

# **22497VIC**

## **Course in Concrete Precast Rectification**

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**

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## Section A: Copyright and course classification information

<p><b>1. Copyright owner of the course</b></p>	<p>Copyright of this course is held by the Department of Education and Training, Victoria.</p> <p>© State of Victoria (Department of Education and Training) 2018.</p>
<p><b>2. Address</b></p>	<p>Executive Director Engagement, Participation and Inclusion Division Higher Education and Skills Group Department of Education and Training (DET) GPO Box 4367 MELBOURNE VIC 3001</p> <p><b>Organisational contact</b> Manager Training Products Higher Education and Skills Group Telephone: (03) 9637 2000 Email: course.enquiry@edumail.vic.gov.au</p> <p><b>Day-to-day contact</b> Curriculum Maintenance Manager (CMM), Building Industries Holmesglen Institute PO Box 42 HOLMESGLEN VIC 3148 Telephone: (03) 9564 1987 Email: teresa.signorello@holmesglen.edu.au</p>
<p><b>3. Type of submission</b></p>	<p>Accreditation</p>
<p><b>4. Copyright acknowledgement</b></p>	<p>Copyright of the following units of competency from nationally endorsed training packages is administered by the Commonwealth of Australia and can be accessed <a href="#">here</a>. © Commonwealth of Australia</p> <p>The following units of competency:</p> <ul style="list-style-type: none"> <li>• CPCCWHS1001 Prepare to work safely in the construction industry</li> <li>• CPCCCM3001 Operate elevated work platforms up to 11 metres</li> </ul> <p>are from the <b>CPC Construction, Plumbing and Services Training Package</b>.</p> <p>The following units of competency:</p> <ul style="list-style-type: none"> <li>• CPCCOHS2001A Apply OHS requirements, policies and procedures in the construction industry</li> <li>• CPCCCO2021A Handle concreting materials</li> <li>• CPCCCM2010B Work safely at heights</li> <li>• CPCCCLSF2001A Licence to erect, alter and dismantle scaffolding basic level</li> </ul> <p>are from the <b>CPC08 Construction, Plumbing and Services Training Package</b>.</p>

	<p>The following unit of competency:</p> <ul style="list-style-type: none"> <li>• TLILIC0005 Licence to operate a boom-type elevating work platform (boom length 11 metres or more)</li> </ul> <p>is from the <b>TLI Transport and Logistics Training Package</b>.</p>
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<p><b>6. Course accrediting body</b></p>	<p>Victorian Registration and Qualifications Authority (VRQA)</p>

<b>7. AVETMISS information</b>	<p><b>ANZSCO code – 6 digit</b>  <a href="#">Australian and New Zealand Standard Classification of Occupations</a>  338212 Concreter</p> <p><b>ASCED code – 4 digit</b>  <a href="#">Field of Education</a>  0403 Building</p> <p><b>National course code</b>  22497VIC</p>
<b>8. Period of accreditation</b>	1 January 2019 to 31 December 2023

## Section B: Course information

<b>1. Nomenclature</b>		<b>Standard 1 AQTF Standards for Accredited Courses</b>
<b>1.1 Name of the qualification</b>	Course in Concrete Precast Rectification	
<b>1.2 Nominal duration of the course</b>	238 – 248 hours	
<b>2. Vocational or educational outcomes</b>		<b>Standard 1 AQTF Standards for Accredited Courses</b>
<b>2.1 Purpose of the course</b>	<p>The 22497VIC <i>Course in Concrete Precast Rectification</i> provides an accredited training program and vocational outcomes for a person to be employed as a concrete precast rectifier/patcher and repairer.</p> <p>The course does not align with any specific AQF level, but rather complements existing competencies gained by workers in the building and construction industry.</p> <p>Therefore, it is appropriately designated as a ‘Course in Concrete Precast Rectification’.</p> <p>On completion of the 22497VIC <i>Course in Concrete Precast Rectification</i>, participants will have the skills and knowledge to:</p> <ul style="list-style-type: none"> <li>• identify hazards and associated risks when working in a concrete precast rectification role</li> <li>• assess and determine appropriate patching and repair methods and material requirements</li> <li>• plan and safely prepare for concrete precast patch and repair tasks</li> <li>• make accurate calculations, measurements and judgments for product mixing and material consistency</li> <li>• employ appropriate curing techniques for cement, grout and epoxy materials</li> <li>• use a range of application and finishing techniques to various surface types</li> <li>• modify work processes/repair methods, according to changing circumstances.</li> </ul>	

<b>3. Development of the course</b>	<b>Standards 1 and 2 AQTF Standards for Accredited Courses</b>
<b>3.1 Industry/enterprise/ community needs</b>	<p><b>Background</b></p> <p>The building industry in Australia has experienced unprecedented growth in recent years, largely due to favourable economic conditions and a rising population; in June 2017 Australia's population experienced the fastest pace of expansion in the developed world<sup>1</sup>. Increased demand for housing, commercial precincts and infrastructure has caused investors, both private and government, to seek out efficient construction methods and materials to keep pace with societal requirements.</p> <p>The evolution of concrete precast product offers an appealing solution; it is easily transported, allows for precision in production and installation, and consists of low carbon material composites that improve emission ratings. These economic and sustainable benefits<sup>2</sup> make it a popular choice for developers, with concrete precast wall panelling commonly applied to the construction of high rise apartments and industrial complexes.</p> <p>The emergence of new concrete precast product necessitates the use of new work practices and associated skill and knowledge. Construction utilising this product involves a process of precise positioning, and specialised patching and finishing methods in order to support building integrity.</p> <p>Building components cast within concrete precast elements during manufacture, such as stitch plates, ferrules, grout tubes and lifting points, require specific treatments by workers who possess a range of critical thinking, problem solving and trade level skills, as well as product and occupational health and safety (OHS)/work health and safety (WHS) knowledge.</p> <p>However, the buoyant economy and unprecedented investment by Federal and State governments in infrastructure development (\$8 billion per year to 2021)<sup>3</sup> has put pressure on the supply of available trade labour. Labour shortages have been consistently reported for most building trade categories on a national basis in recent years. With the construction industry characterised by contract labour<sup>4</sup>, industry identified a need for skill development related to this particular building element.</p>

<sup>1</sup> Cole, W. Reuters. Australia's population growth outpaces world as migrants rush in, 14 December 2017.

<sup>2</sup> M. Stambos & L. D'Agostino, National Concrete Precast Repair Association, (p.2), 2017.

<sup>3</sup> L. Van Onselen, Turnbull's "unprecedented" infrastructure can't outrun population ponzi, Australian budget, Australian Economy, 31 January 2018.

<sup>4</sup> Artibus Innovation, CPC Construction, Plumbing and Services Training Package Companion Volume Implementation Guide (p.4), May 2018.



	<p>The National Concrete Precast Repair Association (NCPRA), the peak body for the patch and repair of concrete precast elements, is concerned for the impact incorrect practices will have for the quality of construction projects. The NCPRA has cited numerous incidents of poor patching practices within the construction industry that may present serious issues related to building integrity and public safety.</p> <p>Provision of a course focussed on concrete precast rectification would address this apparent skill gap and build workforce capability to meet current and future need in this area.</p> <p><b>Target group for the course</b></p> <p>Participants undertaking this course will come from a range of cohorts, which include:</p> <ul style="list-style-type: none"> <li>• new entrants to the building and construction industry with limited or no on-site experience</li> <li>• existing workers in building and construction who wish to formalise their experience</li> <li>• qualified tradespeople from the building and construction industry wanting to extend their skill base.</li> </ul> <p>Participants are not expected to have knowledge of the building and construction industry prior to enrolling into this course.</p> <p><b>Anticipated demand for the course</b></p> <p>Demand for this course can be determined by current building industry statistics related to its size and sector growth forecasts. In Australia, the construction industry generates over \$300 billion dollars in the domestic economy annually, and has a projected annual growth rate of 2.5% between 2017 and 2022<sup>5</sup>. It is the second largest industry in Australia and the third biggest contributor to workforce numbers, employing 1,040,000 Australians or 8.9% of the working population<sup>6</sup>.</p> <p>Due to high international migration levels into Melbourne (now considered the migration capital of Australia), Victoria is the only state to record population growth at a rate higher than the national average i.e. 2.4% vs. 1.6%. This has spurred construction in the residential sector, particularly within the apartment market.</p>
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<sup>5</sup> AISC, National Industry Insights Report 2018-Construction, <https://nationalindustryinsights.aisc.net.au/industries/construction> last accessed 18 June 2018.

<sup>6</sup> Master Builders Australia, Building and Construction Industry Forecasts Australia, December 2017.

	<p>A short-term trough is expected within this sector; however elevated levels of activity are anticipated to be sustained in the medium-term. Non-residential building approvals are 40% higher than 2016-2017, suggesting there is more growth to come in the next twelve months<sup>7</sup>. Major transport infrastructure projects including the \$11 billion Melbourne Metro Rail and \$10 billion North East Link, are either in the planning or development phase, underpinning continued demand for labour into the medium-term.</p> <p>As projections for construction activity overall are positive, and given the wide use of concrete precast elements within all sectors (note the use of precast concrete wall panels in residential construction more than tripled between 2001-2008<sup>8</sup>), a skilled and capable workforce is required to ensure concrete precast rectification is performed to regulatory and safety standards; this course facilitates that training.</p> <p><b>Course consultation and validation process</b></p> <p>Project steering committee (PSC) members represent the major stakeholders invested in the curriculum including the regulators for building (Victorian Building Authority), safety (WorkSafe Victoria) and the peak employer body (Master Builders Association of Victoria). The NCPRA, the industry peak body, was represented through the executive.</p> <p>Key individual enterprises also held positions from private and public construction materials and building products suppliers, construction and building repair firms.</p> <p>Desktop reviews of current building and construction industry statistics and related concrete precast rectification research was also undertaken to support the development of the accredited course.</p>
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<sup>7</sup> Master Builders Australia, Building and Construction Industry Forecasts - Victoria Commentary, (p.3), Dec 2017.

<sup>8</sup> Cement concrete & Aggregates Australia, Concrete the Responsible Choice Sustainability Brochure, (p.18), 2008.

	<p><b>Project steering committee</b></p> <p>A project steering committee (PSC) was formed to guide the development of the accredited course, consisting of:</p> <p>Len D’Agostino (Chair)    National Concrete Precast Repair Association</p> <p>Michael Stambos            CXM Building Constructions</p> <p>Philip Alviano                Master Builders Association (MBA)</p> <p>Jennifer Mason                Victorian Building Authority</p> <p>Alan Threadwell              Metropolitan Fire Brigade</p> <p>Guy Phillips                    WorkSafe Victoria</p> <p>Stephen Mellios               Kane Constructions</p> <p><b>In attendance:</b></p> <p>Teresa Signorello              CMM, Building Industries, Holmesglen Institute</p> <p>Susan Fechner                 CMM Project Officer, Building Industries, Holmesglen Institute</p> <p>The role of the PSC was to evaluate, confirm and validate the outcomes of the course. The members also provided technical information throughout the project. P. Alviano replaced C. Williams as PSC representative for the MBA after the first PSC meeting. D. Hocking and B. McMurray relinquished their roles during the project due to unforeseen circumstances.</p> <p>The outcomes of several national units were carefully considered by the PSC with respect to their potential relevance and application to the course context.</p> <p>The course:</p> <ul style="list-style-type: none"> <li>• does not duplicate, by title or coverage, the outcomes of an endorsed training package qualification</li> <li>• 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</li> <li>• 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</li> <li>• does not comprise units that duplicate units of competency of a training package qualification.</li> </ul>
<p><b>3.2 Review for re-accreditation</b></p>	<p>Not applicable, this is a course accreditation.</p>

<b>4. Course outcomes</b>	<b>Standards 1, 2, 3 and 4 AQTF Standards for Accredited Courses</b>
<b>4.1 Qualification level</b>	<p><b>Reference: Standards 1, 2 and 3 AQTF Standards for Accredited Courses</b></p> <p>The 22497VIC Course in Concrete Precast Rectification meets an identified industry need but does not have the breadth, depth or volume of learning of a qualification.</p>
<b>4.2 Employability skills</b>	<p><b>Reference: Standard 4 AQTF Standards for Accredited Courses</b></p> <p>Not applicable.</p>
<b>4.3 Recognition given to the course (if applicable)</b>	<p><b>Reference: Standard 5 AQTF Standards for Accredited Courses</b></p> <p>Not applicable.</p>
<b>4.4 Licensing/regulatory requirements (if applicable)</b>	<p><b>Reference: Standard 5 AQTF Standards for Accredited Courses</b></p> <p>A Construction Induction Card (CIC), issued by WorkSafe Australia, is required for individuals entering a construction site.</p> <p>There are no licensing requirements for the course.</p> <p>Competency in the following high risk work licence units will result in the attainment of the licence from Worksafe through an application process;</p> <p>CPCCLSF2001A Licence to erect, alter and dismantle scaffolding basic level</p> <p>TLILIC0005 Licence to operate a boom-type elevating work platform (boom length 11metres or more)</p>
<b>5. Course rules</b>	<b>Standards 2, 6, 7 and 9 AQTF Standards for Accredited Courses</b>
<p><b>5.1 Course structure</b></p> <p>To be awarded the 22497VIC Course in Concrete Precast Rectification, the following units of competency must be completed:</p> <ul style="list-style-type: none"> <li>• nine (9) core units</li> <li>• one (1) elective unit.</li> </ul> <p>Ten (10) units of competency must be completed in total. Where the full course is not completed a Statement of Attainment will be issued for any completed unit.</p>	

Unit of competency code	Field of Education code (six-digit)	Unit of competency title	Pre-requisite	Nominal hours
<b>Core units</b>				
CPCCWHS1001	061301	Prepare to work safely in the construction industry	Nil	6
CPCCCM2010B	061301	Work safely at heights	CPCCOHS2001A	8
CPCCCO2021A	040399	Handle concreting materials	CPCCOHS2001A	24
CPCCCM3001	030717	Operate elevated work platforms up to 11 metres	Nil	32
CPCCOHS2001A	061301	Apply OHS requirements, policies and procedures in the construction industry	Nil	20
VU22665	061301	Assess safety of work area in close proximity to a confined space	Nil	8
VU22666	040399	Patch and repair concrete precast components	Nil	50
VU22667	040399	Apply surface finishes to patched concrete precast components	Nil	40
VU22668	040399	Caulk concrete precast elements	Nil	20
<b>Elective units (choose 1)</b>				
CPCCLSF2001A	040329	Licence to erect, alter and dismantle scaffolding basic level	Nil	40
TLILIC0005	030717	Licence to operate a boom-type elevating work platform (boom length 11 metres or more)	Nil	30
<b>Total nominal hours</b>				<b>238 – 248</b>

<p><b>5.2 Entry requirements</b></p>	<p><b>Reference: Standard 9 AQTF Standards for Accredited Courses</b></p> <p>There are no entry requirements for the <i>22497VIC Course in Concrete Precast Rectification</i>. The following is a general guide to entry in relation to the language, literacy and numeracy skills of learners aligned to the Australian Core Skills Framework (ACSF).</p> <p>Learners are best equipped to achieve the course outcomes in the <i>22497VIC Course in Concrete Precast Rectification</i> if they have minimum language, literacy and numeracy skills that are equivalent to Level 2 of the ACSF.</p> <p>Learners with language, literacy and numeracy skills at a lower level than suggested will require additional support to successfully undertake the 'course in'.</p>
<p><b>6. Assessment</b></p>	<p><b>Standards 10 and 12 AQTF Standards for Accredited Courses</b></p>
<p><b>6.1 Assessment strategy</b></p>	<p><b>Reference: Standard 10 AQTF Standards for Accredited Courses</b></p> <p>All assessment, including Recognition of Prior Learning (RPL), must be compliant with the requirements of:</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• the Standards for Registered Training Organisations (SRTOs) 2015, OR</li> <li>• the relevant guidelines and SRTOs at the time of assessment.</li> </ul> <p>The nature of the work undertaken is hands-on and practical. Assessment strategies should therefore reflect this. It is recommended that the assessment strategy for the <i>22497VIC Course in Concrete Precast Rectification</i> includes:</p> <ul style="list-style-type: none"> <li>• oral and written questioning related to underpinning knowledge</li> <li>• the practical demonstration of activities which combine a number of learning outcomes to provide depth and context to the training</li> <li>• holistic assessment that reflects realistic job tasks.</li> </ul> <p>Assessment strategies for imported units from training packages should be consistent with the assessment requirements/evidence guides for the relevant training packages.</p>

<p><b>6.2 Assessor competencies</b></p>	<p><b>Reference: Standard 12 AQTF Standards for Accredited Courses</b></p> <p>Assessment must be undertaken by a person or persons, in accordance with:</p> <ul style="list-style-type: none"> <li>• Standard 1.4 of the AQTF: Essential Conditions and Standards for Initial/Continuing Registration and Guidelines 3 of the VRQA Guidelines for VET Providers, OR</li> <li>• the SRTOs 2015, OR</li> <li>• the relevant guidelines and SRTOs at the time of assessment.</li> </ul> <p>All assessment of units imported from training packages and/or accredited courses must reflect the requirements for assessors specified in the relevant source training product.</p>
<p><b>7. Delivery</b></p>	<p><b>Standards 11 and 12 AQTF Standards for Accredited Courses</b></p>
<p><b>7.1 Delivery modes</b></p>	<p><b>Reference: Standard 11 AQTF Standards for Accredited Courses</b></p> <p>The course aims to develop practical competencies within an industry setting. Practical demonstrations and opportunity for application are considered to provide the most suitable strategy to reflect the objectives of the course. Some areas of content may be common to more than one element or more than one unit, therefore integration may be appropriate.</p> <p>Delivery options, including grouping of learners and learning activities, should recognise the varying learning needs, educational backgrounds, preferred learning styles and constraints of the individual learner and the specific requirements of each unit. The units may be delivered singularly, or they may be integrated holistically with a number of units.</p> <p>As the role involves practical skill development, the practical skill component of the course must be delivered in a:</p> <ul style="list-style-type: none"> <li>• workplace, OR</li> <li>• simulated workplace that accurately reflects workplace conditions. Practical exercises may take the form of realistic, holistic projects to provide the learner with a 'real work' experience.</li> </ul> <p>The knowledge components of the course may be delivered using face-to-face, online or blended modes.</p>

<p><b>7.2 Resources</b></p>	<p><b>Reference: Standard 12 AQTF Standards for Accredited Courses</b></p> <p>Delivery and assessment materials should reflect the workplace environment, as far as possible, and include, at a minimum:</p> <ul style="list-style-type: none"> <li>• tools and equipment for the rectification of concrete precast components</li> <li>• basic materials to complete practical concrete precast rectification projects</li> <li>• relevant concrete precast rectification workplace documentation such as specifications and work instructions</li> <li>• relevant personal protective equipment (PPE)</li> <li>• computers.</li> </ul> <p>Refer to the individual units for specific tool and equipment requirements.</p> <p>Training must be undertaken by a person or persons, in accordance with:</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• the SRTOs 2015, OR</li> <li>• the relevant guidelines and SRTOs at the time of assessment.</li> </ul> <p>Trainers of nationally endorsed units of competency must meet any additional requirements specified in the relevant training product.</p>
<p><b>8. Pathways and articulation</b></p>	<p><b>Standard 8 AQTF Standards for Accredited Courses</b></p>
	<p>There are no formal articulation or credit transfer arrangements into other VET or higher education qualifications for the <i>XXXVIC Course in Concrete Precast Rectification</i>. Persons who have already completed relevant units within the course will receive credit for those units.</p>



**9. Ongoing monitoring and evaluation**

***Standard 13 AQTF Standards for Accredited Courses***

The CMM for Building Industries is responsible for the ongoing monitoring and evaluation of the *22497VIC Course in Concrete Precast Rectification*.

A formal review will be undertaken half way through the accreditation period, and will be based on feedback received from students, trainers and industry stakeholder surveys/consultations. The VRQA will be notified of any significant changes required to the course.

## Section C - Units of competency

The following is a list of imported units of competency for the course, which can be downloaded from the National Register (<https://training.gov.au/>):

• CPCCWHS1001	Prepare to work safely in the construction industry
• CPCCCM2010B	Work safely at heights
• CPCCCO2021A	Handle concreting materials
• CPCCCM3001	Operate elevated work platforms up to 11 metres
• CPCCOHS2001A	Apply OHS requirements, policies and procedures in the construction industry
• CPCCLSF2001A	Licence to erect, alter and dismantle scaffolding basic level
• TLILIC2005	Licence to operate a boom-type elevating work platform (boom length 11 metres or more)

The following is a list of the units of competency developed for the course that complies with the current requirements from the Training Package Development Handbook and is detailed in this section of the course document:

VU22665	Assess safety of work area in close proximity to a confined space
VU22666	Patch and repair concrete precast components
VU22667	Apply surface finishes to patched concrete precast components
VU22668	Caulk concrete precast elements

<b>Unit code</b>	VU22665
<b>Unit title</b>	Assess safety of work area in close proximity to a confined space
<b>Unit descriptor</b>	<p>This unit describes the performance outcomes, skills and knowledge required to assess the safety of a work area, which is in close proximity to a confined space.</p> <p>It involves identifying a confined space, identifying and assessing associated hazards and risks, and determining the safety of the work area in order for work to commence. This unit does not address entering or working within a confined space.</p> <p>No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication. However, licensing does exist concerning entry to a confined space.</p> <p>Completion of the general induction training program specified by the National Code of Practice for Induction Training for Construction Work (ASCC 2007) is required before entering a construction work site. Achievement of unit, <i>CPCCWHS1001 Prepare to work safely in the construction industry</i>, meets this requirement.</p>
<b>Employability Skills</b>	This unit contains Employability Skills.
<b>Application of the unit</b>	<p>This unit supports the attainment of the skills and knowledge required for construction workers to apply occupational health and safety (OHS)/work health and safety (WHS) requirements to their work space prior to undertaking work activities near and around a confined space.</p> <p>This unit applies to those working under supervision as part of a team within the residential/commercial or civil construction industry. Work parameters are well established and responsibility for the quality of work outputs is expected.</p> <p>The outcomes of this unit do not cover the required skills and knowledge for compliance with codes/standards/regulations for entering confined spaces.</p>

ELEMENT		PERFORMANCE CRITERIA	
<i>Elements describe the essential outcomes of a unit of competency.</i>		<i>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.</i>	
1.	Determine existence of a confined space	1.1	Review the <b><i>nature and characteristics</i></b> of the work area and compare to safe work method statement (SWMS).
		1.2	Assess and confirm the existence of a <b><i>confined space</i></b> , according to <b><i>confined space criteria</i></b> described within OHS/WHs regulations.
		1.3	Record the outcome of the confined space assessment using appropriate workplace documentation.
2.	Assess safety of work area around confined space	2.1	Identify <b><i>hazards</i></b> and assess risks associated with confined spaces that may impact the safety of the immediate work area using appropriate OHS/WHs codes of practice.
		2.2	Report the safety of the work area around the confined space to the supervisor and proceed, according to established workplace procedures.

### REQUIRED SKILLS AND KNOWLEDGE

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

#### Required skills:

- communication skills to convey ideas and information of confined space assessment
- writing skills to complete safety report outcomes on appropriate workplace documentation
- literacy skills to read and interpret workplace documents, OHS/WHs safety regulations, SWMS
- initiative skills to:
  - recognise a potential confined space
  - identify hazards and risks within the immediate work area
- problem solving skills to evaluate a potential confined space against OHS/WHs criteria
- self management skills to collect, organise and understand information related to confined space assessment.

**Required knowledge:**

- common construction industry terminology
- the definition, and common types of, workplace safety hazards and risks
- appropriate confined space signage and symbols
- basic principles of risk management
- workplace procedures for reporting hazard and risk assessments to designated personnel
- characteristics and types of confined spaces
- OHS/WHS hierarchy of control
- safe work practices in a construction working environment
- rights and responsibilities of workplace parties under WHS legislation
- relevant OHS/WHS regulations, policies and codes of practice e.g. confined spaces.

**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.*

***Nature and characteristics*** may include:

- closed or open air environment
- high rise or ground development
- stage of construction development
- level and type of trade activity
- existence of walk through traffic
- presence of stock items (cable, cement, etc.)
- proximity to explosive power tools
- electric wiring
- water pipes
- exhaust fans.

***Confined space*** may include, but is not limited to:

- shafts
- pits
- pipes
- ducts
- flues
- chimneys
- silos
- containers

	<ul style="list-style-type: none"> <li>• pressure vessels</li> <li>• wet or dry wells</li> <li>• tunnels</li> <li>• trenches</li> <li>• other enclosed or partially enclosed structures.</li> </ul>
<p><b>Confined space criteria</b> may include, but is not limited to:</p>	<ul style="list-style-type: none"> <li>• an enclosed or partially enclosed space that is not designed or intended primarily to be occupied by a person, and is, or is designed or intended to be, at normal atmospheric pressure while any person is in the space; and is, or is likely to be a risk to health and safety from: <ul style="list-style-type: none"> <li>○ an atmosphere that does not have a safe oxygen level, OR</li> <li>○ contaminants, including airborne gases, vapours and dusts, that may cause injury from fire or explosion, OR</li> <li>○ harmful concentrations of any airborne contaminants, OR</li> <li>○ engulfment.</li> </ul> </li> </ul>
<p><b>Hazards</b> may include, but is not limited to:</p>	<ul style="list-style-type: none"> <li>• harmful airborne contaminants, fire and explosion, biological e.g. micro-organisms, noise, vertical opening of confined space (falls, slips, trips).</li> </ul>

<b>EVIDENCE GUIDE</b>	
<p><i>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.</i></p>	
<b>Overview of assessment</b>	<p>This unit of competency could be assessed in the workplace or a close simulated environment, provided that simulated or project-based assessment techniques replicate building and construction conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended.</p>
<b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b>	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> <li>• access, read, interpret and apply information for defining a confined space</li> <li>• determine the potential effect a confined space may have on a work area with consideration to changing environmental variables</li> <li>• comply with appropriate workplace procedures to communicate outcomes of safety of work area assessment.</li> </ul>

<p><b>Context of and specific resources for assessment</b></p>	<p>The application of competency is to be assessed in the workplace or realistically simulated workplace. Assessment is to occur under standard and authorised work practices, safety requirements and environmental constraints.</p> <p>Assessment is to comply with relevant regulatory or Australian Standards requirements.</p> <p>Resource implications for assessment include:</p> <ul style="list-style-type: none"> <li>• materials and equipment relevant to the assessment of a confined space</li> <li>• documentation including SWMS, confined space template code of practice</li> <li>• realistic tasks or simulated tasks covering the mandatory task requirements.</li> </ul>
<p><b>Method of assessment</b></p>	<p>A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:</p> <ul style="list-style-type: none"> <li>• direct observation of the candidate in a real workplace setting or simulated environment</li> <li>• written and oral questioning to test underpinning knowledge and its application to determining the safety of a work area around a confined space</li> <li>• project activities that allow the candidate to demonstrate the application of skills and knowledge.</li> </ul>

<b>Unit code</b>	VU22666
<b>Unit title</b>	Patch and repair concrete precast components
<b>Unit descriptor</b>	<p>This unit describes the performance outcomes, skills and knowledge required to inspect, prepare and patch components within concrete precast elements to meet Building Code of Australia (BCA) standards.</p> <p>No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.</p> <p>Completion of the general induction training program specified by the National Code of Practice for Induction Training for Construction Work (ASCC 2007) is required before entering a construction work site. Achievement of unit, <i>CPCCWHS1001 Prepare to work safely in the construction industry</i>, meets this requirement.</p>
<b>Employability Skills</b>	This unit contains Employability Skills.
<b>Application of the unit</b>	<p>This unit supports the attainment of the skills and knowledge required for construction workers to apply patching practices to a range of concrete precast components, typically stitch plates, ferrules, grout ducts, dowels and lifters.</p> <p>The work context relates to high rise developments predominantly, within residential and commercial construction environments, however civil construction environments are equally applicable.</p> <p>It includes component inspection to determine the type and scope of work, preparation of materials, tools and equipment, and performance of patch and repair techniques to workplace standards. Dust suppression and work safety related to powdered substances is embedded within work practices.</p> <p>This unit applies to those working autonomously with limited supervision, sometimes as part of a small team. While work parameters are established, judgement is required to solve a variety of predictable and sometimes unpredictable problems. Responsibility for the quality of work outputs is expected.</p>



ELEMENT		PERFORMANCE CRITERIA	
<i>Elements describe the essential outcomes of a unit of competency.</i>		<i>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.</i>	
1.	Determine patch and repair job requirements	1.1	Obtain <b>authorised</b> job sheets, work instructions or job specification and identify <b>job requirements</b> .
		1.2	Determine applicable <b>occupational health and safety (OHS)/work health and safety (WHS) requirements</b> , in accordance with safe work method statement (SWMS), workplace policies and <b>relevant documents</b> .
		1.3	Inspect <b>concrete precast component</b> to patch or repair and consider <b>rectification variables</b> to determine possible patch and repair methods to apply.
		1.4	Notify supervisor of any concrete precast component repairs that do not meet fire rating requirements of the BCA regulations.
		1.5	Clarify and confirm rectification methods with supervisor to ensure compliance with project/structure specification.
2.	Prepare to undertake patching and repair	2.1	Identify <b>materials</b> and associated quantities/measurements required for patch and repair, according to job specification.
		2.2	Locate and interpret material safety data sheet (MSDS) requirements for materials recorded on the job specification, noting <b>particular safety requirements</b> for opening packaging containing powdered substances.
		2.3	Recognise <b>environmental factors</b> that may impact the ability to contain powdered material when in use.
		2.4	Select and dress in appropriate <b>personal protective equipment (PPE)</b> ensuring all items are secure and intact, as per workplace safety regulations.
		2.5	Select and assemble materials, <b>tools and equipment</b> required for patch and repair tasks, according to job specification requirements.
		2.6	Clearly communicate pending work practice involving the disbursement of powdered substances to work colleagues to facilitate risk reduction practices.

ELEMENT		PERFORMANCE CRITERIA	
3.	Prepare concrete precast component surface for patching	3.1	Remove loose and spalling concrete from repair area with caution, to minimise potential damage to the concrete precast component, and risk of falling debris, using appropriate tools and PPE.
		3.2	Clean the surface area of the concrete precast component, removing any <b>extraneous items</b> where necessary, and ensure the area is free from loose material, dust, dirt, oil and grease.
		3.3	Assess and undertake <b>structural repairs</b> , according to material specifications and appropriate rectification methods.
		3.4	Obtain supervisor inspection of structural repair, where appropriate, to comply with project fire rating and structural integrity requirements.
		3.5	Apply <b>appropriate priming agent</b> to the surface area adhering to dilution measurements of manufacturers' requirements and SWMS.
4.	Mix patching agents	4.1	Open packaging of powdered substances, according to safety requirements specified in hazardous substances code of practice.
		4.2	Measure <b>liquid agent</b> , according to ratios specified in manufacturers' requirements and pour into mixing container without spillage.
		4.3	Remove measured amounts of powdered substance from packaging with minimal agitation.
		4.4	Add powdered substance to liquid in intervals while mixing, to reduce potential disbursement of powdered substance.
		4.5	Check mix is lump free, impose curing times with cognisance to <b>environmental variables</b> and assess resulting consistency, according to manufacturers' requirements.
5.	Perform patch and repair	5.1	Check the surface area of the concrete precast component is completely dry and the applied priming agent fully covers and seals the repair area.
		5.2	Press mix into repair area firmly using appropriate tool, adding successive layers to build the patch to surface level.

ELEMENT		PERFORMANCE CRITERIA	
		5.3	Spread and texture the concrete patch to match the surrounding concrete using a trowel to achieve a basic smooth surface.
		5.4	Assess completed patch and repair against workplace quality standards and relevant Australian Standards.
6.	Clean work area	6.1	Contain, label and store powdered material for reuse, or disposed of powdered material, in accordance with environmental requirements, legislation, such as regulations/codes of practice and workplace procedures.
		6.2	Clean tools and equipment, checked for serviceability and store, in accordance with manufacturers' recommendations and standard workplace procedures.
		6.3	Clean and tidy work area to ensure space is free of powdered substances that may cause potential contamination to self and others, in accordance with OHS/WHS regulations.
		6.4	Remove and dispose of PPE, according to OHS/WHS regulations.

### REQUIRED SKILLS AND KNOWLEDGE

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

#### Required skills:

- planning and organising skills to:
  - identify and obtain materials, tools and equipment required for patching and repair
  - complete work tasks in a logical and efficient sequence
- self management skills to work safely by applying appropriate:
  - PPE and manual handling techniques
  - methods for the suppression of powdered substances
- literacy skills to:
  - read and interpret
    - product information and MSDS
    - job specifications and instructions
  - apply OHS/WHS, SWMS and other relevant workplace procedures
- numeracy skills to make measurements and calculations for material requirements

- learning skills to modify work processes to suit changing circumstances
- initiative skills to:
  - identify environmental factors that impact work processes
  - act on faults with tools, materials and processes
  - work sustainably
- problem solving skills to:
  - determine appropriate preparation applications
  - identify effects of under filled/over filled grout tubes
  - refer fire rating issues outside area of responsibility to appropriate personnel
- teamwork skills to:
  - promote a safe working environment
  - participate and engage in group discussion (toolbox meetings)
- writing skills to complete workplace documentation
- technology skills to:
  - use and maintain tools safely
  - apply tool techniques effectively
  - access the internet for standards checklists
  - make emergency calls
- oral communication skills to:
  - use appropriate patch and repair terminology
  - question and confirm task requirements
  - report incidents and faults.

#### **Required knowledge:**

- terminology used for patching and repair
- specifications used for patching and repair
- types of concrete precast components
- fire rating requirements relevant to concrete precast component repairs
- location of workplace documents and their purpose
- workplace procedures related to communication protocols
- relevant OHS/WHS regulations, policies and codes of practice e.g. drop zones, hazardous substances, PPE, manual handling techniques
- concrete precast standards in relation to patching and repair guide
- principles of risk management (hierarchy of controls)
- effects of removal of trench or temporary supports and associated risk of structural collapse
- structural risks associated with the removal of a 'popped bolt'
- principles of sustainability relevant to material reuse

- basic work planning
- concrete patch and repair tool types, purpose and functions
- types, characteristics and purposes of patching and repair materials, including powdered substances and structural grout
- correct grouting methods
- consequences of poor grouting methods for structural integrity and fire rating compliance
- types of concrete surface imperfections and their causes, including blowholes, crazing, dusting, flaking, honeycombing and pop-outs
- effects of unsafe use of powdered substances used for patching and repair
- characteristics of patching and repair materials and their effect on, and appropriateness of use with, priming agents
- processes for calculating material measurements and quantities
- storage and labelling of materials.

### 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.*

**Authorised** may include:

- project design engineer
- erection design engineer
- engineer.

**Job requirements** may include:

- type and number of components to patch, including grout duct and structural grout
- patching and repair materials
- priming processes
- basic surface finishing requirements.

**Occupational health and safety (OHS)/Work health and safety (WHS) requirements** may include:

- state or territory legislation and regulations, including, permits for drop zones and requirements around temporary structural supports
- organisational safety policies and procedures
- material safety management systems
- hazardous and dangerous goods codes of practice
- relevant health regulations
- manual handling procedures
- the use of personal protective equipment
- organisation insurance requirements.

<p><b>Relevant documents</b> may include:</p>	<ul style="list-style-type: none"> <li>• material safety data sheets (MSDS)</li> <li>• job instructions</li> <li>• BCA regulations</li> <li>• hazardous substances code of practice.</li> </ul>
<p><b>Concrete precast component</b> may include:</p>	<ul style="list-style-type: none"> <li>• soffit</li> <li>• stitch plate</li> <li>• dowel</li> <li>• grout duct/grout tube</li> <li>• ferrule</li> <li>• lifter</li> <li>• connection plate fixings (e.g. to balconies).</li> </ul>
<p><b>Rectification variables</b> may include:</p>	<ul style="list-style-type: none"> <li>• location of rectification</li> <li>• access to rectification</li> <li>• moisture content (air)</li> <li>• outdoor weather conditions (rain/humidity)</li> <li>• condition of welds and adequacy, according to quality assurance or engineer report</li> <li>• scratched galvanised steel</li> <li>• rust</li> <li>• cracked concrete patches</li> <li>• cast-in dowel</li> <li>• depth of grouting or 'face up'</li> <li>• consistency of grout used in grout duct</li> <li>• appearance of grout overflow around grout duct due to air bubble</li> <li>• fire rating of patches and compliance to standards.</li> </ul>
<p><b>Materials</b> may include:</p>	<ul style="list-style-type: none"> <li>• cement</li> <li>• grout</li> <li>• epoxy mortar</li> <li>• sand</li> <li>• water</li> <li>• mixing agent</li> <li>• bond breaker</li> <li>• additives</li> <li>• aggregate.</li> </ul>

<p><b>Particular safety requirements</b> may include:</p>	<ul style="list-style-type: none"> <li>• setting up drop zone</li> <li>• draught free work space</li> <li>• stabilise packaged material on solid surface</li> <li>• packaged material positioned ‘the right way up’</li> <li>• material bulk positioned in the lower section of the packaging</li> <li>• cut (rather than tear) packaging along perforated lines</li> <li>• open packaging away from self</li> <li>• OHS/WHS legislation</li> <li>• safety regulations and codes of practice, e.g. dangerous goods (storage and handling) regulations, hazardous substances code of practice, manual handling.</li> </ul>
<p><b>Environmental factors</b> may include:</p>	<ul style="list-style-type: none"> <li>• wind</li> <li>• rain</li> <li>• air conditioning</li> <li>• draughty airway.</li> </ul>
<p><b>Personal protective equipment (PPE)</b> may include:</p>	<ul style="list-style-type: none"> <li>• disposable dust mask</li> <li>• safety glasses</li> <li>• waterproof gloves</li> <li>• ear muffs</li> <li>• work wear.</li> </ul>
<p><b>Tools and equipment</b> may include:</p>	<ul style="list-style-type: none"> <li>• buckets</li> <li>• mixing tray</li> <li>• mixing drill</li> <li>• pourer</li> <li>• steel float</li> <li>• trowel</li> <li>• putty knife</li> <li>• spatula</li> <li>• shovels</li> <li>• brush</li> <li>• wheelbarrows</li> <li>• electric cement mixers</li> <li>• chisels</li> </ul>

	<ul style="list-style-type: none"> <li>• levels (spirit, automatic, laser)</li> <li>• compactor</li> <li>• scissors</li> <li>• hammer</li> <li>• stirring sticks</li> <li>• portable drill</li> <li>• masonry grinding disc</li> <li>• stiff bristle brush</li> <li>• cloth.</li> </ul>
<b>Extraneous items</b> may include:	<ul style="list-style-type: none"> <li>• bolt.</li> </ul>
<b>Structural repairs</b> may include:	<ul style="list-style-type: none"> <li>• insertion of pins</li> <li>• dry pack grouting between panels</li> <li>• flowable grouting</li> <li>• grouting.</li> </ul>
<b>Appropriate priming agent</b> may include:	<ul style="list-style-type: none"> <li>• concrete to concrete</li> <li>• concrete to steel</li> <li>• compromised precast components such as: <ul style="list-style-type: none"> <li>○ scratched galvanised steel lifters</li> <li>○ lifter voids filled with water</li> <li>○ scratched grout tubes.</li> </ul> </li> </ul>
<b>Liquid agent</b> may include:	<ul style="list-style-type: none"> <li>• water</li> <li>• epoxy resin</li> <li>• curing agent.</li> </ul>
<b>Environmental variables</b> may include:	<ul style="list-style-type: none"> <li>• air moisture e.g. humidity</li> <li>• air temperature</li> <li>• wind</li> <li>• sun exposure.</li> </ul>



<b>EVIDENCE GUIDE</b>	
<p><i>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.</i></p>	
<p><b>Overview of assessment</b></p>	<p>This unit could be assessed in the workplace or a close simulated environment, provided that simulated or project-based assessment techniques replicate building and construction conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended.</p>
<p><b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b></p>	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> <li>• access, read, interpret and apply information for patching and repair operations</li> <li>• comply with appropriate workplace procedures and safety regulations related to tool and material handling, use, maintenance and storage</li> <li>• identify the effect of poor preparatory practices on patch and repair outcomes</li> <li>• clean, prime and patch a surface consisting of at least: <ul style="list-style-type: none"> <li>– one steel concrete precast component and</li> <li>– one non-steel concrete precast component including dry packing and grout duct to workplace quality standards.</li> </ul> </li> </ul>
<p><b>Context of and specific resources for assessment</b></p>	<p>The application of competency is to be assessed in the workplace or realistically simulated workplace.</p> <p>Assessment is to occur under standard and authorised work practices, safety requirements and environmental constraints.</p> <p>Assessment is to comply with relevant regulatory or Australian Standards requirements.</p> <p>Resource implications for assessment include:</p> <ul style="list-style-type: none"> <li>• materials and equipment relevant to patching and repair operations</li> <li>• documentation including job safety analysis (JSA), SWMS, confined space template code of practice, Building Certification Systems (BCS)</li> <li>• realistic tasks or simulated tasks covering the mandatory task requirements.</li> </ul>

<b>Method of assessment</b>	<p>A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:</p> <ul style="list-style-type: none"><li>• direct observation of the candidate performing patching and repair operations in a real workplace setting or simulated environment</li><li>• written and oral questioning to test underpinning knowledge and its application to determining the preparation, mixing and finishing requirements of patching and repair operations, including health and safety issues related to powdered substances</li><li>• project activities that allow the candidate to demonstrate the application of skills and knowledge related to patch and repair practices.</li></ul>
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<b>Unit code</b>	VU22667
<b>Unit title</b>	Apply surface finishes to patched concrete precast components
<b>Unit descriptor</b>	<p>This unit describes the performance outcomes, skills and knowledge required to finish concrete surfaces of patched concrete precast components, according to specified finishing requirements.</p> <p>This unit relates to manual finishing techniques only. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.</p> <p>Completion of the general induction training program specified by the National Code of Practice for Induction Training for Construction Work (ASCC 2007) is required before entering a construction work site. Achievement of unit, <i>CPCCWHS1001 Prepare to work safely in the construction industry</i>, meets this requirement.</p>
<b>Employability Skills</b>	This unit contains Employability Skills.
<b>Application of the unit</b>	<p>This unit supports the attainment of the skills and knowledge required for construction workers to apply a range of finishing techniques to concrete surfaces of patched concrete precast components.</p> <p>The work context relates to high rise developments predominantly, within residential and commercial construction environments, however civil construction environments are equally applicable.</p> <p>It includes inspection of a patched surface to determine the type and scope of work, preparation of materials, tools and equipment, and performance of finishing techniques to workplace standards. Dust suppression and work safety related to powdered substances is embedded within work practices.</p> <p>This unit applies to those working autonomously with limited supervision, sometimes as part of a small team. While work parameters are established, judgement is required to solve a variety of predictable and sometimes unpredictable problems. Responsibility for the quality of work outputs is expected.</p>

ELEMENT		PERFORMANCE CRITERIA	
<i>Elements describe the essential outcomes of a unit of competency.</i>		<i>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.</i>	
1.	Plan for surface finishing	1.1	Obtain job specification/work instructions and identify <b>specifications</b> for <b>finishing coat</b> tasks.
		1.2	Identify <b>relevant codes and standards</b> for finishing coats for concrete precast.
		1.3	Identify <b>materials</b> and associated quantities/measurements required for surface finishing, according to job specification.
		1.4	Locate and interpret material safety data sheet (MSDS) requirements for materials recorded on the job specification, noting <b>particular safety requirements</b> for opening packaging containing powdered substances.
		1.5	Recognise <b>environmental factors</b> that may impact the ability to contain powdered material when in use.
2.	Prepare for surface finishing	2.1	Select and confirm compatible surface coating for patched concrete precast, according to work instructions, manufacturers' specifications and <b>location of patch</b> .
		2.2	Determine surface preparation methods for finishing coat application to achieve the desired finish.
		2.3	Select and dress in appropriate <b>personal protective equipment (PPE)</b> ensuring all items are secure and intact, as per workplace safety regulations.
		2.4	Select and assemble materials, <b>tools and equipment</b> required for surface finishing tasks, according to job specification requirements.
		2.5	Clearly communicate pending work practice involving the disbursement of powdered substances to work colleagues to facilitate risk reduction practices.

ELEMENT		PERFORMANCE CRITERIA	
3.	Prepare patch for surface finishing	3.1	Assess curing of patched concrete precast component to determine strength of concrete and readiness for surface finish application.
		3.2	Prepare patched precast surface, according to the <b>priming requirements</b> of selected finishing coat to be used.
4.	Apply concrete finishing technique	4.1	Mix coating materials to ratio according to manufacturers' specifications.
		4.2	Apply coatings using the appropriate <b>application technique</b> , according to work instructions and manufacturers' specifications.
		4.3	Finish the coating to achieve a consistent appearance with surrounding surface and apply protection measures for finishes, where appropriate.
		4.4	Apply <b>textured surface finishing technique</b> , according to manufacturers' specifications and workplace quality standards, where appropriate.
		4.5	Obtain supervisor inspection of finished patch, where appropriate, to comply with project fire rating and structural integrity requirements.
5.	Clean work area	5.1	Contain, label and store powdered material for reuse, or disposed of powdered material, in accordance with environmental requirements, legislation, such as regulations/codes of practice and workplace procedures.
		5.2	Clean tools and equipment, checked for serviceability and store, in accordance with manufacturers' recommendations and standard workplace procedures.
		5.3	Clean and tidy work area to ensure space is free of powdered substances that may cause potential contamination to self and others, in accordance with OHS /WHS regulations.
		5.4	Remove and dispose of PPE, according to OHS/WHS regulations.

## REQUIRED SKILLS AND KNOWLEDGE

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

### Required skills:

- planning and organising skills to:
  - identify and obtain materials, tools and equipment required for surface finishing
  - complete work tasks in a logical and efficient sequence
- self management skills to work safely by applying appropriate:
  - PPE and manual handling techniques
  - methods for the suppression of powdered substances
- literacy skills to:
  - read and interpret:
    - product information and MSDS
    - job specifications and instructions
  - apply OHS/WHS, safe work method statement (SWMS) and other relevant workplace procedures
- numeracy skills to make measurements and calculations for material requirements
- learning skills to modify work processes to suit changing circumstances
- initiative skills to:
  - identify environmental factors that impact work processes
  - act on faults with tools, materials and processes
  - refer fire rating issues outside area of responsibility to appropriate personnel
  - work sustainably
- problem solving skills to:
  - determine appropriate preparation applications
  - assess quality of finished surface to meet regulations and fire rating standards
- teamwork skills to:
  - promote a safe working environment
  - participate and engage in group discussion (tool box meetings)
- writing skills to complete workplace documentation
- technology skills to:
  - use and maintain tools safely
  - apply tool techniques effectively
  - access the internet for standards checklists
  - make emergency calls
- oral communication skills to:
  - use appropriate surface finishing terminology
  - question and confirm task requirements
  - report incidents and faults.

**Required knowledge:**

- terminology used for surface finishing
- specifications used for surface finishing
- types of concrete precast components
- fire rating requirements relevant to concrete precast component repairs
- location of workplace documents and their purpose
- workplace procedures related to communication protocols
- relevant OHS/WHS regulations, policies and codes of practice e.g. drop zones, hazardous substances, PPE, manual handling techniques
- relevant Australian Standards in relation to surface finishing
- principles of risk management (hierarchy of controls)
- effects of removal of trench or temporary supports and associated risk of structural collapse
- principles of sustainability relevant to material reuse
- basic work planning
- concrete surface finishing tool types, purpose and functions
- types, characteristics and purposes of surface finishing materials, including powdered substances
- types of concrete surface imperfections and their causes, including blowholes, crazing, dusting, flaking, honeycombing and pop outs
- effects of unsafe use of powdered substances used for surface finishing
- characteristics of surface finishing materials and their effect on, and appropriateness of use with, priming agents
- processes for calculating material measurements and quantities
- storage and labelling of materials.

**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.*

**Specifications** may include:

- manufacturers' specifications and instructions
- MSDS
- regulatory and legislative requirements
- relevant Australian Standards and codes
- safe work method statement (SWMS)
- safe work procedures
- work schedules, specifications and requirements.

<b>Finishing coat</b> may include:	<ul style="list-style-type: none"> <li>• trowelled on finishes (render and texture)</li> <li>• cement setting</li> <li>• sand finish and stucco (rough)</li> <li>• rolled on finishes</li> <li>• brush on finishes</li> <li>• colour matched concrete</li> <li>• acid etching.</li> </ul>
<b>Relevant codes and standards</b> may include:	<ul style="list-style-type: none"> <li>• mortar and grout (AS 3600 or equivalent).</li> </ul>
<b>Materials</b> may include:	<ul style="list-style-type: none"> <li>• cement</li> <li>• bonding agents</li> <li>• pre-mixed compounds e.g. epoxy mortar</li> <li>• pigment / dye</li> <li>• chemical stains</li> <li>• fine aggregate</li> <li>• coarse aggregate</li> <li>• stains.</li> </ul>
<b>Particular safety requirements</b> may include:	<ul style="list-style-type: none"> <li>• dust suppression</li> <li>• setting up a drop zone</li> <li>• OHS/WHS legislation</li> <li>• safety regulations and codes of practice, e.g. dangerous goods (storage and handling) regulations, hazardous substances code of practice, manual handling.</li> </ul>
<b>Environmental factors</b> may include:	<ul style="list-style-type: none"> <li>• wind</li> <li>• rain</li> <li>• air conditioning</li> <li>• draughty airway.</li> </ul>
<b>Location of patch</b> may include:	<ul style="list-style-type: none"> <li>• flat/horizontal surfaces (zero gravity)</li> <li>• wall/vertical surfaces</li> <li>• ceiling surfaces</li> <li>• corner surfaces.</li> </ul>



<p><b>Personal protective equipment (PPE)</b> may include:</p>	<ul style="list-style-type: none"> <li>• disposable dust mask</li> <li>• safety glasses</li> <li>• water proof gloves</li> <li>• ear muffs</li> <li>• work wear.</li> </ul>
<p><b>Tools and equipment</b> may include:</p>	<ul style="list-style-type: none"> <li>• buckets</li> <li>• mixing tray</li> <li>• steel float</li> <li>• trowel</li> <li>• putty knife</li> <li>• spatula</li> <li>• brush</li> <li>• levels (spirit, automatic, laser)</li> <li>• power mixers</li> <li>• screed boards</li> <li>• straight edges</li> <li>• compactor</li> <li>• scissors</li> <li>• hammer</li> <li>• stirring sticks</li> <li>• stiff bristle brush</li> <li>• cloth</li> <li>• carborundum stone</li> <li>• angle grinder</li> <li>• appropriate grinding pad</li> <li>• acid</li> <li>• bleach</li> <li>• sponge.</li> </ul>
<p><b>Priming requirements</b> may include:</p>	<ul style="list-style-type: none"> <li>• clean dry surface.</li> </ul>
<p><b>Application technique</b> may include:</p>	<ul style="list-style-type: none"> <li>• brushing on</li> <li>• floating</li> <li>• rolling on</li> <li>• trowelling.</li> </ul>

<p><b>Textured surface finishing technique</b> may include:</p>	<ul style="list-style-type: none"> <li>• polished precast</li> <li>• brush-on finishes</li> <li>• acid etched</li> <li>• sandblasted precast</li> <li>• coloured precast</li> <li>• water wash concrete</li> <li>• specific render and texture.</li> </ul>
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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.*

<p><b>Overview of assessment</b></p>	<p>This unit could be assessed in the workplace or a simulated environment, provided that simulated or project-based assessment techniques replicate building and construction conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended.</p>
<p><b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b></p>	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> <li>• access, read, interpret and apply information for concrete precast patch finishing operations</li> <li>• comply with appropriate workplace procedures and safety regulations related to tool and material handling, use, maintenance and storage</li> <li>• identify the effect of poor preparatory practices on finishing outcomes</li> <li>• clean, prime and finish a wet surface requiring: <ul style="list-style-type: none"> <li>– one colour matched concrete finish (from colour chart) to workplace quality standards</li> <li>– one tooled surface finish</li> </ul> </li> <li>• clean and prime a cured (dry) patch for the following subsequent surface finishes: <ul style="list-style-type: none"> <li>– one abrasive surface finish</li> <li>– one polished surface finish</li> <li>– one acid etched surface finish</li> </ul> </li> </ul> <p>to workplace quality standards.</p>

<p><b>Context of and specific resources for assessment</b></p>	<p>The application of competency is to be assessed in the workplace or realistically simulated workplace.</p> <p>Assessment is to occur under standard and authorised work practices, safety requirements and environmental constraints.</p> <p>Assessment is to comply with relevant regulatory or Australian Standards requirements.</p> <p>Resource implications for assessment include:</p> <ul style="list-style-type: none"> <li>• materials and equipment relevant to concrete precast finishing operations</li> <li>• documentation including job safety analysis (JSA), colour charts, industry standards, SWMS, Building Certification Systems (BCS)</li> <li>• realistic tasks or simulated tasks covering the mandatory task requirements.</li> </ul>
<p><b>Method of assessment</b></p>	<p>A range of assessment methods should be used to assess practical skills and knowledge.</p> <p>The following examples are appropriate for this unit:</p> <ul style="list-style-type: none"> <li>• direct observation of the candidate performing concrete precast finishing operations in a real workplace setting or simulated environment</li> <li>• written and oral questioning to test underpinning knowledge and its application to determining the finishing requirements of patching and repair operations</li> <li>• project activities that allow the candidate to demonstrate the application of skills and knowledge related to concrete precast surface finishing operations.</li> </ul>

<b>Unit code</b>	VU22668
<b>Unit title</b>	Caulk concrete precast elements
<b>Unit descriptor</b>	<p>This unit describes the performance outcomes, skills and knowledge required to caulk joints between concrete precast elements, according to specified requirements.</p> <p>No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.</p> <p>Completion of the general induction training program specified by the National Code of Practice for Induction Training for Construction Work (ASCC 2007) is required before entering a construction work site. Achievement of unit, <i>CPCCWHS1001 Prepare to work safely in the construction industry</i>, meets this requirement.</p>
<b>Employability Skills</b>	This unit contains Employability Skills.
<b>Application of the unit</b>	<p>This unit supports the attainment of the skills and knowledge required for construction workers to apply caulking techniques to vertical and horizontal joints between concrete precast elements for the preservation of building integrity. Caulking may involve the application of sealant to a clean joint, or the rectification of a previously sealed joint.</p> <p>The work context relates to high rise developments predominantly, within residential and commercial construction environments, however civil construction environments are equally applicable.</p> <p>It includes inspection of the surface joint to determine the type and scope of work, preparation of materials, tools and equipment, and performance of cleaning, caulking and finishing techniques to workplace standards.</p> <p>This unit applies to those working autonomously with limited supervision, sometimes as part of a small team. While work parameters are established, judgement is required to solve a variety of predictable and sometimes unpredictable problems. Responsibility for the quality of work outputs is expected.</p>

ELEMENT		PERFORMANCE CRITERIA	
<i>Elements describe the essential outcomes of a unit of competency.</i>		<i>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.</i>	
1.	Plan for caulking	1.1	Obtain job sheets/work instructions and identify <b>specifications</b> for caulking task.
		1.2	Determine applicable <b>occupational health and safety (OHS)/work health and safety (WHS) requirements</b> , in accordance with safe work method statement (SWMS), workplace policies and <b>relevant documents</b> .
		1.3	Determine <b>location of joint</b> and confirm relevant safety requirements with supervisor, including working aloft, fall protection, accessibility, and drop zones.
2.	Prepare to undertake caulking	2.1	Select and dress in appropriate <b>personal protective equipment (PPE)</b> ensuring all items are secure and intact, as per workplace safety regulations.
		2.2	Inspect joint between concrete precast elements and consider <b>rectification variables</b> to determine possible preparation methods to apply to achieve optimal adhesion, in accordance with manufacturers' requirements.
		2.3	Clarify and confirm rectification method with supervisor to ensure compliance with project/structure specification, fire rating requirements and applicable acoustic requirements.
		2.4	Identify <b>materials</b> and associated quantities/measurements required for caulking, according to job specification.
		2.5	Select and assemble materials, <b>tools and equipment</b> required for caulking tasks, according to job specification requirements.
3.	Prepare concrete precast joint for caulking	3.1	Remove any <b>existing fill</b> and clean joint between concrete precast elements, using an <b>appropriate method</b> , to ensure the surface area is free from laitance, dust and dirt.
		3.2	Review need for bond break tape and install backing rod using a blunt edged tool, into joint between concrete precast elements, according to industry standard ratios, to control depth of injected caulking material.

ELEMENT		PERFORMANCE CRITERIA	
		3.3	Check backing rod installation to ensure material is firmly secured within the joint, free of punctures and air pockets and complies with fire rating standards and applicable acoustic requirements.
		3.4	Apply priming agent, if required, to both edges/sides of backing rod and concrete precast elements for optimal adhesion, as per manufacturers' specification.
		3.5	Review sequence of planned caulking task to facilitate uninterrupted and timely application, ensuring all tools, equipment and materials are ready for use and joint is accessible and free from obstructions.
4.	Apply caulking and finishing technique to concrete precast element joint	4.1	Apply sealant in a constant motion using steady pressure, filling the required void, to achieve a uniform appearance, according to work instructions and manufacturers' specifications.
		4.2	Back tool the sealant immediately after caulking, using appropriate caulking tool, according to workplace quality standards to achieve a smooth and uniform finish, ensuring both sides of the joint are flush with sealant chamfer end.
5.	Clean work area	5.1	Contain, label and store materials for reuse, or dispose of, in accordance with environmental requirements, legislation, such as regulations/codes of practice and workplace procedures.
		5.2	Clean tools and equipment, checked for serviceability and store, in accordance with manufacturers' recommendations and standard workplace procedures.
		5.3	Clean and tidy work area, in accordance with OHS/WHS regulations.
		5.4	Remove and dispose of PPE, according to OHS/WHS regulations.
		5.5	Obtain supervisor inspection of rectification, where appropriate, for compliance approval with project fire rating, applicable acoustic requirements and structural integrity requirements.

## REQUIRED SKILLS AND KNOWLEDGE

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

### Required skills:

- planning and organising skills to:
  - identify and obtain materials, tools and equipment required for caulking
  - check optimum charge of caulking gun batteries before use
  - complete work tasks in a logical and efficient sequence
- self management skills to work safely by applying appropriate:
  - PPE and manual handling techniques
- literacy skills to:
  - read and interpret:
    - product information and MSDS
    - job specifications and instructions
  - apply OHS/WHS, SWMS and other relevant workplace procedures
- numeracy skills to make measurements and calculations for material requirements
- learning skills to modify work processes to suit changing circumstances
- initiative skills to:
  - identify product repair factors that impact work processes
  - act on faults with tools, materials and processes
  - refer fire rating and building integrity issues outside area of responsibility to appropriate personnel
  - work sustainably
- problem solving skills to:
  - determine appropriate preparation applications
  - assess quality of finished caulk surface to meet regulations and fire rating standards
- teamwork skills to:
  - promote a safe working environment
  - participate and engage in group discussion (toolbox meetings)
- writing skills to complete workplace documentation
- technology skills to:
  - use and maintain tools safely
  - apply tool techniques effectively
  - access the internet for standards checklists
  - make emergency calls
- oral communication skills to:
  - use appropriate caulking terminology
  - question and confirm task requirements.

**Required knowledge:**

- terminology used for caulking
- specifications used for joint caulking
- types of concrete precast elements
- fire rating requirements relevant to concrete precast element rectification
- location of workplace documents and their purpose
- workplace procedures related to communication protocols
- relevant OHS/WHS regulations, policies and codes of practice e.g. fall protection, drop zones, hazardous substances, PPE, manual handling techniques
- relevant Australian Standards and guidelines in relation to joint caulking of concrete precast elements
- principles of sustainability relevant to material reuse
- work planning and logical task sequencing
- caulking tool types, purpose and functions
- types, characteristics and purposes of caulking materials
- types of concrete surface variables that reduce optimal sealant adhesion, including concrete precast release agent residue, laitance, dirt and dust
- characteristics of caulking materials and their effect on, and appropriateness of use with, priming agents
- processes for calculating material measurements and quantities
- storage and labelling of materials.

**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.*

**Specifications** may include:

- manufacturers' specifications and instructions
- MSDS
- regulatory and legislative requirements
- relevant Australian Standards, codes and guidelines
- safe work procedures
- work schedules, specifications and requirements.



<p><b>Occupational health and safety (OHS)/work health and safety (WHS) requirements</b> may include:</p>	<ul style="list-style-type: none"> <li>• state or territory legislation and regulations</li> <li>• organisational safety policies and procedures</li> <li>• maintenance of structural supports and hazard identification related to structural collapse</li> <li>• fall protection equipment, including harnesses</li> <li>• fall protection barriers</li> <li>• drop zones</li> <li>• approved egress and access to/from work area</li> <li>• material safety management systems</li> <li>• hazardous and dangerous goods codes of practice</li> <li>• relevant health regulations</li> <li>• manual handling procedures</li> <li>• the use of personal protective equipment</li> <li>• organisation insurance requirements</li> <li>• electrical no-go zones and working around power lines.</li> </ul>
<p><b>Relevant documents</b> may include:</p>	<ul style="list-style-type: none"> <li>• MSDS</li> <li>• job instructions</li> <li>• National Construction Code (NCC) regulations</li> <li>• hazardous substances code of practice</li> <li>• drop zone permits.</li> </ul>
<p><b>Location of joint</b> may include:</p>	<ul style="list-style-type: none"> <li>• horizontal surface voids, including ceiling &amp; floor</li> <li>• vertical surface voids</li> <li>• external structural surfaces</li> <li>• internal structural surfaces, including lift shafts and stair wells</li> <li>• corners.</li> </ul>
<p><b>Personal protective equipment (PPE)</b> may include:</p>	<ul style="list-style-type: none"> <li>• fall protection equipment, including harnessing</li> <li>• disposable dust mask</li> <li>• safety glasses</li> <li>• waterproof gloves</li> <li>• ear muffs</li> <li>• work wear.</li> </ul>

<p><b>Rectification variables</b> may include:</p>	<ul style="list-style-type: none"> <li>• existing silicon or caulking material</li> <li>• existing backing rod</li> <li>• laitance</li> <li>• concrete precast bonding agent residue</li> <li>• sealed concrete precast surface</li> <li>• painted concrete precast surface</li> <li>• moisture content of joint.</li> </ul>
<p><b>Materials</b> may include:</p>	<ul style="list-style-type: none"> <li>• pre-primed sealant e.g. silicon</li> <li>• non-primed sealant</li> <li>• primer/bonding agents/fixer</li> <li>• bond break tape</li> <li>• backing rod: <ul style="list-style-type: none"> <li>- fire resistant: <ul style="list-style-type: none"> <li>○ closed cell</li> <li>○ open cell</li> </ul> </li> </ul> </li> </ul>
<p><b>Tools and equipment</b> may include:</p>	<ul style="list-style-type: none"> <li>• wire brush</li> <li>• soft brush</li> <li>• scraper</li> <li>• air compressors and hoses</li> <li>• portable blower</li> <li>• sander/grinder</li> <li>• caulking “slicks”</li> <li>• spatula</li> <li>• roller</li> <li>• putty knife</li> <li>• caulking gun</li> <li>• power leads</li> <li>• testing equipment (moisture meter).</li> </ul>
<p><b>Existing fill</b> may include:</p>	<ul style="list-style-type: none"> <li>• sealant</li> <li>• backing rod.</li> </ul>
<p><b>Appropriate method</b> may include:</p>	<ul style="list-style-type: none"> <li>• light sanding</li> <li>• air pressure cleaning</li> <li>• brushing.</li> </ul>

<b>EVIDENCE GUIDE</b>	
<p><i>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.</i></p>	
<p><b>Overview of assessment</b></p>	<p>This unit of competency could be assessed in the workplace or a close simulated environment, provided that simulated or project-based assessment techniques replicate building and construction conditions, materials, activities, responsibilities and procedures. Holistic or project-based assessment with other related units is recommended.</p>
<p><b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b></p>	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> <li>• access, read, interpret and apply information for concrete precast caulking tasks</li> <li>• comply with appropriate workplace procedures and safety regulations related to work access and performance, tool and material handling, use, maintenance and storage</li> <li>• identify the effect of poor preparatory practices on project fire rating, applicable acoustic and structural integrity requirements</li> <li>• clean, prime, caulk and finish, to workplace quality standards, <b>two</b> concrete precast joints, one of which must be a rough surface, that include any combination of the following variables: <ul style="list-style-type: none"> <li>– an unfilled/void joint</li> <li>– removal of fill from an existing caulked joint</li> <li>– use of primed sealant</li> <li>– use of non-primed sealant</li> </ul> </li> </ul> <p>ensuring that all variables are addressed across the two assessments.</p>

<p><b>Context of and specific resources for assessment</b></p>	<p>The application of competency is to be assessed in the workplace or realistically simulated workplace.</p> <p>Assessment is to occur under standard and authorised work practices, safety requirements and environmental constraints.</p> <p>Assessment is to comply with relevant regulatory or Australian Standards requirements.</p> <p>Resource implications for assessment include:</p> <ul style="list-style-type: none"> <li>• materials and equipment relevant to concrete precast caulking tasks</li> <li>• documentation including job safety analysis (JSA), industry standards, SWMS, Building Certification Systems (BCS)</li> <li>• realistic tasks or simulated tasks covering the mandatory task requirements.</li> </ul>
<p><b>Method of assessment</b></p>	<p>A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:</p> <ul style="list-style-type: none"> <li>• direct observation of the candidate performing concrete precast caulking operations in a real workplace setting or simulated environment</li> <li>• written and oral questioning to test underpinning knowledge and its application to determining the preparation, application and finishing requirements of caulking operations</li> <li>• project activities that allow the candidate to demonstrate the application of skills and knowledge related to concrete precast caulking tasks.</li> </ul>