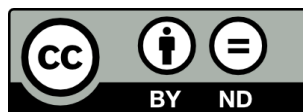


22304VIC
Certificate II in Plumbing
(Pre-apprenticeship)

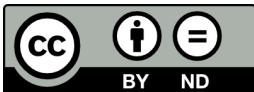
Version 1.1



This course has been accredited under Parts 4.4 and 4.6 of the Education and Training Reform Act 2006.

Accredited by	Victorian Registration and Qualifications Authority
From	1 January 2016
To	31 December 2020
Course Code	<i>22304VIC</i>

Version 1.1 Rectified nominal hours for HLTAID002 Provide basic emergency life support and nominal duration of course



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Section A – Copyright and course classification information

1. Copyright owner of the course	Department of Education and Training
2. Address	<p>Executive Director Training Participation and Facilitation Division Department of Education and Training GPO Box 4367 Melbourne VIC 3001</p> <p>Day to Day Contact: Curriculum Maintenance Manager, Building and Construction Holmesglen Institute Phone: (03) 9564 1987 Email: teresa.signorello@holmesglen.edu.au</p>
3. Type of submission	<p>Reaccreditation.</p> <p>The 22304VIC Certificate II in Plumbing (Pre-apprenticeship) replaces and is equivalent to 22138VIC Certificate II in Plumbing (Pre-apprenticeship).</p>
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5. Licensing and franchise	Copyright of this material is reserved to the Crown in the right of the State of Victoria.

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<p>6. Course accrediting body</p>	<p>Victorian Registration and Qualifications Authority</p>	
<p>7. AVETMISS information</p>	<p>ANZSCO code</p>	<p>334111 Plumber (General)</p>
	<p>ASCED code – 4 digit</p>	<p>0403 Building</p>
	<p>National course code</p>	<p>22304VIC</p>
<p>8. Period of accreditation</p>	<p>1 January 2016 – 31 December 2020</p>	

Section B – Course information

1. Nomenclature – Standard 1 AQTF Standards for Accredited Courses	
1.1 Name of the qualification	Certificate II in Plumbing (Pre-apprenticeship).
1.2 Nominal duration of the course	492 nominal hours.
2. Vocational or educational outcomes – Standard 1 AQTF Standards for Accredited Courses	
2.1 Purpose of the course	<p>The Certificate II in Plumbing (Pre-apprenticeship) will prepare graduates with the skills and knowledge for entry into an apprenticeship (Certificate III in Plumbing) in one of the various sectors of the plumbing industry.</p> <p>This qualification has a range of units that introduce the learner to basic plumbing skills and knowledge including:</p> <ul style="list-style-type: none"> • working safely as part of a team • measuring and calculating • using basic industry terminology to communicate effectively • reading plans and specifications • selecting and using plumbing tools, equipment and materials • producing simple technical drawings • using basic welding equipment • using plumbing pipes, fittings and fixtures to simulate plumbing installations. <p>This qualification is not linked to any occupational regulatory outcome.</p>
3. Development of the course – Standards 1 and 2 AQTF Standards for Accredited Courses	
3.1 Industry / enterprise/ community needs	<p>Background information</p> <p>The plumbing industry in Australia is a highly regulated sector of the building and construction industry. It consists mainly of small business operators and contractors. Industry revenue is forecast to trend upwards by an annualised 2.0% over the five years to 2019 (Construction and Property Services Industry Skills Council <i>Environmental Scan 2014–15</i>).</p> <p>The plumbing industry has had a long association with, and has offered considerable support for, pre-apprenticeship training. Whilst it is not the only pathway to employment, stakeholders encourage new entrants to have a range of basic skills that promote safety and an understanding of how the industry works before commencing a full-time apprenticeship. Previous course reaccreditation processes have attracted significant interest from the major stakeholders including the Master Plumbers Association, Plumbing Trades Employees Union, Air-</p>

Conditioning and Mechanical Contractors Association, Victorian Building Authority and directly from employers.

Both the industry and the community value a safe, clean water supply, quality sanitation facilities and dry and comfortable shelter and this is reflected by the fact that plumbing is a highly regulated industry that is also a registered and licensed occupation.

Confirmation of industry and community support for the course

Providing training prior to commencing full-time employment offers a range of efficiencies to the wider community. The student cohort is predominately young people who benefit greatly from the additional support and pastoral care of full-time study in an adult learning environment. Whilst technical skills are a vital component of the course, support when making a career choice and becoming work-ready (including understanding the expectations of plumbing employers) benefits students and improves their attitude to lifelong learning. It also develops their understanding of how they can contribute to the community,

The support by business for the plumbing pre-apprenticeship is reflected in the number of students who obtain an apprenticeship on graduation. Whilst this depends on the delivery model chosen by the training provider, there is a close correlation between the traditional 12–16 week full-time course delivery and employment. It is hoped sound data on this topic will be available with the implementation of the Unique Student Identifier.

The course provides employers with job ready applicants who have basic plumbing skills and knowledge—including an understanding of site safety, plumbing terminology, materials, tools and following instructions—that can be built on and developed in the workplace.

Employers advise that graduates of the course are more attractive as potential apprentices. This is important advice for plumbing apprentice seekers; at the time of writing for example, research from seek.com.au shows 40 positions currently available for an apprentice plumber in Victoria. The work exists for individuals who give themselves the best career start opportunities and undertaking this course is a solid beginning.

Many RTOs have relationships with equipment providers and strive to provide the use of up-to-date technology and processes

Target group for the course

This course is designed specifically for those from a range of age groups and backgrounds interested in obtaining employment as a plumbing apprentice.

Successful course graduates would continue the CPC32413 Certificate III in Plumbing. This allows for employment as a plumbing apprentice in the domestic or commercial/industrial sectors.

Ongoing demand for the course

The Victorian Skills Gateway states that a Plumber (General) is a specialist occupation-in-demand. Plumbing is described as a skills shortage area with more skilled workers needed now. There are currently 24,500 plumbers in Victoria and while these numbers are

expected to remain stable over the next five years employment prospects will continue to be strong (<http://www.education.vic.gov.au/> viewed 21 May 2015).

The table below shows the available data of enrolments in the Certificate II in Plumbing (Pre-apprenticeship). Completion rates are unavailable.

Year	Government subsidised	Fee for Service
2013	699	752
2014	679	1271

Demand for the Certificate II in Plumbing (Pre-apprenticeship) will continue to be strong for several further reasons.

The support for pre-apprenticeship training is evident by the acknowledgment of employers and plumbing organisations that it is an advantage for a job seeker to have a pre-apprenticeship. It is well understood by employers and potential new entrants to the industry as a valuable stepping-stone towards an apprenticeship.

As at May 2015, there were 18 training organisations registered to deliver the current course, with a new training provider entering the market in 2015.

Course consultation and validation process

Consultation involved:

- formation of a Steering Committee to oversee the course review process
- a review of student feedback surveys
- consultation with the Certificate II Plumbing Moderation and Validation Group
- interviews with teachers about their delivery of the course and its content
- interviews with key industry stakeholders
- a desktop review of current plumbing research
- a review of the skills and knowledge profile.

The role of the Steering Committee in this project was to confirm and validate the direction and outcomes of the course review. The members also provided technical information and training advice.

The Steering Committee included members from the representative employer associations, employers (large and small), the union, the regulatory body and training providers. The group met on three occasions and also contributed significantly to the development of the new units and course structure.

Skills and knowledge outcomes

As part of identifying current skills and knowledge, the consultation process involved revising the skills and knowledge profile. The outcomes of this are included as Appendix 1.

3.2 Review for reaccrreditation

This application is being made for a reaccrreditation of behalf of the Department of Education and Training.

The current course 22138VIC Certificate II in Plumbing (Pre-apprenticeship) is due to expire on 31 December 2015, with the previous course, 21642VIC originally accredited in July 2005 to 30 June 2011.

Members of the steering committee included:

- Kyle Paten (A G Coombs Pty Ltd (Projects)) Chair
- Matthew Gipp (Cooke and Dowsett Pty Ltd)
- Glenn Graham (Chisholm Institute)
- Peter Hall (P & J Hall Plumbing Pty Ltd)
- Alexandra Mannell (Master Plumbers and Mechanical Services Association of Australia)
- Ross Marshallsea (Victorian Building Authority)
- Russell Menzies (Plumbing Trades Employees Union)
- Noel Roney (Swinburne University)
- Teresa Signorello (Curriculum Maintenance Manager, Building and Construction)
- Laura Steedman (Air Conditioning and Mechanical Contractors' Association)

It was agreed by the steering committee members that the course content had satisfied the key requirements of a pre-apprentice and that only minor changes would be required to keep the course relevant to industry's needs. The existing units had been written to allow flexibility for advancements in technology and changes to legislation to be easily adapted by RTOs. However, some small amendments were required to better reflect the nature of an AQF Level 2 graduate and the intent of the industry. There were also editorial improvements to ensure consistency in the language and structure of the accredited units.

The nominal hours of the new course remain unchanged.

Transition arrangements

A table mapping the existing course structure to the new course to indicate equivalence is on the next page.

Unit code and title from 22138VIC		Units from 22304VIC		Relationship
CPCPCM2002A	Carry out interactive workplace communication	CPCPCM2039A	Carry out interactive workplace communication	Not equivalent
BSBWRT301A	Write simple documents	BSBWRT301	Write simple documents	Equivalent
HLTFA201A	Provide basic emergency life support	HLTAID002	Provide basic emergency life support	Not equivalent
CPCCOHS1001A	Work safely in the construction industry	CPCCOHS1001A	Work safely in the construction industry	Equivalent
CPCCOHS2001A	Apply OHS requirements, policies and procedures in the construction industry	CPCCOHS2001A	Apply OHS requirements, policies and procedures in the construction industry	Equivalent
CPCCCM1002A	Work effectively and sustainably in the construction industry	VU21794	Prepare to work in the plumbing industry	Not equivalent (rewritten for an AQF Level 2 qualification)
CPCCCM1005A	Carry out measurements and calculations	CPCCCM1015A	Carry out measurements and calculations	Not equivalent
CPCCCM2006A	Apply basic levelling procedures	VU21795	Use and apply basic levelling equipment for plumbing	Not equivalent (rewritten to be in a plumbing context)
CPCCCM2001A	Read and interpret plans and specifications	CPCCCM2001A	Read and interpret plans and specifications	Equivalent
CUVCRS04B	Produce technical drawings	CUVACD303A	Produce technical drawings	Equivalent
VU20526	Use basic plumbing hand tools	VU21797	Use basic plumbing hand tools	Equivalent
VU20527	Use basic power tools	VU21798	Use basic power tools	Equivalent

Unit code and title from 22138VIC		Units from 22304VIC		Relationship
VU20528	Perform basic oxy-acetylene welding and cutting	VU21793	Perform basic oxy-acetylene welding and cutting	Equivalent
VU20529	Use basic electric welding equipment and techniques	VU21796	Use basic electric welding equipment and techniques	Equivalent
VU20530	Use plumbing pipes, fittings and fixtures to simulate plumbing installations	VU21799	Use plumbing pipes, fittings and fixtures to simulate plumbing installations	Equivalent
VU20531	Apply basic sheet metal practices	VU21789	Apply basic sheet metal practices	Equivalent
VU20532	Fabricate simple plumbing pipe systems	VU21791	Fabricate simple plumbing pipe systems	Equivalent
VU20533	Cut and penetrate building materials and structures	VU21790	Cut and penetrate building materials and structures	Equivalent
VU20534	Identify career pathways in the plumbing industry	VU21792	Identify career pathways in the plumbing industry	Equivalent

4. Course outcomes – Standards 1, 2, 3, 4 and 5 AQTF Standards for Accredited Courses

4.1 Qualification level

This qualification has been developed to enable participants to achieve the underpinning skills, knowledge and ability to meet AQF Level 2 requirements and to provide them with a solid foundation from which to undertake future apprenticeship training at the Certificate III level.

The outcomes of the 22304VIC Certificate II in Plumbing (Pre-apprenticeship) are consistent with the distinguishing features of the learning outcomes specified in the Australian Qualifications Framework in that they will enable students to:

- perform tasks where the choice between a limited range of options is required (e.g. pipe sizes and lengths)
- demonstrate skills and problem-solving techniques where the range of skills and solutions is clearly defined (e.g. select appropriate basic plumbing tools and equipment for use)
- demonstrate basic operational knowledge in a moderate range of areas particularly trade-specific skills (e.g. use power tools)
- collect, interpret and record information from varied sources (e.g. read and interpret plans and specifications)
- take limited responsibility for his or her own productivity in work and learning (e.g. the ability to complete tasks within a given time frame)
- develop methods and strategies to obtain employment in the plumbing sector.

On completion of the Certificate II in Plumbing (Pre-apprenticeship) participants will have the skills and knowledge to:

- define and relate plumbing industry terminology
- distinguish plumbing industry streams and opportunities
- identify the properties and characteristics of plumbing and building materials
- distinguish, select and use plumbing tools for their appropriate application
- plan, calculate and mark out basic plumbing tasks
- follow work instructions and select safe working procedures.

The **volume of learning** for this qualification is typically 0.5 to 1 year and incorporates a range of learning activities such as:

- structured activities to develop the technical skills of the course and the theoretical knowledge that underpins performance
- unstructured activities to reinforce and practice skills and collect and consider information about different employment areas and work opportunities.

<p>4.2 Employability skills</p>	<p>The employability skills to be achieved in this course are shown in Appendix 2.</p>
<p>4.3 Recognition given to the course (if applicable)</p>	<p>Participants who complete the unit CPCCOHS1001A Work safely in the construction industry may apply to Work Safe Victoria for a Construction Induction Card.</p>
<p>4.4 Licensing/ regulatory requirements (if applicable)</p>	<p>Participants who visit a construction site will require a Construction Induction Card (CIC) issued by Work Safe Victoria. Further information is available at www.worksafe.vic.gov.au.</p> <p>Plumbing work is defined by eight main classes and six specialised classes. A person must be registered or licensed with the Victorian Building Authority (VBA) to legally carry out any work within these classes.</p> <p>Most individuals apply to be registered or licensed with the VBA after they have completed a plumbing apprenticeship. This requires attainment of the Certificate III in Plumbing, plus a minimum of four years plumbing experience.</p> <p>Individuals who undertake this course will not have a registration or license outcome.</p> <p>There are no other licensing requirements for this course.</p>

5. Course rules – Standards 2, 6,7 and 9 AQTF Standards for Accredited Courses

5.1 Course structure

To be awarded the 22304VIC Certificate II in Plumbing (Pre-apprenticeship) all 19 units of competency must be achieved.

All units are *core* to provide a consistent outcome for graduates with basic skills that allows for employment across all streams of plumbing.

Where the full course is not completed a Statement of Attainment will be issued for any completed unit.

Unit of competency code	Field of Education code	Unit of competency title	Pre-requisite	Nominal hours
CPCCOHS1001A		Work safely in the construction industry		6
CPCCOHS2001A		Apply OHS requirements, policies and procedures in the construction industry		20
CPCCCM1015A		Carry out measurements and calculations		20
CPCPCM2039A		Carry out interactive workplace communication		10
CPCCCM2001A		Read and interpret plans and specifications		36
BSBWRT301		Write simple documents		30
CUVACD303A		Produce technical drawings		50
HLTAID002		Provide basic emergency life support		12
VU21789	040327	Apply basic sheet metal practices	CPCCOHS1001A	50
VU21790	040399	Cut and penetrate building materials and structures	CPCCOHS1001A	30
VU21791	040327	Fabricate simple plumbing pipe systems	CPCCOHS1001A	30
VU21792	120501	Identify career pathways in the plumbing industry		30
VU21793	040327	Perform basic oxy-acetylene welding and cutting	CPCCOHS1001A	20
VU21794	120599	Prepare to work in the plumbing industry		20
VU21795	040301	Use and apply basic levelling equipment for plumbing		8
VU21796	040327	Use basic electric welding equipment and techniques	CPCCOHS1001A	20
VU21797	040327	Use basic plumbing hand tools	CPCCOHS1001A	50
VU21798	040327	Use basic power tools	CPCCOHS1001A	20
VU21799	040327	Use plumbing pipes, fittings and fixtures to simulate plumbing installations	CPCCOHS1001A	30
Total maximum nominal hours				492

<p>5.2 Entry requirements</p>	<p><i>Standard 9 AQTF Standards for Accredited Courses</i></p> <p>It is recommended that the potential learners have basic communication, literacy and numeracy skills that are sufficiently well developed for them to participate in the training.</p>
<p>6. Assessment – Standards 10 and 12 AQTF Standards for Accredited Courses</p>	
<p>6.1 Assessment strategy</p>	<p>Standard 10 AQTF Standards for Accredited Courses</p> <p>All assessment will be consistent with the AQTF Essential Conditions and Standards for Initial / Continuing Registration Standards 1.2 / 1.5 or Standard 1: Clauses 1.1 and 1.8 of the Standards for Registered Training Organisations (SRTOs) 2015.</p> <p>See https://www.comlaw.gov.au/details/F2014L01377</p> <p>The nature of work undertaken in the plumbing industry is hands-on and practical. Assessment strategies should therefore reflect this.</p> <p>It is recommended that the assessment strategy for the Certificate II in Plumbing (Pre-apprenticeship) qualification includes:</p> <ul style="list-style-type: none"> • oral or written questioning related to underpinning knowledge • the practical demonstration of activities which combine a number of learning outcomes to provide depth and context to the pre-apprenticeship training • holistic assessment that reflects realistic job tasks. <p>Assessment must be consistent with the evidence guide statements within individual units.</p> <p>Assessment of imported nationally endorsed units of competency must be consistent with the assessment requirements of the relevant Training Package.</p> <p>Assessment may occur in a workplace, simulated workplace or classroom that has access to the appropriate resources as detailed in section 7.2.</p>
<p>6.2 Assessor competencies</p>	<p><i>Standard 12 AQTF Standards for Accredited Courses</i></p> <p>Assessor competencies for this course are consistent with the requirements of the AQTF Standards for Registration Standard 1.4 that require trainers and assessors to:</p> <ul style="list-style-type: none"> • have the training and assessment competencies determined by the National Skills Standards Council (NSSC) or its successors, • have the relevant vocational competencies at least to the level being delivered or assessed, and;

	<ul style="list-style-type: none"> continue to develop their vocational and training and assessment competencies to support continuous improvements in the delivery of RTO services. <p>See AQTF User guides to the Essential Conditions and Standards for Initial/Continuing Registration or Standard 1: Clauses 1.13, 1.14, 1.15, 1.16 and 1.17 of the Standards for Registered Training Organisations (SRTOs) 2015.</p>
7. Delivery – Standards 11 and 12 AQTF Standards for Accredited Courses	
7.1 Delivery modes	<p><i>Standard 11 AQTF Standards for Accredited Courses</i></p> <p>It is recommended that units CPCPCM2039A Carry out interactive workplace communication and CPCCOHS1001A Work safely in the construction industry are delivered at the commencement of the course to ensure safety and clear communication is followed throughout the course delivery.</p> <p>The Certificate II in Plumbing (Pre-apprenticeship) may be delivered using a combination of delivery modes including:</p> <ul style="list-style-type: none"> face-to-face, classroom-based delivery practical demonstration blended or flexible (e-learning) delivery delivery in a simulated workplace. <p>The units have been developed to support a variety of applications within the context of the suggested range of variables. This may involve the use of practical industry-based activities and/or projects to develop skills and knowledge. Therefore the delivery strategy is suited for the units to be delivered as stand-alone units or combined as a delivery strategy.</p> <p>It is recommended that the practical exercises take the form of realistic and holistic projects to provide the participants with a simulated real work experience under supervision.</p>
7.2 Resources	<p><i>Standard 12 AQTF Standards for Accredited Courses</i></p> <p>Resources include teachers/trainers who meet the Australian Quality Training Framework Essential Conditions and Standards for Initial / Continuing Registration Standard 1.4 or Standard 1: Clauses 1.13, 1.14, 1.15, 1.16 and 1.17 of the Standards for Registered Training Organisations (SRTOs) 2015.</p> <p>Personal protective equipment (PPE) is identified in each of the specific units. The use of these OHS resources and the safe use of tools and equipment are implicit in every unit within the pre-apprenticeship and must be incorporated with the introduction of any new task or activity.</p> <p>Delivery of the Certificate II in Plumbing (Pre-apprenticeship) requires:</p> <ul style="list-style-type: none"> basic plumbing tools classroom facilities

	<ul style="list-style-type: none"> • workshop facilities including welding • a simulated workplace environment • basic materials to complete practical plumbing projects • a computer or mobile device with internet access • relevant plumbing documentation and legislation. <p>Refer to the individual units for specific tools and equipment required for assessment.</p>
<p>8. Pathways and articulation</p>	<p><i>Standard 8 AQTF Standards for Accredited Courses</i></p> <p>As the course contains a number of units from nationally endorsed Training Packages, credit transfer is available in relation to any qualifications or courses that include these units.</p>
<p>9. Ongoing monitoring and evaluation</p>	<p><i>Standard 13 AQTF Standards for Accredited Courses</i></p> <p>The Curriculum Maintenance Manager (CMM) for Building and Construction is responsible for the ongoing monitoring and evaluation of the Certificate II in Plumbing (Pre-apprenticeship).</p> <p>A formal course evaluation by the CMM will normally be undertaken halfway through the accreditation period and will be based on student and teacher evaluation surveys and industry stakeholder’s surveys/consultation. These stakeholders may include the Victorian Building Authority, Master Plumbers and Mechanical Services Association of Australia, the Plumbing Trades Employees Union, the Air Conditioning and Mechanical Contractors Association and businesses employing plumbing apprentices.</p> <p>Should a Training Package be endorsed that contains a qualification equal to the Certificate II in Plumbing (Pre-apprenticeship) and is acceptable to the industry, then the Training Package qualification will supersede this qualification.</p> <p>The Victorian Registration and Qualifications Authority (VRQA) will be formally notified of any modifications to the course documentation following the required processes.</p>

Appendix 1 – Skills and knowledge profile

Skills and knowledge required	Relevant unit of competency
<p>The student must use and apply basic levelling procedures to accurately set out plumbing components.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Identify, assess, select and check suitable tools, equipment and materials and report any faults • Obtain and interpret work instructions to prepare for basic levelling activities. • Set up, test and use levelling devices, confirm the accuracy of the readings and document the results • Clean, check and store the levelling equipment after using it <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen), non-verbally (such as with hand signals) and in writing (read / write) • Do calculations • Solve problems • Plan and organise the work • Use technology <p>Knowledge</p> <ul style="list-style-type: none"> • The names, purposes and functions of levelling devices relevant to plumbing (and the correct terms to use) • Workplace requirements and procedures (including for safety, environment, interpreting engineering drawings and sketches, setting out, reporting and quality) • Use and understanding of gradients and levelling procedures 	Basic levelling

Skills and knowledge required	Relevant unit of competency
<p>The student must mark out, clean, cut, join, bend and fold sheet metal and sheet metal products for a range of simple plumbing-related tasks.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Discuss job plans and specifications to determine the work sequence, fabrication techniques and materials and quantities required • Check tools and equipment and report any faults • Select and fit personal protection equipment • Mark out, clean, cut, join, bend and fold sheet metal and sheet metal products • Clean, check and store tools and equipment used • Clean up the work area and dispose of waste <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read / write) • Solve problems • Plan and organise the work • Work as one of a team <p>Knowledge</p> <ul style="list-style-type: none"> • How sheet metal practices are used in the plumbing industry • The properties and characteristics of sheet metal (and the correct terms to use) • Workplace requirements and procedures (including for safety, reporting and quality assurance) about basic sheet metal practices • PPE needed for basic sheet metal practices • Sustainability issues relating to basic sheet metal practices (such as minimising and recycling waste) 	<p>Apply basic sheet metal practices</p>

Skills and knowledge required	Relevant unit of competency
<p>The student must work in a way that ensures the safety of themselves and others (including the public) on a construction site or off-site construction industry workplace.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Identify, assess and report; hazards and safety risks, materials containing asbestos • Follow safe work practices and instructions, and duty-of-care requirements • Contribute to OHS, hazard, accident and incident reports • Identify, secure and identify (and handle and use, if appropriate) hazardous materials • Control risks and construction hazards effectively and immediately. • Select and fit personal protection equipment • Identify, assess, select and check suitable tools, equipment and materials and report any faults • Select and erect and comply with barricades and signs • Don't use prohibited tools and equipment in areas identified as with asbestos • Keep work area tidy to prevent incidents • Provide first aid for minor injuries • Evacuate a site as a response to a simulated emergency • Select and use firefighting equipment to extinguish a simulated mechanical fire <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read / write) • Plan and organise the work • Use technology • Work as one of a team <p>Knowledge</p> <ul style="list-style-type: none"> • Relevant legislation, regulations, standards, codes of practice and industry standards/guidance notes • Construction industry terminology • The OHS hierarchy of controls • OHS responsibilities and rights of people they work with, or who are responsible for their OHS (including OHS committees and representatives) • Workplace requirements and procedures (including for OHS, reporting and quality assurance) 	<p>Apply OHS requirements, policies and procedures in the construction industry</p>

Skills and knowledge required	Relevant unit of competency
<p>The student must communicate clearly, accurately and in line with workplace norms using spoken, visual and written methods.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Give and clarify spoken instructions, and communicate effectively by speaking • Communicate effectively visually (such as through gestures and signs) with others • Locate documents (such as safety information, work instructions, equipment and tools instructions, signs and information bulletins) and read, understand and apply the information in them • Write data and information in a range of workplace documents, including in the student's personnel records <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read /write) • Use initiative • Use technology • Work as one of a team <p>Knowledge</p> <ul style="list-style-type: none"> • Industry terminology • Job safety analyses and safe work method statements • Workplace requirements, procedures and documents (including for conveying instructions, recording and reporting, visual signals and signs) • Sustainability issues relating to communication 	<p>Carry out interactive workplace communication</p>
<p>The student must carry out measurements and perform simple calculations to determine task and material requirements for a construction job</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Confirm work instructions • Identify and select suitable measuring and calculating equipment • Obtain and record measurements • Calculate and record quantities of materials, dimensions, volumes, ratios and percentages • Use calculations to estimate approximate quantities within acceptable margins <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read / write) • Do calculations • Solve problems • Plan and organise work activities • Use technology • Work as one of a team <p>Knowledge</p> <ul style="list-style-type: none"> • Industry terminology • Workplace requirements and procedures (including for safety, reporting and quality) 	<p>Carry out measurements and calculations</p>

Skills and knowledge required	Relevant unit of competency
<p>The student must cut and penetrate—safely, effectively and efficiently—a range of building materials and structures as part of simple, plumbing-related tasks.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Discuss building structures, the types and properties of building materials, job plans and specifications to determine the tools and equipment to use and the work sequence • Select and check tools and equipment and report any faults • Select and fit personal protection equipment • Check mark outs • Securely position materials, then cut and penetrate building materials and structures • Clean, check and store tools and equipment used • Clean up the work area and dispose of waste <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read / write) • Solve problems • Plan and organise the work • Use technology • Work as one of a team <p>Knowledge</p> <ul style="list-style-type: none"> • The properties and characteristics of building structures and materials (and the correct terminology to use, including for cutting and penetrating techniques) • Workplace requirements and procedures (including for safety and quality assurance) • PPE needed for work tasks • Relevant Australian standards, building codes and plumbing regulations • Relevant sustainability issues (such as minimising and recycling waste) <p>Note: the student must not use grinders with more than 150 mm disc capacity.</p>	<p>Cut and penetrate building materials and structures</p>

Skills and knowledge required	Relevant unit of competency
<p>The student must fabricate, assemble and test drainage, water and gas tubes and pipes for a range of simple plumbing-related tasks.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Discuss job plans and specifications to determine the work sequence • Select tools and equipment • Select and fit personal protection equipment • Fabricate, assemble and test tubes and pipes • Clean, check and store tools and equipment used • Clean up the work area and dispose of waste <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read / write) • Solve problems • Plan and organise the work • Work as one of a team <p>Knowledge</p> <ul style="list-style-type: none"> • How basic tube and pipe systems are used in the plumbing industry • The properties and characteristics of tubes and pipes (and the correct terms to use for fabricating and fabricating them) • Workplace requirements and procedures (including for safety, quality assurance and Australian standards requirements) about fabricating simple plumbing pipe systems • PPE needed for basic sheet metal practices • Sustainability issues relating to basic sheet metal practices (such as minimising and recycling waste) 	<p>Fabricate simple plumbing pipe systems</p>

Skills and knowledge required	Relevant unit of competency
<p>The student must identify employment opportunities in the plumbing industry, and implement the main methods of applying for a job.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Find and organise information about key events in the plumbing industry, to understand and be able to explain past, present and emerging trends in the industry • Identify the plumbing industry's streams and sectors, and the types of employment opportunities in them • Identify the main job roles and responsibilities in the plumbing industry • Identify sources of information about employment opportunities in the plumbing industry • Take actions to prepare to apply, and to apply, for work <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read / write) • Work as one of a team • Use technology to search for, save and organise information) • Plan and organise tasks • Self-manage and learn • Use initiative and enterprise <p>Knowledge</p> <ul style="list-style-type: none"> • Key events in the plumbing industry • Streams and sectors in the plumbing industry • Job roles and responsibilities • Workplace requirements and procedures for safety 	<p>Identify career pathways in the plumbing industry</p>

Skills and knowledge required	Relevant unit of competency
<p>The student must use oxy-acetylene equipment and techniques—safely, effectively and efficiently—for welding and cutting tasks related to simple plumbing jobs.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Interpret job specifications to identify, assess and select suitable oxy-acetylene equipment and techniques for the tasks • Check the oxy-acetylene equipment and report any faults • Select and fit personal protection equipment • Select and securely position materials • Commission and regulate the oxy-acetylene equipment, and use it safely to make welds and cuts • Switch off, protect, clean, check and store the oxy-acetylene equipment after using it • Clean up the work area and dispose of waste <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read /write) • Solve problems • Plan and organise to use the hand tools • Work as one of a team <p>Knowledge</p> <ul style="list-style-type: none"> • The names, purposes and functions of oxy-acetylene equipment (and the correct terms to use) • Workplace requirements and procedures (including for safety, reporting and quality assurance) about using oxy-acetylene equipment • Hazards specific to the equipment, and how to mitigate them • PPE required for each tool, and how to use it • Sustainability issues relating to the preparation and use of the oxy-acetylene equipment (such as minimising and recycling waste) 	<p>Perform basic oxy-acetylene welding and cutting</p>
<p>The student must produce technical drawings.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Identify the purpose of, and requirements for, technical drawings • Prepare technical drawing equipment and materials • Draft technical drawings, review them with relevant people, and amend them if required • Finalise and submit technical drawings <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read /write) • Do calculations and measurements • Plan and organise the work • Solve problems • Use technology <p>Knowledge</p> <ul style="list-style-type: none"> • The names, purposes and functions of materials, tools and equipment used for technical drawing • Technical drawing practice, history and theory • Intellectual property issues and legislation relating to technical drawing 	<p>Produce technical drawings</p>

Skills and knowledge required	Relevant unit of competency
<p>The student must recognise and respond to life-threatening emergencies.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Recognise and assess an emergency situation, and immediate hazards • Assess the casualty, recognise the need for first aid and seek emergency response services help • Perform cardiopulmonary resuscitation (CPR) • Provide first aid • Communicate details of the incident to emergency response services and the supervisor • Maintain confidentiality of information <p>Knowledge</p> <ul style="list-style-type: none"> • Basic anatomy and physiology relating to basic emergency life support • Australian Resuscitation Council (ARC) guidelines • State / territory regulations, first aid codes of practice and workplace requirements and procedures 	<p>Provide basic emergency life support</p>
<p>The student must read and interpret plans and specifications relevant to plumbing tasks.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Identify types of drawings and their key features and functions • Recognise and verify any amendments to drawings and specifications • Recognise commonly used construction symbols and abbreviations, using the legend • Locate and identify key features on a site plan, at a site • identify project dimensions and construction types, nominated locations, environmental controls and tolerances for ancillary works • Identify job specifications and, from them, standards of work, finishes, tolerances and material attributes <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen), non-verbally (such as with hand signals) and in writing (read / write) • Do calculations • Plan and organise the work • Use technology <p>Knowledge</p> <ul style="list-style-type: none"> • Construction terminology 	<p>Read and interpret plans and specifications</p>

Skills and knowledge required	Relevant unit of competency
<p>Technical skills</p> <ul style="list-style-type: none"> • Interpret job specifications to identify, assess and select suitable electric welding equipment and techniques • Select and securely position materials • Commission and regulate the electric welding equipment, and use it safely to weld • Switch off, protect, clean, check and store the electric welding equipment after using it • Clean up the work area and dispose of waste <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read / write) • Solve problems • Plan and organise to use the hand tools • Work as one of a team <p>Knowledge</p> <ul style="list-style-type: none"> • The names, purposes and functions of electric welding equipment and techniques (and the correct terms to use) • The properties and characteristics of materials to be welded • Workplace requirements and procedures (including for safety, reporting and quality assurance) about using electric welding equipment, and relevant Australian standards • Hazards specific to the electric welding equipment, and how to mitigate them • Sustainability issues relating to the preparation and use of the electric welding equipment (such as minimising and recycling waste) <p>Note: the student must not use angle or side grinders with a disc capability greater than 150 mm in diameter</p>	<p>Use basic electric welding equipment and techniques</p>

Skills and knowledge required	Relevant unit of competency
<p>The student must use basic plumbing hand tools—safely, effectively and efficiently—for a range of simple plumbing tasks.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Identify, assess and select suitable hand tools for the plumbing tasks • Check the hand tools and report any faults • Select and fit personal protection equipment • Use the hand tools safely • Clean, check and store the hand tools after using them • Clean up the work area and dispose of waste <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read / write) • Solve problems • Plan and organise to use the hand tools • Work as one of a team <p>Knowledge</p> <ul style="list-style-type: none"> • The names, purposes and functions of hand tools (and the correct terms to use) • Workplace requirements and procedures (including for safety, reporting and quality assurance) about using hand tools • Hazards specific to each tool and how to mitigate them • PPE required for each tool, and how to use it • Sustainability issues relating to the preparation and use of the tools 	<p>Use basic plumbing hand tools</p>

Skills and knowledge required	Relevant unit of competency
<p>The student must use basic plumbing power tools—safely, effectively and efficiently—for a range of simple plumbing tasks.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Identify, assess and select suitable power tools for the plumbing tasks • Check the power tools and report any faults • Select and fit personal protection equipment • Select and securely position materials • Use the power tools safely • Switch off, protect, clean, check and store the power tools after using them • Clean up the work area and dispose of waste <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read / write) • Solve problems • Plan and organise to use the hand tools • Work as one of a team <p>Knowledge</p> <ul style="list-style-type: none"> • The names, purposes and functions of hand tools (and the correct terms to use) • Types and sources of power • Workplace procedures, including reporting, about using hand tools • Hazards specific to each tool and how to mitigate them • PPE required for each tool, and how to use it • Sustainability issues relating to the preparation and use of the tools <p>Note: power tools now <u>include</u> angle or side grinders, electric saws, rolled grooving tools, electric PVC welding tools, hydraulic tools, digital or electronic tools, specialist plumbing cutting tools and specialist plumbing crimping tools.</p>	<p>Use basic power tools</p>

Skills and knowledge required	Relevant unit of competency
<p>The student must select, fit and secure plumbing pipes, fittings and fixtures associated with basic plumbing tasks.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Discuss job plans and specifications to identify, select and prepare pipes, fittings and fixtures suitable for simple plumbing tasks • Fix and secure the pipes, fittings and fixtures in the correct sequence • Clean, check and store tools and equipment used • Clean up the work area and dispose of waste <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read / write) • Solve problems • Plan and organise the work • Work as one of a team <p>Knowledge</p> <ul style="list-style-type: none"> • The names, properties and characteristics of pipes, fittings and fixtures (and the correct terms to use) • Workplace requirements and procedures (including for safety, reporting and quality assurance) about using pipes, fittings and fixtures • Relevant Australian standards and environment protection legislation • Sustainability issues relating to the use of pipes, fittings and fixtures (such as minimising and recycling waste) 	<p>Use plumbing pipes, fittings and fixtures to simulate plumbing installations</p>

Skills and knowledge required	Relevant unit of competency
<p>The student must understand the industry and the jobs it offers, understand and accept their responsibilities, plan and carry out their work (individually and in a team) and identify their learning needs.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Identify the industry structure, occupations in the building industry and work roles • Determine registration and licensing requirements of plumbers • On-site meeting procedures <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) and in writing (read / write) • Plan and organise tasks • Use technology to locate information on the internet • Work cooperatively as one of a team • Understand an individuals contribution to the teams goals <p>Knowledge</p> <ul style="list-style-type: none"> • Relevant legislation, regulations, standards, codes of practice and industry standards /guidance notes • Key stakeholders in the plumbing industry • Plumbing industry terminology • Workplace requirements and procedures (including for OHS, environmental and job tasks) 	<p>Prepare to work in the plumbing industry</p>

Skills and knowledge required	Relevant unit of competency
<p>The student must know OHS legislative requirements and basic ways to manage risk and prevent injury and illness in the construction industry.</p> <p>Technical skills</p> <p>Identify, explain and discuss:</p> <ul style="list-style-type: none"> ○ their duty of care, safe work practices and other OHS responsibilities ○ basic risk management principles ○ common construction hazards and ways of controlling them ○ how OHS information is communicated and documented ○ who does what in the workplace, in terms of OHS ○ the use and meaning of safety signs and symbols ○ how, and to whom, to report hazards, incidents and injuries ○ how to respond to incidents and emergencies ○ how to access first aid ○ fire safety equipment ○ how to select and use relevant personal protective equipment. <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively verbally (speak / listen) <p>Knowledge</p> <ul style="list-style-type: none"> • Relevant legislation, regulations, standards, codes of practice and industry standards/guidance notes • the OHS hierarchy of controls • workers' compensation and injury management requirements • OHS responsibilities and rights of people they work with, or who are responsible for their OHS (including OHS committees and representatives) • Workplace requirements and procedures (including for responding to hazards, incidents and injuries, evacuation and reporting) 	<p>Work safely in the construction industry</p>
<p>The student must plan, draft, review and finalise a range of documents to accurately convey basic information.</p> <p>Technical skills</p> <ul style="list-style-type: none"> • Determine the document's requirements (its audience, purpose, format, main points and sequence of points) • Find out the main points to be included in the document • Gather the information for the document • Write a first draft • Review the draft to check it meets the requirements • Check the quality of the grammar and spelling, and have the document proofread • Finalise and send the document, and file a copy <p>Employability skills</p> <ul style="list-style-type: none"> • Communicate effectively in writing (read / write) • Solve problems <p>Knowledge</p> <ul style="list-style-type: none"> • Basic grammar, spelling and punctuation • Document production resources (such as dictionaries, thesauruses, templates and style sheets) • Workplace requirements and procedures for document production 	<p>Write simple documents</p>

Appendix 2 – Employability skills

Employability Skills	Industry/enterprise requirements for this qualification include the following:
Initiative and enterprise	<ul style="list-style-type: none"> <input type="checkbox"/> Adapt to new situations <input type="checkbox"/> Identify opportunities for future employment in the plumbing industry <input type="checkbox"/> Translate ideas into action within limits of responsibility
Communication	<ul style="list-style-type: none"> <input type="checkbox"/> Listen to and understand workplace instructions and information <input type="checkbox"/> Complete written reports and other relevant documentation <input type="checkbox"/> Enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand <input type="checkbox"/> Use language and concepts appropriate to cultural differences <input type="checkbox"/> Use appropriate terminology associated with plumbing tasks <input type="checkbox"/> Report faults <input type="checkbox"/> Communicate information about problems with work <input type="checkbox"/> Read and interpret work instructions, plans, specifications and signs
Teamwork	<ul style="list-style-type: none"> <input type="checkbox"/> Work as a team member to cooperatively share tools, equipment and workspace <input type="checkbox"/> Work as a member of a team to contribute to the planning and execution of work tasks <input type="checkbox"/> Define role as part of a team <input type="checkbox"/> Apply teamwork skills to a range of situations
Technology	<ul style="list-style-type: none"> <input type="checkbox"/> Use appropriate tools, machines and equipment safely and effectively <input type="checkbox"/> Use communication technology appropriate to the workplace <input type="checkbox"/> Commission equipment to enable use <input type="checkbox"/> Clean and service tools
Problem solving	<ul style="list-style-type: none"> <input type="checkbox"/> Identify and report any workplace hazards <input type="checkbox"/> Use tools in appropriate sequence <input type="checkbox"/> Secure materials in an appropriate manner <input type="checkbox"/> Identify distortions and faults <input type="checkbox"/> Adjust work method in response to changing situation <input type="checkbox"/> Show independence and initiative in identifying problems and solving them within limits of responsibility <input type="checkbox"/> Apply knowledge of materials, product purpose and processes to operations <input type="checkbox"/> Monitor workplace activities and identify and report faults or problems <input type="checkbox"/> Apply problem solving strategies

Employability Skills	Industry/enterprise requirements for this qualification include the following:
Self management	<ul style="list-style-type: none"> <input type="checkbox"/> Evaluate and monitor own performance to ensure good work standard and completion of work on time <input type="checkbox"/> Use and apply PPE equipment <input type="checkbox"/> Identify resources to seek employment <input type="checkbox"/> Understand the standard of work expected at a work site <input type="checkbox"/> Take some responsibility for planning and organising own work to complete assigned tasks <input type="checkbox"/> Have knowledge and confidence in own abilities
Planning and organising	<ul style="list-style-type: none"> <input type="checkbox"/> Manage time and priorities to complete work <input type="checkbox"/> Manage materials in a sustainable manner <input type="checkbox"/> Store tools, materials and equipment when not in use <input type="checkbox"/> Take initiative and make decisions within limits of responsibility <input type="checkbox"/> Establish goals and deliverables <input type="checkbox"/> Identify and obtain appropriate equipment
Learning	<ul style="list-style-type: none"> <input type="checkbox"/> Be willing to learn new ways of working <input type="checkbox"/> Apply the principles of sustainability <input type="checkbox"/> Understand Australian Standards and plumbing regulations <input type="checkbox"/> Identify different streams and sectors in the plumbing industry <input type="checkbox"/> Determine range of roles in the plumbing industry <input type="checkbox"/> Seek information to improve performance from people and workplace documents such as policies and procedures <input type="checkbox"/> Understand tools and equipment characteristics, technical capabilities, limitations and procedures <input type="checkbox"/> Ask questions to expand own knowledge

Section C – Units of competency

VU21789 Apply basic sheet metal practices

VU21790 Cut and penetrate building materials and structures

VU21791 Fabricate simple plumbing pipe systems

VU21792 Identify career pathways in the plumbing industry

VU21793 Perform basic oxy-acetylene welding and cutting

VU21794 Prepare to work in the plumbing industry

VU21795 Use and apply basic levelling equipment for plumbing

VU21796 Use basic electric welding equipment and techniques

VU21797 Use basic plumbing hand tools

VU21798 Use basic power tools

VU21799 Use plumbing pipes, fittings and fixtures to simulate plumbing installations

VU21789 Apply basic sheet metal practices

Unit descriptor This unit specifies the competency required to cut, join and bend sheet metal products for a range of simple plumbing jobs in accordance with job, organisational and legal requirements.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Employability skills This unit contains employability skills.

Prerequisite unit CPCCOHS1001A Work safely in the construction industry

Application of the unit This unit is to be conducted under supervision.

This unit provides the participant with the skills and knowledge to cut, join, fabricate and bend a range of sheet metals and sheet metal products.

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

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 range statement. Assessment of performance is to be consistent with the evidence guide.

- | | |
|--|--|
| 1. Plan to perform sheet metal practices | <p>1.1 Sheet metal properties and characteristics are discussed and related to specific tasks.</p> <p>1.2 Correct terminology is used when discussing sheet metal products and applying basic sheet metal practices.</p> <p>1.3 Principles of sustainability are applied to work preparation and the plumbing application.</p> <p>1.4 Quality assurance requirements are identified and adhered to in accordance with workplace procedures.</p> |
| 2. Prepare for sheet metal practices | <p>2.1 Fabrication techniques relevant to sheet metal and sheet metal products are discussed and determined for specific tasks.</p> <p>2.2 Plans and specifications for the tasks are discussed with the supervisor to determine the designated sequence.</p> <p>2.3 Safety (OHS) and environmental requirements associated with sheet metal practices are assessed and adhered to and provide a safe workplace environment.</p> <p>2.4 Quantities for the tasks are calculated, to support efficient cutting and to avoid waste.</p> |
| 3. Cut and join sheet metal and sheet metal products | <p>3.1 Materials are marked out according to the requirements of the task, plans and specifications.</p> <p>3.2 Personal protective equipment (PPE) is selected, applied and maintained for the task.</p> <p>3.3 Tools and equipment are checked for serviceability and faults reported to the supervisor.</p> |



- | | | |
|---|-----|---|
| | 3.4 | Sheet metal is cut to the required shape and dimension, using appropriate cutting tools. |
| | 3.5 | Joining methods and compatible materials are selected and applied to comply with the task and specifications. |
| 4. Bend and fold sheet metal and sheet metal products | 4.1 | Tools and equipment are selected to make bends and folds that comply with job specifications and plans. |
| | 4.2 | Bent and folded sheet metal and sheet metal products are cleaned and prepared for joining. |
| | 4.3 | Materials are handled in a safe and appropriate manner and to the requirements of the task. |
| 5. Clean up the work area | 5.1 | The work area is cleaned in accordance with workplace procedures, legislation and regulations. |
| | 5.2 | Tools and equipment are cleaned, checked for serviceability and stored in accordance with workplace procedures. |
| | 5.3 | Materials and waste are disposed of, recycled or stored in accordance with workplace procedures, legislation and regulations. |

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Communicate effectively:
 - by speaking and listening, including when asking for materials and equipment and when receiving and confirming task instructions and requirements
 - by reading and interpreting documents, drawings and specifications.
- Use numbers effectively to calculate, measure and mark out.
- Solve problems when calculating and marking out materials, checking tools and equipment for serviceability and selecting suitable tools for the task.
- Plan and organise work including to obtain work instructions and sequence tasks.
- Use technology to operate hand tools to cut and join sheet metal, assemble component parts, bend and fold sheet metal, and maintain tools and equipment effectively and safely.
- Work cooperatively as a team member.

Required knowledge

- Sheet metal practices apply to the plumbing industry.
- Properties and characteristics of sheet metal.
- Correct terminology associated with sheet metal products and practices.
- Workplace safety requirements and OHS legislation.
- Relevant legislation and regulations relating to basic sheet metal practices including Australian standards and plumbing codes, and for occupational health and safety.
- Basic mathematical calculations.
- Principles of sustainability.

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.

Types of **sheet metal** may include, but are not limited to:

- zincalume
- galvanised iron
- colourbond
- lead
- aluminium
- copper.

Principles of sustainability may relate to:

- use of materials and resources to meet the current needs of society while preserving the environment for the future
- selection of material
- efficient use and recycling of material
- disposal of waste material to ensure minimal environmental impact
- energy efficiency
- water efficiency
- environmental, social and economic considerations.

Quality assurance requirements include:

- Australian Standards
- Environment Protection Authority (EPA)
- organisational quality assurance
- site safety plan
- workplace operations and procedures.

Fabrication techniques may include, but are not limited to:

- jointing
- sealing
- cutting
- folding
- bending
- dressing
- swaging.

Specifications may include:

- charts, hand drawings, diagrams and sketches
- instructions issued by supervisor
- job drawings
- manufacturers' specifications and instructions
- material safety data sheets (MSDS)

- organisational work specifications and requirements, regulatory and legislative requirements, particularly:
 - building and plumbing codes
 - OHS and environmental requirements
 - plumbing and gasfitting authority regulations
 - relevant Australian Standards
 - safe work procedures relating to handling and storing plumbing materials, including the disposal of waste
 - signage
 - verbal, written and graphical instructions.

Safety (OHS) is to be in accordance with state and territory legislation and regulations and may include:

- manual handling materials and equipment
- hazard control
- hazardous materials and substances.
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and procedures
- use of first aid equipment
- workplace environment and safety.

Types of **materials** may include, but are not limited to:

- flat sheet
- corrugated
- ribbed
- quad spouting
- fascia gutter
- round downpipe
- rectangle downpipe
- duct profiles.

Joining methods may include, but are not limited to:

- lapped joints
- groove seams
- knock-up joint
- mechanical joint
- scotch rivet
- blind rivet
- self-drilling screws
- spot welding
- silicone
- soldering
- brazing.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range statement.

Overview of assessment	This unit of competency must be assessed in a plumbing workshop or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate plumbing and services workplace conditions, materials, activities, responsibilities and procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The assessment must confirm the person is competent to identify, select and use correct terminology appropriate to sheet metal tools, equipment and materials in a safe and sustainable manner appropriate to the job task.
Context of and specific resources for assessment	<p>An assessment must be done in an actual or simulated plumbing workplace.</p> <p>An assessment must be conducted using current workplace techniques, procedures, tools, equipment and materials, and in accordance with all legal work requirements.</p> <p>Evidence may include the results of projects, and evidence of the process the participant followed.</p> <p>Reasonable adjustments should be made as required to the assessment of a person with personal characteristic(s) protected by law to ensure the assessment environment or methods do not disadvantage them.</p> <p>Assessments should not require higher employability skills than those required for the work being assessed.</p> <p>The main assessment resources should be:</p> <ul style="list-style-type: none"> • a plumbing workshop or simulated workplace • a supply of a range of sheet metals • a manual folding machine • other tools and equipment for joining, bending and folding sheet metal • manufacturers' instructions • job tasks, specifications, work instructions and workplace procedures.
Method of assessment	<p>Assessment must be by direct observation of work being performed, applying the required knowledge and skills, including with questioning about required knowledge, to determine the person's competency over time in a range of situations.</p> <p>Assessment may be in conjunction with assessment of other units of competency.</p> <p>If the assessment is part of a structured learning program, evidence may relate to several instances of work at different times, separated by further learning and practice. The assessor must decide only when they are completely confident the person is competent.</p>

VU21790 Cut and penetrate building materials and structures

Unit descriptor This unit specifies the competency required identify the properties of building materials and structures to facilitate cutting and penetration for a range of simple plumbing jobs and in accordance with job, organisational and legal requirements.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Employability skills This unit contains employability skills.

Prerequisite unit CPCCOHS1001A Work safely in the construction industry

Application of the unit This unit is to be conducted under supervision.

Note: The range statement lists tools that **must not** be included in this unit.

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

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 range statement. Assessment of performance is to be consistent with the evidence guide.

- | | |
|---|---|
| 1. Plan to cut or penetrate building materials | <p>1.1 <i>Building structures</i> are discussed to determine their composition and method of construction.</p> <p>1.2 Types and properties of <i>building materials</i> are discussed to determine appropriate tools to make cuts or penetrations.</p> <p>1.3 <i>Safety (OHS)</i> and environmental requirements to safely cut or penetrate building materials are discussed to identify potential hazards.</p> <p>1.4 Correct terminology is used when discussing building materials, structures and cutting and penetrating techniques.</p> <p>1.5 <i>Quality assurance</i> requirements are identified and adhered to in accordance with workplace procedures.</p> <p>1.6 <i>Principles of sustainability</i> are applied to work preparation and the plumbing application.</p> |
| 2. Prepare to cut or penetrate building materials or structures | <p>2.1 Appropriate <i>tools</i> are selected to make cuts or penetrations to building materials or structures.</p> <p>2.2 Plans and <i>specifications</i> for the job are discussed with the supervisor to determine the sequence of tasks.</p> <p>2.3 Mark outs are assessed and checked for obstructions or hazards before making cuts or penetrations.</p> <p>2.4 Personal protective equipment (PPE) relevant to the specific tool, material and task is selected and fitted correctly.</p> |



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| 3. Perform cuts or penetrations to building materials or structures | 3.1 Safety (OHS) and environmental requirements associated with cutting or penetrating building materials or structures are adhered to and provide a safe workplace environment. |
| | 3.2 Materials are appropriately secured to make cuts or penetrations. |
| | 3.3 Cutting or penetrating tools and equipment are used following manufacturers' recommendations to complete tasks. |
| | 3.4 Cuts and penetrations are executed to materials and structures to complete job tasks. |
| 4. Clean up the work area | 4.1 The work area is cleaned in accordance with workplace procedures, legislation and regulations. |
| | 4.2 Tools and equipment are cleaned, checked for serviceability and stored in accordance with workplace procedures. |
| | 4.3 Materials and waste are disposed of, recycled or stored in accordance with workplace procedures, legislation and regulations. |

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Communicate effectively by:
 - speaking and listening, including when preparing to and cutting and penetrating building materials and structures as well as when receiving and confirming task instructions and requirements
 - reading and interpreting documents, drawings and specifications.
- Use numbers effectively to measure and mark out.
- Solve problems by:
 - marking out and checking for obstructions
 - securing materials appropriately.
- Plan and organise work including to obtain work instructions and sequence tasks.
- Use technology to use and maintain tools and equipment effectively and safely.
- Work cooperatively as a team member.

Required knowledge

- Purpose of cutting or penetrating building structures.
- Correct terminology associated with cutting or penetrating building structures.
- Workplace safety requirements and OHS legislation.
- Methods of cutting and penetrating building materials and structures in the plumbing industry.

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.

Building structures may include, but are not limited to:

- domestic
- industrial
- concrete
- brick
- timber
- steel
- glass
- sheet metal
- composite materials.

Building materials may include, but are not limited to:

- timber
- steel
- concrete
- masonry products
- plaster products
- sheet metal
- alloys
- copper
- brass
- plastic
- aluminium.

Safety (OHS) is to be in accordance with state and territory legislation and regulations and may include:

- handling materials
- hazard control
- hazardous materials and substances
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and procedures
- use of first aid equipment
- workplace environment and safety.

Quality assurance may include:

- Australian Standards
- Environment Protection Authority (EPA)
- organisational quality assurance policy
- site safety plan
- workplace operations and procedures.

Principles of sustainability may relate to:

- use of materials and resources to meet the current needs of society while preserving the environment for the future
- selection of material
- efficient use and recycling of material
- disposal of waste material to ensure minimal environmental impact
- energy efficiency
- water efficiency
- environmental, social and economic considerations.

Tools may include, but are not limited to:

- hand saws
- hacksaws
- tin snips
- bolsters
- hammers
- wood chisels
- drills
- steel and masonry drill bits
- hole saws
- plugging chisel
- cold chisel
- grinders under 150 mm
- oxy-acetylene.

Tools must not include:

- grinders over 150 mm disc capacity.

Specifications may include:

- charts, drawings, diagrams and sketches
- manufacturers' specifications and instructions
- material safety data sheets (MSDSs)
- organisational work specifications and requirements, regulatory and legislative requirements including:
 - building and plumbing codes
 - OHS and environmental requirements
 - plumbing and gasfitting authority regulations
 - relevant Australian Standards
 - safe work procedures for handling and storing plumbing materials, including waste disposal
 - signage
 - verbal, written and graphic instructions.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range statement.

Overview of assessment	This unit of competency must be assessed in a plumbing workshop or a close simulation of the workplace environment provided that simulated or project-based assessment techniques fully replicate plumbing and services workplace conditions, materials, activities, responsibilities and procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The assessment must confirm the person is competent to safely and using the correct terminology, prepare to and make cuts and penetrations to building materials and structures.
Context of and specific resources for assessment	<p>An assessment must be done in an actual or simulated plumbing workplace.</p> <p>An assessment must be conducted using current workplace techniques, procedures, tools, equipment and materials, and in accordance with all legal work requirements.</p> <p>Evidence may include the results of projects, and evidence of the process the participant followed.</p> <p>Reasonable adjustments should be made as required to the assessment of a person with personal characteristic(s) protected by law to ensure the assessment environment or methods do not disadvantage them.</p> <p>Assessments should not require higher employability skills than those required for the work being assessed.</p> <p>The main assessment resources should be:</p> <ul style="list-style-type: none"> • a plumbing workshop or simulated workplace • materials and equipment for cutting and penetrating building materials and structures • manufacturers' instructions • job tasks, specifications, work instructions and workplace procedures.
Method of assessment	<p>Assessment must be by direct observation of work being performed, applying the required knowledge and skills, including with questioning about required knowledge, to determine the person's competency over time in a range of situations.</p> <p>Assessment may be in conjunction with assessment of other units of competency.</p> <p>If the assessment is part of a structured learning program, evidence may relate to several instances of work at different times, separated by further learning and practice. The assessor must decide only when they are completely confident the person is competent.</p>

VU21791 Fabricate simple plumbing pipe systems

Unit descriptor This unit specifies the competency required distinguish, select and fabricate drainage, water and gas tubing and pipes for a range of simple plumbing jobs and in accordance with job, organisational and legal requirements.

Registration and/or licensing requirements are applicable to undertake tasks associated with this unit. A person who carries out plumbing work in Victoria must be registered or licensed with the Victorian Building Authority (or working under supervision).

Employability skills This unit contains employability skills.

Prerequisite unit CPCCOHS1001A Work safely in the construction industry

Application of the unit This unit is to be conducted under supervision.
Applications that may apply include properties and characteristics of pipes and tubes, pipes and tube system installations and fabrications, assemblage techniques of pipes and tubes.

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

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 range statement. Assessment of performance is to be consistent with the evidence guide.

- | | |
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| 1. Plan to assemble pipes and tubing | <p>1.1 Safety (OHS) requirements associated with the use of welding equipment, and workplace environmental requirements, are adhered to and provide a safe workplace environment.</p> <p>1.2 Quality assurance requirements are identified and adhered to in accordance with workplace procedures.</p> <p>1.3 Correct terminology is used when discussing the fabrication and assembly of pipes and tubes.</p> <p>1.4 Plans and specifications for the job are discussed with the supervisor to determine the sequence of tasks.</p> |
| 2. Prepare to assemble pipes and tubing | <p>2.1 Properties and characteristics of tubes and pipes are reviewed to determine that they meet Australian Standards and quality assurance requirements.</p> <p>2.2 Tube and pipe installations in plumbing applications are reviewed to determine their function and compliance with plumbing regulations.</p> <p>2.3 Tools and equipment for fabrication and assembly are selected according to the job requirements.</p> |

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| 3. Join and bend pipes and tubing | 3.1 Personal protective equipment (PPE) relevant to joining and bending pipes and tubing is selected, correctly fitted and maintained. |
| | 3.2 Appropriate fabrication and assembly techniques are used, according to job specifications. |
| | 3.3 Testing procedures on fabricated tasks are applied to determine if the completed work is within predetermined tolerances. |
| 4. Clean up the work area | 4.1 The work area is cleaned in accordance with workplace procedures, legislation and regulations. |
| | 4.2 Tools and equipment are cleaned, checked for serviceability and stored in accordance with workplace procedures. |
| | 4.3 Materials and waste are disposed of, recycled or stored in accordance with workplace procedures, legislation and regulations. |

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Communicate effectively by:
 - speaking and listening, including when fabricating simple plumbing pipe systems as well as when receiving and confirming task instructions and requirements
 - reading and interpreting documents, drawings and specifications.
- Solve problems to ensure installations are compliant with plumbing regulations.
- Plan and organise work including to obtain work instructions and sequence tasks, and to test plumbing tube and pipe systems for compliance.
- Use technology to use and maintain tools and equipment effectively and safely.
- Work cooperatively as a team member.

Required knowledge

- Purpose of fabricating simple plumbing pipe systems.
- Correct terminology used when fabricating simple plumbing pipe systems.
- Workplace safety requirements and OHS legislation.
- Methods of fabricating simple plumbing pipe systems in the plumbing industry.
- Relevant legislation and regulations relating to fabricating simple plumbing pipe systems including Australian standards and plumbing codes, and for occupational health and safety.

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.

Safety (OHS) is to be in accordance with state and territory legislation and regulations and may include:

- manual handling materials and equipment
- hazard control
- hazardous materials and substances
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and procedures
- use of first aid equipment
- workplace environment and safety.

Quality assurance requirements may include:

- Australian Standards
- Environment Protection Authority (EPA)
- organisational quality assurance policy
- site safety plan
- workplace operations and procedures.

Specifications may include:

- charts, hand drawings, diagrams and sketches
- instructions issued by the supervisor
- job drawings
- manufacturers' specifications and instructions
- material safety data sheets (MSDS)
- organisational work specifications and requirements, regulatory and legislative requirements, particularly:
 - building / plumbing codes
 - OHS and environmental requirements
 - plumbing and gasfitting authority regulations
 - relevant Australian Standards
 - safe work procedures relating to handling and storing plumbing materials, including the disposal of waste
 - signage
 - verbal, written and graphical instructions.

Types of ***tools and equipment*** may include:

- oxy and acetylene handpieces, tips and attachments
- mild steel pipes and tubing
- copper and brass pipes and tubing
- PVC pipes and tubing
- hacksaws
- tube and pipe cutters

- branch pullers and expanders
- bending springs and lever arm tube benders
- welding rods
- fluxes and cleaners
- clamps
- workbenches.

Fabrication and assembly
techniques may include:

- cutting
- bending
- forming
- jointing
- threading
- sealing
- welding
- brazing.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range statement.

Overview of assessment	This unit of competency must be assessed in a plumbing workshop or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate plumbing and services workplace conditions, materials, activities, responsibilities and procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The assessment must confirm the person is competent to safely and sustainability select and use tools, equipment and materials to fabricate and assemble pipe systems appropriate to the job task.
Context of and specific resources for assessment	<p>An assessment must be done in an actual or simulated plumbing workplace.</p> <p>An assessment must be conducted using current workplace techniques, procedures, tools, equipment and materials, and in accordance with all legal work requirements.</p> <p>Evidence may include the results of projects, and evidence of the process the participant followed.</p> <p>Reasonable adjustments should be made as required to the assessment of a person with personal characteristic(s) protected by law to ensure the assessment environment or methods do not disadvantage them.</p> <p>Assessments should not require higher employability skills than those required for the work being assessed.</p> <p>The main assessment resources should be:</p> <ul style="list-style-type: none"> • a plumbing workshop or simulated workplace • tools and equipment for fabricating and assembling pipes and fittings • a sand pit for trenching and laying pipe systems • a range of pipes and fittings • manufacturers' instructions • job tasks, specifications, work instructions and workplace procedures.
Method of assessment	<p>Assessment must be by direct observation of work being performed, applying the required knowledge and skills, including with questioning about required knowledge, to determine the person's competency over time in a range of situations.</p> <p>Assessment may be in conjunction with assessment of other units of competency.</p> <p>If the assessment is part of a structured learning program, evidence may relate to several instances of work at different times, separated by further learning and practice. The assessor must decide only when they are completely confident the person is competent.</p>

VU21792 Identify career pathways in the plumbing industry

Unit descriptor This unit specifies the competency required to distinguish and determine opportunities and pathways of employment in the plumbing industry.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Employability skills This unit contains employability skills.

Application of the unit A person may use this competency when planning and undertaking personal and professional development for work in the plumbing industry.

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

Performance criteria indicate the standard of performance required to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.

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| 1. Locate information on the history of plumbing | 1.1 Key milestones and developments in plumbing are listed to establish past, present and emerging trends in the plumbing industry.
1.2 Information about key milestones is systematically gathered and organised for future reference. |
| 2. Define sectors in the plumbing industry | 2.1 Different streams and sectors in the plumbing industry are identified and discussed to identify options for employment.
2.2 The range of roles and responsibilities of personnel in the plumbing industry are distinguished to identify key stakeholders. |
| 3. Use information to support career pathway opportunities in the plumbing industry | 3.1 Sources of information that relate to employment opportunities in the plumbing industry are identified.
3.2 Methods and strategies to gain employment are applied and documented to enhance opportunities.
3.3 Resources are used to seek employment opportunities in the plumbing industry. |

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Communicate effectively by:
 - speaking and listening when identifying career pathways in the plumbing industry as well as when receiving and confirming requirements
 - reading and writing to identifying career pathways in the plumbing industry, including when completing written reports and other documents and when identifying and using research and resource information.
- Solve problems to identify resources to seek employment.

- Plan and organise work to collect and catalogue information.
- Use computers to search the internet, find web-based resources, store and organise information and write and present basic documents.
- Work cooperatively as a team member.

Required knowledge

- How to present basic documents.
- Highlights in the history of plumbing.
- Plumbing industry sectors and the types of jobs in each.
- How to use search engines on the internet.
- How to save electronic information.
- How to organise information chronologically and sequentially.

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.

Information may include:

- historical case studies
- historical timelines
- history books
- video and DVDs
- newspaper articles
- newsletters
- industry journals.

Streams and sectors may include:

- general
- sanitary
- mechanical services
- gasfitting
- roofing
- drainage
- fire
- irrigation
- sustainable plumbing
- water
- registered
- licensed
- contractor
- retail

- manufacturing
- education
- design
- management
- estimating.

Methods and strategies
may include:

- resume writing
- job application writing
- interview practice
- interview role plays
- networking.

Resources may include:

- internet
- computers
- employment agencies
- print media
- associations
- career counselling
- social and industry networks
- government incentives.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range statement.

Overview of assessment

A person who demonstrates competency in this unit must be able to provide evidence that they can distinguish sectors in the plumbing industry and develop strategies to gain employment into the industry.

This unit can be assessed in a classroom with access to information technology.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The assessment must confirm the person is competent to categorise historical moments in the history of plumbing in Australia to determine the different streams and sectors in the plumbing industry and develop methods and strategies to seek and identify employment opportunities in the plumbing industry.

Context of and specific resources for assessment

An assessment can be done in a classroom with access to information technology resources.

Evidence may include the results of projects, and evidence of the process the participant followed.

Reasonable adjustments should be made as required to the assessment of a person with personal characteristic(s) protected by law to ensure the assessment environment or methods do not disadvantage them.

Assessments should not require higher employability skills than those required for the work being assessed.

Method of assessment

Assessment must be by applying the required knowledge and skills, including with questioning about required knowledge, to determine the person's competency over time in a range of situations.

Assessment may be in conjunction with assessment of other units of competency.

If the assessment is part of a structured learning program, evidence may relate to several instances of work at different times, separated by further learning and practice. The assessor must decide only when they are completely confident the person is competent.

VU21793 Perform basic oxy-acetylene welding and cutting

Unit descriptor	<p>This unit specifies the competency required to use oxy-acetylene equipment to make welds and cuts, and to rectify any defects and distortions as part of a variety of plumbing jobs and in accordance with job, organisational and legal requirements.</p> <p>Registration and/or licensing requirements are applicable to undertake tasks associated with this unit. A person who carries out plumbing work in Victoria must be registered or licensed with the Victorian Building Authority (or working under supervision).</p>
Employability skills	This unit contains employability skills.
Prerequisite unit	CPCCOHS1001A Work safely in the construction industry
Application of the unit	<p>This unit is to be conducted under supervision.</p> <p>A person may use this competency when fabricating pipe systems in a range of materials, and when cutting and joining various sheet metal.</p>

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

Performance criteria indicate the standard of performance required to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.

1. Plan to weld and cut	<p>1.1 Correct terminology is used when discussing basic oxy-acetylene welding and cutting.</p> <p>1.2 Quality assurance requirements are identified and adhered to in accordance with workplace procedures.</p> <p>1.3 Plans and specifications are obtained from the supervisor to determine the appropriate use of oxy-acetylene to the job task.</p> <p>1.4 Types of oxy-acetylene welding and cutting techniques are discussed to determine their suitability for a range of job tasks.</p> <p>1.5 Safety (OHS) requirements associated with the use of oxy-acetylene and workplace environmental requirements are adhered to and provide a safe workplace environment.</p> <p>1.6 Principles of sustainability are applied to work preparation and the plumbing application.</p>
2. Prepare materials and equipment for welding and cutting	<p>2.1 Personal protective equipment (PPE) is selected, correctly fitted and maintained.</p> <p>2.2 Materials are selected and securely clamped prior to welding or cutting to avoid hazard and injury.</p> <p>2.3 Equipment and techniques appropriate to the specification of the job are identified and applied to fulfil the job task.</p> <p>2.4 Oxy-acetylene equipment is commissioned and regulated properly</p>

for a specific job and in accordance with manufacturers' recommendations to avoid misuse.

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| 3. Weld and cut materials | <p>3.1 Welds and cuts are performed in accordance with the work plan and job task to minimise waste.</p> <p>3.2 Sustainable work practices ensure waste minimisation.</p> <p>3.3 Defects and distortions are identified and rectified in accordance with the job task.</p> <p>3.4 Tools, equipment and materials are used appropriately and in sequence with the job task.</p> <p>3.5 Welds and cuts are cleaned in accordance with the specification.</p> |
| 4. Clean up the work area | <p>4.1 The work area is cleaned in accordance with workplace procedures, legislation and regulations.</p> <p>4.2 Tools and equipment are cleaned, checked for serviceability and stored in accordance with workplace procedures.</p> <p>4.3 Materials and waste are disposed of, recycled or stored in accordance with workplace procedures, legislation and regulations.</p> |

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Communicate effectively:
 - by questioning, speaking and listening, including when performing basic oxy-acetylene welding and cutting and when receiving and confirming task instructions and requirements
 - by accessing, reading and interpreting documents, drawings and specifications.
- Solve problems to:
 - secure and brace materials
 - identify distortions and defects
 - manage materials in a sustainable manner.
- Plan and organise work to obtain work instructions and sequence tasks.
- Use technology to:
 - use and maintain tools and equipment effectively and safely
 - commission equipment in accordance with manufacturers' instructions.
- Work cooperatively with others.

Required knowledge

- Purpose and function of oxy-acetylene tools and equipment.
- Correct terminology associated with oxy-acetylene welding and cutting.
- Workplace safety requirements and OHS legislation.
- Methods of performing basic oxy-acetylene welding and cutting in the plumbing industry.

- Relevant legislation and regulations relating to performing basic oxy-acetylene welding and cutting including Australian standards and plumbing codes, and for occupational health and safety.

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.

Quality assurance may include:

- Australian Standards
- Environment Protection Authority (EPA)
- organisational quality assurance policy
- site safety plan
- workplace operations and procedures.

Specifications may include:

- charts and hand drawings diagrams and sketches
- instructions issued by supervisor
- job task drawings
- manufacturers' specifications and instructions
- material safety data sheets (MSDSs)
- organisational work specifications and requirements, regulatory and legislative requirements, particularly:
 - OHS and environmental requirements
 - plumbing and gasfitting authority regulations
 - relevant Australian Standards
 - safe work procedures relating to handling and storing plumbing materials, including the disposal of waste
 - Signage
 - verbal, written and graphical instructions.

Safety (OHS) is to be in accordance with state and territory legislation and regulations and may include:

- manual handling materials and equipment
- hazard control
- hazardous materials and substances
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and procedures
- use of first aid equipment
- workplace environment and safety.

Principles of sustainability may relate to:

- use of materials and resources to meet the current needs of society while preserving the environment for the future
- selection of material
- efficient use and recycling of material

- disposal of waste material to ensure minimal environmental impact
- energy efficiency
- water efficiency
- environmental, social and economic considerations.

Types of **materials** may include:

- copper
- brass
- mild steel
- sheet steel
- galvanised iron
- alloys
- stainless steel
- fluxes and cleaners.

Types of **tools and equipment** may include:

- oxy-acetylene handpieces, tips and attachments
- oxy-acetylene bottles
- mild steel
- non-ferrous metals welding rods
- clamps
- wire brushes
- workbenches.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range statement.

Overview of assessment	This unit of competency must be assessed in a plumbing workshop or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate plumbing and services workplace conditions, materials, activities, responsibilities and procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The assessment must confirm the person is competent to select and use tools, equipment and materials in a safe, sustainable manner to perform basic welding and cutting using oxy-acetylene.
Context of and specific resources for assessment	<p>An assessment must be done in an actual or simulated plumbing workplace.</p> <p>An assessment must be conducted using current workplace techniques, procedures, tools, equipment and materials, and in accordance with all legal work requirements.</p> <p>Evidence may include the results of projects, and evidence of the process the participant followed.</p> <p>Reasonable adjustments should be made as required to the assessment of a person with personal characteristic(s) protected by law to ensure the assessment environment or methods do not disadvantage them.</p> <p>Assessments should not require higher employability skills than those required for the work being assessed.</p> <p>The main assessment resources should be:</p> <ul style="list-style-type: none"> • a plumbing workshop or simulated workplace • materials and equipment for oxy-acetylene cutting and welding • manufacturers' instructions • job tasks, specifications, work instructions and workplace procedures.
Method of assessment	<p>Assessment must be by direct observation of work being performed, applying the required knowledge and skills, including with questioning about required knowledge, to determine the person's competency over time in a range of situations.</p> <p>Assessment may be in conjunction with assessment of other units of competency.</p> <p>If the assessment is part of a structured learning program, evidence may relate to several instances of work at different times, separated by further learning and practice. The assessor must decide only when they are completely confident the person is competent.</p>

VU21794**Prepare to work in the plumbing industry****Unit descriptor**

This unit specifies the competency required to develop a general awareness and knowledge of the plumbing industry and the ability to work as part of a team.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Employability skills

This unit contains employability skills.

Application of the unit

A person may use this competency to underpin effective performance working as part of a team in the plumbing industry. In-depth knowledge is not required.

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

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.

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| 1 | Access plumbing industry information | 1.1 | Scope and structure of the building industry and its importance to the economy is recognised. |
| | | 1.2 | Registration and licensing requirements of plumbers are determined for specific sectors of the industry. |
| | | 1.3 | Industry stakeholders that are involved in the plumbing industry are identified. |
| | | 1.4 | Sources of current legislation, regulations and technical information that relate to plumbing work are identified. |
| 2 | Identify own development needs | 2.1 | Skills and knowledge necessary to work effectively in the plumbing industry are determined. |
| | | 2.2 | Own learning needs for future work requirements are identified in consultation with appropriate personnel. |
| | | 2.3 | Opportunities to learn and develop required skills and knowledge for future plumbing industry work opportunities are identified. |
| 3 | Work safely in a team | 3.1 | Contributions made by teams to achieving job requirements in the plumbing industry are understood. |
| | | 3.2 | Procedures for workplace plumbing team meetings are followed in accordance with supervisor's instructions. |
| | | 3.3 | Individual contributions to team activities are determined and undertaken in accordance with the plumbing job. |
| | | 3.4 | Safe work methods and practices are identified to meet Australian government and state and territory OHS legislative requirements. |

- 3.5 Causes of disharmony and other barriers to achieving the team goals are referred to the appropriate person for resolution.

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Communicate effectively by:
 - speaking and listening, including when obtaining plumbing industry information
 - reading and writing, including accessing and reading documents, drawings and specifications.
- Use numbers to locate information in plumbing legislation.
- Solve problems as they arise in the course of work.
- Plan and organise work including:
 - obtaining work instructions
 - sequencing tasks.
- Use technology to locate key stakeholders information from the internet.
- Work cooperatively as a team member

Required knowledge

- Types of regulatory information accessible and relevant to plumbers.
- Team dynamics.

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.

Building industry scope may include:

- bricklaying and blocklaying
- carpentry
- concreting
- painting and decorating
- plumbing
- roof tiling
- solid plastering
- wall and ceiling lining
- wall and floor tiling
- waterproofing.

Registration and licensing
includes

- water
- sanitary
- drainage
- mechanical services
- roofing
- gas services
- irrigation
- fire protection

(Note: Certificate II in Plumbing (Pre-apprenticeship) does not result in registration/license).

Industry stakeholders may include:

- unions
- employer associations
- professional bodies
- regulatory authorities
- government departments
- training providers
- employers
- employees
- group training organisations
- clients/customers.

Legislation, regulations and technical information may include environmental, safety and technical:

- Australian Standards and Handbooks
- National Construction Code
- Regulations
- Acts of Parliament
- guidance notes.

Learning needs may include:

- formal vocational education and training (preapprenticeship/apprenticeship/post trade)
- on-the-job training
- off-the-job training
- recognition of prior learning
- refresher training.

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance criteria, Required Skills and Knowledge and Range Statement, and with the Assessment Section of the accreditation submission.

Overview of assessment

A person who demonstrates competency in this unit must be able to provide evidence that they can access information relevant to their job and work as part of a team in the plumbing industry

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The assessment process must confirm the consistent and accurate use of the required knowledge and skills to:

- identify the roles of key plumbing industry stakeholders in the building industry
- work collaboratively in a team on a plumbing task and participate in plumbing team meetings.

Context of and specific resources for assessment

- An assessment must be done in an actual or simulated plumbing workplace.
- An assessment must be conducted using current workplace techniques, procedures, tools, equipment and materials, and in accordance with all legal work requirements.
- Evidence may include the results of projects, and evidence of the process the participant followed.
- Reasonable adjustments should be made to the assessment of candidates with personal characteristic(s) protected by law to ensure the assessment environment or methods do not disadvantage them.
- Assessments should not require higher employability skills than those required for the work being assessed.
- The main assessment resources should be:
 - access to current plumbing information
 - access to the internet
 - relevant legislation, Australian Standards and Codes.

Method of assessment

- Assessment must be by direct observation of work being performed, applying the required knowledge and skills, including with questioning about required knowledge, to determine the person's competency over time in a range of situations.
- Assessment may be in conjunction with assessment of other units of competency.
- If the assessment is part of a structured learning program, evidence must relate to several instances of work at different times, separated by further learning and practice. The assessor must decide only when they are completely confident the person is competent.

VU21795**Use and apply basic levelling equipment for plumbing****Unit descriptor**

This unit specifies the competency required to select, set up and use suitable basic levelling equipment; and take, record and mark levels and heights, including with gradients, for a range of simple plumbing jobs and in accordance with job, organisational and legal requirements.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Employability skills

This unit contains employability skills.

Prerequisite unit

CPCCOHS1001A Work safely in the construction industry

Application of the unit

This unit of competency supports the skills to use basic levelling equipment for applications in the plumbing industry.

This unit is to be conducted under supervision.

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

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 range statement. Assessment of performance is to be consistent with the evidence guide.

- | | |
|---|---|
| 1. Plan and prepare for work | <p>1.1 Safety (OHS) requirements associated with the use of levelling equipment, and workplace environmental requirements, are adhered to and provide a safe workplace environment.</p> <p>1.2 Quality assurance requirements are identified and adhered to in accordance with workplace procedures.</p> <p>1.3 Correct terminology is used when working with basic levelling equipment.</p> <p>1.4 Types of levelling equipment and their functions are discussed to determine their suitability for the job task.</p> |
| 2. Set up and use basic levelling equipment | <p>2.1 Basic levelling equipment is selected to meet the requirements of the task.</p> <p>2.2 Heights or levels to be transferred or established are identified from project plans or instructions.</p> <p>2.3 Levelling equipment is set up and tested in accordance with manufacturers' instructions and workplace instructions.</p> <p>2.4 Levels are taken, recorded and marked within the required tolerances and specifications according to job requirements and workplace procedures.</p> <p>2.5 Gradients are identified and applied to tasks in accordance with task specifications.</p> |
| 3. Clean up the work | <p>3.1 The work area is cleaned in accordance with workplace</p> |

- | | |
|------|---|
| area | procedures, legislation and regulations. |
| 3.2 | Tools and equipment are cleaned, checked for serviceability and stored in accordance with workplace procedures. |
| 3.3 | Materials and waste are disposed of, recycled or stored in accordance with workplace procedures, legislation and regulations. |

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Communicate effectively by:
 - speaking and listening, including when preparing to and transferring a level and when receiving and confirming instructions about the plumbing job or task
 - reading and interpreting documents, drawings and specifications.
- Solve problems:
 - by selecting appropriate levelling equipment
 - by identifying and reporting any faults in tools, equipment or materials.
- Plan and organise work including to obtain work instructions and sequence tasks.
- Use technology to use and maintain tools and equipment effectively and safely.
- Work cooperatively as a team member.

Required knowledge

- Purpose and function of levelling equipment.
- Correct terminology associated with levelling equipment.
- Workplace safety requirements and OHS legislation.
- Basic mathematical calculations.

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.

Safety (OHS) is to be in accordance with state and territory legislation and regulations and may include:

- handling materials
- hazard control
- hazardous materials and substances
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and procedures
- workplace environment and safety.

Quality assurance may include:

- site safety plan

- organisational quality assurance policy
- workplace operations and procedures
- specified tolerances.

Levelling equipment may include:

- hand tools
- measuring equipment
- string line
- boning rods
- rotating laser level
- automatic level
- spirit level
- water level.

Gradients may include:

- 1.65%
- 2.5%.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range statement.

Overview of assessment

A person who demonstrates competency in this unit must be able to provide evidence that they can safely use basic levelling equipment within organisational requirements applicable to the plumbing industry.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The assessment must confirm the person is competent to select, set up and use basic levelling equipment and take, record and mark levels and heights, including those with gradients.

Context of and specific resources for assessment

An assessment must be done in an actual or simulated plumbing workplace.

An assessment must be conducted using current workplace techniques, procedures, tools, equipment and materials, and in accordance with all legal work requirements.

Evidence may include the results of projects, and evidence of the process the participant followed.

Reasonable adjustments should be made as required to the assessment of a person with personal characteristic(s) protected by law to ensure the assessment environment or methods do not disadvantage them.

Assessments should not require higher employability skills than those required for the work being assessed.

The main assessment resources should be:

- a plumbing workshop or simulated workplace
- materials and equipment for levelling applications
- manufacturers' instructions
- job tasks, specifications, work instructions and workplace procedures.

Method of assessment

Assessment must be by direct observation of work being performed, applying the required knowledge and skills, including with questioning about required knowledge, to determine the person's competency over time in a range of situations.

Assessment may be in conjunction with assessment of other units of competency.

If the assessment is part of a structured learning program, evidence may relate to several instances of work at different times, separated by further learning and practice. The assessor must decide only when they are completely confident the person is competent.

VU21796 Use basic electric welding equipment and techniques

Unit descriptor This unit specifies the competency required to use a range of electric welding tools and techniques as part of a variety of plumbing jobs and in accordance with job, organisational and legal requirements.

Registration and/or licensing requirements are applicable to undertake tasks associated with this unit. A person who carries out plumbing work in Victoria must be registered or licensed with the Victorian Building Authority (or working under supervision).

Employability skills This unit contains employability skills.

Prerequisite unit CPCCOHS1001A Work safely in construction industry

Application of the unit This unit is to be conducted under supervision.

A range of electric welding tools (MIG, TIG, ARC, SPOT) and equipment should be used to weld a variety of materials including mild steel.

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

Performance criteria indicate the standard of performance required to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.

- | | |
|---|--|
| 1. Plan to weld using an electric welder | <p>1.1 Safety (OHS) and environmental requirements associated with the use of electrical welding equipment, and workplace environmental requirements, are adhered to and provide a safe workplace environment.</p> <p>1.2 Australian Standards and quality assurances are adhered to ensure organisational and industry procedures.</p> <p>1.3 Plans and specifications for the task are obtained from the supervisor.</p> <p>1.4 Equipment is selected appropriate to the job task.</p> <p>1.5 Principles of sustainability are applied to work preparation and the plumbing application.</p> |
| 2. Prepare to weld using an electric welder | <p>2.1 Materials' characteristics and properties are discussed.</p> <p>2.2 Materials are secured and supported to facilitate the job task.</p> <p>2.3 Equipment is commissioned and controls regulated appropriately for specific tasks and in accordance with manufacturers' recommendations.</p> <p>2.4 Correct terminology is used when discussing the use of basic electric welding equipment and techniques.</p> <p>2.5 Personal protective equipment (PPE) is selected, fitted and maintained, relevant to the specific tool or piece of equipment used in the job task.</p> |
| 3. Perform a range | <p>3.1 Tools, equipment and materials are used in the predetermined</p> |

of electric welding techniques		sequence according to the job specification.
	3.2	Welds are performed in accordance with the work plan and job task to minimise waste.
	3.3	Welds are prepared and cleaned in accordance with the job task.
	3.4	Power is switched off and tools and equipment safely protected when not in use.
4. Clean up the work area	4.1	The work area is cleaned in accordance with workplace procedures, legislation and regulations.
	4.2	Tools and equipment are cleaned, checked for serviceability and stored in accordance with workplace procedures.
	4.3	Materials and waste are disposed of, recycled or stored in accordance with workplace procedures, legislation and regulations.

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Communicate effectively by:
 - speaking and listening, including when using basic electric welding equipment and techniques and when receiving and confirming task instructions and requirements
 - reading and interpreting documents, drawings and specifications.
- Solve problems to:
 - secure and brace materials
 - identify distortions and defects
 - clean welds and cuts.
- Plan and organise work including to obtain work instructions and sequence tasks.
- Use technology to:
 - use and maintain tools and equipment effectively and safely
 - commission equipment in accordance with manufacturers' instructions
 - power up and shut down equipment.
- Work cooperatively as a team member.

Required knowledge

- Purpose and function of a range of electric welding tools and techniques.
- Correct terminology when using basic electric welding tools and equipment.
- Workplace safety requirements and OHS legislation.
- Methods of using basic electric welding equipment and techniques in the plumbing industry.
- Relevant legislation and regulations relating to electric welding including Australian standards and plumbing codes, and for occupational health and safety.
- Principles of sustainability.

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.

Safety (OHS) is to be in accordance with state and territory legislation and regulations and may include:

- handling materials
- hazard control
- hazardous materials and substances
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and procedures
- use of first aid equipment
- workplace environment and safety.

Quality assurance requirements may include:

- Australian Standards
- Environment Protection Authority (EPA)
- organisational quality assurance policy
- site safety plan
- workplace operations and procedures.

Specifications may include:

- charts and hand drawings
- diagrams and sketches
- instructions issued by the supervisor
- task drawings
- manufacturers' specifications and instructions
- material safety data sheets (MSDS)
- organisational work specifications and requirements, regulatory and legislative requirements, particularly:
 - OHS and environmental requirements
 - plumbing and gasfitting authority regulations
 - relevant Australian Standards
 - safe work procedures relating to handling and storing plumbing materials and disposal of waste
 - signage
 - verbal, written and graphical instructions
 - task schedules, plans and specifications.

Principles of sustainability may relate to:

- use of materials and resources to meet the current needs of society while preserving the environment for the future
- selection of material
- efficient use and recycling of material
- disposal of waste material to ensure minimal environmental impact
- energy efficiency

- water efficiency
- environmental, social and economic considerations.

Materials may include:

- mild steel
- galvanised iron
- sheet metal
- copper
- brass
- alloys
- cast iron.

Types of **tools and equipment** may include:

- arc welders
- mig welders
- tig welders
- spot welders
- clamps
- welding rods
- chippers
- wire brushes.

Tools that must not be used include:

- angle or side grinders with a disc capability greater than 150 mm in diameter.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range statement.

Overview of assessment

This unit of competency must be assessed in a plumbing workshop or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate plumbing and services workplace conditions, materials, activities, responsibilities and procedures.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The assessment must confirm the person is competent to select, inspect and use electric welding tools in a safe, sustainable and appropriate manner.

Context of and specific resources for assessment

An assessment must be done in an actual or simulated plumbing workplace.

An assessment must be conducted using current workplace techniques, procedures, tools, equipment and materials, and in accordance with all legal work requirements.

Evidence may include the results of projects, and evidence of the process the participant followed.

Reasonable adjustments should be made as required to the assessment of a person with personal characteristic(s) protected by law to ensure the assessment environment or methods do not disadvantage them.

Assessments should not require higher employability skills than those required for the work being assessed.

The main assessment resources should be:

- a plumbing workshop or simulated workplace
- materials and equipment for electric welding techniques
- manufacturers' instructions
- job tasks, specifications, work instructions and workplace procedures.

Method of assessment

Assessment must be by direct observation of work being performed, applying the required knowledge and skills, including with questioning about required knowledge, to determine the person's competency over time in a range of situations.

Assessment may be in conjunction with assessment of other units of competency.

If the assessment is part of a structured learning program, evidence may relate to several instances of work at different times, separated by further learning and practice. The assessor must decide only when they are completely confident the person is competent.

VU21797 Use basic plumbing hand tools

Unit descriptor	This unit specifies the competency required to use basic hand tools for a range of simple plumbing tasks. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
Employability skills	This unit contains employability skills.
Prerequisite unit	CPCCOHS1001A Work safely in the construction industry
Application of the unit	This unit is to be conducted under supervision.

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

Performance criteria indicate the standard of performance required to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.

1. Identify basic plumbing hand tools	<p>1.1 Safety (OHS) requirements associated with the use of basic plumbing hand tools, and workplace environmental requirements, are adhered to and provide a safe workplace environment.</p> <p>1.2 Quality assurance requirements are identified and adhered to in accordance with workplace procedures.</p> <p>1.3 Principles of sustainability are applied to work preparation and the plumbing application.</p> <p>1.4 Correct terminology is used when working with basic plumbing hand tools.</p> <p>1.5 Types of basic plumbing hand tools and their functions are discussed to determine their suitability for the job.</p>
2. Prepare to use basic plumbing hand tools	<p>2.1 Basic plumbing hand tools are selected to meet the requirements of the job.</p> <p>2.2 Hand tools are checked for serviceability, safety and any faults reported to supervisor in accordance with workplace procedures.</p> <p>2.3 Workplace procedures are followed when selecting and using basic hand tools.</p> <p>2.4 Personal protective equipment (PPE) is selected and fitted correctly, relevant to the specific tool and its use.</p>
3. Manage basic plumbing hand tools	<p>3.1 Hand tools are safely handled according to their intended use and manufacturers' recommendations.</p> <p>3.2 Hand tools are employed appropriately in sequence with the task and job specification.</p> <p>3.3 Hand tools are safely situated when not in immediate use.</p>
4. Clean up the work	<p>4.1 The work area is cleaned in accordance with workplace</p>

- area procedures, legislation and regulations.
- 4.2 Tools and equipment are cleaned, checked for serviceability and stored in accordance with workplace procedures.
- 4.3 Materials and waste are disposed of, recycled or stored in accordance with workplace procedures, legislation and regulations.

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Communicate effectively by:
 - speaking and listening, including requesting and using basic plumbing hand tools and when receiving and confirming task instructions and requirements
 - reading and interpreting documents, drawings and specifications.
- Solve problems to use tools in the sequence of the task.
- Plan and organise work including to obtain work instructions and sequence tasks.
- Use technology to use and maintain tools and equipment effectively and safely.
- Work cooperatively as a team member.

Required knowledge

- Purpose and function of hand tools.
- Correct terminology when using basic plumbing hand tools.
- Workplace safety requirements and OHS legislation.
- Methods of using basic plumbing hand tools in the plumbing industry.
- Relevant legislation and regulations relating to using basic plumbing hand tools including Australian standards and plumbing codes, and for occupational health and safety.

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.

Safety (OHS) is to be in accordance with state and territory legislation and regulations and may include:

- handling materials
- hazard control
- hazardous materials and substances
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and procedures
- use of first aid equipment
- workplace environment and safety.

Quality assurance may include:

- Australian Standards

- Environment Protection Authority (EPA)
- organisational quality assurance policy
- site safety plan
- workplace operations and procedures.

Principles of sustainability may relate to:

- use of materials and resources to meet the current needs of society while preserving the environment for the future
- selection of material
- efficient use and recycling of material
- disposal of waste material to ensure minimal environmental impact
- energy efficiency
- water efficiency
- environmental, social and economic considerations.

Basic plumbing hand tools may include:

- pipe wrenches, footprints, multi-grips
- hacksaws
- wood saw
- tin snips
- files and rasps
- lead beating tools
- pop riveters
- caulking guns
- soldering irons
- squares
- spirit levels
- screwdrivers
- hammers
- chisels, wood and masonry
- shifters
- basin spanners
- tube cutters
- tube benders
- tube flaring tools
- shovel, pick, crowbar
- hydraulic tools
- digital and electronic devices
- specialist crimping tools.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range statement.

Overview of assessment	A person who demonstrates competency in this unit must be able to provide evidence that they can safely, effectively and efficiently use basic hand tools within organisational requirements and applicable to the plumbing industry
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The assessment must confirm the person is competent to select, inspect and use basic hand tools in a safe, sustainable and appropriate manner applicable to the job task.
Context of and specific resources for assessment	<p>An assessment must be done in an actual or simulated plumbing workplace.</p> <p>An assessment must be conducted using current workplace techniques, procedures, tools, equipment and materials, and in accordance with all legal work requirements.</p> <p>Evidence may include the results of projects, and evidence of the process the participant followed.</p> <p>Reasonable adjustments should be made as required to the assessment of a person with personal characteristic(s) protected by law to ensure the assessment environment or methods do not disadvantage them.</p> <p>Assessments should not require higher employability skills than those required for the work being assessed.</p> <p>The main assessment resources should be:</p> <ul style="list-style-type: none"> • a plumbing workshop or simulated workplace • basic hand tools • materials and equipment for using hand- held tools • manufacturers' instructions • job tasks, specifications, work instructions and workplace procedures.
Method of assessment	<p>Assessment must be by direct observation of work being performed, applying the required knowledge and skills, including with questioning about required knowledge, to determine the person's competency over time in a range of situations.</p> <p>Assessment may be in conjunction with assessment of other units of competency.</p> <p>If the assessment is part of a structured learning program, evidence may relate to several instances of work at different times, separated by further learning and practice. The assessor must decide only when they are completely confident the person is competent.</p>

VU21798 Use basic power tools

Unit descriptor This unit specifies the competency required to identify, select, use and store basic power tools associated with simple plumbing tasks.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Employability skills This unit contains employability skills.

Prerequisite unit CPCCOHS1001A Work safely in the construction industry

Application of the unit This unit is to be conducted under supervision.

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

Performance criteria indicate the standard of performance required to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.

- | | |
|-------------------------------------|---|
| 1. Identify basic power tools | <p>1.1 Safety (OHS) requirements associated with the use of power tools, and workplace environmental requirements, are determined to provide a safe workplace environment.</p> <p>1.2 Quality assurance requirements are identified and adhered to in accordance with workplace procedures.</p> <p>1.3 Basic power tool types and their functions are discussed and specified for designated plumbing tasks.</p> <p>1.4 Appropriate power sources are identified to determine that outlets and cables match tool specifications.</p> <p>1.5 Information is accessed and documentation completed in accordance with workplace procedures.</p> |
| 2. Prepare to use basic power tools | <p>2.1 Power tools are selected consistent with the requirements of the task, job requirements and manufacturers' specifications.</p> <p>2.2 Correct terminology is used when discussing the use of basic power tools.</p> <p>2.3 Personal protective equipment (PPE) is selected, applied and maintained, relevant to the specific tool.</p> <p>2.4 Equipment to support, brace, hold and position materials is correctly selected and set up to avoid hazards and injury.</p> <p>2.5 Principles of sustainability are applied to work preparation and the plumbing application.</p> |

- | | |
|----------------------------|---|
| 3. Apply basic power tools | 3.1 Materials are cut and drilled according to the designated plumbing task and job specifications. |
| | 3.2 Power tools are switched off and are safely positioned when not in immediate use during the job task. |
| 4. Clean up the work area | 4.1 The work area is cleaned in accordance with workplace procedures, legislation and regulations. |
| | 4.2 Tools and equipment are cleaned, checked for serviceability and stored in accordance with workplace procedures. |
| | 4.3 Materials and waste are disposed of, recycled or stored in accordance with workplace procedures, legislation and regulations. |

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Communicate effectively by:
 - speaking and listening, including when reporting faults, using basic power tools and when receiving and confirming task instructions and requirements
 - reading and interpreting documents, drawings and specifications.
- Solve problems to:
 - identify appropriate power sources and cables
 - secure and brace materials.
- Plan and organise work including to select power tool consistent with the task and sequence tasks.
- Use technology to use and maintain tools and equipment effectively and safely.
- Work cooperatively as a team member.

Required knowledge

- Purpose and function of basic power tools
- Power sources and types.
- Correct terminology associated with using basic power tools.
- Workplace safety requirements and OHS legislation.
- Methods of using basic power tools in the plumbing industry.
- Relevant legislation and regulations relating to using basic power tools including Australian standards and plumbing codes, and for occupational health and safety.

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.

Safety (OHS) is to be in accordance with state and territory legislation and regulations and may include:

- manual handling materials and equipment
- hazard control
- hazardous materials and substances
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and procedures
- use of first aid equipment
- workplace environment and safety.

Safety (OHS) must include:

- AS/NZS 3760, In-service safety inspection and testing of electrical equipment. This standard specifies procedures for the safety inspection and testing of low-voltage, single-phase and poly-phase (e.g. nominal 240V and 415V) electrical equipment connected to the power supply by a flexible lead and/or connecting device.

Quality assurance may include:

- Australian Standards
- Environment Protection Authority
- organisational quality assurance policy
- site safety plan
- workplace operations and procedures.

Documentation may include:

- sign out/sign in of tools from store
- fault report if applicable
- risk assessment form.

Power tools may include:

- electric and battery-powered drills
- electric circular saws
- rolled grooving tools
- electric PVC welding tools
- hydraulic tools
- digital or electronic tools
- specialist plumbing cutting tools
- specialist plumbing crimping tools.

Principles of sustainability may relate to:

- use of materials and resources to meet the current needs of society while preserving the environment for the future
- selection of material
- efficient use and recycling of material

- disposal of waste material to ensure minimal environmental impact
- energy efficiency
- water efficiency
- environmental, social and economic considerations.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range statement.

Overview of assessment	This unit of competency must be assessed in a plumbing workshop or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate plumbing and services workplace conditions, materials, activities, responsibilities and procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The assessment must confirm the person is competent to select, inspect and use basic power tools in a safe, sustainable and appropriate manner, relevant to job task requirements.
Context of and specific resources for assessment	<p>An assessment must be done in an actual or simulated plumbing workplace.</p> <p>An assessment must be conducted using current workplace techniques, procedures, tools, equipment and materials, and in accordance with all legal work requirements.</p> <p>Evidence may include the results of projects, and evidence of the process the participant followed.</p> <p>Reasonable adjustments should be made as required to the assessment of a person with personal characteristic(s) protected by law to ensure the assessment environment or methods do not disadvantage them.</p> <p>Assessments should not require higher employability skills than those required for the work being assessed.</p>
Method of assessment	<p>Assessment must be by direct observation of work being performed, applying the required knowledge and skills, including with questioning about required knowledge, to determine the person's competency over time in a range of situations.</p> <p>Assessment may be in conjunction with assessment of other units of competency.</p> <p>If the assessment is part of a structured learning program, evidence may relate to several instances of work at different times, separated by further learning and practice. The assessor must decide only when they are completely confident the person is competent.</p>

VU21799 Use plumbing pipes, fittings and fixtures to simulate plumbing installations

Unit descriptor	<p>This unit specifies the competency required to identify plumbing pipes, plumbing fittings and plumbing fixtures, including fastening, as part of a variety of simulated plumbing jobs (that is, jobs that will not actually have water or gas connected) and in accordance with job, organisational and legal requirements.</p> <p>Registration and/or licensing requirements are applicable to undertake tasks associated with this unit. A person who carries out plumbing work in Victoria must be registered or licensed with the Victorian Building Authority (or working under supervision).</p>
Employability skills	This unit contains employability skills.
Prerequisite unit	CPCCOHS1001A Work safely in the construction industry
Application of the unit	<p>This unit is to be conducted under supervision.</p> <p>This unit is to be embedded into other units to provide the participant with the skills and knowledge to assemble, fabricate and support plumbing pipes, plumbing fittings and plumbing fixtures in an appropriate sequence and in accordance with plumbing regulation</p>

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

Performance criteria indicate the standard of performance required to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.

1. Identify pipes, fittings and fixtures	<p>1.1 Correct terminology is used when discussing properties and characteristics of pipes, fittings and fixtures, and when requesting component parts.</p> <p>1.2 <i>Principles of sustainability</i> are applied to work preparation and the plumbing application.</p> <p>1.3 Pipes, fittings and fixtures are selected for suitability for a simple plumbing task.</p>
2. Manage pipes, fittings and fixtures	<p>2.1 Plans and <i>specifications</i> for the task are discussed with the supervisor.</p> <p>2.2 <i>Pipes, fittings and fixtures</i> are prepared for suitability for a simple plumbing task.</p> <p>2.3 Australian Standards and <i>quality assurances</i> requirements are adhered to, in accordance with organisational procedures.</p> <p>2.4 <i>Safety (OHS)</i> requirements associated with manual handling and workplace environmental requirements are adhered to and provide a safe workplace environment.</p>

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| 3. Work with pipes, fittings and fixtures | <p>3.1 Pipes, fittings and fixtures are used according to manufacturers' recommendations and job task requirements.</p> <p>3.2 Pipes, fittings and fixtures are fixed and secured in accordance with regulations, manufacturers' recommendations and job task requirements.</p> <p>3.3 Pipes, fittings and fixtures are applied in an appropriate sequence to the job task and in accordance with manufacturers' recommendations.</p> |
| 4. Secure fasteners and fixings | <p>4.1 Substrate and/or material to be fastened or fixed to is assessed for compatibility to the task.</p> <p>4.2 Material or fixture is assessed for its compatibility with proposed fasteners and fixings to be used.</p> <p>4.3 Purpose of materials or fixture to be fastened is identified and tolerances are assessed.</p> <p>4.4 Fasteners and fixings are installed according to the manufacturer specifications.</p> |
| 5. Clean up the work area | <p>5.1 The work area is cleaned and waste is disposed of or recycled in accordance with the state or territory legislation and workplace procedures.</p> <p>5.2 Tools and equipment are cleaned, checked for serviceability and stored in accordance with the workplace procedures.</p> <p>5.3 Materials and waste are disposed of, recycled or stored in accordance with the state or territory legislation and workplace procedures.</p> |

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Communicate effectively by:
 - speaking and listening, including when using plumbing pipes, fittings and fixtures to simulate plumbing installations as well as when receiving and confirming task instructions and requirements
 - reading and interpreting documents, drawings and specifications.
- Solve problems to secure components.
- Plan and organise work including to obtain work instructions and sequence tasks.
- Use technology to use and maintain tools and equipment effectively and safely, including to assemble component parts.
- Work cooperatively as a team member.

Required knowledge

- Purpose, characteristics and application of a range of plumbing pipes, plumbing fittings and plumbing fixtures.
- Correct terminology for using plumbing pipes, fittings and fixtures to simulate plumbing installations.

- Environmental Protection Authority (EPA) legislation.
- Workplace safety requirements and OHS legislation.
- Methods of using plumbing pipes, fittings and fixtures to simulate plumbing installations.
- Relevant legislation and regulations relating to using plumbing pipes, fittings and fixtures to simulate plumbing installations including Australian standards and plumbing codes, and for safety and sustainability.

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.

Principles of sustainability may relate to:

- use of materials and resources to meet the current needs of society while preserving the environment for the future
- selection of material
- efficient use and recycling of material
- disposal of waste material to ensure minimal environmental impact
- energy efficiency
- water efficiency
- environmental, social and economic considerations.

Specifications may include:

- charts, hand drawings, diagrams and sketches
- instructions issued by supervisor
- job task drawings
- manufacturers' specifications and instructions
- material safety data sheets (MSDS)
- organisational work specifications and requirements, regulatory and legislative requirements, particularly:
 - OHS and environmental requirements
 - plumbing and gasfitting authority regulations.

Types of ***pipes*** must include:

- copper tube
- mild steel
- polymer pipes.

Types of ***pipes*** may include, but are not limited to:

- alloy tube
- cast iron
- galvanised steel
- stainless steel
- aluminium
- composite pipe.

Types of **fittings** may include:

- brass fittings
- copper fittings
- galvanised iron fittings
- cast iron fittings
- bends
- junctions
- ceramic
- plastic
- taps
- valves
- spindles
- handles
- washers and O rings
- filters.

Types of **fixtures** may include:

- baths
- basins
- sinks
- WC
- urinal
- troughs
- shower base
- water heating units
- dishwasher.

Quality assurance requirements include:

- Australian Standards
- Environment Protection Authority (EPA)
- organisational quality assurance policy
- site safety plan
- workplace operations and procedures.

Safety (OHS) is to be in accordance with state and territory legislation and regulations and may include:

- manual handling materials and equipment
- hazard control
- hazardous materials and substances
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and procedures
- use of first aid equipment
- workplace environment and safety
- relevant Australian Standards
- safe work procedures relating to handling and storing plumbing

materials, including the disposal of waste

- signage
- verbal, written and graphical instructions.

Fasteners and fixings
may include:

- chemical fasteners
- masonry anchors
- screws.
- Nails
- toggles
- clips
- brackets
- pipe supports.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range statement.

Overview of assessment	This unit of competency must be assessed in a plumbing workshop or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate plumbing and services workplace conditions, materials, activities, responsibilities and procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The assessment must confirm the person is competent to identify, select and work with and fasten pipes, fittings and fixtures and/or equipment in a safe and sustainable manner and in accordance with the relevant to job task requirements and manufacturers' recommendations.
Context of and specific resources for assessment	<p>An assessment must be done in an actual or simulated plumbing workplace.</p> <p>An assessment must be conducted using current workplace techniques, procedures, tools, equipment and materials, and in accordance with all legal work requirements.</p> <p>Evidence may include the results of projects, and evidence of the process the participant followed.</p> <p>Reasonable adjustments should be made as required to the assessment of a person with personal characteristic(s) protected by law to ensure the assessment environment or methods do not disadvantage them.</p> <p>Assessments should not require higher employability skills than those required for the work being assessed.</p> <p>The main assessment resources should be:</p> <ul style="list-style-type: none"> • a plumbing workshop or simulated workplace • a range of pipes, fittings and fixtures • a range of fasteners and fixings • manufacturers' instructions • job tasks, specifications, work instructions and workplace procedures.
Method of assessment	<p>Assessment must be by direct observation of work being performed, applying the required knowledge and skills, including with questioning about required knowledge, to determine the person's competency over time in a range of situations.</p> <p>Assessment may be in conjunction with assessment of other units of competency.</p> <p>If the assessment is part of a structured learning program, evidence may relate to several instances of work at different times, separated by further learning and practice. The assessor must decide only when they are completely confident the person is competent.</p>