanical ventilation		
	sewerage and drainage		
	• water.		

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design workplace conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended.	
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 legislative requirements applicable to the design of residential buildings apply the principles of structural and construction to the design of residential buildings in compliance with the applicable local government authority, relevant legislation and the BCA develop specifications for structural components of a residential building and the requirements for safe and healthy use of the building. 	
Context of and specific resources for assessment	 Assessment of essential required knowledge will usually be conducted in an off-site context. Assessment is to comply with relevant legislation. Resource implications for assessment include: realistic tasks or simulated tasks covering the mandatory task requirements relevant specifications and documentation, including land title, site plan, working drawings and specifications and relevant legislation research resources, including industry-related 	

Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance. Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.	
	Evidence should:	
	 reinforce the integration of Employability Skills with workplace tasks and job roles 	
	• be transferable to other circumstances and environments	
	• relate to a number of performances assessed on different occasions which reflects the scope of the job role.	
	Assessment methods may include:	
	 observation of tasks in real or simulated work conditions, with questioning to confirm knowledge of construction technology 	
	case study of best practice for a specific building project	
	• report detailing recommended performance-based solutions to a design problem for a residential building.	
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.	

Unit code and title		VU22456 Apply structural and construction technology to the design of commercial buildings			
Unit descriptor		This struc com	This unit specifies the outcomes required to apply structural and construction technology to the design of commercial buildings.		
		It red prov to 9 struc build	It requires compliance with state legislation and the provisions for Building Code of Australia (BCA) Classes 2 to 9 and relevant Australian Standards as they apply to the structural and construction components of a commercial building.		
		No li requ	No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.		
			However, this unit forms part of a minimum qualification requirement for registration with the Victorian Building Authority as a building designer (architectural).		
Employability Skills		This	unit contains Employability Skills.		
Application of the unit		This unit supports the attainment of the skills and knowledge required for building designers to apply structural and construction technology to the design of commercial buildings and includes compliance with current legal responsibilities of building designers for construction methods. The outcomes of this unit do not cover the required skills and knowledge for the application of structural and construction technology to the design of residential buildings, which are addressed in the unit, <i>VU22455 Apply structural and construction technology to</i> <i>the design of residential buildings</i> .			
ELEMENT		PER	FORMANCE CRITERIA		
Elements describe the essential outcomes of a unit of competency.		Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.			
1	Apply the regulatory requirements for the design of commercial	1.1	Relevant legislation impacting on design and construction is investigated and interpreted for a commercial building.		
	- Salialings	1.2	Relevant sections of the BCA and Australian Standards are researched and applied to the <i>structural and construction principles</i> of commercial buildings.		
		1.3	Local government planning and construction regulations are investigated and interpreted for the design and construction of a commercial building.		

ELEMENT		PER	PERFORMANCE CRITERIA	
2	Investigate site	2.1	Site features and available services are identified to plan <i>site preparation</i> to inform the design intent and for preparation of documentation.	
		2.2	Soil engineer's report is interpreted to determine specifications for <i>footing systems</i> appropriate for foundation design.	
		2.3	Environmental issues impacting on the site are identified and controlled according to regulatory requirements.	
3 Analyse and apply construction techniques and/or methodologies	3.1	<i>Structural systems</i> are analysed and construction methodologies are applied to solve construction system and design issues.		
		3.2	Structural principles are integrated into the building fabric to accommodate materials and finishes, according to relevant standards and design intent.	
		3.3	Alternative approaches to the construction of commercial buildings are considered to accommodate <i>special conditions</i> and in accordance with relevant standards and design intent.	
		3.4	Scope of work and performance requirements are determined and documented according to project requirements.	
4	Specify structural requirements	4.1	<i>Timber wall, floor and roof framing</i> systems are designed and detailed in accordance with timber framing code and with consultation with engineer, if required.	
		4.2	Bracing and tie-down system is designed and detailed to meet structural requirements.	
		4.3	Steel framing systems are identified and detailed in accordance with construction practices.	
		4.4	Framing requirements, including all fixings and materials are specified and details documented.	
		4.5	Unreinforced and reinforced masonry systems are identified and detailed for the construction of internal and external walls in compliance with the relevant legislation.	
		4.6	Details of <i>weatherproofing</i> are indicated to meet relevant Australian Standards.	

ELEMENT		PER	FORMANCE CRITERIA
5	Comply with fire resistance requirements	5.1	Building is designed to maintain structural stability and provide <i>safeguards</i> in the event of fire.
		5.2	Specifications for building design comply with statutory requirements for fire separation and relevant legislation.
6	Specify requirements for safety, health and amenity	6.1	Wet area materials and sealing of wall and flooring junctions are specified and details documented.
		6.2	Facilities and room heights are designed and documented in accordance with the relevant legislation.
		6.3	Opportunities for natural light and ventilation are considered and mechanical air handling systems for heating, cooling and ventilation are selected on the basis of efficiency and performance.
		6.4	Sound insulation materials are selected for sound transmission for walls and penetrations and in accordance with the relevant legislation.
		6.5	The provisions for safe movement and access are designed in accordance with the relevant legislation.
		6.6	Building insulation levels, glazing requirements and ventilation are analysed to determine energy usage.
7	Specify requirements for construction	7.1	Details for claddings, linings, finishes and coatings are specified in accordance with the relevant legislation.
		7.2	<i>Joinery fabrication and installations</i> are selected and details of materials and finishes are documented.
		7.3	Provisions for the installation and connection of <i>services</i> are specified in accordance with the relevant legislation.

This describes the essential skills and knowledge and their level, required for this unit.

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements and share information with internal and external personnel, where required
 - read and interpret:
 - o construction drawings and specifications
 - o state regulatory authority requirements
 - o Australian Standards
 - relevant sections of the BCA
 - o other relevant legislation
 - o reports prepared by specialised personnel
 - use language, terminology and concepts appropriate to industry conventions
- Written skills to:
 - accurately document construction specifications
 - document construction specifications to mitigate project risks
 - prepare documentation to an accepted industry standard
- · Numeracy skills to apply measurements and calculations to construction systems
- Problem solving skills to:
 - interpret relevant legislation for the design and construction of a commercial building
 - apply construction techniques and methodologies to the intent of the design
 - specify requirements for construction standards and practices
 - select structural members according to project or specification requirements
- Initiative and enterprise skills to:
 - combine materials into workable construction systems
 - analyse site conditions to establish specifications
 - resolve construction and design issues with regard to structural systems
 - work with relevant consultants/consultant documentation
- Planning and organisational skills to collect, organise and analyse information for:
 - the interpretation of legislation
 - the development of building design and specifications
- Technological skills to complete documentation and calculations
- Self management skills to enable construction specifications to be completed within designated time frame
- Teamwork skills during consultation with, and coordination of, internal and external personnel
- Work safely in a design drafting working environment and on a site according to legislation and workplace policies and procedures

- Structural components and construction methodologies and related terminology
- The principles of construction of commercial buildings
- The characteristics, performance and application of construction materials
- Working drawings and specifications for the design of commercial buildings
- Effects of legislative requirements on the design approval process
- Integration of services in a building design
- Statutory requirements for fire separation for commercial buildings
- Specifications for a commercial building providing optimum safety, health and amenity for users

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 in the Performance Criteria is detailed below. Add any 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.

<i>Relevant legislation</i> may include:	 Acts and ordinance Regulations National Construction Code series: BCA, Volume 1 and 2 Plumbing Code of Australia, Volume 3 Australian Standards
Structural and construction principles include:	 construction methods, standards and services in compliance with relevant legislation and design specifications, such as: compatibility of structural elements differential movement effects of deflection effects of shrinkage effects of wind integration of elements and/or systems principles of beams and column design solution of force systems behaviour of structural materials thermal expansion and contraction timber framing design connection details types and behaviour of loads.

Local government planning and construction regulations include:	 occupational health and safety (OHS)/work health and safety (WHS)
	relevant Australian Standards
	town planning.
Site preparation includes:	access
	 batter/gradients
	earthworks and/or cut and fill
	existing services
	 interpretation of topographical features
	orientation
	platforms
	retaining walls
	soil classification
	stormwater
	surface and subsoil drainage
	termite risk management
	trenches.
Footing systems include:	bored piers
	dewatering
	driven piles
	ground stabilisation
	pad and pedestal footings
	pier and beam
	raft slabs
	retaining walls
	tanking.
Structural systems may	bracing and tie-down
include, but is not limited to:	 columns, beams and lintels
	composite structures
	concrete footing and slab systems
	 connection methods and systems
	masonry (solid and cavity)
	non-structural systems:
	 cladding systems which must include environmental components, such as water harvesting and shading/screening devices
	 reinforcement types and placement
	suspended floors
	• timber floor, wall and roof framing.

Structural principles	forces		
include:	loads		
	stresses and strains.		
Special conditions	altitude		
include:	bushfire hazards		
	local wind loads		
	other conditions relevant to specific local conditions		
	seismic activity.		
Scope of work includes:	characteristics		
	compatibility		
	• dimensions		
	location		
	patterns		
	quantities		
	• sizes		
	• surfaces		
	type of products/services.		
Performance	• cost		
requirements include:	 detail relating to availability of material 		
	heritage factors		
	nominated subcontractors		
	 provision of site access/facilities 		
	quality assurance		
	standard procedures		
	 standards of work 		
	work schedules.		
Timber wall, floor and	composition of natural and manufactured timber products		
roof framing includes:	 connection principles and methodologies 		
	floor framing:		
	 design of floor framing layouts 		
	 provision for and inclusion of bracing and tie-down and services 		
	roof framing:		
	 truss design 		
	 truss layout 		
	 conventional roofing systems 		
	- connections		
	 allowance for roofing 		

	 stress grading wall framing: wind loads calculation of sizes configuration of composite timber structures jointing systems allowance for linings and finishes.
<i>Bracing and tie-down</i> includes:	 calculation of bracing requirements calculation of tie-down requirements calculation of wind loads creation of bracing schedules in accordance with accepted industry standards creation of tie-down schedules provision of tie-down requirements and construction systems selection of suitable bracing to meet requirements and construction system(s).
Steel framing systems include:	 basic portal frame cold formed steel framing systems hot rolled steel members, e.g. columns, beams.
Unreinforced and reinforced masonry systems include:	 aerated autoclaved concrete articulation blockwork brick or block veneers expansion joints and proprietary items jointing load bearing brickwork non-loading brickwork mortars piers shrinkage ventilation bonding.
<i>Weatherproofing</i> includes:	 damp proof courses and flashings drainage ventilation width of cavity.

Safeguards include:	 design that allows for: avoiding damage to other buildings fire brigade intervention
	 safe evacuation of the building.
Statutory requirements for fire separation include:	 fire resistance levels fire source features class of building multi-residential timber-framed construction concrete, blockwork, brickwork AAC, lightweight construction, e.g. plasterboard protection of openings sole occupancy units paths of travel fire stairs and isolated stairs non-combustible materials housing in bushfire areas according to regional regulations.
Safe movement and access include:	 access for maintenance, including: roof access built-in provision of roof hatch ladders walk platforms roof mounted services fall arrest systems adequate lighting for daily use and emergencies balustrade handrails stair tread nosings stairs construction swimming pool fencing tactile indicators.
Joinery fabrication and installations include:	 cupboards kitchen benching window and door frames.
Services include:	 air-conditioning communication systems electricity gas mechanical ventilation sewerage and drainage.

EVIDENCE GUIDE		
The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.		
Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design workplace conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended.	
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 legislative requirements applicable to the design of commercial buildings apply the principles of structural and construction to the design of commercial buildings in compliance with the applicable local government authority, relevant legislation and the BCA develop specifications for structural components of a commercial building 	
Context of and specific resources for assessment	 Assessment of essential required knowledge will usually be conducted in an off-site context. Assessment is to comply with relevant legislation. Resource implications for assessment include: realistic tasks or simulated tasks covering the mandatory task requirements relevant specifications and documentation, including land title, site plan, working drawings and specifications and relevant legislation appropriate support materials research resources, including industry-related information. 	

Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.
	Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.
	Evidence should:
	 reinforce the integration of Employability Skills with workplace tasks and job roles
	 be transferable to other circumstances and environments
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role.
	Assessment methods may include:
	 observation of tasks in real or simulated work conditions, with questioning to confirm knowledge of construction technology
	case study of best practice for a specific building project
	• report detailing recommended performance-based solutions to a design problem for a residential building.
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

Un	it code and title	VU22457 Comply with relevant legislation in the desig of residential buildings	
Unit descriptor		This inter resic	unit specifies the outcomes required to access, pret and apply relevant legislation to the design of lential buildings.
		It inc for re Clas reco requ of th	ludes the ability to apply a range of design solutions esidential buildings (Building Code of Australia (BCA) ses 1 and 10), in compliance with the BCA and make mmendations for alternative solutions, as required. It ires thorough knowledge of the purpose and content e BCA.
		No li requ	censing, legislative, regulatory or certification irements apply to this unit at the time of publication.
		How requ Auth	ever, this unit forms part of a minimum qualification irement for registration with the Victorian Building ority as a building designer (architectural).
Em	ployability Skills	This	unit contains Employability Skills.
Application of the unit		This unit supports the attainment of the skills and knowledge required for building designers to apply relevant legislation to the design of residential buildings and includes compliance with current legal responsibilities of building designers. The outcomes of this unit do not cover the required skills and knowledge for compliance with codes and standards in the design of commercial buildings, which are covered in the unit, <i>VU22458 Comply with relevant</i> <i>legislation in the design of commercial buildings</i> .	
EL	EMENT	PER	FORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency.		Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.	
1	Classify buildings	1.1	The nature of a building is determined according to use and arrangement.
		1.2	The criteria of the BCA are determined to apply the defined classification.
		1.3	BCA requirements for classifications are identified and interpreted.
2	2 Access and interpret relevant code and	2.1	Victorian building regulations are referenced in relation to the hierarchy of legislation.
	requirements	2.2	Relevant performance requirements and provisions are determined from the National Construction Code (NCC) that applies to residential buildings.
		2.3	Australian Standards are accessed and interpreted.

ELEMENT PERFORMANCE CRITERIA		FORMANCE CRITERIA	
3	Analyse and apply a range of solutions to a design problem	3.1	Alternative solutions to a construction or design problem that comply with the requirements of the BCA are discussed and proposed in accordance with company policies and procedures.
		3.2	Assessment methods referenced in the BCA are analysed to determine whether a construction or design solution complies with performance requirements or Deemed-to-Satisfy (DTS) provisions of the BCA.
		3.3	Performance-based solutions are identified and documented in accordance with the BCA.
		3.4	Relevant documentation is identified and completed according to the requirements of <i>relevant legislation</i> .

This describes the essential skills and knowledge and their level, required for this unit.

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements and share information with internal and external personnel, where required
 - read and interpret complex documents, including:
 - o relevant legislation
 - o site plans
 - \circ the BCA
 - o specifications
 - working drawings
 - use language and concepts appropriate to industry conventions
- Written skills to document design solutions and other workplace documentation
- Numeracy skills to apply measurements and calculations
- Problem solving skills to design concepts and principles in accordance with the BCA, namely BCA Classes 1 and 10
- Planning and organisational skills to collect, organise and analyse information from relevant legislation
- Teamwork skills when working with internal and external personnel
- Technological skills to complete documentation and calculations
- Learning skills to:
 - maintain professional currency, memberships and networks
 - source current information regarding materials performance and its application
- Work safely in a design drafting working environment and on a site according to legislation and workplace policies and procedures

- Legal responsibilities and obligations of building designers
- Basic design principles and the behaviour of structures under stress, strain, compression, bending or combined actions
- BCA performance hierarchy
- Definitions and common technical terms or usage specified under general provisions of the BCA
- Understanding of the BCA in relation to BCA Classes 1 and 10
- Understanding of the BCA in relation to building types, applications and limitations
- General nature of materials and the effects of performance
- Relevant Australian Standards and guidelines
- Relevant legislative and occupational health and safety (OHS)/work health and safety (WHS) requirements, codes and practices

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 in the Performance Criteria is detailed below. Add any 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.		
Assessment methods include:	 specifications and definitions in the BCA for: comparison with DTS provisions evidence of suitability expert judgment verification methods. 	
Performance requirements include:	 performance-based contractual requirements that must be fulfilled by any party those contained within other legislation applicable to a specific project those determined to be relevant to a specific project according to the BCA 	
<i>Relevant legislation</i> may include:	 Acts and ordinance Regulations NCC series: BCA, Volume 1 and 2 Plumbing Code of Australia, Volume 3 Australian Standards practice and technical notes. 	

EVIDENCE GUIDE		
The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.		
Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design workplace conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended.	
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: apply organisational policies and procedures, including OHS/WHS and quality assurance requirements, where applicable interpret the building hierarchy of legislation and the associated compliance requirements access, interpret and apply codes, standards and guidelines to the design of a specific residential building project recommend alternative solutions to a design or construction problem in accordance with relevant legislation. 	
Context of and specific resources for assessment	 Assessment of required knowledge will usually be conducted in an off-site context. Assessment is to comply with relevant legislation. Resource implications for assessment include: realistic tasks or simulated tasks covering the mandatory task requirements relevant specifications and work instructions the BCA and relevant Australian Standards and guidelines. 	

Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.	
	Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.	
	Evidence should:	
	 reinforce the integration of Employability Skills with workplace tasks and job roles 	
	• be transferable to other circumstances and environments	
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role. 	
	Assessment methods may include:	
	 observation of tasks in real or simulated work conditions, with questioning to confirm knowledge of relevant legislation 	
	 written assignment detailing the relevant codes and standards for a specific project 	
	 report detailing recommended performance-based solutions to a design problem 	
	• drawing documentation and specifications demonstrating compliance with relevant legislation.	
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.	

Unit code and title		VU2 of co	2458 Comply with relevant legislation in the design ommercial buildings		
Unit descriptor		This inter com	This unit specifies the outcomes required to access, interpret and apply relevant legislation to the design of commercial buildings.		
		It inc the c Code in co alter knov	Pludes the ability to apply a range of design solutions to construction or design of a commercial building (Building e of Australia (BCA) Classes 2 to 9), including Type B, impliance with the BCA and make recommendations for native solutions as required. It requires thorough wedge of the purpose and content of the BCA.		
		No li requ	No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.		
		How requ Auth	However, this unit forms part of a minimum qualification requirement for registration with the Victorian Building Authority as a building designer (architectural).		
Em	ployability Skills	This	unit contains Employability Skills.		
Application of the unit		This knov legis inclu build of thi for c resid VU2 resid	This unit supports the attainment of the skills and knowledge required for building designers to apply relevant legislation to the design of commercial buildings and includes compliance with current legal responsibilities of building designers for construction methods. The outcomes of this unit do not cover the required skills and knowledge for compliance with codes and standards in the design of residential buildings, which are covered in the unit, <i>VU22457 Comply with relevant legislation in the design of</i> <i>residential buildings</i> .		
EL	EMENT	PER	FORMANCE CRITERIA		
Elements describe the essential outcomes of a unit of competency.		Perfo demo used, and/o consi	rmance criteria describe the required performance needed to nstrate achievement of the element. Where bold italicised text is further information is detailed in the required skills and knowledge r the range statement. Assessment of performance is to be stent with the evidence guide.		
1	Classify buildings	1.1	The nature of a building is determined according to use and arrangement.		
		1.2	The criteria of the BCA are determined to apply the defined classification.		
		1.3	BCA requirements for classifications are identified and interpreted.		

ELEMENT		PER	FORMANCE CRITERIA
2	Access and interpret relevant code and other legislative requirements	2.1	Victorian building regulations are referenced in relation to the hierarchy of legislation.
		2.2	Relevant performance requirements and provisions are determined from the National Construction Code (NCC) series that apply to commercial buildings.
		2.3	Australian Standards are accessed and interpreted.
3	Analyse and apply a range of solutions to a design problem	3.1	Alternative solutions to a construction or design problem that comply with the requirements of the BCA are discussed and proposed in accordance with company policies and procedures.
		3.2	Assessment methods referenced in the BCA are analysed to determine whether a construction or design solution complies with performance requirements or Deemed-to-Satisfy (DTS) provisions of the BCA.
		3.3	Performance-based solutions are identified and documented in accordance with the BCA.
		3.4	Relevant documentation is identified and completed according to the requirements of <i>relevant legislation</i> .

This describes the essential skills and knowledge and their level, required for this unit.

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements and share information with internal and external personnel, where required
 - read and interpret complex documents, including:
 - o relevant legislation
 - o site plans
 - \circ the BCA
 - o specifications
 - o working drawings
 - use language and concepts appropriate to industry conventions
- Written skills to document design solutions and other workplace documentation
- Numeracy skills to apply measurements and calculations
- Problem solving skills to design concepts and principles in accordance with the BCA, namely BCA Classes 2 to 9

- Planning and organisational skills to collect, organise and analyse information from relevant legislation
- Teamwork skills when working with internal and external personnel
- Technological skills to complete documentation and calculations
- Learning skills to:
 - maintain professional currency, memberships and networks
 - source current information regarding materials performance and its application
- Work safely in a design drafting working environment and on a site according to legislation and workplace policies and procedures

- Legal responsibilities and obligations of building designers
- Basic design principles and the behaviour of structures under stress, strain, compression, bending or combined actions
- BCA performance hierarchy
- Definitions and common technical terms or usage specified under general provisions of the BCA
- Understanding of the BCA in relation to BCA Classes 2 to 9
- Understanding of the BCA in relation to building types, including Type B, applications and limitations
- General nature of materials and the effects of performance
- Relevant Australian Standards and guidelines
- Relevant legislative and occupational health and safety (OHS)/work health and safety (WHS) requirements, codes and practices

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 in the Performance Criteria is detailed below. Add any 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.

Assessment methods include:	 specifications and definitions in the BCA for: comparison with DTS provisions evidence of suitability expert judgment verification methods.
Performance requirements include:	 performance-based contractual requirements that must be fulfilled by any party those contained within other legislation applicable to a specific project those determined to be relevant to a specific project according to the BCA.

Relevant legislation may	Acts and ordinance
include:	Regulations
	NCC series:
	 BCA, Volume 1 and 2
	 Plumbing Code of Australia, Volume 3
	Australian Standards
	 practice and technical notes.

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EVIDENCE GUIDE			
The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.			
Overview of assessmentThis unit could be assessed in the workplace or a clossimulation of the workplace environment, provided the simulated or project-based assessment techniques rebuilding design workplace conditions, materials, active responsibilities and procedures.Holistic or project-based assessment with other related is recommended.			
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: apply organisational policies and procedures, including OHS/WHS and quality assurance requirements, where applicable interpret the building hierarchy of legislation and the associated compliance requirements access, interpret and apply codes, standards and guidelines to the design of a specific commercial building project recommend alternative solutions to a design or construction problem in accordance with relevant 		
Context of and specific resources for assessment	nd specific or assessmentAssessment of required knowledge will usually be conducted in an off-site context.Assessment is to comply with relevant legislation.Resource implications for assessment include:• realistic tasks or simulated tasks covering the mandat task requirements• relevant specifications and work instructions• the BCA and relevant Australian Standards and quidelines.		

Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.	
	Evidence should:	
	 reinforce the integration of Employability Skills with workplace tasks and job roles 	
	• be transferable to other circumstances and environments	
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role. 	
	Assessment methods may include:	
	 observation of tasks in real or simulated work conditions, with questioning to confirm knowledge of relevant legislation 	
	 written assignment detailing the relevant codes and standards for a specific project 	
	 report detailing recommended performance-based solutions to a design problem 	
	 drawing documentation and specifications demonstrating compliance with relevant legislation. 	
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.	

Unit code and title		VU2	2459 Design safe buildings	
Unit descriptor		This desig (OH a bu	This unit specifies the outcomes required to apply safe design principles to control occupational health and safety (OHS)/work health and safety (WHS) risk during the life of a building.	
		It includes the ability to identify and comply with legal responsibilities and obligations and evaluate OHS/WHS hazards associated with the design, construction and use of a building during its life cycle. Applying safe design principles requires consultation with stakeholders and specialist advisors and the ability to make recommendations for alternative design solutions and incorporate risk controls into the building design and end use.		
		No li requ	censing, legislative, regulatory or certification irements apply to this unit at the time of publication.	
		How requ Auth	However, this unit forms part of a minimum qualification requirement for registration with the Victorian Building Authority as a building designer (architectural).	
Em	ployability Skills	This	unit contains Employability Skills.	
Application of the unit		This unit supports the attainment of the skills and knowledge required for building designers to design safe buildings, which comply with current OHS/WHS legislation and relevant sections of the National Construction Code.		
ELEMENT		PER	FORMANCE CRITERIA	
Elements describe the essential outcomes of a unit of competency.		Perfo demo used, and/c consi	rmance criteria describe the required performance needed to instrate achievement of the element. Where bold italicised text is further information is detailed in the required skills and knowledge or the range statement. Assessment of performance is to be stent with the evidence guide.	
1	Investigate OHS/WHS requirements in the design process	1.1	Legal responsibilities and obligations of building designers for the safety of end users and beneficiaries are identified to enable the elimination of OHS/WHS <i>hazards</i> and control residual OHS/WHS risk.	
		1.2	<i>Stakeholders</i> involved in the design and construction process are consulted to determine <i>specific OHS/WHS issues</i> .	
		1.3	Sources of current information and data of OHS/WHS principles, materials, technology and systems are researched for application in the design and construction process.	
		1.4	Client is consulted to confirm the needs of those involved in the <i>subsequent life cycle stages</i> of the building.	

ELEMENT		PER	PERFORMANCE CRITERIA	
2	Undertake hazard identification and OHS/WHS risk evaluation	2.1	OHS/WHS risks are identified and a <i>risk analysis</i> conducted across the life cycle of the building according to <i>the hierarchy of control</i> .	
		2.2	OHS/WHS risk controls are selected through a systematic analysis of the likelihood and consequences of exposure to the hazard.	
		2.3	A process for review of hazard identification and risk control is developed to incorporate potential alterations to design decisions or specifications.	
		2.4	A residual risk register is established and the information circulated to those involved in the downstream or subsequent life cycle stages.	
3	Produce designs to facilitate safe construction, use and maintenance of a building	3.1	Benefits of safe design are identified and communicated to stakeholders.	
		3.2	Situations are identified where consultation with specialist advisors is required, and their services are utilised, as necessary.	
		3.3	Client is informed of any <i>high risks</i> in design requirements and alternatives, including design modifications, which are agreed and documented.	
		3.4	Risk controls are incorporated into design to facilitate the safe use and maintenance of the building in accordance with legislative requirements.	
		3.5	Relevant documentation is provided to client for the education and training of end users and employees, to ensure safe and efficient operation and maintenance of the building.	

This describes the essential skills and knowledge and their level, required for this unit.

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements and share information with internal and external personnel, where required
 - read and interpret:
 - the Building Code of Australia (BCA)
 - o relevant OHS/WHS legislation and Australian Standards
 - o workplace documentation relating to the safe design of buildings
 - o plans, drawing and specifications
 - use language and concepts appropriate to industry conventions
- Written skills to:
 - produce workplace documentation
 - record data and findings on historical and current information pertaining to OHS/WHS
- Problem solving skills to:
 - identify legal responsibilities and obligations regarding safe design
 - analyse and evaluate data on OHS/WHS hazards, reports and compensation claims
 - negotiate client expectations of OHS/WHS outcomes
 - apply principles of safe design to the life cycle of a building
- Planning and organisational skills to collect, organise and analyse information on safe design
- Initiative and enterprise skills in:
 - developing practical risk controls
 - recommending alterations to design to improve safety
- Teamwork skills when consulting specialist advisors and stakeholders
- Self management skills in recognising limits of own expertise and seeking the advice of others, when required
- Learning skills in maintaining up-to-date knowledge of safe design principles and changes to legislation
- Technology skills to produce required documentation
- Work safely in a design drafting working environment according to legislation and workplace policies and procedures

- Legislative and regulatory requirements for OHS/WHS information, data and consultation
- Principles and practices of a systematic approach to risk management
- Basic principles of anthropometry
- Direct and indirect influences that impact on OHS/WHS and the environment in the design and use of a building
- The hierarchy of control and considerations for deciding between different methods of control
- Interdependent relationships between ergonomics and stressors, such as physiological factors, awkward posture, poor lighting and ventilation and thermal environment
- Legislative responsibilities of building designers with regard to OHS/WHS at all stages of design, construction and end use of a building

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 in the Performance Criteria is detailed below. Add any 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.			
<i>Legal responsibilities</i> as stated in:	 Australian Standards specified in Conditions of Contracts Occupational Health and Safety Act, Work Health and Safety Act and Regulations relevant sections of the BCA. 		
OHS/WHS hazards may include, but are not limited	 accessing roofs, walkways, stairs for both the users of the building and maintenance personnel 		
to:	 exposure to health hazards from biological materials 		
	exposure to occupational violence		
	head injuries		
	 inadequate vehicle/pedestrian separation 		
	 inadequate ventilation of lighting 		
	 limited access for emergency services 		
	 limited access to undertake systems of work, including cleaning and maintenance activities 		
	 poor siting of buildings or lack of separation between multiple buildings 		
	 storage and handling of dangerous goods and hazardous substances 		
	 work involving exposure to high energy hazards e.g. temperature 		
	working at height		
	 materials used within the construction process. 		

Stakeholders include:	all maintenance contractor personnel
	 all visiting personnel to the premises
	 client personnel, employees and agents
	 end user personnel, employees and agents
	 relevant design and construction personnel.
<i>Specific OHS/WHS issues</i> may include:	 any hazards that could impact on those involved in the design, construction phase and the end use of the building. In particular, the requirements for all visitors to the construction site to meet current legislative obligations and work site procedures.
Sources of current information and data	 Acts, Regulations, codes of practice and Australian Standards
includes:	the BCA
	 Commonwealth and state OHS/WHS and other regulatory bodies, such as the Australian Safety and Compensation Council
	industry advisory bodies
	 professional and industry associations
	research literature.
Subsequent life cycle	construction
stages include:	• design
	maintenance and servicing
	supply/installation
	• use.
Risk analysis may include:	 accessing the effectiveness of existing controls
	 analysing previous compensation claims and hazard reports
	 defining the range of consequences and the likelihood of their occurrence
	determining a level of risk
	 identifying demographic of end user
	 researching industry specific hazards.
<i>The hierarchy of control</i> may include:	 eliminating the hazard, and where this is not possible, minimising risk by:
	 substitution
	 isolation
	 engineering controls
	 administrative controls
	 using personal protective equipment (PPE).

<i>Risk register</i> may include:	 an indication of the likelihood of the consequences occurring possible consequences in terms of injury or damage scenarios or circumstances under which injury or illness may occur.
<i>High risks</i> may include, but are not limited to:	 siting of building(s) or structure(s) high consequence hazards, such as: temperature pressure health hazards systems of work, such as: inadequate vehicle/pedestrian access exposure to hazardous substances working at heights environment, such as inadequate ventilation or lighting incident mitigation, such as: siting of assembly areas inadequate egress inadequate emergency services access.
<i>Risk controls</i> include:	 review design brief review written specifications identifying solutions from recognised standards applying risk management techniques discussing design options consultation processes for changes in design.
<i>Relevant documentation</i> includes:	 material relating to key design elements, such as: exterior roof and wall materials key mechanical machinery landscaping location of services warranties windows and exterior doors.
EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design drafting workplace conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended.
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 legal responsibilities and obligations and organisational policies and procedures, including OHS/WHS implement risk management processes for the identification of OHS/WHS hazards and selection of suitable controls consult with relevant stakeholders to determine safety requirements in the life cycle stages of a building design a safe building which complies with current legislative requirements for the design, construction and use of a building.
Context of and specific resources for assessment	 Assessment of essential required knowledge will usually be conducted in an off-site context. Assessment is to comply with relevant legislation, including the BCA and Australian Standards. Resource implications for assessment include: realistic tasks or simulated tasks covering the mandatory task requirements relevant legislation, standards and codes relevant specifications and documentation, including working drawings, specifications and plans appropriate support materials research resources, including OHS/WHS related information.

Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.
	Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.
	Evidence should:
	 reinforce the integration of Employability Skills with workplace tasks and job roles
	• be transferable to other circumstances and environments
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role.
	Assessment methods may include:
	 observation of tasks in real or simulated work conditions, with questioning to confirm knowledge of OHS/WHS legislation
	case study of best practice for a specific building project
	 development of a risk register for a specific building project
	 portfolio of design documentation relevant to the safe design of a building.
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

Un	it code and title	VU2	2460 Design sustainable buildings	
Un	it descriptor	This princ	unit specifies the outcomes required to apply the siples of sustainability to building design.	
		It inc minir land susta desig the b legis Aust	Pludes the application of sustainable practices to mise negative impacts of the construction process and use on the environment, incorporate passive design, ainable water use and energy efficiency into a building on and select suitable materials for the construction of building. It requires compliance with relevant lation, Australian Standards and the Building Code of ralia (BCA).	
		No li requ	censing, legislative, regulatory or certification irements apply to this unit at the time of publication.	
		However, this unit forms part of a minimum qualification requirement for registration with the Victorian Building Authority as a building designer (architectural).		
Em	ployability Skills	This	unit contains Employability Skills.	
Application of the unit		This unit supports the attainment of the skills and knowledge required for building designers to design sustainable buildings within the context of relevant legislation, the BCA and Australian Standards.		
EL	EMENT	PER	FORMANCE CRITERIA	
Eler outo	ments describe the essential comes of a unit of competency.	Perfo demo used, and/o consi	rmance criteria describe the required performance needed to nstrate achievement of the element. Where bold italicised text is further information is detailed in the required skills and knowledge or the range statement. Assessment of performance is to be stent with the evidence guide.	
1	Determine the impacts of building development on the	1.1	Impacts of building development on surrounding ecosystems are researched to identify the benefits of sound environmental policy.	
	natural environment	1.2	<i>Triple Bottom Line approaches</i> are determined for consideration in the designing of buildings.	
		1.3	Current government and industry responses to Ecologically Sustainable Development (ESD) are researched and representative organisations for ESD are identified to ascertain current policies and legislation.	

ELEMENT		PERFORMANCE CRITERIA		
2	Incorporate sustainable criteria into building design	2.1	Location, specific climates and their characteristics are identified and their impact on building design is researched to inform the design.	
		2.2	Basic principles and integration for building orientation, minimal site impact, thermal mass, insulation, glass exposure and ventilation are determined to maximise integration of sustainable design principles in the design.	
		2.3	<i>Site influences</i> and <i>sun path</i> are considered to maximise opportunities for passive heating and cooling.	
		2.4	<i>Passive design principles</i> are incorporated into a design project.	
		2.5	<i>Sustainable site development practices</i> are included in design specifications.	
		2.6	Appropriate form of construction is selected and documented according to client brief and specifications.	
3	Select sustainable materials	3.1	Characteristics of sustainable materials are identified and analysed to inform material selection.	
		3.2	Sustainability of a <i>range of building materials</i> is compared and suitable materials are selected for a specific building design in accordance with current legislation and the BCA.	
4	Incorporate systems for sustainable water use	4.1	Systems for <i>water collection, storage, use and re-use</i> are incorporated into building design in accordance with relevant legislation and local restrictions.	
		4.2	Alternative systems for reticulated water and effluent disposal are investigated and described.	
		4.3	<i>Strategies to prevent run-off</i> are investigated and incorporated into design.	
5	Incorporate energy efficiency into building design	5.1	Energy efficient design principles are identified in accordance with current legislation and the BCA.	
		5.2	Renewable energy sources are researched and integrated into building design and best practice options for energy conservation are recommended.	
		5.3	Selection and use of energy efficient fittings, appliances and services are determined and included in design specifications.	

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements and share information with internal and external personnel, where required
 - read and interpret:
 - o the BCA
 - o relevant legislation and Australian Standards
 - o other relevant documentation
 - research information on sustainable building principles
 - use language and concepts appropriate to industry conventions
- Written skills to:
 - develop recommendations and strategies for sustainable building design
 - document data and findings to industry standards
- · Teamwork skills to work effectively with clients and other stakeholders
- Problem solving skills to:
 - analyse and evaluate data on construction materials and integrate sustainable and energy efficient systems into building design
 - determine the potential cost versus benefit of alternative sustainable options
- Planning and organisational skills to collect, organise and analyse information on sustainable building practices
- Initiative and enterprise skills in interpreting information and developing sustainable design solutions
- Learning skills in updating knowledge of sustainable materials and building practices
- Technology skills to:
 - complete documentation and calculations
 - operate computer energy rating systems, where applicable
- Work safely in a design drafting working environment according to legislation and workplace policies and procedures

- Principles of sustainability in building design
- Mandatory disclosure
- Green star rating system
- Building adaptation for catastrophic events responding to climate change
- Indoor environmental quality (air quality, thermal comfort, acoustics)
- Characteristics of ecosystems
- Macro and micro climates
- Site topography features
- Effects of fossil fuels on the atmosphere
- Energy consumption relative to construction processes and building use
- Greenhouse gas emissions and ozone depletion theories
- Impacts of climate change
- Impacts of national strategies on building design
- Principles of designing buildings for durability and adaptability
- Life cycle assessment principles
- Basic principles of cradle-to-grave analysis
- Nature of construction materials and effect on performance
- R values (overall thermal resistance) for construction material
- Software used to predict building performance
- Energy auditing principles
- Processes for the administration and preparation of documentation
- Processes for the development of documentation, such as working drawings and specifications
- The BCA Deemed-to-Satisfy (DTS) energy efficiency provisions
- Occupational health and safety (OHS)/Work health and safety (WHS) workplace policies and procedures
- Relevant federal, state or territory legislation and local government policy and procedures

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 in the Performance Criteria is detailed below. Add any 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.

Triple Bottom Line approaches are:	 the impacts on natural and human capital, as well as financial capital. They focus on decision making and reporting which explicitly considers economic, environmental and social performance.
Government and industry responses may include:	 Brundtland Report Emissions Trading Green Paper Environmental Management Systems ISO 14000 Standards from International Organization for Standardization Kyoto Protocol National Greenhouse Response Strategy National Strategy for Ecologically Sustainable Development (NSESD) UN Local Agenda 21 – the Rio Declaration on Environment and Development Commonwealth, state and local government Acts, Regulations and development carbon trading codes of practice state environment protection policies.
<i>Organisations</i> include, but are not limited to:	 Australian Building Codes Board Australian Greenhouse Office (AGO) Environment Australia Environmental Protection Agency (EPA) Green Building Council (GBC) Leadership in Energy and Environmental Design (LEED) Living Building Challenge.
<i>Location specific climates</i> include:	 Australian climates influenced by topological and geographical elements climate zones as classified by the BCA DTS energy efficiency provisions micro climates in specific locations.

Site influences include:	 existing vegetation natural water courses noise orientation prevailing winds topography views.
<i>Sun path</i> includes:	shadow angle calculationshadow map diagramsorientation.
<i>Passive design principles</i> include:	 natural air flow natural and artificial shading orientation passive cooling passive heating thermal mass.
Sustainable site development practices include:	 maintaining appropriate existing vegetation minimal site excavation preservation of natural features recycling stations uninterrupted natural water courses utilisation of existing roads, thoroughfares and utilities water containment techniques and strategies to prevent run-off rainwater collection and re-use during construction.
<i>Sustainable materials</i> include those which:	 are biodegradable are locally manufactured or available on-site are remanufactured, re-usable or recycled can be re-used or recycled do not contain or emit toxic substances do not have a negative impact on the environment during their production, usage and disposal have a low embodied energy require minimal processing.

Range of building	caulks and adhesives
materials include:	concrete
	doors
	flooring and floor coverings
	insulation
	 interior finishes and trim
	masonry
	 mechanical systems/heating, ventilation and air- conditioning
	 paintings and coatings
	 plumbing systems and equipment
	 renewable energy components
	roofing
	 thermal and moisture protection
	 timber, plastics and composites
	windows and glazing systems.
Water collection, storage,	 black water systems filter beds
use and re-use includes:	bladder storage
	greywater systems
	rainwater tanks.
Strategies to prevent run-	maximising the use of impervious surfaces
off includes:	 preservation of existing vegetation
	water collection.
Energy efficient design	 application and assessment of the BCA
principles include:	 performance-based solutions
	best practice to conserve energy:
	 appliance usage
	 building location and orientation
	 choice and product performance
	 compliance with legislation pertinent to conserving energy
	 living practices that maximise benefit
	climate conditions:
	 climate zones in Australia specified in the BCA
	 micro climates associated with a specific area

	energy consumption:
	 low energy lighting
	 solar hot water systems
	 star rated appliances
	 window coverings and glazing
	energy efficient construction:
	 construction methods
	 durability and adaptability
	 efficient design briefs
	 geography and topography of site
	- location
	 materials used which maximise re-use potential
	 method of application
	Building Information Modeling (BIM)
	star rating systems:
	 Building Energy Rating Scheme (BERS) computer model
	 First Rate computer model
	 Nationwide House Energy Rating Scheme (NatHERS) computer model
	outcomes for building users:
	 avoiding sick building syndrome
	workplace productivity measures.
Renewable energy	biomass energy
sources include:	geothermal energy
	hydroelectric energy
	solar energy
	wind energy
	co/tri generation sources.

EVIDENCE GUIDE The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package. **Overview of assessment** This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design workplace conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended. Critical aspects for A person who demonstrates competency in this unit must assessment and evidence be able to provide evidence of the ability to: required to demonstrate apply the principles of sustainable building design in competency in this unit accordance with current legislation and government policies evaluate and recommend sustainable materials suitable • for the construction of a specific building design in accordance with client brief and specifications research, evaluate and report on data and findings, make recommendations and develop strategies for the design of sustainable buildings for at least one building development project that complies with the applicable local government authority, relevant legislation and the BCA. **Context of and specific** Assessment of essential required knowledge will usually be resources for assessment conducted in an off-site context. Assessment is to comply with relevant regulatory or Australian Standards' requirements. Resource implications for assessment include: realistic tasks or simulated tasks covering the mandatory task requirements relevant specifications and documentation • appropriate support materials research resources, including industry-related information. 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	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.
	Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.
	Evidence should:
	 reinforce the integration of Employability Skills with workplace tasks and job roles
	• be transferable to other circumstances and environments
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role.
	Assessment methods may include:
	 observation of tasks in real or simulated work conditions, with questioning to confirm knowledge required of current sustainable materials and building practices
	 research and reporting on case studies of best practice sustainable buildings
	 report on sustainable construction materials
	• portfolio of a range of sustainable construction materials.
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders, or specialist training staff.

Un	it code and title	VU22461 Integrate services layout into design documentation			
Unit descriptor		This layou docu (BCA 2 to 2	This unit specifies the outcomes required to integrate the layout of services and connections into building design documentation for residential (Building Code of Australia (BCA) Classes 1 and 10) and commercial (BCA Classes 2 to 9) buildings.		
		It inc susta and agre requ Stan	ludes the knowledge and application of current ainable and energy efficient practices and appliances involves consultation with other professionals to obtain ement on service layout details and specifications. It ires compliance with relevant legislation, Australian dards and the BCA.		
		No li requ	censing, legislative, regulatory or certification irements apply to this unit at the time of publication.		
		However, this unit forms part of a minimum qualification requirement for registration with the Victorian Building Authority as a building designer (architectural).			
Em	ployability Skills	This	unit contains Employability Skills.		
Application of the unit		This knov servi build finali legis	unit supports the attainment of the skills and vledge required for building designers to integrate ces layout into designs for residential and commercial ings in consultation with other professionals and se documentation in compliance with relevant lation and the BCA.		
ELEMENT		PER	FORMANCE CRITERIA		
Elements describe the essential outcomes of a unit of competency.		Perfo demo used, and/o consi	rmance criteria describe the required performance needed to nstrate achievement of the element. Where bold italicised text is further information is detailed in the required skills and knowledge r the range statement. Assessment of performance is to be stent with the evidence guide.		
1	Document layouts of water supply and hot water systems	1.1	<i>Water supply</i> , connection and layout are identified and documented for buildings connected to a town supply or a tank storage supply in accordance with the <i>relevant legislation</i> .		
		1.2	Installation of water services supplying fire hydrants, fire hose reels and fire sprinkler systems and interconnection of water tanks for fire services are identified in accordance with the relevant legislation.		
		1.3	Details of hot water systems are evaluated and documented according to suitability and energy rating to maximise energy efficiency.		

ELEMENT		PER	PERFORMANCE CRITERIA	
2	2 Document sewerage and drainage disposal methods and layouts	2.1	Sewerage connection and layout are determined for connection in accordance with the relevant legislation.	
		2.2	Disposal of sewerage from fixtures situated below the level of the local authority sewer for both residential and commercial buildings are identified in accordance with the relevant legislation.	
		2.3	The design and installation of drainage systems are documented in accordance with relevant legislation and stormwater disposal methods are identified.	
3 Document and layo ventilation air-condi fire prote	Document methods and layout for ventilation, air-conditioning and fire protection	3.1	Methods and layout of <i>mechanical ventilation and</i> <i>air-conditioning</i> systems are evaluated and documented according to energy rating to maximise energy efficiency and optimise indoor environmental quality.	
	systems	3.2	Systems for natural ventilation are evaluated to determine optimal building performance.	
		3.3	Methods for smoke hazard management are evaluated and documented according to the relevant legislation.	
		3.4	Requirements for <i>fire protection systems</i> for various building classifications are evaluated and documented in accordance with the relevant legislation.	
4	Document natural and artificial lighting options	4.1	Design considerations for natural lighting are evaluated to determine optimal user comfort in accordance with Australian Standards for lighting levels.	
		4.2	Artificial lighting and light sources are compared to recommended service luminance in accordance with the relevant legislation.	
5	Document electrical and electronic services layout	5.1	<i>Electrical and electronic service systems</i> are evaluated and documented and supply authorities are identified.	
		5.2	Design and installation of emergency warning systems, emergency lighting and exit signage are evaluated and documented in accordance with the relevant legislation.	
		5.3	<i>Methods of vertical transportation</i> are evaluated and documented in accordance with the relevant legislation.	

EL	EMENT	PERFORMANCE CRITERIA	
6	Finalise services layout	6.1	Details of services layout and any required amendments are confirmed with service engineer or other consultants.
		6.2	Shop drawings and other relevant documentation are checked and signed off against design specifications.

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

- Communication skills to:
 - consult with other professionals and negotiate required amendments, as required
 - read and interpret:
 - relevant documentation and legislation
 - the BCA
 - o plans, working drawings and specifications
 - use language and concepts appropriate to industry conventions, including industry terminology and definitions
 - use and interpret non-verbal communication
- Numeracy skills to apply measurements and basic calculations relating to service installations
- Written skills to:
 - accurately document details and specifications of services layout
 - document specifications to mitigate project risks
 - prepare documentation to an accepted industry standard
- Teamwork skills to work effectively with clients and other stakeholders
- Problem solving skills to:
 - interpret information from plans and drawings
 - identify and resolve typical faults and problems
 - evaluate mechanical ventilation and air-conditioning for energy efficiency
 - apply standards to artificial lighting and light sources
- Planning and organising skills to collect, organise and analyse information on services layouts
- Initiative and enterprise skills to apply design concepts and principles relating to service installations
- Self management skills to enable the completion of work tasks according to timelines and project schedule

- Technology skills to:
 - use relevant computer software
 - produce documentation and calculations
- Work safely in a design drafting working environment according to legislation and workplace policies and procedures

- Nature of materials and effect on performance relating to service installations
- Working drawings and specifications relating to service installations
- A variety of design concepts and principles relating to service installation
- Role and responsibilities of building designers relating to services layout
- Service installation terminology, definitions, installation methods and hazards in relation to devices and systems using Australian Standards, the BCA and manufacturer's specifications
- Sustainability and energy efficiency principles and practices in relation to services installation

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 in the Performance Criteria is detailed below. Add any 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.				
Water supply includes:	a town supply			
	 single and two-stage pumping for multi-function connected services 			
	 tank storage supply relative to the public water supply and reservoir heights. 			
Relevant legislation may	Acts and ordinance			
include:	Regulations			
	National Construction Code series:			
	 BCA, Volume 1 and 2 			
	 Plumbing Code of Australia, Volume 3 			
	Australian Standards			
	practice and technical notes.			
Details of hot water	area to be serviced			
systems include:	height of installation			
	 number of outlets and energy sources available 			
	type of occupancy			
	• type of system.			

Sewerage connection and layout includes:	 local authority sewerage drainage system septic or bio-chemical treatment unit graded or vertical discharge pipes 			
	 inspection shafts and ORGs. 			
<i>Mechanical ventilation and air-conditioning includes:</i>	 air-conditioning applications air distribution, including mechanical ventilation for car parks 			
	 air filtration, including air filters, ducting, main filter types 			
	all intake systems fire dampers			
	fume discharge systems			
	 smoke control and exhaust systems 			
	 warm water and cooling towers. 			
<i>Fire protection systems</i> include:	 fire and smoke detectors and alarms fire collars fire hydrants, fire hoses and reels sprinkler systems. 			
Design considerations for natural lighting includes:	 glare reduction low life cycle cost reduced emissions reduced operating costs reflectance of interior surfaces window size and spacing. 			
Electrical and electronic service systems includes:	 categories of cabling and layout of equipment for: data telecommunications lift controls power supplies service systems safeguards and access for maintenance, repair and extension telecommunications connection to site and distribution facilities type of service (emergency power and alternative power sources). 			
<i>Methods of vertical transportation</i> includes:	 escalators hoists lifts pedestrian movers. 			

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate design drafting workplace conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended.		
Critical aspects for assessment and evidence required to	A person who demonstrates competency in this unit must be able to provide evidence of the ability to:		
demonstrate	into the design of a residential or commercial building		
competency in this unit	 consult with other professionals to negotiate details of services layout 		
	 interpret and comply with relevant legislation. 		
Context of and specific resources for	Assessment of essential required knowledge will usually be conducted in an off-site context.		
assessment	Assessment is to comply with relevant regulatory or Australian Standards' requirements.		
	Resource implications for assessment include:		
	 realistic tasks or simulated tasks covering the mandatory task requirements 		
	 specifications and documentation for services layout 		
	 the BCA and relevant Australian Standards 		
	• research resources, including industry-related information.		
Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.		
	Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.Evidence should:		
	 reinforce the integration of Employability Skills with workplace tasks and job roles 		
	• be transferable to other circumstances and environments		
	relate to a number of performances assessed on different occasions which reflects the scope of the job role		

Assessment methods may include:	
• observation of tasks in real or simulated work conditions, with questioning to confirm knowledge of current practices in the layout of services	
• development of documentation integrating services layout	
 research project on energy efficient heating, ventilation and air-conditioning systems. 	
Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties such as existing supervisors, team leaders or specialist training staff.	

Un	it code and title	VU22462 Produce preliminary and working drawings for residential buildings		
Unit descriptor		This unit specifies outcomes required to produce two and three-dimensional drawings in accordance with standard industry practice and to a level suitable for building permit approval applications.		
		It includes the ability to read and interpret plans and specifications and to produce preliminary and working drawings for residential buildings (Building Code of Australia (BCA) Classes 1 and 10).		
		No li requ	censing, legislative, regulatory or certification irements apply to this unit at the time of publication.	
		However, this unit forms part of a minimum qualification requirement for registration with the Victorian Building Authority as a building designer (architectural).		
Em	ployability Skills	This unit contains Employability Skills.		
Ар	pplication of the unit required for building designers to produ working drawings for residential buildin and 10) within the context of relevant le Australian Standards.		unit supports the attainment of the skills and knowledge ired for building designers to produce preliminary and sing drawings for residential buildings (BCA Classes 1 10) within the context of relevant legislation, the BCA and ralian Standards.	
		The outcomes of this unit do not cover the required skills and knowledge for producing working drawings for commercial buildings, which are covered in the unit, <i>VU22463 Produce preliminary and working drawings for commercial buildings</i> .		
EL	EMENT	PERFORMANCE CRITERIA		
Eler outo com	ments describe the essential comes of a unit of npetency.	Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consisten with the evidence guide.		
1	Produce preliminary drawings	1.1	Types of preliminary drawings required and key features to be recorded conform to the scope and standard of the job being undertaken.	
		1.2	Tools and equipment required for producing sketches/drawings are prepared and checked for safety and serviceability.	
		1.3	Simple two and three-dimensional drawings are created to resolve construction details.	

ELEMENT		PERFORMANCE CRITERIA	
2 Read, interpret and articulate plans and specifications for a residential building	Read, interpret and articulate plans and	2.1	Relevant <i>plans and specifications</i> are identified to develop a set of working drawings.
	2.2	Key information is located, interpreted and articulated according to relevant specifications and <i>relevant legislation</i> .	
		2.3	Advice is sought from client and other stakeholders, when required, to articulate and clarify any issues.
3	Produce preliminary working drawings	3.1	<i>Working drawings for residential buildings</i> are produced using <i>standard drawing conventions</i> and in accordance with current Australian Standards.
		3.2	Industry best practice conventions are applied to the production of <i>building drawings</i> .
4	Produce a set of working drawings	4.1	Working drawings are completed to meet architectural conventions and in accordance with the relevant legislation.
		4.2	Working drawings are checked with team members for consistency of presentation, cross-referencing and accuracy and to comply with relevant legislation.

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm client needs and share information with team members
 - read and interpret:
 - \circ the BCA
 - o relevant legislation and Australian Standards
 - o plans and specifications
 - o other relevant documentation
 - use language and concepts appropriate to industry conventions
 - use and interpret non-verbal communication
- Written skills to produce simple preliminary drawings
- Teamwork skills to:
 - work effectively with clients and other stakeholders
 - produce preliminary and working drawings within allocated responsibilities

- Problem solving skills to interpret information from plans, specifications and client brief to develop required preliminary drawings
- Planning and organising skills to produce preliminary and working drawings within an allocated time frame
- Initiative and enterprise skills to achieve creative and innovative approaches in the production of drawing tasks
- Numeracy skills to apply calculation and measuring techniques
- Technological skills to:
 - use computer software to enable production of working drawings
 - complete documentation and calculations
- Work safely in a design drafting working environment according to legislation and workplace policies and procedures

- Drafting and drawing protocols
- Industry conventions and features, including direction, scale, key, contours, symbols and abbreviations
- Processes for the administration and preparation of documentation
- Processes for the interpretation of reports, working drawings and specifications
- Research methods to locate relevant information
- Structural, design and construction principles of buildings
- Process for the consideration of a budget constraint
- Relevant federal or state legislation and local government policy and procedures, including occupational health and safety (OHS)/work health and safety (WHS) requirements.
- Functions and operation of computer software used to produce working drawings

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 in the Performance Criteria is detailed below. Add any 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.				
Types of preliminary drawings include: Key features include:	 floor plans land boundaries and footprint of building/site plans orthographic drawings schematic drawings that show articulation of services sectional views that detail key construction elements. building levels and variations fixtures and fittings services electrical layout wall penetrations (doors/windows) walls. 			
Plans and specifications include:	 plans: set of working drawings construction technology details finishes and specification notes to a standard suitable for building approval sections relating to main components of construction information from consultants may include: soil tests shop drawings (steel fabrication) structural engineering drawings survey plans and level plans for construction site costing/preliminary estimates energy rating Bushfire Attack Level (BAL) temporary structures and works. 			
<i>Relevant legislation</i> may include:	 Acts and ordinance Regulations National Construction Code series: BCA, Volume 1 and 2 Plumbing Code of Australia, Volume 3 Australian Standards practice and technical notes. 			

Working drawings for residential buildings	area analysis		
include:	BCA Classes 1 and 10 buildings		
	 computer-generated or print-based presentations 		
	construction and general notes		
	floor plans		
	location		
	neighbouring buildings		
	 plan and specification interpretation 		
	projections		
	sections		
	services		
	 residential dwellings (elementary or conventional) 		
	• site plans		
	two and three-dimensional drawings.		
Standard drawing	appropriate scale		
conventions include:	graphic symbols		
	lettering		
	 line work (line weight/line type) 		
	numbering.		
Building drawings may	banks and landscaping		
apply to:	 base structure – timber and masonry 		
	cathedral ceilings		
	certificate of title to land		
	chimney construction		
	 complex roof and wall shapes 		
	 composite construction (e.g. steel and timber) 		
	 conversion of plans and specifications to architectural and building detail 		
	drawing protocols, including:		
	 abbreviations 		
	– legends		
	 lettering standards 		
	– numbering		
	 paper size 		
	– scale		
	 standard units of measurement 		
	– symbols		

electrical connections plan
excavation cut and fill
 flashings and box gutters
 general plumbing services plan
 glazing, including bay window construction
 insulation and sarking
 internal and external wall claddings
• joinery
land surveyor plans
 large span timber beams and connections, including glue laminated beams
levels and contours
retaining walls
roof construction
 sewerage connection and easement plan
 soil classification and tests
• stairs
 stormwater connection and easement plan
timber and masonry
upper floor construction
wall construction
 window and door schedules.

EVIDENCE GUIDE			
The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.			
Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design workplace conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended.		
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/WHS regulations applicable to workplace operations apply organisational policies and procedures, including quality assurance requirements, where applicable produce two and three-dimensional drawings for residential building projects complete working drawings to industry best practice and as determined by the project brief 		
Context of and specific resources for assessment	 Assessment of required 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: realistic tasks or simulated tasks covering the mandatory task requirements relevant specifications and work instructions computer facilities and drafting environment with appropriate levels of illumination and ventilation workplace instructions relating to safe work practices the BCA and relevant Australian Standards research resources, including industry-related systems 		

Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.		
	Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.		
	Evidence should:		
	 reinforce the integration of Employability Skills with workplace tasks and job roles 		
	be transferable to other circumstances and environments		
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role. 		
	Assessment methods may include:		
	 observation of tasks in real or simulated work conditions, with questioning to confirm knowledge of building specifications and required documentation 		
	 practical assessment in the development of a set of working drawings. 		
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.		

Unit code and title		VU22463 Produce preliminary and working drawings for commercial buildings			
Unit descriptor		This unit specifies outcomes required to produce two and three-dimensional drawings in accordance with standard industry practice and to a level suitable for building permit approval applications.			
		It inc spec draw Aust	It includes the ability to read and interpret plans and specifications and to produce preliminary and working drawings for commercial buildings (Building Code of Australia (BCA) Classes 2 to 9).		
		No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.			
		How requ Auth	ever, this unit forms part of a minimum qualification irement for registration with the Victorian Building ority as a building designer (architectural).		
Employability Skills		This	unit contains Employability Skills.		
Application of the unit		This unit supports the attainment of the skills and knowledge required for building designers to produce preliminary and working drawings for commercial buildings (BCA Classes 2 to 9) within the context of relevant legislation, the BCA and Australian Standards. The outcomes of this unit do not cover the required skills and knowledge for producing working drawings for residential buildings, which are covered in the unit, <i>VU22462 Produce preliminary and working drawings for</i> <i>residential buildings.</i>			
ELEMENT		PERFORMANCE CRITERIA			
Elements describe the essential outcomes of a unit of competency.		Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.			
1	Produce preliminary drawings	1.1	Simple two and three-dimensional preliminary drawings are created using architectural drawing conventions and in compliance with <i>relevant legislation</i> .		
		1.2	Sectional drawings of simple structural elements are created using architectural drawing conventions.		
		1.3	Essential information is recorded on drawings with symbols and abbreviations according to architectural drawing conventions.		

ELEMENT		PERFORMANCE CRITERIA	
2	Read and interpret plans and specifications for a commercial building	2.1	Relevant <i>plans and specifications</i> are identified to develop a set of working drawings.
		2.2	Key information is located, interpreted and articulated according to relevant specifications and relevant legislation.
		2.3	Advice is sought from client and other stakeholders, when required, to articulate and clarify any issues.
3	Produce preliminary working drawings	3.1	Requirements and criteria for <i>preliminary working drawings</i> are interpreted according to the scope of the job being undertaken.
		3.2	Preliminary working drawings with annotated construction details are completed in accordance with the relevant legislation.
4	Produce a set of working drawings	4.1	Scope of works and time frame for completion of drawings is negotiated and agreed.
		4.2	<i>Working drawings</i> are completed to meet architectural conventions and in accordance with the relevant legislation.
		4.3	Detailed specifications are included on working drawings and are completed to architectural conventions.
		4.4	Working drawings are checked for consistency of presentation, cross-referencing and accuracy and to ensure compliance with relevant legislation.

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm client needs and share information with team members
 - read and interpret:
 - \circ the BCA
 - plans and specifications
 - o relevant legislation and Australian Standards
 - o other relevant documentation
 - produce simple preliminary drawings
 - use language and concepts appropriate to industry conventions
 - use and interpret non-verbal communication
- Teamwork skills to:
 - work effectively with clients and other stakeholders
 - negotiate individual work tasks with others
- Problem solving skills to interpret information from plans, specifications and client brief
- Planning and organising skills to produce working drawings within allocated time frame
- Initiative and enterprise skills to achieve creative and innovative approaches in relevant drawing tasks
- Numeracy skills to:
 - produce drawings for commercial buildings
 - apply calculation and measuring techniques
- Technological skills to:
 - use computer software to enable production of working drawings
 - complete documentation and calculations
- Work safely in a design drafting working environment according to organisational policies and procedures

- Drafting and drawing protocols
- Industry conventions for the production of working drawings
- Processes for the administration and preparation of documentation
- Processes for the interpretation of reports, working drawings and specifications
- Relevant federal or state legislation and local government policy and procedures, including occupational health and safety (OHS)/work health and safety (WHS) requirements
- Research methods to locate relevant information
- Structural, design and construction principles of buildings
- · Process for the consideration of a budget constraint
- · Functions and operation of computer software used to produce working drawings

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 in the Performance Criteria is detailed below. Add any 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.

<i>Relevant legislation</i> may include:	 Acts and ordinance Regulations National Construction Code series: BCA, Volume 1 and 2 Plumbing Code of Australia, Volume 3 Australian Standards practice and technical notes.
Plans and specifications include:	 plans: set of working drawings construction technology details finishes and specification notes to a standard suitable for building approval sections relating to main components of construction information from consultants may include: soil tests shop drawings (steel fabrication) structural engineering drawings survey plans and level plans construction site costing/preliminary estimates energy rating Bushfire Attack Level (BAL) temporary structures and works.
<i>Preliminary working drawings</i> include:	 area analysis BCA Classes 2 to 9 buildings computer-generated or paper-based presentations construction notes details elevations floor plans general notes location or neighbouring buildings plan and specification interpretation projections sections

	services
	site plans
	 two and three-dimensional drawings
	 two and times amenoional arawings type 'B' and type 'C' buildings
Working drawings applies	banks and landscaping
10.	 base structure – timber and masonry
	certificate of title to land
	 complex roof and wall shapes
	 composite construction (e.g. steel and timber)
	 conversion of plans and specifications to architectural and building detail
	drawing protocols, including:
	 abbreviations
	– legends
	 lettering standards
	– numbering
	 paper size
	– scale
	 standard units of measurement
	– symbols
	electrical connections plan
	excavation cut and fill
	flashings and box gutters
	general plumbing service plan
	glazing, including window and door schedules
	insulation and sarking
	 internal and external wall claddings
	• joinery
	land surveyor plans
	• large span timber beams and connections, including glue laminated beams
	levels and contours
	 research journal in accordance with project aims, comprising:
	 photographs
	 record of site visits
	- sections
	 three-dimensional sketches
	roof construction

sewerage connection and easement plan
 soil classification and tests
stairs
 stormwater connection and easements plan
timber and masonry
upper floor construction
wall construction.

EVIDENCE GUIDE			
The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.			
Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design workplace conditions, materials, activities, responsibilities and procedures.		
	Holistic or project-based assessment with other related units is recommended.		
Critical aspects for assessment and evidence	A person who demonstrates competency in this unit must be able to provide evidence of the ability to:		
required to demonstrate competency in this unit	 comply with OHS/WHS regulations applicable to workplace operations 		
	 apply organisational policies and procedures, including quality assurance requirements, where applicable 		
	 produce two and three-dimensional drawings for commercial buildings (BCA Classes 2 to 9) 		
	 complete working drawings to industry best practice and as determined by the project brief. 		
Context of and specific resources for assessment	Assessment of required 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:		
	 realistic tasks or simulated tasks covering the mandatory task requirements 		
	 relevant specifications and work instructions 		
	 computer facilities and drafting environment with appropriate levels of illumination and ventilation 		
	workplace instructions relating to safe work practices		
	the BCA and relevant Australian Standards		
	 research resources, including industry-related systems information. 		

Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.
	Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.
	Evidence should:
	 reinforce the integration of Employability Skills with workplace tasks and job roles
	• be transferable to other circumstances and environments
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role.
	Assessment methods may include:
	• observation of tasks in real or simulated work conditions, with questioning to confirm knowledge of building specifications and requirements for working drawings
	 practical assessment in the development of working drawings for commercial buildings.
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

Unit code and title		VU22464 Select construction materials for building projects		
Unit descriptor		This unit specifies the outcomes required to evaluate and select a range of suitable construction materials for building projects, taking into account a range of criteria, including physical attributes, cost and sustainability.		
		It includes the ability to analyse properties and characteristics to determine their suitability for application in the construction of a building. It requires selection of materials that comply with relevant legislation, Australian Standards and the Building Code of Australia (BCA).		
		No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.		
		However, this unit forms part of a minimum qualification requirement for registration with the Victorian Building Authority as a building designer (architectural).		
Employability Skills		This unit contains Employability Skills.		
Application of the unit		This unit supports the attainment of the skills and knowledge required for building designers to select suitable construction materials for buildings within the context of relevant legislation, the BCA and Australian Standards.		
ELEMENT		PERFORMANCE CRITERIA		
Elements describe the essential outcomes of a unit of competency.		Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.		
1	Analyse characteristics of construction materials	1.1	Manufacturing processes of a range of <i>construction</i> <i>materials</i> is researched to establish limitations of practical application.	
		1.2	Quality standards and performance of materials are investigated for adherence to the <i>relevant legislation</i> and the suitability for <i>types of structures</i> .	
		1.3	Materials are analysed to determine their application with regard to substructure, fixings, coatings or finishes, specific construction systems, visual effects and compatibility.	
		1.4	Manufacturing/conversion tolerances are detailed, including 'building in' tolerances to determine their impact on material properties.	

ELEMENT		PER	PERFORMANCE CRITERIA	
		1.5	New and emerging construction materials are researched to ensure industry best practice and sustainability application.	
		1.6	Relevant information is recorded in a suitable format for future reference.	
2	Evaluate materials for their suitability for building projects	2.1	Materials are investigated to identify their <i>sustainable characteristics</i> to minimise environmental impact.	
		2.2	Materials are analysed for their <i>thermal and acoustic characteristics</i> to determine appropriate applications in accordance with the relevant legislation.	
		2.3	Materials are analysed to determine <i>durability,</i> <i>structural integrity</i> and <i>fire resistance</i> to determine appropriate applications in accordance with the relevant legislation.	
		2.4	Defects , short and long-term degradation, timber preservation and protection of metals are investigated to determine appropriate applications in accordance with the relevant legislation.	
		2.5	<i>Transportation, on-site storage requirements and</i> <i>handling</i> of materials is investigated to determine their impact on construction methodology and occupational health and safety (OHS)/work health and safety (WHS) level of risk.	
3	Recommend suitable 3 materials 3	3.1	A range of commonly used construction materials is selected, according to their purpose, standard application and manufacturer's specifications.	
		3.2	Construction materials and <i>interior finish products</i> are recommended for <i>specific attributes and characteristics</i> in accordance with design specifications.	
		3.3	Specifications for construction materials are determined and recorded.	
This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements and share information with internal and external personnel, where required
 - read and interpret complex documents, including:
 - o the BCA
 - relevant legislation and Australian Standards
 - o plans, drawings and specifications
 - use language and concepts appropriate to industry conventions
- Written skills to document data and findings to industry standards
- Problem solving skills to:
 - identify typical defects in construction materials
 - analyse and evaluate data on construction materials
- Planning and organisational skills to collect, organise and analyse information on construction materials
- Initiative and enterprise skills in:
 - selecting suitable construction materials, taking into account a range of criteria, including physical attributes, cost and sustainability
 - applying selection principles relating to performance of materials according to their purpose
- Technological skills to complete documentation and calculations
- Work safely in a design drafting working environment and on a site according to legislation and workplace policies and procedures

- Manufacturing processes and their effects on the use and application of construction materials
- Structural, thermal, acoustic and visual properties of materials and how these are utilised to achieve a desired outcome and meet specifications and legislative requirements
- Durability, weatherability, jointing, thermal expansion, compatibility, connection systems with regard to the application of materials
- Systems, processes and methodology used to incorporate materials into a structure
- Substructures, jointing systems and fixings required to incorporate materials into a building
- Effect of substructures on the use of materials
- Effect of transport, handling and storage on materials

- Principles of designing buildings for durability and adaptability
- Life cycle assessment principles
- Nature of construction materials, including emerging technologies, and effect on performance
- Environmental impact issues relating to material selection and use
- R and U values (overall thermal resistance) for construction material
- Grading process and grade markings used to categorise timber and timber products
- Relevant sections of the BCA and relevant federal, state or territory legislation
- Material safety data sheet purpose and content

RANGE STATEMENT

Construction materials include, but are not limited to:	 adhesives and sealants admixtures cement clay bricks and pavers composite materials, e.g. sandwich panels concrete cast in situ fire rated protective coatings glass metals mortars plaster and plasterboard plastics pre-cast structural concrete components sandstone terracotta and concrete roof tiles timber and timber products
	engineered timber products.
<i>Relevant legislation</i> may include:	 Acts and ordinance Regulations National Construction Code series: BCA, Volume 1 and 2 Plumbing Code of Australia, Volume 3 Australian Standards practice and technical notes.

Types of structures include:	 structures with concrete skeleton and slabs
	• structures with steel and metallic column and member
	construction
	 structures with timber and other composite material construction.
Sustainable characteristics	 materials that have minimal packaging
include:	 high recycled content or recyclability
	locally produced or sourced
	low embodied energy
	 low in volatile organic compounds (VOCs)
	 low life cycle cost ease of demolition, disassembly, re-use and disposal
	materials that are easily cleaned and maintained
	 raw materials sourced with minimal negative environmental impact.
Thermal and acoustic	combustibility
characteristics include:	 expansion joint requirements
	fire indices
	 fire resistance and insulation values for composite materials
	resonance
	 sound transmission coefficients
	 thermal expansion and contraction
	• thermal resistance (R and U values).
Durability includes:	Iongevity
	sturdiness
	weatherability.
Structural integrity includes:	 compatibility with other materials and/or systems
Siruciural integrity includes.	 structural properties
Fire resistance includes:	fire resistance levels to meet the BCA.
Defects include:	 those caused by incorrect placement, installation or application or in naturally occurring materials.
Transportation, on-site	carnage or other methods of handling
storage requirements and	fixing systems
nandling includes:	on-site quality control
	on-site handling and storage
	road transport.

<i>Interior finish products</i> include, but are not limited to:	ceramic tileschipboard
	laminates
	MDF board
	• tilt up panel.
Specific attributes and characteristics include:	aesthetics
	availability
	• cost
	durability
	sustainability.

EVIDENCE GUIDE		
The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.		
Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate design drafting workplace conditions, materials, activities, responsibilities and procedures.	
	Holistic or project-based assessment with other related units is recommended.	
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: identify, analyse and evaluate the characteristics of construction materials for their application and sustainability comply with the requirements of the relevant legislation with regard to the thermal acoustic and fire resistant qualities of construction materials make recommendations for suitable materials to satisfy construction requirements, aesthetics, cost effectiveness, client brief and the requirements of the relevant legislation. 	

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Context of and specific resources for assessment	Assessment of required 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:	
	 realistic tasks or simulated tasks covering the mandatory task requirements 	
	 relevant specifications and documentation, including legislative documents and standards 	
	 appropriate support materials, including current information and data on the characteristics and use of construction materials 	
	 samples of construction materials or examples of material use in situ 	
	 research resources, including industry-related information. 	
Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.	
	Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.	
	Evidence should:	
	 reinforce the integration of Employability Skills with workplace tasks and job roles 	
	 be transferable to other circumstances and environments 	
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role. 	
	Assessment methods may include:	
	 observation of tasks in real or simulated work conditions, with questioning to confirm the knowledge of sustainable building materials 	
	 reinforcing the integration of Employability Skills with workplace tasks and job roles 	
	 case studies of best practice in the use of appropriate materials for a building project. 	
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.	

Un	it code and title	VU22465 Provide design solutions for residential and commercial buildings			
Unit descriptor		This unit specifies the outcomes required to apply the theories and principles of design to the design of buildings. It must be applied to both residential buildings (Building Code of Australia (BCA) Classes 1 and 10) and commercial buildings (BCA Classes 2 to 9), of Type B construction.			
		It red infor their desig brief stake	It requires the ability to research, analyse and evaluate information on the history and elements of architecture and their influence on current practice. It includes developing a design response, which meets the requirements of a project brief, and communicating a final design solution to relevant stakeholders.		
		No li requ	censing, legislative, regulatory or certification irements apply to this unit at the time of publication.		
		However, this unit forms part of a minimum qualification requirement for registration with the Victorian Building Authority as a building designer (architectural).			
Em	ployability Skills	This	unit contains Employability Skills.		
Ар	plication of the unit	This unit supports the attainment of the skills and knowledge required for building designers to apply the principles, theories and emerging trends of design to residential and commercial building projects.			
ELEMENT		PER	PERFORMANCE CRITERIA		
Elements describe the essential outcomes of a unit of competency.		Perfo demo used, and/o consi	rmance criteria describe the required performance needed to instrate achievement of the element. Where bold italicised text is further information is detailed in the required skills and knowledge or the range statement. Assessment of performance is to be stent with the evidence guide.		
1	Research the key movements of global architecture	1.1	A range of research techniques is used to source information on the influential periods of global architecture in residential and commercial building design through the works of recognised architects and designers.		
		1.2	Architectural terminology and language is identified for application in research.		
		1.3	<i>Emerging residential and commercial design</i> <i>trends</i> are identified and key themes of change explored to inform application in practice		
		1.4	Own knowledge and understanding of global architecture is developed through review and <i>critical</i> <i>analysis</i> of the <i>influences and features</i> of recognised works and emerging trends.		

ELEMENT		PER	PERFORMANCE CRITERIA	
		1.5	The <i>principal characteristics</i> of predominant architectural styles are researched and recorded.	
		1.6	Impacts of global architecture are analysed for their influence on Australian regional architecture.	
2 Determine design principles	2.1	The history and main principles of design theories are researched and examined to inform, compare and contrast with present beliefs, methods and practice.		
		2.2	Sound and innovative <i>design principles</i> are researched and its application to a tectonic concept is analysed.	
		2.3	The relationship between art, architecture and nature is explored to determine the application of form, functionality and aesthetics in design.	
		2.4	The relationship of principles of symmetry, rhythm and symbolism in art and architecture are researched and their application and influence in design is explored with current theories of culture, politics and technology.	
3	Apply design principles to the context of a site	3.1	The project brief is analysed to determine client requirements for the design.	
		3.2	The correlation between human behaviour, function, aesthetics, typology, neighbourhood character and site context is analysed to determine patterns of movement, spatial relationships and visual goals determined by the project brief.	
		3.3	Circulation patterns/bubble diagrams are developed to illustrate patterns of movement and spatial relationships.	
		3.4	Social, sustainable and technical factors are integrated in accordance with relevant building and planning regulatory requirements and contextual and site restraints.	
		3.5	Information of precedent buildings is established to facilitate application to current concept development.	
		3.6	Town planning controls are analysed and applied to design to comply with local council regulations.	

ELEMENT		PER	PERFORMANCE CRITERIA	
4 Develop and express ideas through freehand sketching	Develop and express ideas through freehand sketching	4.1	Principal elements of sketching are identified and explored through visual and sketched studies of built forms and their internal and external features.	
	4.2	Sketches are produced using a <i>range of media</i> to interpret design solutions and concepts and to illustrate details of construction, structural and aesthetic elements of a design.		
		4.3	Selected visualisation techniques are used to enhance readability and interpretation and to display a range of material finishes .	
		4.4	Sketches are produced with accurate proportions and in accordance with project timelines, as required.	
5	5 Resolve and communicate design solutions to a built form	5.1	Architectural theories are evaluated and integrated to a conceptual program.	
		5.2	Features of comparable building designs are researched to inform the development of a design solution.	
		5.3	Design theories, concepts and ideas are combined to produce a design solution.	
		5.4	The elements of human needs, the environment, sustainability and technology are integrated into a concept design.	
		5.5	A range of alternative responses is developed and reviewed and a final solution is selected for presentation to <i>relevant stakeholders</i> .	
		5.6	The final design solution is confirmed against the project brief and communicated to relevant stakeholders through appropriate <i>presentation media</i> .	

This describes the essential skills and knowledge and their level, required for this unit.

- Communication skills to:
 - enable clear and direct communication, using effective listening and questioning techniques to identify and confirm requirements and share information with relevant stakeholders
 - communicate a design solution
 - read and interpret:
 - o design briefs
 - construction drawings and specifications
 - o Australian Standards
 - o relevant sections of the National Construction Code
 - o research material, including architectural literature and relevant texts
 - use language, terminology and semantics relevant to building design and architecture
- Written skills to:
 - document research on the influences of global architecture and design principles
 - produce freehand and enhanced sketches for the interpretation of a design or of architectural features
- Problem solving skills to:
 - apply design theories and ideas to a built form
 - apply design principles within regulatory requirements
 - respond to the challenges of irregular shaped sites
- Initiative and enterprise skills to:
 - resolve construction and design issues with regard to structural systems and site context
 - incorporate functionality and aesthetics into a built form
 - evaluate historical and conventional design principles with modern practices and methods
 - develop a design response according to the project brief requirements for stakeholder consideration
- Planning and organising skills to:
 - collect, organise and analyse information on:
 - world architecture and its principal characteristics
 - the works of recognised architects and designers
 - o complete design response within allocated time frame

- Learning skills in the development of own knowledge and understanding of global architecture and design trends
- Technological skills to research and record information
- Teamwork skills to consult with client and other stakeholders
- Work safely in a design drafting working environment according to legislation and workplace policies and procedures

- Architectural terminology and semantics
- Design processes
- Research methods to locate relevant information
- Influential architects and designers of the 20th and 21st Centuries
- Global and Australian architectural styles
- Architectural concepts applied to a residential and commercial design solution
- Principles of structural and construction technology
- Principles of universal design
- Basic principles of anthropometrics and ergonomics
- Material characteristics and applications
- Tectonic themes
- Regulatory, contextual and site constraints
- Planning concepts
- Principles of human behaviour, functionality and aesthetics
- Historical and modern design principles
- Current and emerging residential and commercial design trends
- Modern theories of culture, politics and technology

RANGE STATEMENT

<i>Research techniques</i> include:	 architectural literature and references desk research Internet interviews photographs and digital images observations of built environment site visits.
<i>Influential periods of global architecture</i> may include, but are not limited to:	 Edwardian Georgian Victorian gothic mid-20th Century post modern post-industrial renaissance 21st Century colonial early modern.
Architectural terminology and language includes:	 aesthetics allegory classical composition contemporary context culture deconstruction ecology esquisse form genius loci identity metaphor organic

	• palimpsest
	phenomenology
	post-structural
	primitive
	regionalism
	schematic
	• style
	• symbolism
	tectonic
	typology
	• zeitgeist.
Emerging residential and	modular structures
commercial design trends	 prefabricated off-site elements
may include:	 low energy rating
	self-sufficient buildings
	collaborative/flexible open spaces
	mixed use space
	'experience' design
	planning for technology
	green design
	smart glass
Critical analysis may	analysing and evaluating
include:	critiquing
	 comparing and contrasting beliefs, interpretations and theories
	 developing criteria for evaluation
	debating and discussing
	 noting significant similarities and differences
	reading and listening
	reflecting.
Influences and features	 contemporary theories and concepts
may include:	 distinctive architectural language or element that can be attributed to a particular designer or architect
	thinkers and philosophers.
Principal characteristics	external
include:	internal
	materials
	structural systems.

Design principles include:	 aesthetics balance contrast dominance (emphasis) functionality gradation harmony proportion radiation repetition rhythm scale symmetry unity.
Social, sustainable and technical factors include:	 privacy and degrees of transparency inherent flexibility of design (allowing for adaptive reuse) purpose and meaning to design's constructional/structural system or expression.
Principal elements of sketching includes:	 proportion scale light, shade texture composition line weight negative and positive space.
<i>Range of media</i> includes:	 coloured pencils erasers ink markers pastels pencils transferring mediums various paper types water colours.

<i>Visualisation techniques</i> include:	 computerised and/or hand rendering techniques burnishing hatching line drawings negative space rubbing scoring stippling
	tonal rendering.
Material finishes include:	 natural finishes, e.g. stone, timber, slate, rammed earth, vegetation
	 non-reflective textured materials used both internally and externally, e.g. carpet, tiles, pavers, brick, rendered surfaces
	 reflective surfaces, e.g. walls, floors, mirrors, glass, water.
	clients
include:	structural engineers
	building surveyors
	Victorian Building Authority
	heating, cooling and air-conditioning consultants
	 local council and other relevant authorities.
<i>Presentation media</i> may include:	 Building Information Modeling (BIM) detailed hand drawn or digitally generated drawings freehand sketches.

EVIDENCE GUIDE				
The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.				
Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate design drafting workplace conditions, materials, activities, responsibilities and procedures.			
	Holistic or project-based assessment with other related units is recommended.			
Critical aspects for assessment and evidence	A person who demonstrates competency in this unit must be able to provide evidence of the ability to:			
required to demonstrate competency in this unit	 research and apply knowledge of global architecture, architects and designers and their influences on modern design theories 			
	apply architectural concepts to a built form			
	 develop design solutions which meet the requirements of the project brief, town planning and regulatory controls 			
	 one residential design based on BCA Classes 1 and 10 			
	and			
	 one commercial design based on BCA Classes 2 to 9 of Type B construction 			
	 communicate design solutions to stakeholders using presentation media. 			
Context of and specific resources for assessment	Assessment of essential required 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:			
	 realistic tasks or simulated tasks covering the mandatory task requirements 			
	 relevant specifications and documentation and legislation 			
	 images of significant buildings reflecting specific architectural styles and features 			
	research resources, including architectural literature.			

Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.		
	Evidence should:		
	 reinforce the integration of Employability Skills with workplace tasks and job roles 		
	• be transferable to other circumstances and environments		
	• relate to a number of performances assessed on different occasions which reflects the scope of the job role.		
	Assessment methods may include:		
	 practical demonstration of digital production of project documentation in real or simulated work conditions, with questioning to confirm knowledge of designing objects 		
	 submission of project documentation, both physical and digital, that complies with project brief 		
	• portfolio of documentation for an architectural project.		
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.		

Unit code and title		VU22466 Integrate digital applications into architectural workflows			
Unit descriptor		This unit specifies the outcomes required to use a range of digital applications for the production of outputs in architectural workflows. It includes the ability to determine the appropriate digital applications required for specific project outputs and the application of architectural standards and conventions to produce and manage the project. Work is likely to be undertaken with limited supervision and in consultation with team members and external consultants.			
		No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.			
		How requ Auth	ever, this unit forms part of a minimum qualification irement for registration with the Victorian Building ority as a building designer (architectural).		
Em	ployability Skills	This	unit contains Employability Skills.		
Application of the unit		This unit supports the attainment of the skills and knowledge required for building designers to produce digital drawings and data for architectural projects using a variety of digital applications.			
ELEMENT		PERFORMANCE CRITERIA			
Elements describe the essential outcomes of a unit of competency.		Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.			
1	Determine digital production of architectural workflows	1.1	Productivity advantages are investigated and applied to data management systems, organisational standards and overall practice workflows.		
		1.2	Individual workflows are established for projects to maximise productivity within given time frames.		
		1.3	Team strategies are organised to enable collaboration between participants in the project team.		
2	Analyse project requirements to determine outputs	2.1	Project brief is evaluated to determine the digital applications, including Building Information Modeling (BIM) based software, and data requirements within the project scope.		
		2.2	Relevant external stakeholders and internal personnel are identified to plan development of documents according to order of precedence and agreed timelines.		

ELEMENT		PERFORMANCE CRITERIA	
		2.3	Digital security issues are considered and workplace procedures for copyright and privacy are complied with in the communication of documents.
		2.4	<i>Hardware requirements</i> are evaluated to determine their limitations and suitability.
		2.5	Work is planned to ensure compliance with the National Construction Code (NCC), relevant Australian Standards and other <i>relevant legislation</i> .
3	Select project formats	3.1	<i>Appropriate applications</i> are selected to produce required documentation.
		3.2	Digital protocols are determined and created to develop the project documentation according to workplace policy and client requirements.
4	Produce digital data for projects	4.1	File formats and <i>transfer protocols</i> and standards are applied to enable the use of data in chosen applications.
		4.2	Object data and component libraries are selected for implementation in project outputs.
		4.3	Relevant information is researched from reliable sources to ensure compliance with regulatory building requirements.
5	Produce project outputs	5.1	Digital and physical output methods are selected to ensure compliance with industry standard delivery methods, client and stakeholder requirements.
		5.2	Conventions and standards related to layout and print sizing, for both physical and digital outputs, are identified and implemented.
		5.3	Digital and physical <i>communication conventions</i> are examined and selected according to their cost effectiveness and sustainability.
		5.4	Interim draft output and digital communications is produced to confirm that outputs meet project requirements, and modifications are made, as necessary.
		5.5	Final output of project documentation are produced for submission to relevant stakeholders in compliance with regulatory requirements.

ELEMENT	PER	FORMANCE CRITERIA
	5.6	Outputs are evaluated to ensure compliance with planned project outcomes.
	5.7	Investigate and create a range of outputs achievable from identified digital data workflows.

This describes the essential skills and knowledge and their level, required for this unit.

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements and share information with internal and external personnel, where required
 - engage and interact with digital and electronic distributed information and learning systems
 - read and interpret:
 - o construction drawings and specifications
 - o state regulatory authority requirements/relevant legislation
 - o Australian Standards
 - o relevant sections of the Building Code of Australia
 - o software manuals
 - use language, terminology and concepts appropriate to industry conventions
- Planning and organising skills to:
 - coordinate workflows according to priorities and agreed timelines
 - meet project milestone requirements
 - confirm outputs meet project requirements
- Teamwork skills for collaboration and consultation with both external and internal personnel
- Initiative and enterprise skills to:
 - create and/or use object data and component libraries
 - analyse file structures and use them effectively
- Self management skills to enable the production of documentation within allocated time frame
- Learning skills in self directed approach to updating skills in software use and knowledge of emerging technologies
- Technology skills to use software applications suitable for production of documentation required for the project
- Numeracy skills to produce required documentation
- Problem solving skills to determine integration of workflows

- Functions, operation and management of software programs required for the production of various stages of project documentation
- The application of standards and conventions in the production and management of architectural documentation
- Australian and International Standards for BIM data sharing
- Purpose and benefits of project outputs to related contexts
- Construction and materials technology in the production of architectural documentation
- Principles of design and their application
- Principles of designing objects and spaces in three-dimensions and their translation into computer-based design methodologies
- Organisational quality requirements for the production of digital outputs
- Organisational and legislative requirements for documentation in all stages of the building design project
- Occupational health and safety (OHS)/work health and safety (WHS) legislation and guidelines relevant to software use
- Recognition of file structures
- Development and use of file structures
- Features of file structures for BIM management

RANGE STATEMENT

<i>Team strategies</i> could include:	 collaboration amongst practice team members collaboration with external consultants identifying individual roles and responsibilities.
Relevant external stakeholders may include, but not limited to:	 structural engineers building surveyors clients Victorian Building Authority heating, cooling and air-conditioning consultants local council and other relevant authorities.
Digital security issues include:	 protection of client privacy protection of client and organisation intellectual property permissions for access to folders and files maintenance of digital storage.

Hardware requirements include:	 devices, such as: scanners digitisers printers/plotters digital projectors/display devices external storage devices workstation platform.
<i>Relevant legislation</i> may include:	 Acts and ordinance Regulations NCC series: BCA, Volume 1 and 2 Plumbing Code of Australia, Volume 3 Australian Standards practice and technical notes.
<i>Appropriate applications</i> could include, but are not limited to:	 5D software animation software BIM software design documentation software graphic development and/or editing software internet and network communication platforms multimedia and rendering software.
Digital protocols may vary according to workplace policies but include:	 archiving digital back-up platforms production set-up and management.
<i>Transfer protocols</i> include:	 distributed information systems transfer of data transfer of images data from consultants.
<i>Relevant information</i> includes:	information from Australian websites and publicationstrade literature.
<i>Digital and physical output methods</i> include, but are not limited to:	 email online paper output physical model, e.g. 3D printer or cam device.

<i>Communication</i> <i>conventions</i> include, but are not limited to:	 methods to transfer data through communication services, such as: email/social media file transfer protocol (FTP)/Internet cloud services etc web client servers.
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EVIDENCE GUIDE			
The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.			
Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design workplace conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended.		
Critical aspects for assessment and evidence	A person who demonstrates competency in this unit must be able to provide evidence of the ability to:		
required to demonstrate competency in this unit	 apply organisational policies and procedures, including OHS/WHS and quality assurance requirements, where applicable 		
	 comply with copyright and trade practices legislation and organisational privacy and security policies and procedures 		
	 produce digitally generated information for an architectural project 		
	 collaborate and consult with team members and outside agencies 		
	 meet the criteria of the project brief to the required standard and within allocated timelines. 		
Context of and specific resources for assessment	Assessment of essential required knowledge will usually be conducted in an off-site context.		
	Assessment is to comply with relevant legislation.		
	Resource implications for assessment include:		
	appropriate computer hardware and software		
	 access to architectural conventions, best practice and workplace procedures 		
	the NCC and relevant Australian Standards		
	 task sheets, sample drawings and supporting documentation, as required. 		

Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.		
	Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.		
	Evidence should:		
	 reinforce the integration of Employability Skills with workplace tasks and job roles 		
	 be transferable to other circumstances and environments 		
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role. 		
	Assessment methods may include:		
	 practical demonstration of digital production of project documentation in real or simulated work conditions, with questioning to confirm knowledge of designing objects 		
	 submission of project documentation, both physical an digital, that complies with project brief portfolio of documentation for an architectural project. 		
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.		

Un	Unit code and title		VU22467 Present architectural designs		
Unit descriptor		This unit specifies the outcomes required to present a design concept for an architectural project. The design could be for a residential (Building Code of Australia (BCA) Classes 1 and 10) or commercial (BCA Classes 2 to 9) building.			
		It includes reviewing the project brief, developing presentation materials and presenting the final design concept to relevant stakeholders. Materials for presentation could include preliminary drawings, computer generated drawings/images, or models. It requires the ability to effectively clarify or communicate ideas and the design concept to stakeholders.			
		No li requ	censing, legislative, regulatory or certification irements apply to this unit at the time of publication.		
		However, this unit forms part of a minimum qualification requirement for registration with the Victorian Building Authority as a building designer (architectural).			
Em	ployability Skills	This unit contains Employability Skills.			
Application of the unit		This unit supports the skills and knowledge required for building designers to present an architectural design to relevant stakeholders. Work is likely to be under limited or no supervision and in consultation with a variety of stakeholders.			
ELEMENT		PER	FORMANCE CRITERIA		
Elements describe the essential outcomes of a unit of competency.		Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.			
1	Plan presentation	1.1	The project brief is reviewed to confirm requirements for presentation.		
		1.2	Suitable presentation format is selected according to project brief, timelines and budgetary limitations.		
		1.3	Relevant stakeholders are consulted during presentation planning to ensure appropriate format and materials are determined.		
		1.4	Consultation with team members is undertaken to determine individual responsibilities and time frames in the planning of presentation.		

ELEMENT		PER	FORMANCE CRITERIA
2	Produce presentation images and/or models	2.1	Presentation materials and equipment are selected to suit the format and purpose of the presentation and client requirements.
		2.2	Final drawings/models are produced for presentation to stakeholders within agreed time frames and to industry standards.
		2.3	A range of presentation materials is produced to assist comprehension of final design.
3	Make presentation to client or stakeholder	3.1	Equipment and materials are organised for presentation and team members are briefed on their roles and responsibilities for the presentation, as required.
		3.2	<i>Non-verbal and verbal communication</i> <i>techniques</i> are used to secure and maintain the interest of the audience.
		3.3	Opportunities are provided for stakeholders to seek clarification on central concepts and ideas, and presentation is adjusted to meet the needs of the audience, if required.
		3.4	Key concepts are summarised at strategic points to facilitate understanding.

This describes the essential skills and knowledge and their level, required for this unit.

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements and share information with internal and external personnel, where required
 - read and interpret:
 - o project brief
 - o architectural documentation
 - use language, terminology and concepts appropriate to industry conventions
- Facilitation and presentation skills to communicate design concept to stakeholders
- Written skills to:
 - sketch preliminary presentation drawings using a variety of media and different techniques, as required
 - communicate design ideas and concepts in sketch format
 - prepare documentation to an accepted industry standard

- Problem solving skills to:
 - identify requirements for presentation according to project brief
 - liaise with stakeholders to plan presentation
- Initiative and enterprise skills to:
 - develop presentation that meets client requirements
 - produce presentation materials to industry standard to assist client in understanding key features of design
- Planning and organisational skills to:
 - plan, prepare and facilitate a design presentation
 - complete work within accepted time frames
- Technological skills to:
 - complete presentation materials using a variety of computer software
 - operate presentation equipment
 - develop presentation materials
- Self management skills to coordinate own responsibilities in planning presentation within designated time frame
- Teamwork skills during consultation with, and coordination of, internal and external personnel
- Work safely in a design drafting working environment according to legislation and workplace policies and procedures

- Techniques required for sketches/drawings, including:
 - Colour and its applications
 - Rendering techniques and applications
- Relationship between sketching and rendering techniques and the appropriate media
- Functions and operation of computer digital editing applications
- Presentation methods and techniques
- Occupational health and safety (OHS)/work health and safety (WHS) requirements in the development and facilitation of a design presentation

RANGE STATEMENT

Requirements for presentation includes:	 budget documentation presentation materials stakeholders timing.
Presentation materials include:	 2D images 3D images animated views models plans and elevations.
<i>Non-verbal and verbal communication techniques</i> include:	 body language emotion eye contact facial expression gestures intonation speaking style voice quality, pitch and volume.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design workplace conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended.
Critical aspects for assessment and evidence	A person who demonstrates competency in this unit must be able to provide evidence of the ability to:
required to demonstrate competency in this unit	 liaise with client and external stakeholders in the development of a design presentation
	 prepare and facilitate a design presentation to industry standard
	• communicate design ideas and solutions with sketches and images.
Context of and specific resources for assessment	This unit is to be assessed using industry best practice, safety requirements and environmental constraints relevant to a design drafting workplace.
	Assessment of required 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:
	 realistic tasks or simulated tasks covering the mandatory task requirements
	 relevant specifications and work instructions
	access to appropriate computer hardware and software to enable the production of digital images
	 access to electronic equipment required for the presentation of design concept
	• workplace instructions relating to safe work practices and addressing hazards and emergencies.

Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.	
	Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.	
	Evidence should:	
	 reinforce the integration of Employability Skills with workplace tasks and job roles 	
	 be transferable to other circumstances and environments 	
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role. 	
	Assessment methods may include:	
	 observation of a design presentation in real or simulated work conditions, with questioning to confirm knowledge of design presentation techniques and materials 	
	 sketches and digitally generated images for the presentation of a design concept 	
	 portfolio of sketches and design images 	
	 models representing design concept for a building project. 	
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.	

Unit code and title		VU22468 Manage architectural project administration		
Unit descriptor		This unit specifies the outcomes required to manage architectural administration and the development of project documentation. It requires the knowledge of the legislation pertaining to project administration and the ability to comply with the organisational requirements for quality assurance. Work is expected to be undertaken in consultation with both internal personnel and external consultants and with limited supervision.		
		No li requ	censing, legislative, regulatory or certification irements apply to this unit at the time of publication.	
		How requ Auth	ever, this unit forms part of a minimum qualification irement for registration with the Victorian Building ority as a building designer (architectural).	
Em	ployability Skills	This	unit contains Employability Skills.	
Ар	plication of the unit	This knov docu arch	unit supports the attainment of the skills and vledge required for building designers to manage the imentation and administration requirements for itectural projects.	
EL	EMENT	PER	FORMANCE CRITERIA	
Elements describe the essential outcomes of a unit of competency.		Perfo demo used, and/o consi	rmance criteria describe the required performance needed to instrate achievement of the element. Where bold italicised text is further information is detailed in the required skills and knowledge or the range statement. Assessment of performance is to be stent with the evidence guide.	
1	Determine documentation processes	1.1	Schedule of drawings required for approval stages is developed and items included in the contract documentation are determined.	
		1.2	The process for contract documentation development, including the order of precedence, is determined and the associated legal responsibilities are reviewed.	
		1.3	The main forms of contracts, their essential components and the process of contract enforcement are reviewed, including the means for dispute resolution.	
		1.4	Conditions under which a contract can be deemed valid/invalid are determined.	
		1.5	Organisational systems for recording, storage and retrieval of information are complied with, including processes for privacy and security.	
		1.6	Procedures for all types of file management, printing and electronic communication are followed in the development of project documentation.	

EL	ELEMENT		PERFORMANCE CRITERIA		
2	Determine requirements for approval submission	2.1	Planning scheme provisions are researched to determine state and local planning policies, <i>zones</i> and <i>overlays</i> and other provisions affecting land use and development.		
		2.2	Types of planning permit and additional approvals are identified and details reviewed according to the requirements of the planning scheme.		
		2.3	Required <i>documentation</i> is identified for planning approval submission according to local council specifications.		
		2.4	Stages of approval process are determined according to particular project requirements and recorded for inclusion in project management schedule.		
3	Complete a standard contract	3.1	Statutory authorities connected to the project are identified and applicable information is obtained.		
		3.2	Quality assurance standards and procedures are identified which may impact on building projects and contracts.		
		3.3	Types of <i>standard architectural/building contracts</i> required for specific stages in the <i>documentation process</i> are identified and the appropriate templates are accessed, including the <i>relevant legislation</i> requirements.		
		3.4	Standard contract is completed ensuring all information is correct and complies with relevant legislation and organisational quality assurance procedures.		
		3.5	Basic cost indicators are calculated for a specific building project and invoices are prepared in accordance with organisational procedures.		
4	Determine requirements for copyright compliance	4.1	Legal principles for <i>copyright</i> are identified and the implications for designers are analysed.		
		4.2	Organisational procedures for copyright and protection against plagiarism are identified and all documentation is developed in compliance.		
5	Determine requirements for Competition and Consumer Act	5.1	The provisions of the Competition and Consumer Act that impact on design drafting practices are researched. The impacts of these provisions are analysed and the organisational procedure for their management is followed, to ensure compliance with legislation.		

ELEMENT		PERFORMANCE CRITERIA	
6	Complete a standard specification	6.1	Standard forms of specifications are identified and the limitations are defined with reference to a specific building project.
		6.2	Specification is selected and customised as necessary, to suit the building project, in consultation with relevant parties.
		6.3	Standard/customised specification for the building project is completed to a professional standard.
7	7 Complete project management schedule	7.1	Parameters, milestones and benchmarks associated with a building project are identified.
		7.2	<i>Project constraints</i> are analysed and strategies are implemented for their management.
		7.3	Schedule is produced showing project milestones and various approval stages to ensure effective project management.

This describes the essential skills and knowledge and their level, required for this unit.

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements and share information with internal and external personnel, where required
 - read and interpret complex documents, including:
 - relevant legislation, codes and standards
 - National Construction Code
 - o planning permit application requirements and other relevant documentation
 - use language and concepts appropriate to industry conventions
- Written skills to:
 - prepare project documentation
 - correspond with external personnel
- Numeracy skills to calculate basic cost indicators for a building project
- Problem solving skills to:
 - determine appropriate contract to suit an architectural project
 - determine the limitations of standard specifications and justify their selection

- Planning and organising skills to:
 - prepare documentation in readiness for approval stages
 - manage project documentation processes
 - coordinate work with consultants, stakeholders and authorities, as required
- Learning skills to:
 - identify impacts of quality assurance standards and procedures
 - identify legal principles of copyright
- Self management skills to meet timelines and project schedule
- Teamwork skills when working with internal and external personnel
- Technological skills to use computers and other office equipment
- Work safely in a design drafting working environment and on a site according to legislation and workplace policies and procedures

- Common terminology, definitions, methods, process and procedures used in relation to a design drafting office
- Occupational health and safety (OHS)/work health and safety (WHS) requirements associated with a design drafting office
- Basic understanding of legislation and how it relates to architectural services and the building industry, including:
 - Domestic Building Contracts Act
 - Contract Law
 - Competition and Consumer Act
 - copyright
 - building approvals
 - requirements of statutory authorities
 - Occupational Health and Safety Act/Work Health and Safety Act
 - income tax and GST
 - Australian Standards
- Professional associations and regulatory bodies, including:
 - Building Designers Association of Victoria
 - Master Builders Association of Australia
 - Australian Institute of Architects
 - Victorian Building Authority
 - Housing Industry Association
- Legal liabilities of parties involved in the execution of a building project
- Basic cost indicators for a building project
- Standard architectural/building contracts and their essential components

- Contract documentation process, including order of precedence and relationships between the documents
- Tender process
- Legal liabilities of each party within the terms of the contract conditions under which a contract can be deemed valid/invalid
- Agencies and the means available in the process of contract enforcement
- Means for the resolution of disputes
- The principles of project management
- Use and implication of specification notes on drawings and the difference between a specification
- File transmittal, revision and management of project file
- Project management software, where applicable

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 in the Performance Criteria is detailed below. Add any 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.		
Zones include:	 business commercial industrial mixed use public land residential special purpose. 	
<i>Overlays</i> include:	 design and development environmental audit heritage significant landscape. 	
<i>Types of planning permit</i> includes:	 advertising signage business planning construction and/or extension of single or multi-dwellings on a lot industrial planning subdivision planning waiver of car parking. 	

<i>Additional approvals</i> include:	 building permit environmental licence health approval heritage approval liquor licence waste discharge licence works approval.
<i>Documentation</i> includes, but is not limited to:	 A3 plans application form boundary re-establishment survey concept landscape plan copy of title requirements of reference authorities design response plan elevations neighbourhood and site description plan neighbourhood character design response form roof plan sections shadow diagrams site layouts site photographs streetscape elevation written statement.
<i>Quality assurance standards and procedures</i> include:	 Australian Standards as they relate to quality assurance definitions of quality project quality plan quality assurance checklist quality assurance system, such as: quality management and control quality manual quality procedure and task instruction.

Standard architectural/building contracts are based on:	 availability of builder client need company policy construction time frame level of risk project size.
<i>Documentation process</i> includes:	 concept design construction contract documentation design development proposal schematic design working drawings.
<i>Relevant legislation</i> may include:	 Acts and ordinance Regulations National Construction Code series: Building Code of Australia (BCA), Volume 1 and 2 Plumbing Code of Australia, Volume 3 Australian Standards practice and technical notes.
<i>Basic cost indicators</i> include:	 cost indicator program costing guide cost table preliminary estimate.
<i>Copyright</i> includes:	 copyright duration copyright infringement copyright of employees copyright pertaining to the designer being employed as a subcontractor or secondary consultant copyright relating to the use of documents definitions fees paid to building designers intellectual property licence to utilise documents on the construction site minimising copyright risk patent registered designs trademark.
Standard forms of specifications include:	 contracts estimates plans, elevations, sections and details specification types: 'natspec'
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	 customised
	trade packages.
Project constraints include:	budget restrictions
	client requirements
	gaps in expertise
	need for expert consultation
	relevant authorities
	relevant project standards
	time constraints.

EVIDENCE GUIDE			
The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.			
Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design workplace conditions, materials, activities, responsibilities and procedures.		
	Holistic or project-based assessment with other related units is recommended.		
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/WHS legislation and its relationship to the design office and building sites 		
	 determine requirements for contract legislation, standard architectural and building contracts, contract documentation processes and legal implications for all parties and liability 		
	 comply with copyright and competition and consumer legislation 		
	apply quality assurance principles		
	 complete standard contracts and apply specifications associated with a specific architectural project 		
	 complete a project management schedule for an architectural project. 		

Context of and specific resources for assessment	Assessment of required 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:		
	 realistic tasks or simulated tasks covering the mandatory task requirements 		
	 documentation, including quality assurance standards and procedures and standard contract templates 		
	 the BCA and relevant Australian Standards and legislation 		
	 project management software. 		
Method of assessment	Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance.		
	Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both.		
	Evidence should:		
	 reinforce the integration of Employability Skills with workplace tasks and job roles 		
	• be transferable to other circumstances and environments		
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role. 		
	Assessment methods may include:		
	 observation of tasks in real or simulated work conditions, with questioning to confirm the knowledge required to manage project administration 		
	 individual/group assignments to research and analyse relevant legislation 		
	• projects to develop project schedule for a building project		
	 practical exercises to develop documentation for a building project. 		
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.		

Un	it code and title	VU2	VU22469 Undertake complex architectural projects				
Unit descriptor		This unit specifies the outcomes required to undertake complex architectural projects for residential (Building Code of Australia (BCA) Classes 1 and 10) and/or commercial (BCA Classes 2 to 9) buildings.					
		It inc brief conc relev	It includes consultation with a client to prepare a project brief and the development and presentation of a design concept that meets the requirements of the brief and relevant legislative requirements and codes and standards.				
		It rec and diag relev requ	It requires the preparation of all necessary documentation and the development of a critical path management diagram. It requires thorough knowledge of the BCA, relevant Australian Standards and local authority regulatory requirements.				
		No li requ	censing, legislative, regulatory or certification irements apply to this unit at the time of publication.				
		However, this unit forms part of a minimum qualification requirement for registration with the Victorian Building Authority as a building designer (architectural).					
Em	ployability Skills	This	This unit contains Employability Skills.				
Application of the unit		This unit supports the attainment of the skills and knowledge required for building designers to complete complex architectural projects, which comply with the BCA and other relevant legislation. Work is expected to be undertaken in consultation with other stakeholders and under limited supervision.					
		It requires the problem solving skills to complete a design/documentation project.					
EL	EMENT	PERFORMANCE CRITERIA					
Elements describe the essential outcomes of a unit of competency.		Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.					
1	Determine requirements for the	1.1	Client is consulted to confirm details of building design to develop the project brief.				
	project	1.2	Preliminary analysis of planning and local authority regulations is undertaken to ascertain requirements.				
		1.3	Feasibility study is performed to determine and document the viability of the project.				

ELEMENT		PERFORMANCE CRITERIA		
		1.4	<i>Site analysis</i> and survey are undertaken and a detailed site analysis is prepared for planning permit application.	
		1.5	Brief is drafted and evaluated against <i>client</i> <i>requirements</i> and submitted to client for confirmation, and any amendments are negotiated.	
2	Develop design concept	2.1	Design response is developed in accordance with client brief and presentation drawings/models are produced for client presentation.	
		2.2	Design concept is presented to client using a variety of <i>presentation materials</i> to assist in understanding key concepts.	
		2.3	Approval for the final design is obtained from client, and the relevant documentation is finalised for client contract.	
3	Finalise design	3.1	The approved design is finalised and reviewed against the budget and the appropriate documentation is developed to adequately communicate the design.	
		3.2	A preliminary selection of materials and finishes is selected in accordance with project brief.	
		3.3	Planning application documents are prepared and the client is assisted with lodgement of the Town Planning application and the processes to complete the application and advertising process.	
		3.4	Consultation is undertaken with local authorities, neighbours and other interested parties, if required.	
		3.5	Design work to be undertaken by external personnel is coordinated, as required.	
		3.6	Design concepts for internal spaces, finishes and services are developed and relevant documentation is developed or obtained.	
4	Prepare and coordinate documentation development	4.1	Documents are prepared in accordance with workplace procedures to enable the project to be tendered.	
		4.2	Details of <i>specifications</i> are integrated into documentation, as required.	

ELEMENT		PERFORMANCE CRITERIA		
		4.3	Joinery and internal spaces and electrical documents are prepared or facilitated for inclusion into contract set.	
		4.4	Drainage and landscape documents are prepared or facilitated for inclusion into contract set.	
		4.5	Work from specialist consultants is coordinated and integrated into architectural documentation.	
		4.6	Opinion of probable cost is prepared or facilitated and completed documents are checked and submitted for building approval.	
5	Prepare a critical path management diagram	5.1	Suitable methods for building <i>procurement</i> are determined according to project brief and organisational procedures.	
		5.2	Requirements for <i>project supervision</i> are determined to ensure design intent and specifications comply with contract documents and project schedule.	
		5.3	Stages for the implementation of progress claims, claims for extensions of time and issuing of progress certificates are identified according to the project schedule.	
		5.4	Stages for the preparation of defect notices and certificates for practical completion and final completion are identified according to the project schedule.	
		5.5	A critical path management diagram is finalised and confirmed with relevant stakeholders for all stages in the design and construction process.	

REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

- Communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements and share information with internal and external personnel, where required
 - read and interpret:
 - o relevant legislation
 - o Australian Standards
 - o relevant sections of the National Construction Code
 - use language, terminology and concepts appropriate to industry conventions
 - communicate design concept to client and other stakeholders
- Written skills to:
 - sketch preliminary design solutions and presentation drawings using a variety of media and different techniques, as required
 - prepare documentation to an accepted industry standard
- Problem solving skills to:
 - ascertain local regulatory requirements
 - identify key stages of design and construction process
 - coordinate work from consultants into architectural documentation
 - compare tender processes
- Initiative and enterprise skills to:
 - develop design solutions that meet client requirements
 - negotiate amendments to the client brief
- Planning and organisational skills to:
 - coordinate the team members in the development of documentation
 - liaise with client and stakeholders throughout the project
 - complete work within accepted time frames
- Technological skills to:
 - produce presentation materials and contract documentation using a variety of computer software
 - operate presentation equipment
- Self management skills to coordinate own responsibilities and complete tasks according to project schedule
- Teamwork skills to:
 - coordinate team members and their work output
 - coordinate work from other consultants.
- Work safely in a design drafting working environment and on a site according to legislation and workplace policies and procedures

Required knowledge:

- Relevant legislation, including:
 - Building Act
 - Building Regulations
 - Planning and Environment Act
 - Occupational Health and Safety Act/Work Health and Safety Act
 - Domestic Buildings Contracts Act
 - Building and Construction Security of Payment Act
 - Environment Protection Act and Regulations
 - Disability Services Act
 - Health Act and Regulations
 - Heritage Regulations
- Relevant sections of the BCA
- State and local regulatory requirements
- Legal responsibilities of building designers
- Sustainable building practices
- Essential safety measures for buildings
- Construction materials and finishes
- Construction and structural principles
- Design theories and principles
- Workplace procedures and documentation requirements for building project administration
- Digital software used in the production of presentation materials and documentation

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 in the Performance Criteria is detailed below. Add any 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.

<i>Site analysis</i> includes:	 local climate conditions physical characteristics relationship of site to adjoining buildings and surrounding environment.
<i>Client requirements</i> include:	 allocation of space any limitations that impact on the design budget estimate, including construction, design and statutory costs construction methodology fittings and furniture

Presentation materials include:	 intended site materials and finishes project timelines purpose and function of the proposed building specific fixtures. 2D images 3D images
	 animated views models plans and elevations.
<i>External personnel</i> includes:	 electricians engineers heating, ventilation and air-conditioning engineers interior designers landscapers plumbers.
Documents include:	project brief.
Specifications include:	 appliances interior and exterior finishes type, strength and size/quantity of materials workmanship.
Procurement includes:	 forms of tendering lump sum design and construct cost plus.
<i>Project supervision</i> includes:	 administering variations and obtaining client approvals meeting with client, contractors and other stakeholders periodic site visits providing instructions to clarify contract documents providing supplementary details and information reviewing shop drawings and other builder's submissions.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design 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 legislative requirements applicable to the design of buildings develop a design and documentation for a residential and/or commercial building in compliance with the relevant legislation develop a critical path management diagram according to the project schedule comply with the organisational processes for project administration. 	
Context of and specific resources for assessment	 Assessment of essential required 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: realistic tasks or simulated tasks covering the mandatory task requirements relevant specifications and documentation, including land title, site plan, working drawings and specifications and relevant legislation appropriate support materials research resources, including industry-related information. 	

Method of assessment	 Evidence should be gained through a range of methods to ensure valid and reliable assessment and consistency in performance. Evidence should be gathered as part of the learning process, where appropriate, and could be from assessment of the unit alone, through an integrated assessment activity or a combination of both. 		
	Evidence should:		
	 reinforce the integration of Employability Skills with workplace tasks and job roles 		
	• be transferable to other circumstances and environments		
	 relate to a number of performances assessed on different occasions which reflects the scope of the job role. 		
	Assessment methods may:		
	 include observation of tasks in real or simulated work conditions, with questioning to confirm knowledge of legislative requirements for the design of a residential or commercial building 		
	 reinforce the integration of Employability Skills with workplace tasks and job roles 		
	• include evidence relating to a number of performances assessed on different occasions which reflects the scope of the job role.		
	Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.		

Un	it code and title	VU22470 Conduct, interpret and apply a Bushfire Attack Level (BAL) assessment		
Unit descriptor		This unit specifies the outcomes required to conduct, interpret and apply Bushfire Attack Level (BAL) assessments to the design and construction of buildings. This includes relevant theoretical knowledge of fire, understanding of the regulatory framework, assessing a location and education of, and consultation with, clients about the benefits of achieving the required fire resistance.		
		No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.		
		How requ Auth	ever, this unit forms part of a minimum qualification irement for registration with the Victorian Building ority as a building designer (architectural).	
Em	ployability Skills	This	unit contains Employability Skills.	
Application of the unit		This unit is aimed at determining and applying the outcome of a BAL assessment to building design, material selection and construction methods so that buildings better withstand the effects of a bushfire and provide greater protection for occupants and buildings. It involves a methodical, stepped process to determine and assess the bushfire risk of the site and the determination of the BAL using Method 1 (the simplified bushfire risk method from AS 3959).		
ELEMENT		PER	FORMANCE CRITERIA	
Elements describe the essential outcomes of a unit of competency.		Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.		
1	Analyse cause and effect of bushfires	1.1	Requirements relevant to undertaking a BAL assessment are identified and complied with, including <i>occupational health and safety (OHS)/work health and safety (WHS)</i> , legislative, organisational and certification requirements.	
		1.2	Bushfire behaviour is analysed to determine potential impact on buildings and the environment in bushfire-prone areas.	
		1.3	The impact of topography and weather conditions are analysed to determine the risk of bushfires occurring and potential impact on human life and protection of buildings.	

ELEMENT		PER	PERFORMANCE CRITERIA		
		1.4	Sources of combustion are identified to determine how they influence bushfires.		
		1.5	<i>Stakeholders</i> are consulted and <i>information sources</i> accessed to identify benefits of undertaking a BAL assessment.		
		1.6	Responsibilities of local, state and national authorities are reviewed to determine their role in minimising the impact of bushfires.		
2 Correlate information about site conditions	2.1	Objectives of <i>legislation and standards</i> covering buildings in bushfire-prone areas are reviewed to identify measures to improve performance of buildings when subjected to bushfire attack.			
		2.2	The location of the site is identified to determine the <i>Fire Danger Index (FDI)</i> for the site.		
		2.3	Site <i>vegetation classification, vegetation type</i> and <i>exclusions</i> are identified to determine potential contribution to supporting fire progress.		
		2.4	The <i>distance of vegetation</i> from buildings is measured to determine the level of bushfire risk to the site.		
		2.5	The slope of the land under the classified vegetation is measured to determine the direct influence on the severity of a bushfire.		
3	Determine the BAL for site	3.1	The FDI, vegetation classification and type, distance of vegetation and slope are used to select the BAL applicable to the site.		
		3.2	The BAL assessment relevant to the site is checked to confirm accuracy.		
		3.3	The BAL assessment limitations are communicated to client and benefits of achieving required fire resistance is discussed.		
		3.4	Details of the BAL assessment are documented and reported according to organisational requirements.		

ELEMENT		PERFORMANCE CRITERIA	
4	Interpret relevant bushfire information	4.1	Requirements relevant to applying a BAL assessment in a bushfire-prone area and in a Bushfire Management Overlay (BMO) to the design and construction process are identified and complied with, including OHS/WHS.
		4.2	Standard <i>definitions associated with bushfires</i> are explained in the context of building design.
		4.3	Purpose of applying a BAL assessment is determined to inform design decisions.
		4.4	<i>Effects of bushfires</i> on humans and buildings are explained as they relate to each BAL.
		4.5	Risks associated with each BAL are analysed to determine impact on building design, materials and construction methods.
5	Integrate bushfire protection requirements into building design and construction	5.1	Building designs and individual design features are analysed to determine their resistance to bushfire and reduce the level of risk to occupants.
		5.2	Features and benefits of materials are analysed to determine their suitability for the BAL assessment.
		5.3	Design and construction requirements for buildings in bushfire-prone areas reflect the outcomes of the BAL assessment and the Australian Standards.

REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

- Communication skills to:
 - use appropriate communication and interpersonal techniques with colleagues, clients and others
 - accurately record and report workplace information, and maintain documentation
- Comply with legislation, regulations, standards, codes of practice and established safe practices and procedures for undertaking and applying a BAL assessment to the design and construction process
- Problem solving skills to:
 - analyse, interpret and integrate information
 - Identify problems and apply appropriate response procedures
- Planning and organising skills to prepare resources required for site assessment

Required knowledge:

- Applicable Commonwealth, state or territory licensing, legislative, regulatory or certification requirements and codes of practice relevant to the full range of processes for evaluating fire potential and prevention
- Organisational and site standards, requirements, policies and procedures for undertaking and applying a BAL assessment to the design and construction process
- Purpose and processes associated with undertaking a BAL assessment
- Underlying principles for incorporating the outcomes from a BAL assessment into the design and construction process
- Principles of cultural diversity and access and equity
- Environmental protection requirements
- Established communication channels and protocols
- Problem solving techniques
- Environmental risks and hazard prevention
- Procedures for recording, reporting and maintaining workplace records and information
- Appropriate mathematical procedures for estimation and measurement

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 in the Performance Criteria is detailed below. Add any 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.

Occupational health and safety (OHS)/work health and safety (WHS) requirements may include, but are not limited to:	 the use of personal protective equipment and clothing safety equipment first aid equipment hazard and risk control appropriate Safe Work Method Statement (SWMS) appropriate fitness for the task.
<i>Bushfire behaviour</i> includes:	 how bushfires move across different landscapes and vegetation heat transfer – convection, radiation, conduction ember attack variable weather conditions nature and outcome of fire.
Buildings include:	 new buildings alterations and additions to existing buildings.
<i>Sources of combustion</i> include, but are not limited to:	• those specified in the relevant Australian Standards referred to in the Building Act and its associated codes e.g. National Construction Code (NCC) as applicable, including state and territory variations.

<i>Stakeholders</i> include, but are not limited to:	 clients residents in identified high risk areas architects building designers building surveyors builders and land developers local fire authorities community groups regulatory authorities.
<i>Information sources</i> include, but are not limited to:	 internet building industry associations fire services local council national and state governments libraries Victorian Building Authority.
<i>Legislation and standards</i> include, but are not limited to:	 Building Act/planning scheme and its associated codes e.g. NCC as applicable, including state and territory variations, Victorian building regulations. Planning scheme AS 1530 Methods for fire tests on building materials, components and structure AS 1684 Residential timber-framed construction AS 1720 Timber structures-Design methods AS 3837 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter AS 3959 Construction of buildings in bushfire-prone areas.
Fire Danger Index (FDI):	 measures the probability of a bushfire starting and includes the rate of spread, intensity and difficulty of suppression according to various combinations of temperature, relative humidity, wind speed and estimate of fuel state.
Vegetation classification as stated in the Australian Standards includes:	 forest woodland shrubland scrub mallee/mulga rainforest grassland.

Vegetation type as stated in the Australian Standards includes:	 tall woodland open forest low open forest pine plantation woodland open woodland low woodland low open woodland open shrubland closed heath open heath low shrubland closed scrub open scrub tall shrubland tall closed forest low closed forest low open shrubland closed tussock grassland open tussock sparse open tussock dense sown pasture sown pasture open herbfield
	sparse open herbfield.
Exclusions include:	 low threat vegetation and non-vegetated areas refer to AS 3959.
Distance of vegetation:	• measured horizontally from the edge of the building, including parts of the building without external walls e.g. decking, carport to the edge of the vegetation closest to the building.
Slope refers to:	• the upslope or downslope of land under the classified vegetation in relation to the building, not the slope between the classified vegetation and the building, refers to the limitations of Method 1 and Method 2 in AS 3959.

Definitions associated with bushfires include, but are not limited to:	 BAL FDI Fire Resistance Level (FRL) Flame Zone (FZ) distance of vegetation slope vegetation classification and type.
<i>Effects of bushfires</i> include, but are not limited to:	ember attackradiant heatdirect flame contact.

EVIDENCE GUIDE		
The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.		
Overview of assessment	This unit could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques replicate building design drafting workplace conditions, materials, activities, responsibilities and procedures.	
	Holistic or project-based assessment with other related units is recommended.	
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 applicable Commonwealth, state or territory legislative and regulatory requirements and codes of practice, including OHS/WHS, environmental and organisational policies and procedures relevant to undertaking and applying a BAL assessment to the design and construction process communicate effectively and work safely with others determine the level of bushfire risk by undertaking a minimum of two separate BAL assessments. Competency must be assessed on actual sites and include different vegetation classifications and site slopes incorporate the outcomes of one of the BAL assessments conducted into the design and construction of at least are building. 	

Context of and specific resources for assessment	Assessment is to comply with relevant regulatory or Australian Standards requirements.	
	Assessment of essential underpinning knowledge, other than confirmatory questions, will usually be conducted in an off-site context.	
	Assessment of competency for the conduct and application of BAL assessments must be based on actual sites .	
	The following resources should be made available to conduct and apply a BAL assessment on an actual site:	
	a range of appropriate sites	
	 specifications and work instructions 	
	clipboard, pencil and scale rule	
	appropriate measuring instruments	
	 magnetic compass and/or Global Positioning System (GPS) (for remote areas) 	
	digital camera	
	 Internet access for aerial views e.g. Google maps, Nearmap 	
	 AS 3959 Construction of buildings in bushfire-prone areas 	
	 Australian Standards Handbook HB 330 Living in bushfire-prone areas 	
	industry practice notes	
	ongoing professional development requirements	
	BAL assessments	
	 materials and equipment relevant to applying outcomes from BAL assessments to the design and construction process. 	
Method of assessment	Assessment must satisfy the Assessment Guidelines of the course and must be undertaken on appropriate sites.	
	Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and must also reinforce the integration of Employability Skills.	
	The assessment environment should not disadvantage the candidate.	
	Assessment practices should take into account any relevant language or cultural issues related to Aboriginality, gender or language backgrounds other than English.	
	Where the participant has a disability, reasonable adjustment may be applied during assessment.	

Language and literacy demands of the assessment task should not be higher than those of the work role.
Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge for two separate BAL assessments and their interpretation and application to the design of at least one building.
Assessment methods must confirm the ability to correctly interpret and apply the essential underpinning knowledge.
Assessment methods may include:
 direct observation in real-work conditions with questioning to confirm knowledge of relevant theoretical knowledge of fire, bushfire and regulatory requirements
 research and report on case studies of a range of:
 BAL assessments for underpinning knowledge
 designs incorporating BAL assessments
 review of written assignment on benefits of educating and consulting with clients
 review of written assignment on bushfire protection requirements in building designs
 evaluation of reports on causes and effects of bushfires
 review of documentation of BAL assessments
 review of Australian Standards referenced for incorporation into designs for bushfire resistant construction.

Appendix A: Employability Skills summary

Qualification code	22477VIC
Qualification title	Advanced Diploma of Building Design (Architectural)
Qualification descriptor	The following table contains a summary of the Employability Skills required for this qualification. The following table should be interpreted in conjunction with the detailed requirements of each unit of competency packaged in this qualification. The Employability Skills facets described here are broad industry requirements that may vary depending on the work context.

Employability Skills	Industry/enterprise requirements for this qualification include the following:
Communication that contributes to productive	Interacting and using appropriate interpersonal techniques with colleagues, clients and others
and harmonious relations across employees and	 Liaising with regulatory bodies using specialist technical terms
customers	 Reading and interpreting research material, including architectural literature and relevant legislation
	 Developing drawings, plans, specifications and planning approval documentation
	• Questioning, listening and interpreting client design needs
	 Accurately recording and reporting workplace information to industry standard
Teamwork that contributes to productive working	 Working with clients and building professionals to finalise design concepts
relationships and outcomes	Contributing to team meetings concerning a building brief
	Coordinating input of expert advice where appropriate
	Facilitating meetings between clients and teams
Problem solving that	Negotiating resolutions for planning permit applications
contributes to productive outcomes	 Analysing design problems and implementing remedial solutions
	 Analysing site topography and weather conditions to determine risk of bushfires occurring and potential risk to buildings and occupants
	 Interpreting complex calculations relating to building designs' structural requirements and load effects of force and movement on structural elements
	 Making recommendations for the selection of emerging materials for building projects

Initiative and enterprise that contribute to innovative outcomes	 Developing and maintaining professional industry networks Implementing energy conservation strategies and cost saving practices Comparing historical design principles with modern practice Integrating safe building practices into the design of a building Developing effective and compliant quality assurance processes
Planning and organising that contribute to long and short-term strategic planning	 Prioritising personal work tasks in accordance with project deliverables Establishing and maintaining contract administration procedures and frameworks Monitoring project progress to designated milestones Preparing and facilitating a design presentation
Self management that contributes to employee satisfaction and growth	 Networking effectively with architectural professionals Maintaining and developing currency of own professional practice Producing work within allocated time frames and in accordance with project schedule Reflecting on and taking responsibility for own performance Identifying and acting on professional development opportunities
Learning that contributes to ongoing improvement and expansion in employee and company operations and outcomes	 Participating in regular performance reviews of self and others within the team of work responsibilities and performance Assisting others to acquire new skills and knowledge to improve team and individual performance Researching information to maintain up-to-date knowledge of building design practices and materials performance
Technology that contributes to the effective carrying out of tasks	 Using simple levelling equipment Operating office equipment, computers and electronic communication systems Using computer software to develop design solutions and Building Information Modeling (BIM) requirements