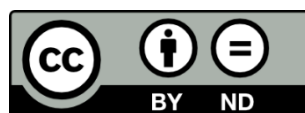


22569VIC

Certificate II in Plumbing

(Pre-apprenticeship)

Version 2



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

Accreditation period: 1 January 2021 to 31 December 2025

Modification History

Version 2 1 September 2022	Course structure updated to reflect current first aid unit HLTAID010 Provide basic emergency life support. This supports the decision of national and state VET Regulators to ensure delivery of current first aid units within Victorian Crown Copyright courses. Please refer to the ASQA website .
Version 1.1 18 February 2021	Minor typos corrected and inclusion of 'for example' in unit descriptor VU23053
Version 1	Accredited 30 October 2020

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Section A: Copyright and course classification information

1. Copyright owner of the course	<p>Copyright of this material is held by the Department of Education and Training Victoria.</p> <p>© State of Victoria (Department of Education and Training) 2021</p>
2. Address	<p>Executive Director</p> <p>Engagement, Participation and Inclusion</p> <p>Higher Education and Skills</p> <p>Department of Education and Training (DET)</p> <p>GPO Box 4367</p> <p>MELBOURNE VIC 3001</p> <p>Organisational contact:</p> <p>Manager, Training Products</p> <p>Higher Education and Skills</p> <p>Telephone: (03) 7022 1619</p> <p>Email: course.enquiry@education.vic.gov.au</p> <p>Day-to-day contact:</p> <p>Curriculum Maintenance Manager, Building Industries</p> <p>Holmesglen Institute</p> <p>PO Box 42</p> <p>HOLMESGLEN VIC 3148</p> <p>Telephone: (03) 9564 1987</p> <p>Email: teresa.signorello@holmesglen.edu.au</p>
3. Type of submission	<p>Reaccreditation.</p>
4. Copyright acknowledgement	<p>The following units of competency:</p> <p>CPCCWHS1001 Prepare to work safely in the construction industry</p>

	<p>CPCCWHS2001 Apply WHS requirements, policies and procedures in the construction industry</p> <p>CPCCCM1015 Carry out measurements and calculations</p> <p>CPCCCM2001 Read and interpret plans and specifications</p> <p>are from the CPC Construction, Plumbing and Services Training Package administered by the Commonwealth of Australia.</p> <p>© Commonwealth of Australia.</p> <p>The following unit of competency:</p> <p>CPCPCM2039A Carry out interactive workplace communication</p> <p>is from the CPC08 Construction, Plumbing and Services Training Package administered by the Commonwealth of Australia.</p> <p>© Commonwealth of Australia.</p> <p>The following unit of competency:</p> <p>BSBWRT311 - Write simple documents</p> <p>is from the BSB Business Services Training Package administered by the Commonwealth of Australia.</p> <p>© Commonwealth of Australia.</p> <p>The following unit of competency:</p> <p>CUAACD303 Produce technical drawings</p> <p>is from the CUA Creative Arts and Culture Training Package administered by the Commonwealth of Australia.</p> <p>© Commonwealth of Australia.</p> <p>The following unit of competency:</p> <p>HLTAID010 Provide basic emergency life support</p> <p>is from the HLT-Health Training Package administered by the Commonwealth of Australia.</p> <p>© Commonwealth of Australia.</p>
<p>5. Licensing and franchise</p>	<p>Copyright of this material is reserved to the Crown in the right of the State of Victoria. © State of Victoria (Department of Education and Training) 2021.</p> <p>This work is licensed under a Creative Commons Attribution-NoDerivs 3.0 Australia licence. See website here</p> <p>You are free to use, copy and distribute to anyone in its original form as long as you attribute Higher Education and Skills, Department of Education and Training as the author and you license any derivative work you make available under the same licence.</p>

	
6. Course accrediting body	Victorian Registration and Qualifications Authority
7. AVETMISS information	<p>ANZSCO code</p> <p>Australian and New Zealand Standard Classification of Occupations 334111 Plumber (General)</p> <p>ASCED Code</p> <p>Field of Education 0403 Building</p> <p>National course code</p> <p>22569VIC</p>
8. Period of accreditation	1 January 2021 to 31 December 2025

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>The outcome of the Certificate II in Plumbing(Pre-apprenticeship) does not meet the requirements for a registered plumber.</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>Society values a clean water supply and safe waste sanitation facilities. Significant health consequences may arise if incompetent practices are applied to the provision of these services. Therefore, the plumbing industry in Australia is a highly regulated sector, and the occupation of 'plumbing' is licenced and registered through acts of law.</p> <p>Approximately 26,750 plumbing businesses operate nationally, mainly small operators and contractors, who provide general plumbing or drainage services. This includes installing and repairing water supply, sewer lines, septic tanks, drainage and gas systems, as well as mechanical and roof plumbing. In terms of segmentation, water plumbing makes up 29.8% of the market, followed by sanitary 23.1%, gas fitting 22.8%, mechanical 14% and drainage and roofing 10.3%.¹</p> <p>The plumbing industry has had a long association with, and offers considerable support for, pre-apprenticeship training. Previous course reaccreditation processes have attracted strong interest from the major industry stakeholders. Involvement in course development by the Master Plumbers Association, Plumbing Trades Employees Union, Air-Conditioning and Mechanical Contractors Association, Victorian Building Authority and a range of employers, ensures contemporary practices are incorporated to produce work ready graduates.</p> <p>Whilst the pre apprenticeship qualification is not the only pathway to employment, stakeholders encourage new entrants to have a</p>	

¹ <https://clients1.ibisworld.com/reports/au/industry/default.aspx?entid=324>

range of basic skills that promote safety and an understanding of how the industry works, before commencing a full-time apprenticeship. This course supports the development of these skills.

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.

Anecdotal information, suggests support by business for the plumbing pre-apprenticeship is reflected in the number of students who obtain an apprenticeship on graduation. Whilst it is incumbent upon training providers to choose delivery strategies appropriate to the needs of their cohort, there is a strong correlation between the traditional 12 to 16 week full-time course delivery model and successful graduate employment as a plumbing apprentice.

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 developed further in the workplace.

Employers advise that graduates of the course are preferred as potential apprentices. This is important advice for those wanting to secure a plumbing apprenticeship. Work continues to exist for individuals and completing this qualification will provide applicants with an advantage in pursuing career opportunities.

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 into the nationally endorsed Certificate III in Plumbing. This allows for employment as a plumbing apprentice in the domestic or commercial/ industrial sectors. Ongoing demand for the course

There are currently 48,200 plumbers operating nationally; prior to COVID-19 future industry growth was described as 'strong'. Moderate job growth was reported from the years 2011 to 2016.²

² <https://joboutlook.gov.au/Occupation?search=Career&code=334111>

There are approximately 19,400 plumbers currently operating in Victoria. Employment prospects within the sector are linked to economic demand, largely based on new developments, or existing residential, commercial and infrastructure plumbing maintenance requirements. While the latter is mostly impervious to economic conditions (e.g. burst pipes require immediate action), work related to property construction is sensitive to the economic environment. The advent of COVID-19 has created a downturn in general business confidence. This is evidenced by the cancellation of a number of prospective private sector construction projects, and indefinite stoppage of those in the design and documentation phases.³

While plumbing demand related to development may be suppressed in the short term, maintenance-related plumbing demand is expected to remain stable over the medium term; employment prospects should continue to arise due to newly created positions as a result of attrition/turnover. Government support for businesses due to the economic effects of COVID-19 may also assist in maintaining business viability and apprenticeship employment. For example, the Australian Government is supporting businesses to keep apprentices employed through a new 'Supporting Apprentices and Trainees Wage Subsidy' until 30 Sept 2020. This may also assist in sustaining course demand in the short term.

Research on SEEK.com.au as at mid July 2020 reveals there are 3,992 positions advertised for a 'plumber' nationally, with 1036 of those vacancies in Victoria. Search terms related to 'plumbing apprenticeship' revealed, 514 vacancies nationally and 196 within Victoria.

The Victorian Skills Gateway (accessed 15 July 2020) records the vocational category of 'Plumber (General)' as a specialist 'occupation in demand' and labels plumbing as a skills shortage area. This has traditionally been the case for this vocational area.

Overall data indicates that skilled workers are required now to address a shortfall in labour supply.

Table 1 shows available enrolment data for the 22304VIC Certificate II in Plumbing (Pre-apprenticeship) representing Victorian enrolments from 2016 to 2020.

Enrolment data for 22304VIC Certificate II in Plumbing (Pre-apprenticeship)

³ <https://aca.org.au/article/pulse-check-no-2-preliminary-results/surveymonkey.com/stories/SM-NT9VPFX9/>



<i>Enrolment data for 22304VIC Certificate II in Plumbing (Pre-apprenticeship) 2016</i>	2017	2018	2019	2020 <i>(half year enrolments only)</i>	
576 GS	535 GS	528 GS	749 GS	346 GS	Government Subsidised
509 FFS	758 FFS	892 FFS	1081 FFS	1122 FFS	Fee For Service

Source: Department of Education and Training data source

Strong enrolment is evident, with over 1,400 enrolments for the first half of 2020, and over 7,000 enrolments since course accreditation. Fee for service enrolments have trended upward consistently over a four year period; government subsidised enrolment remains steady.

Placement of the course on the Free TAFE for Priority Courses List for apprenticeship pathway courses in 2019 and 2020 has had a positive effect on course uptake, particularly in the fee for service area, where half year enrolments for 2020 almost match full year enrolments for 2019.

Emerging graduate statistics reveal that the course has been particularly popular with those aged between 15 to 19 years. Recent figures indicate this trend is changing however, with 60% of all 2020 enrolments over the age of 19 years.

This may suggest some enrolment continuity and roll over, as well as possible career shift for mature age groups due to the Free TAFE initiative.

Enrolments for VET delivered to secondary school students is growing markedly. According to the Victorian Curriculum Assessment Authority total enrolments in 2018 numbered 1,008, 2019 numbered 1,148 and interim enrolments for 2020 number 1,324. In 2019 the delivery of the course within the VET delivered to secondary schools student program underwent a review by the Victorian Curriculum Assessment Authority (VCAA), it is now included as part of the 1,2 3 and 4 unit model for the Victorian Certificate of Education (VCE).

As at May 2020, there were 16 Registered Training Organisations (RTOs) with reported government subsidised delivery of the current course. There are a total of 20 RTOs with the current course on their scope for delivery.

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.*

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.

A project steering committee (PSC) was formed to oversee the development of the proposed accredited course.

The role of the PSC 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 PSC met on the 12th March and 27th July 2020 and included members from representative employer associations, employers (large and small), the Victorian Curriculum and Assessment Authority (VCAA) and training providers.

The PSC was comprised of:

- Kyle Paten - A G Coombs Pty Ltd (Projects), Chair
- Glenn Graham - Chisholm Institute
- Laura Steedman - Air Conditioning and Mechanical Contractors' Association
- Brendan Gould - Master Plumbers Victoria
- Daryl Sutton - Victorian Curriculum and Assessment Authority

In attendance:

- Teresa Signorello, Curriculum Maintenance Manager, Building Industries - Holmesglen Institute
- Susan Fechner, Project Officer - Holmesglen Institute

The 22569VIC Certificate II in Plumbing(Pre-apprenticeship) does not duplicate existing training products.

	<p>This course:</p> <ul style="list-style-type: none"> • does not duplicate, by title or coverage, the outcomes of an endorsed training package qualification • is not a subset of a single training package qualification that could be recognised through one or more statements of attainment or a skill set • does not include units of competency additional to those in a training package qualification that could be recognised through statements of attainment in addition to the qualification • does not comprise units that duplicate units of competency of a training package qualification.
<p>3.2 Review for re- accreditation</p>	<p>Course monitoring and evaluation</p> <p>A mid cycle review of the accredited course was undertaken from March to May 2018 to determine the relevance and currency of its outcomes to industry since accreditation.</p> <p>Data considered for analysis included course enrolments and survey responses from key user groups i.e. graduates, trainers and assessors, existing students of the course and industry employers of the graduates.</p> <p>Desktop research of trending information was also considered in the course review process, consisting of industry report evaluation, appraisal of current affairs issues and monitoring of employment advertisement skill needs.</p> <p>Transition Arrangements</p> <p>The 22569VIC Certificate II in Plumbing (Pre-apprenticeship) replaces and is equivalent to 22304VIC Certificate II in Plumbing (Pre-apprenticeship). The 22304VIC Certificate II in Plumbing (Pre-apprenticeship) is due to expire on 31 December 2020. There can be no new enrolments in the 22304VIC Certificate II in Plumbing (Pre-apprenticeship) after the 31 December 2020.</p> <p>The following table identifies the relationship between units from the previous course and current course.</p>

Mapping Table Certificate II Plumbing (Pre-apprenticeship)

Unit code and title from 22304VIC		Unit code and title from 22569VIC		Relationship
CPCPCM2039A	Carry out interactive workplace communication	CPCPCM2039A	Carry out interactive workplace communication	Same unit
BSBWRT301	Write simple documents	BSBWRT311	Write simple documents	Equivalent
HLTAID002	Provide basic emergency life support	HLTAID002	Provide basic emergency life support	Same unit
CPCCOHS1001A	Work safely in the construction industry	CPCCWHS1001	Prepare to work safely in the construction industry	Equivalent
CPCCOHS2001A	Apply OHS requirements, policies and procedures in the construction industry	CPCCWHS2001	Apply WHS requirements, policies and procedures in the construction industry	Equivalent
VU21794	Prepare to work in the plumbing industry	VU23051	Prepare to work in the plumbing industry	Equivalent
CPCCCM1005A	Carry out measurements and calculations	CPCCCM1015	Carry out measurements and calculations	Equivalent
VU21795	Use and apply basic levelling equipment for plumbing	VU23052	Use and apply basic levelling equipment for plumbing	Equivalent
CPCCCM2001A	Read and interpret plans and specifications	CPCCCM2001	Read and interpret plans and specifications	Equivalent
CUVACD303A	Produce technical drawings	CUAACD303	Produce technical drawings	Equivalent

Unit code and title from 22304VIC		Unit code and title from 22569VIC		Relationship
VU21797	Use basic plumbing hand tools	VU23054	Use basic plumbing hand tools	Equivalent
VU21798	Use basic power tools	VU23055	Use basic power tools	Equivalent
VU21793	Perform basic oxy-acetylene welding and cutting	VU23050	Perform basic oxy-acetylene welding and cutting	Equivalent
VU21796	Use basic electric welding equipment and techniques	VU23053	Use basic electric welding equipment and techniques	Equivalent
VU21799	Use plumbing pipes, fittings and fixtures to simulate plumbing installations	VU23056	Use plumbing pipes, fittings and fixtures to simulate plumbing installations	Equivalent
VU21789	Apply basic sheet metal practices	VU23046	Apply basic sheet metal practices	Equivalent
VU21791	Fabricate simple plumbing pipe systems	VU23048	Fabricate simple plumbing pipe systems	Equivalent
VU21790	Cut and penetrate building materials and structures	VU23047	Cut and penetrate building materials and structures	Equivalent
VU21792	Identify career pathways in the plumbing industry	VU23049	Identify career pathways in the plumbing industry	Equivalent

4. Course outcomes	Standards 1, 2, 3 and 4 AQTF Standards for Accredited Courses
4.1 Qualification level	<p>Reference: Standards 1, 2 and 3 AQTF Standards for Accredited Courses</p> <p>The outcomes of the 22569VIC Certificate II in Plumbing (Pre-apprenticeship) complies with the level 2 specifications of the Australian Qualifications Framework second edition, January 2013.</p> <p>Graduates will have a range of cognitive, technical and communication skills to:</p> <ul style="list-style-type: none"> • 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 (e.g. resume writing and interview practice). <p>On completion of the Certificate II in Plumbing (Pre-apprenticeship) participants will have the skills and knowledge to:</p> <ul style="list-style-type: none"> • define and use 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 apply safe working procedures.

	<p>The volume of learning for this qualification is typically 0.5 to 1 year and incorporates a range of learning activities such as:</p> <ul style="list-style-type: none"> • 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.
4.2 Employability skills	<p><i>Reference: Standard 4 AQTF Standards for Accredited Courses</i></p> <p><i>The employability skills to be achieved in this course are shown in Appendix 2.</i></p>
4.3 Recognition given to the course(if applicable)	<p><i>Reference: Standard 5 AQTF Standards for Accredited Courses</i></p> <p><i>Not applicable.</i></p>
4.4 Licensing/ regulatory requirements (if applicable)	<p>Reference: Standard 5 AQTF Standards for Accredited Courses</p> <p>There are no licensing requirements for this course.</p> <p>Participants who visit a construction site will require a Construction Induction Card (CIC) issued by Work Safe Victoria, which can be achieved by completing the unit CPCCWHS1001 Prepare to work safely in the construction industry. Further information is available on the Worksafe website here.</p> <p>Plumbing work is defined by ten (10) main classes and five (5) 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>
5. Course rules	Standards 2, 6, 7 and 9 AQTF Standards for Accredited Courses
5.1 Course structure	<p>To be awarded the 22569VIC Certificate II in Plumbing (Pre-apprenticeship) all 19 units of competency must be achieved.</p> <p>All units are <i>core</i> to provide a consistent outcome for graduates with basic skills that allows for employment across all streams of plumbing.</p> <p><i>Where the full course is not completed a Statement of Attainment will be issued for any completed unit.</i></p>

Unit of competency code	Field of Education code (six-digit)	Unit of competency title	Pre-requisite	Nominal hours
Core units				
CPCCWHS1001	061301	Prepare to work safely in the construction industry	Nil	6
CPCCWHS2001	061301	Apply WHS requirements, policies and procedures in the construction industry	Nil	20
CPCCCM1015	010101	Carry out measurements and calculations	Nil	20
CPCPCM2039A	120505	Carry out interactive workplace communication	Nil	10
CPCCCM2001	040301	Read and interpret plans and specifications	Nil	36
BSBWRT311	080901	Write simple documents	Nil	30
CUAACD303	100501	Produce technical drawings	Nil	50
HLTAID010	069907	Provide basic emergency life support	Nil	12
VU23046	040327	Apply basic sheet metal practices	Nil	50
VU23047	040399	Cut and penetrate building materials and structures	Nil	30
VU23048	040327	Fabricate simple plumbing pipe systems	Nil	30
VU23049	120501	Identify career pathways in the plumbing industry	Nil	30
VU23050	040327	Perform basic oxy-acetylene welding and cutting	Nil	20
VU23051	120599	Prepare to work in the plumbing industry	Nil	20
VU23052	040301	Use and apply basic levelling equipment for plumbing	Nil	8
VU23053	040327	Use basic electric welding equipment and techniques	Nil	20
VU23054	040327	Use basic plumbing hand tools	Nil	50
VU23055	040327	Use basic power tools	Nil	20
VU23056	040327	Use plumbing pipes, fittings and fixtures to simulate plumbing installations	Nil	30
Total nominal hours				492

<p>5.2 Entry requirements</p>	<p>Standard 9 AQTF Standards for Accredited Courses <i>There are no entry requirements for the 22569VIC Certificate II in Plumbing (Pre-apprenticeship).</i></p> <p>Learners enrolling in the 22569VIC Certificate II in Plumbing (Pre-apprenticeship) are best equipped to successfully undertake the course if they have as a minimum, language, literacy and numeracy skills that align to Level 2 of the Australian Core Skills Framework (ACSF). The ACSF can be accessed from the education department's website available here.</p> <p><i>Learners with language, literacy and numeracy skills at a lower level than suggested may require additional support to successfully undertake the qualification.</i></p>
<p>6. Assessment</p>	<p>Standards 10 and 12 AQTF Standards for Accredited Courses</p>
<p>6.1 Assessment strategy</p>	<p>Reference: Standard 10 AQTF Standards for Accredited Courses</p> <p>All assessment, including Recognition of Prior Learning (RPL), must be compliant with the requirements of:</p> <p style="padding-left: 40px;">Standard 1 of the AQTF: Essential Conditions and Standards for Initial/Continuing Registration and Guidelines 4.1 and 4.2 of the VRQA Guidelines for VET Providers,</p> <p>or</p> <p style="padding-left: 40px;">the Standards for Registered Training Organisations (SRTOs),2015</p> <p>or</p> <p style="padding-left: 40px;">the relevant standards and guidelines for RTOs at the time of assessment.</p> <p>Assessment strategies should be designed to:</p> <ul style="list-style-type: none"> cover the range of skills and knowledge required to demonstrate achievement of competence collect evidence on a number of occasions to suit a variety of contexts and situations be appropriate to the knowledge, skills, methods of delivery and needs and characteristics of learners be equitable to all groups of learners. <p>Assessments should not require higher employability skills than those required for the work being assessed.</p> <p>Assessment may be in conjunction with assessment of other units of competency.</p>



	<p>Assessment strategies for the course should reflect the practical nature of the work undertaken; It is recommended that assessment include:</p> <ul style="list-style-type: none"> oral and written questioning related to underpinning knowledge practical demonstration of activities which combine a number of learning outcomes to provide depth and context to the training holistic assessment that reflects realistic job tasks. <p>Assessment of imported units of competency from nationally endorsed Training Packages must comply with the assessment requirements detailed in the source training product.</p>
<p>6.2 Assessor competencies</p>	<p>Reference: Standard 12 AQTF Standards for Accredited Courses</p> <p>Assessment must be undertaken by a person or persons in accordance with:</p> <ul style="list-style-type: none"> Standard 1.4 of the AQTF: Essential Conditions and Standards for Initial/Continuing Registration and Guidelines 3 of the VRQA Guidelines for VET Providers, or the Standards for Registered Training Organisations (SRTOs)2015, or the relevant standards and Guidelines for RTOs at the time of assessment. <p>Assessment of imported units of competency from nationally endorsed Training Packages must comply with the requirements for assessors specified in the relevant source training product.</p>
<p>7. Delivery</p>	<p>Standards 11 and 12 AQTF Standards for Accredited Courses</p>
<p>7.1 Delivery modes</p>	<p>Reference: Standard 11 AQTF Standards for Accredited Courses</p> <p>The course aims to develop practical competencies within an industry setting. Practical demonstration and opportunity for application are considered to provide the most suitable strategy to reflect the objectives of the course. Some areas of content may be common to more than one element or more than one unit, therefore integration may be appropriate.</p> <p>Delivery options, including grouping of learners and learning activities, should recognise the varying learning needs, educational backgrounds, preferred learning styles and constraints of the individual learner and the specific</p>



	<p>requirements of each unit. The units may be delivered singularly, or they may be integrated holistically with a number of units.</p> <p>As the role involves practical skill development, the practical skill component of the course must be delivered in a:</p> <p style="padding-left: 40px;">workplace,</p> <p>or</p> <p style="padding-left: 40px;">simulated workplace that accurately reflects workplace conditions. Practical exercises may take the form of realistic, holistic projects to provide the learner with a 'real work' experience.</p> <p>The knowledge components of the course may be delivered using face-to-face, online or blended modes.</p> <p>Consideration of the sequencing of unit delivery is required for the following units: CPCCWHS1001 Prepare to work safely in the construction industry and CPCCWHS2001 Apply WHS requirements, policies and procedures in the construction industry. It is recommended that these units be delivered in the initial phase of student learning to introduce foundational knowledge of WHS/OHS. It is expected that WHS/OHS concepts are addressed within subsequent unit delivery to consolidate learning of safety within practical work tasks.</p>
<p>7.2 Resources</p>	<p>Reference: Standard 12 AQTF Standards for Accredited Courses</p> <p>Training must be undertaken by a person or persons in accordance with:</p> <p style="padding-left: 40px;">Standard 1.4 of the AQTF: Essential Conditions and Standards for Initial/Continuing Registration and Guideline 3 of the VRQA Guidelines for VET Providers,</p> <p>or</p> <p style="padding-left: 40px;">the Standards for Registered Training Organisations (SRTOs) 2015,</p> <p>or</p> <p style="padding-left: 40px;">the relevant standards and Guidelines for RTOs at the time of assessment.</p> <p>Delivery and assessment materials should reflect the local work environment as far as possible.</p> <p>Refer to the individual units for specific tool and equipment requirements. Units of competency imported must comply with the requirements for resources specified in the relevant source training product.</p>

8. Pathways and articulation	Standard 8 AQTF Standards for Accredited Courses
	<p><i>There are no formal articulation arrangements in place at the time of accreditation. Learners who complete units of competency from endorsed training packages or accredited courses will be eligible for credit into other qualifications that contain those units.</i></p> <p><u>Refer to the AQF 2nd Edition, 2013 Pathways Policy here</u></p>
9. Ongoing monitoring and evaluation	Standard 13 AQTF Standards for Accredited Courses
	<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, graduates and teacher evaluation surveys and industry stakeholder's surveys/consultation.</p> <p>The Victorian Registration and Qualifications Authority (VRQA) will be notified of any significant changes required to the course.</p>

Appendix 1 - Employability skills

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

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

Section C - Units of competency

The units of competency imported from training packages can be downloaded from the National Register (<https://training.gov.au/>).

CPCCWHS1001 Prepare to work safely in the construction industry

CPCCWHS2001 Apply WHS requirements, policies and procedures in the construction industry

CPCCCM1015 Carry out measurements and calculations

CPCCCM2001 Read and interpret plans and specifications

CPCPCM2039A Carry out interactive workplace communication

BSBWRT311 Write simple documents

CUAACD303 Produce technical drawings

HLTAID010 Provide basic emergency life support

Following is the list of units of competency developed for the course, which comply with the current requirements from the Training Package Development Handbook and is detailed in this section of the course document:

VU23046	Apply basic sheet metal practices	25
VU23047	Cut and penetrate building materials and structures	30
VU23048	Fabricate simple plumbing pipe systems.....	35
VU23049	Identify career pathways in the plumbing industry	39
VU23050	Perform basic oxy-acetylene welding and cutting	43
VU23051	Prepare to work in the plumbing industry	48
VU23052	Use and apply basic levelling equipment for plumbing	52
VU23053	Use basic electric welding equipment and techniques	56
VU23054	Use basic plumbing hand tools	61
VU23055	Use basic power tools.....	65
VU23056	Use plumbing pipes, fittings and fixtures to simulate plumbing installations	70

VU23046**Apply basic sheet metal practices****Unit descriptor**

This unit specifies the skills and knowledge required to cut, join, fabricate 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.

This unit does not meet the requirements for a registered plumber.

Employability skills

This unit contains employability skills.

Prerequisite unit

Nil

Application of the unit

The cutting, joining and bending of sheet metal products applies to a known workplace environment with established parameters. It involves following instructions to cut, join and bend sheet metal for simple plumbing jobs, the application of skills and knowledge within routine activities and exercising limited responsibility. 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.

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|--|--|
| 1. Plan to perform sheet metal practices | 1.1 Identify sheet metal properties and characteristics and relate to specific tasks.
1.2 Use correct terminology when discussing sheet metal products and sheet metal practices.
1.3 Identify principles of sustainability related to plumbing task preparation.
1.4 Identify and adhere quality assurance requirements in accordance with workplace procedures. |
| 2. Prepare for sheet metal practices | 2.1 Confirm plans and specifications for the tasks with the supervisor to determine the designated sequence.
2.2 Follow safety (WHS/OHS) and environmental requirements associated with sheet metal practices.
2.3 Calculate quantities for the task/s to support efficient cutting and to avoid waste.
2.4 Follow principles of sustainability when preparing to cut, join, fabricate and bend sheet metal products. |
| 3. Cut and join sheet metal and sheet metal products | 3.1 Select and fit appropriate personal protective equipment (PPE) for the task.
3.2 Check tools and equipment for serviceability and report faults to the supervisor. |

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| | 3.3 | Mark out materials according to the requirements of the task, plans and specifications. |
| | 3.4 | Apply fabrication techniques relevant to sheet metal and sheet metal products for specific tasks. |
| | 3.5 | Cut sheet metal to the required shape and dimension, using appropriate cutting tools. |
| | 3.6 | Select and apply joining methods and compatible materials to comply with the task and specifications. |
| 4. Bend and fold sheet metal and sheet metal products | 4.1 | Select tools and equipment to make bends and folds that comply with job specifications and plans. |
| | 4.2 | Clean and prepare bent and folded sheet metal and sheet metal products for joining. |
| | 4.3 | Handle materials in a safe and appropriate manner and to the requirements of the task. |
| 5. Clean up the work area | 5.1 | Clean work area in accordance with workplace procedures, legislation and regulations. |
| | 5.2 | Clean tools and equipment, check for serviceability and store in accordance with workplace procedures. |
| | 5.3 | Dispose, recycle or store materials and waste 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

- Communication skills to:
 - actively listen and question to obtain information
 - receive and confirm task instructions and requirements
- Literacy skills to read and interpret documents, drawings and specifications.
- Numeracy skills to effectively calculate, measure and mark out.
- Problem identification and resolution within job parameters to:
 - calculating and marking out materials
 - checking tools and equipment for serviceability
 - selecting suitable tools for the task.
- Planning and organisational skills to plan work including obtaining work instructions and sequencing work tasks.
- Technology skills 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.
- Team skills to work cooperatively as a team member.

Required knowledge

- Sheet metal practices that apply to the plumbing industry.
- Properties and characteristics of sheet metal.

- Correct terminology associated with sheet metal products and practices.
- Workplace safety requirements and WHS/OHS legislation.
- Relevant legislation and regulations relating to basic sheet metal practices including Australian standards and plumbing codes, and for occupational health and safety, including hazard awareness.
- 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.

Sheet metal may include, but is 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 may include:

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

Specifications may include:

- charts, hand drawings, diagrams and sketches
- instructions issued by supervisor
- job drawings
- manufacturers' specifications and instructions
- safety data sheets (SDS)
- 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 (WHS/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 including awareness of asbestos and silica
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and procedures
- access to first aid equipment
- workplace environment and safety.

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

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

Fabrication techniques may include, but are not limited to:

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

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.

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

The assessment must confirm the person is competent to:

- use correct plumbing terminology when completing tasks
- identify, select and use sheet metal tools, equipment and materials in a safe and sustainable manner, appropriate to the job task.

Context of and specific resources for assessment

Assessments must be done in an actual or simulated plumbing workplace.

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

Assessment resources must include:

- a plumbing workshop or simulated workplace
- 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

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

direct observation of the candidate in a real workplace setting or simulated environment

written and oral questioning to test underpinning knowledge and its application to basic sheet metal practices

project activities that allow the candidate to demonstrate the application of skills and knowledge

portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

VU23047

Cut and penetrate building materials and structures

Unit descriptor

This unit describes performance outcomes, skills and knowledge required to identify the properties of building materials and structures to facilitate cutting and penetration for a range of simple plumbing jobs.

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

This unit does not meet the requirements for a registered plumber.

Employability skills

This unit contains employability skills.

Prerequisite unit

Nil

Application of the unit

The cutting and penetration of building materials and structures applies to a known workplace environment with established parameters. It involves following instructions for identifying the properties of building materials and structures to facilitate cutting and penetration, the application of skills and knowledge within routine activities and exercising limited responsibility. This unit is to be conducted under supervision.

Tools that must not be used are grinders over 150 mm disc capacity

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

- 1.1 Identify **building structures** composition and method of construction.
- 1.2 Identify types and properties of **building materials** to determine appropriate tools to make cuts or penetrations.
- 1.3 Identify the **safety (WHS/OHS)** and environmental requirements to safely cut or penetrate building materials to avoid potential hazards.
- 1.4 Use correct terminology when discussing building materials, structures and cutting and penetrating techniques.
- 1.5 Identify and comply with **quality assurance** requirements in accordance with workplace procedures.
- 1.6 identify **principles of sustainability** related to plumbing task preparation.

2. Prepare to cut or penetrate building materials or structures

- 2.1 Select appropriate **tools** to make cuts or penetrations to building materials or structures.
- 2.2 Confirm plans and **specifications** for the job with the supervisor to determine the sequence of tasks.
- 2.3 Assess and check mark outs for obstructions or hazards before making cuts or penetrations.

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| | 2.4 | Select and correctly fit personal protective equipment (PPE) relevant to the specific tool, material and task. |
| | 2.5 | Apply principles of sustainability to the plumbing task. |
| 3. Perform cuts or penetrations to building materials or structures | 3.1 | Comply with safety (WHS/OHS) and environmental requirements associated with cutting or penetrating building materials or structures to provide a safe workplace environment. |
| | 3.2 | Secure materials appropriately to make cuts or penetrations. |
| | 3.3 | Use cutting or penetrating tools and equipment following manufacturers' recommendations to complete tasks. |
| | 3.4 | Cut and penetrate materials and structures to complete job tasks. |
| 4. Clean up the work area | 4.1 | Clean the work area in accordance with workplace procedures, legislation and regulations. |
| | 4.2 | Clean, check for serviceability and store tools and equipment in accordance with workplace procedures. |
| | 4.3 | Dispose, recycle or store materials and waste 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

- Communication skills to:
 - actively listen and question to obtain information when preparing to cut and penetrate building materials and structure
 - receive and confirm task instructions and requirements
- Literacy skills to read and interpret documents, drawings and specifications.
- Numeracy skills to measure and mark out.
- Problem identification and resolution within job parameters to:
 - mark out and check for obstructions
 - secure materials appropriately.
- Self-management skills to plan and organise work including to obtain work instructions and sequence tasks.
- Technology skills to use and maintain tools and equipment effectively and safely.
- Team skills to 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 WHS/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:

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

- handling materials
- hazard control
- hazardous materials and substances including awareness of asbestos and silica
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and procedures
- access to 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
- safety data sheets (SDSs)
- organisational work specifications and requirements, regulatory and legislative requirements including:
 - building and plumbing codes
 - WHS/OHS and environmental requirements
 - plumbing and gas fitting 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.

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

The assessment must confirm the person is competent to:

- use correct terminology when completing tasks
- identify the properties of building materials and structures
- follow instructions
- safely make cuts and penetrations to building materials and structures.

Context of and specific resources for assessment

Assessments must be done in an actual or simulated plumbing workplace.

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

Assessment resources must include:

- 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

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct observation of the candidate in a real workplace setting or simulated environment
- written and oral questioning to test underpinning knowledge and its application to cutting and penetrating building materials and structures
- project activities that allow the candidate to demonstrate the application of skills and knowledge
- portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

VU23048**Fabricate simple plumbing pipe systems****Unit descriptor**

This unit specifies the performance outcomes, skills and knowledge required to distinguish, select and fabricate drainage, water and gas tubing and pipes 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.

This unit does not meet the requirements for a registered plumber.

Employability skills

This unit contains employability skills.

Prerequisite unit

Nil

Application of the unit

The fabrication of simple plumbing pipe systems applies to a known workplace environment with established parameters. It involves following instructions for identifying properties and characteristics of pipes and tubes, pipe and tube system installations and fabrications, assemblage techniques of pipes and tubes, and the application of skills and knowledge within routine activities. 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 to assemble pipes and tubing

- 1.1 Clarify plans and **specifications** for the job with the supervisor to determine the sequence of tasks.
- 1.2 Comply with **safety (WHS/OHS)** and workplace environmental requirements associated with the use of welding equipment.
- 1.3 Identify and comply with **quality assurance** requirements in accordance with workplace procedures.
- 1.4 Use correct terminology when discussing the fabrication and assembly of pipes and tubes.

2. Prepare to assemble pipes and tubing

- 2.1 Review properties and characteristics of tubes and pipes to determine that they meet Australian Standards and quality assurance requirements.
- 2.2 Review tube and pipe installations in plumbing applications to determine their function and compliance with plumbing regulations.
- 2.3 Select **tools and equipment** for fabrication and assembly according to the job requirements.

3. Join and bend pipes and tubing

- 3.1 Select, correctly fit and maintain personal protective equipment (PPE) relevant to joining and bending pipes and tubing.

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| | 3.2 | Use appropriate <i>fabrication and assembly techniques</i> according to job specifications. |
| | 3.3 | Apply testing procedures on fabricated tasks to determine if the completed work is within predetermined tolerances. |
| 4. Clean up the work area | 4.1 | Clean the work area in accordance with workplace procedures, legislation and regulations. |
| | 4.2 | Clean, check for serviceability and store tools and equipment in accordance with workplace procedures. |
| | 4.3 | Dispose, recycle or store materials and waste 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

- Communication skills to:
 - actively listen and question to obtain information when fabricating simple plumbing pipe systems
 - receive and confirm task instructions and requirements
- Literacy skills to read and interpret documents, drawings and specifications.
- Problem identification and resolution within job parameters to:
 - confirm installations are compliant with plumbing regulations.
- Planning and organisational skills to:
 - obtain work instructions
 - sequence tasks
 - test plumbing tube and pipe systems for compliance.
- Technology skills to use and maintain tools and equipment effectively and safely.
- Team skills to 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 WHS/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.

Specifications may include:

- charts, hand drawings, diagrams and sketches
- instructions issued by the supervisor
- job drawings
- manufacturers' specifications and instructions
- safety data sheets (SDS)
- organisational work specifications and requirements, regulatory and legislative requirements, particularly:
 - building / plumbing codes
 - WHS/OHS and environmental requirements
 - plumbing and gas fitting 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 (WHS/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
- access to first aid
- 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.

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.

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

The assessment must confirm the person is competent to:

- safely and sustainably select and use tools, equipment and materials
- identify properties and characteristics of pipes and tubes
- select pipes and tubes for simple plumbing jobs
- follow instructions to fabricate and assemble pipe systems appropriate to the job task.

Context of and specific resources for assessment

Assessment must be done in an actual or simulated plumbing workplace.

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

Assessment resources must include:

- 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

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct observation of the candidate in a real workplace setting or simulated environment
- written and oral questioning to test underpinning knowledge and its application to identify career paths
- project activities that allow the candidate to demonstrate the application of skills and knowledge
- portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

VU23049 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.

This unit does not meet the requirements for a registered plumber.

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 Source information on key milestones and developments in plumbing to establish past, present and emerging trends in the plumbing industry. |
| | 1.2 Gather and organise information about key milestones systematically and for future reference. |
| 2. Define sectors in the plumbing industry | 2.1 Identify different streams and sectors in the plumbing industry to identify options for employment. |
| | 2.2 Identify the range of roles and responsibilities, and key stakeholders in the plumbing industry. |
| 3. Use information to support career pathway opportunities in the plumbing industry | 3.1 Identify sources of information that relate to employment opportunities in the plumbing industry. |
| | 3.2 Identify, apply and document methods and strategies to gain or enhance employment opportunities. |
| | 3.3 Use resources 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

- Communication skills to:
 - actively listen and question to obtain information on career pathways
 - receive and confirm requirements
- Literacy skills to:
 - source and organise information
 - prepare simple documents

- identify resources for career pathways in the plumbing industry
- determine sectors and streams
- determine roles and responsibilities within the sectors
- Technology skills to search the internet, find web-based resources and store information
- Team skills to work cooperatively as a team member.

Required knowledge

- basic document presentation.
- Highlights in the history of plumbing.
- Plumbing industry sectors and the types of jobs in each.
- How to use digital technology such as 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 but not limited:
- general
 - sanitary
 - mechanical services
 - gas fitting
 - 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:

- digital technology including 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.

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

The assessment must confirm the person is competent to:

- provide evidence that they can distinguish different streams and sectors in the plumbing industry
- develop methods and strategies to seek and identify employment opportunities in the plumbing industry.

Context of and specific resources for assessment

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

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

Assessment resources should include:

- Computers
- Internet
- position vacant advertisements
- career counselling

Method of assessment

industry networks

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- written and oral questioning
- project activities
- presentations
- portfolios

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

VU23050 Perform basic oxy-acetylene welding and cutting

Unit descriptor

This unit describes the performance outcomes, skills and knowledge 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 in accordance with job, organisational and legal requirements.

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

This unit does not meet the requirements for a registered plumber.

Employability skills

This unit contains employability skills.

Prerequisite unit

Nil

Application of the unit

The basic oxy-acetylene welding and cutting applies to a known workplace environment with established parameters. It involves following instructions to use oxy-acetylene equipment to perform basic welds and cuts, the application of skills and knowledge within routine activities and exercising limited responsibility. 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. Plan to weld and cut | <ul style="list-style-type: none"> 1.1 Confirm plans and specifications from the supervisor to determine the appropriate use of oxy-acetylene to the job task. 1.2 Use correct terminology when discussing basic oxy-acetylene welding and cutting. 1.3 Identify quality assurance requirements in accordance with workplace procedures. 1.4 Identify types of oxy-acetylene welding and cutting techniques to determine their suitability for a range of job tasks. 1.5 Identify safety (WHS/OHS) and workplace environmental requirements associated with the use of oxy-acetylene. 1.6 Identify principles of sustainability related to plumbing task preparation. |
| 2. Prepare materials and equipment for welding and cutting | <ul style="list-style-type: none"> 2.1 Select, correctly fit and maintain personal protective equipment (PPE). 2.2 Select and securely clamp materials prior to welding or cutting to avoid hazard and injury. 2.3 Identify and use equipment and techniques appropriate to the specification to fulfil the job task. |

- | | | |
|---------------------------|-----|---|
| | 2.4 | Commission and regulate oxy-acetylene equipment for a specific job and in accordance with manufacturers' recommendations to avoid misuse. |
| 3. Weld and cut materials | 3.1 | Follow quality assurance requirements in accordance with workplace procedures. |
| | 3.2 | Follow safety (WHS/OHS) and workplace environmental requirements associated with the use of oxy-acetylene. |
| | 3.3 | Perform welds and cuts in accordance with the work plan and job task to minimise waste. |
| | 3.4 | Use sustainable work practices that ensure waste minimisation. |
| | 3.5 | Identify defects and distortions and rectify in accordance with the job task. |
| | 3.6 | Use tools, equipment and materials appropriately and in sequence with the job task. |
| | 3.7 | Clean welds and cuts in accordance with the specification. |
| 4. Clean up the work area | 4.1 | Clean the work area in accordance with workplace procedures, legislation and regulations. |
| | 4.2 | Clean, check for serviceability and store tools and equipment in accordance with workplace procedures. |
| | 4.3 | Dispose, recycle or store materials and waste 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

- Communication skills to:
 - receive and confirm task instructions and requirements
 - actively listen and question to obtain information when performing basic oxy-acetylene
 - clarify drawings and specifications
 - report work outcomes and problems.
- Literacy skills to:
 - read and interpret work orders, safety data sheets (SDS)
- Problem identification and resolution within job parameters to:
 - determine types of tools and equipment
 - sequence tasks
 - secure and brace materials
 - identify distortions and defects
 - manage materials in a sustainable manner.
- Self-management skills to plan own work within given task parameters
- Planning and organisational skills to obtain work instructions.

- Technology skills to:
 - use and maintain tools and equipment effectively and safely
 - commission equipment in accordance with manufacturers' instructions.
- Team skills to 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 WHS/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.

Specifications may include:

- charts and hand drawings diagrams and sketches
- instructions issued by supervisor
- job task drawings
- manufacturers' specifications and instructions
- safety data sheets (SDSs)
- organisational work specifications and requirements, regulatory and legislative requirements, particularly:
 - WHS/OHS and environmental requirements
 - plumbing and gas fitting 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.

Quality assurance may include:

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

Safety (WHS/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
- access to 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.

Materials may include:

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

Tools, 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.

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 to perform welding task
- follow instructions to perform basic welding and cutting using oxy-acetylene in a safe and sustainable manner.

Context of and specific resources for assessment

Assessment must be done in an actual or simulated plumbing workplace.

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

Assessment resources must include:

- 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

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct observation of the candidate in a real workplace setting or simulated environment
- written and oral questioning to test underpinning knowledge and its application to oxy-acetylene cutting and welding
- project activities that allow the candidate to demonstrate the application of skills and knowledge
- portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

VU23051**Prepare to work in the plumbing industry****Unit descriptor**

This unit describes the performance outcomes, skills and knowledge required to develop a general awareness of the plumbing industry and work as part of a team.

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

This unit does not meet the requirements for a registered plumber.

Employability skills

This unit contains employability skills.

Application of the unit

A person may use this competency to underpin effective performance when 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.

- | | | | |
|---|--------------------------------------|-----|---|
| 1 | Access plumbing industry information | 1.1 | Identify scope and structure of the <i>plumbing industry</i> and its importance to the economy. |
| | | 1.2 | Determine <i>registration and licensing</i> requirements of plumbers for specific sectors of the industry. |
| | | 1.3 | Recognise <i>industry stakeholders</i> that are involved in the plumbing industry and maintain effective working relationships within the scope of the job role. |
| | | 1.4 | Identify sources of current <i>legislation, regulations and technical information</i> that relate to plumbing work. |
| 2 | Identify own development needs | 2.1 | Determine skills and knowledge necessary to work effectively in the plumbing industry. |
| | | 2.2 | Identify own <i>learning needs</i> for future work requirements in consultation with appropriate personnel. |
| | | 2.3 | Identify opportunities to learn and develop required skills and knowledge for future plumbing industry work prospects. |
| 3 | Work safely in a team | 3.1 | Recognise contributions made by teams to achieving job requirements in the plumbing industry. |
| | | 3.2 | Follow procedures for workplace plumbing team meetings in accordance with supervisor's instructions. |

- 3.3 Determine and undertake individual contributions to team activities in accordance with the plumbing job.
- 3.4 Identify Safe work methods and practices to meet Australian government and state and territory WHS/OHS legislative requirements.
- 3.5 Refer causes of disharmony and other barriers to achieving the team goals 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

- Communication skills to:
 - listen and question when obtaining plumbing industry information
 - convey ideas and information such as learning needs
 - report barriers and problems
- Literacy skills to read and interpret registration and licensing documents, legislative and regulatory requirements
- Numeracy skills to locate information in plumbing legislation.
- Problem solving skills to report team issues to the appropriate person.
- Technology skills to locate key stakeholders information from the internet.
- Team skills to work cooperatively as a team member

Required knowledge

- Types of regulatory information accessible and relevant to plumbers.
- Team dynamics.
- Registration and licensing requirements for plumbers.
- Plumbing industry stakeholders

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.

- Plumbing industry** scope may include:
- drainage
 - water
 - gas
 - mechanical services
 - sanitary
 - roofing
 - irrigation

Registration and licensing includes

- fire protection
- refrigerated Air-conditioning
- water
- sanitary
- drainage
- mechanical services
- roofing
- gasfitting
- type B gasfitting
- irrigation
- fire protection
- refrigerated Air-conditioning

(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.

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

The assessment must confirm the person is competent to:

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

Context of and specific resources for assessment

Assessment must be done in an actual or simulated plumbing workplace.

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

Assessment resources must include:

- access to current plumbing information
- access to the internet
- relevant legislation, Australian Standards and Codes.

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

direct observation of the candidate in a real workplace setting or simulated environment

written and oral questioning

project activities that allow the candidate to demonstrate the application of skills and knowledge

portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

VU23052 Use and apply basic levelling equipment for plumbing

Unit descriptor

This unit describes the performance outcomes, skills and knowledge required to select, set up and use suitable basic levelling equipment for simple plumbing jobs.

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

This unit does not meet the requirements for a registered plumber.

Employability skills

This unit contains employability skills.

Prerequisite unit

Nil

Application of the unit

The use of basic levelling equipment applies to a known workplace environment with established parameters. It involves following instructions to take, record and mark levels and heights, including with gradients, for a range of simple plumbing jobs, the application of skills and knowledge within routine activities. 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

- 1.1 Follow **safety (WHS/OHS)** and workplace environmental requirements associated with the use of levelling equipment.
- 1.2 Follow **quality assurance** requirements in accordance with workplace procedures.
- 1.3 Use correct terminology when working with basic levelling equipment.
- 1.4 Identify types of **levelling equipment** and their functions to determine their suitability for the job task.

2. Set up and use basic levelling equipment

- 2.1 Select basic levelling equipment to meet the requirements of the task.
- 2.2 Identify heights or levels to be transferred or established from project plans or instructions.
- 2.3 Set up and test levelling equipment in accordance with manufacturers' instructions and workplace instructions.
- 2.4 Take, record and mark levels within the required tolerances and specifications according to job requirements and workplace procedures.
- 2.5 Identify and apply **gradients** to tasks in accordance with task specifications.

- | | |
|---------------------------|---|
| 3. Clean up the work area | 3.1 Clean work area in accordance with workplace procedures, legislation and regulations. |
| | 3.2 Check for serviceability and store tools and equipment in accordance with workplace procedures. |
| | 3.3 Dispose, recycle or store materials and waste 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

- Communication skills to:
 - actively listen and question to obtain information
 - receive and confirm instructions about the plumbing job or task
- Literacy skills to read and interpret documents, drawings and specifications.
- Problem identification and resolution within job parameters to:
 - select appropriate levelling equipment
 - identify and report any faults in tools, equipment or materials.
- Self management skills to plan and organise work, including to obtain work instructions and sequence tasks.
- Technology skills to use and maintain tools and equipment effectively and safely.
- Team skills to work cooperatively as a team member.

Required knowledge

- Purpose and function of levelling equipment.
- Correct terminology associated with levelling equipment.
- Workplace safety requirements and WHS/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 (WHS/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% above horizon line
- 2.5% above horizon line

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.

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
- take, record and mark levels and heights, including those with gradients.

Context of and specific resources for assessment

Assessment must be done in an actual or simulated plumbing workplace.

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

Assessment resources must include:

- 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

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

direct observation of the candidate in a real workplace setting or simulated environment

written and oral questioning to test underpinning knowledge and its application to basic levelling

project activities that allow the candidate to demonstrate the application of skills and knowledge

portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

VU23053

Use basic electric welding equipment and techniques

Unit descriptor

This unit describes the performance outcomes, skills and knowledge required to use a range of electric welding tools and techniques (for example MIG, TIG, ARC or SPOT) to weld a variety of materials, including mild steel, as part of a variety of plumbing jobs.

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

This unit does not meet the requirements for a registered plumber.

Employability skills

This unit contains employability skills.

Prerequisite unit

Nil

Application of the unit

The use of basic electric welding equipment applies to a known workplace environment with established parameters. It involves following instructions to use a range of welding tools and techniques, for simple plumbing jobs, the application of skills and knowledge within routine activities. This unit is to be conducted under supervision.

Tools that must not be used include angle or side grinders with a disc capability greater than 150mm in diameter.

ELEMENT

PERFORMANCE CRITERIA

Elements describe the essential outcomes of a unit of competency.

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 | <ul style="list-style-type: none"> 1.1 Obtain plans and specifications for the task from the supervisor. 1.2 Identify safety (WHS/OHS) and environmental requirements associated with the use of electrical welding equipment. 1.3 Identify Australian Standards and quality assurance requirements in accordance with workplace procedures. 1.4 Select equipment appropriate to the job task. 1.5 Identify principles of sustainability related to plumbing task preparation. |
| 2. Prepare to weld using an electric welder | <ul style="list-style-type: none"> 2.1 Identify material characteristics and properties. 2.2 Secure and support materials to facilitate the job task. 2.3 Obtain equipment and regulate controls appropriately for specific tasks and in accordance with manufacturers' recommendations. 2.4 Use correct terminology when discussing the use of basic electric welding equipment and techniques. 2.5 Select, fit and maintain personal protective equipment (PPE) , relevant to the specific tool or piece of equipment used in the job task. |

- | | |
|---|--|
| 3. Perform a range of electric welding techniques | <p>3.1 Apply principles of sustainability to welding application.</p> <p>3.2 Follow safety (WHS/OHS) and environmental requirements associated with the use of electrical welding equipment</p> <p>3.3 Use tools, equipment and materials in the predetermined sequence according to the job specification.</p> <p>3.4 Weld in accordance with the work plan and job task to minimise waste.</p> <p>3.5 Prepare and clean welds in accordance with the job task.</p> <p>3.6 Follow Australian Standards and quality assurance requirements in accordance with workplace procedures.</p> <p>3.7 Switch power off and safely protect tools and equipment when not in use.</p> |
| 4. Clean up the work area | <p>4.1 Clean work area in accordance with workplace procedures, legislation and regulations.</p> <p>4.2 Clean, check for serviceability and store tools and equipment in accordance with workplace procedures.</p> <p>4.3 Dispose, recycle or store materials and waste 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

- Communication skills to:
 - actively listen and question to obtain information
 - receive and confirm instructions about the plumbing job or task
- Literacy skills to read and interpret documents, drawings and specifications.
- Problem identification and resolution within job parameters to:
 - secure and brace materials
 - identify distortions and defects
 - clean welds and cuts.
- Self management skills to plan and organise work, including to obtain work instructions and sequence tasks.
- Technology skills to:
 - use and maintain tools and equipment effectively and safely
 - prepare equipment in accordance with manufacturers' instructions
 - power up and shut down equipment.
- Team skills to 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 WHS/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/work health and safety(WHS/OHS).
- 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.

Specifications may include:

- charts and hand drawings
- diagrams and sketches
- instructions issued by the supervisor
- task drawings
- manufacturers' specifications and instructions
- safety data sheets (SDS)
- 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.

Safety (WHS/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
- access to 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.

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.

Tools, 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 150mm 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.

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

The assessment must confirm the person is competent to:

- Follow instructions for use of welding equipment and techniques
- Select and inspect electric welding tools
- use electric welding tools in a safe, sustainable and appropriate manner
- weld a variety of materials, including mild steel, as part of a variety of plumbing jobs.

Context of and specific resources for assessment

Assessment must be done in an actual or simulated plumbing workplace.

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

Assessment resources must include:

- 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

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

direct observation of the candidate in a real workplace setting or simulated environment

written and oral questioning to test underpinning knowledge and its application to electric welding

project activities that allow the candidate to demonstrate the application of skills and knowledge

portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

VU23054 Use basic plumbing hand tools

Unit descriptor This unit describes the performance outcomes, skills and knowledge 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.

This unit does not meet the requirements for a registered plumber.

Employability skills This unit contains employability skills.

Prerequisite unit Nil

Application of the unit The use of basic hand tools applies to a known workplace environment with established parameters. It involves following instructions for the use of basic hand tools for a range of simple plumbing tasks, the application of skills and knowledge within routine activities and exercising limited responsibility. 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 | 1.1 identify safety (WHS/OHS) and workplace environmental requirements associated with the use of basic plumbing hand tools.
1.2 Identify and follow quality assurance requirements in accordance with workplace procedures.
1.3 Identify principles of sustainability related to plumbing task preparation.
1.4 Use correct terminology when working with basic plumbing hand tools.
1.5 Identify types of basic plumbing hand tools and their functions to determine their suitability for the job. |
| 2. Prepare to use basic plumbing hand tools | 2.1 Select basic plumbing hand tools to meet the requirements of the job.
2.2 Check for serviceability and safety of hand tools and report any faults to supervisor in accordance with workplace procedures.
2.3 Follow safety (WHS/OHS) and workplace requirements associated with the selection and use of basic plumbing hand tools
2.4 Select and correctly fit personal protective equipment (PPE) relevant to the specific tool being prepared for use. |
| 3. Manage basic plumbing hand tools | 3.1 Handle hand tools safely according to their intended use and manufacturers' recommendations. |

- | | | |
|---------------------------|-----|---|
| | 3.2 | Use hand tools appropriately in sequence with the task and job specification. |
| | 3.3 | Safely store tools when not in immediate use. |
| 4. Clean up the work area | 4.1 | Clean work area in accordance with workplace procedures, legislation and regulations. |
| | 4.2 | Clean, check for serviceability and store hand tools in accordance with workplace procedures. |
| | 4.3 | Dispose, recycle or store materials and waste 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

- Communication skills to:
 - actively listen and question to obtain information
 - receive and confirm instructions about the plumbing job or task
- Literacy skills to read and interpret documents, drawings and specifications
- Problem solving skills to use tools in the sequence of the task and report any faults with tools.
- Self management skills to plan and organise work, including to obtain work instructions and sequence tasks.
- Technology skills to use and maintain tools and equipment effectively and safely.
- Team skills to 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 WHS/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 (WHS/OHS) is to be in accordance with state and territory legislation and regulations and may include:

- handling materials and hand tools
- hazard control
- hazardous materials and substances
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and procedures
- access to 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.

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

The assessment must confirm the person is competent to:

- follow safety instructions in the use of basic plumbing hand tools
- select and inspect basic plumbing hand tools in a safe and appropriate manner
- use basic plumbing hand tools for simple plumbing tasks.

Context of and specific resources for assessment

Assessment must be done in an actual or simulated plumbing workplace.

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

Assessment resources must include:

- a plumbing workshop or simulated workplace
- basic plumbing hand tools
- materials and equipment for using hand held tools
- manufacturers' instructions
- job tasks, specifications, work instructions and workplace procedures.

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

direct observation of the candidate in a real workplace setting or simulated environment

written and oral questioning

project activities that allow the candidate to demonstrate the application of skills and knowledge

portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

VU23055 Use basic power tools

Unit descriptor

This unit describes the performance outcomes, skills and knowledge 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.

This unit does not meet the requirements for a registered plumber.

Employability skills

This unit contains employability skills.

Prerequisite unit

Nil

Application of the unit

The use of basic power tools applies to a known workplace environment with established parameters. It involves following instructions for the use of basic power tools for a range of simple plumbing tasks, the application of skills and knowledge within routine activities and exercising limited responsibility. This unit is to be conducted under supervision.

PERFORMANCE CRITERIA

ELEMENT

Elements describe the essential outcomes of a unit of competency.

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. Identify basic power tools | <p>1.1 Identify safety (WHS/OHS) and workplace environmental requirements associated with the use of power tools.</p> <p>1.2 Identify quality assurance requirements in accordance with workplace procedures.</p> <p>1.3 Identify basic power tool types and their functions for designated plumbing tasks.</p> <p>1.4 Identify appropriate power sources to determine that outlets and cables match tool specifications.</p> <p>1.5 Identify principles of sustainability related to plumbing task preparation.</p> <p>1.6 Access information and complete documentation in accordance with workplace procedures.</p> |
| 2. Prepare to use basic power tools | <p>2.1 Select power tools consistent with the requirements of the task, job requirements and manufacturers' specifications.</p> <p>2.2 Use correct terminology when discussing the use of basic power tools.</p> <p>2.3 Select, apply and maintain personal protective equipment (PPE) relevant to the specific power tool.</p> |

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| | 2.4 | Select and set up equipment to support, brace, hold and position materials to avoid hazards and injury. |
| | 2.5 | Apply principles of sustainability to the plumbing task. |
| 3. Manage basic plumbing power tools | 3.1 | Follow safety (WHS/OHS) and workplace environmental requirements associated with the use of power tools |
| | 3.2 | Cut and drill materials according to the designated plumbing task and job specifications. |
| | 3.3 | Apply quality assurance requirements in accordance with workplace procedures. |
| | 3.4 | Switch off power tools and safely position when not in immediate use during the job task. |
| 4. Clean up the work area | 4.1 | Clean work area in accordance with workplace procedures, legislation and regulations. |
| | 4.2 | Clean, check for serviceability and store power tools and equipment in accordance with workplace procedures. |
| | 4.3 | Dispose, recycle or store materials and waste 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

- Communication skills to:
 - actively listen and question to obtain information
 - receive and confirm instructions about the plumbing job or task
- Literacy skills to read and interpret documents, drawings and specifications
- Problem identification and resolution within job parameters to:
 - identify appropriate power sources and cables
 - secure and brace materials.
- Self management skills to:
 - select power tools consistent with the task
 - plan and organise work, including to obtain work instructions
 - sequence tasks.
- Technology skills to use and maintain tools and equipment effectively and safely.
- Team skills to 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 WHS/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 (WHS/OHS) is to be in accordance with state and territory legislation and regulations and may include:

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

Safety (WHS/OHS) must include:

- AS/NZS 3760 or its superseding equivalent, related to in-service safety inspection and testing of electrical equipment. This standard specifies procedures for 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.

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.

Documentation may include:

- sign out/sign in of power 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.

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.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>The assessment must confirm the person is competent to:</p> <ul style="list-style-type: none"> • follow safety instructions in the use of basic plumbing power tools • select and inspect basic plumbing power tools in a safe and appropriate manner • use basic plumbing power tools for simple plumbing tasks.
Context of and specific resources for assessment	<p>Assessment must be done in an actual or simulated plumbing workplace.</p> <p>Assessment must be conducted using current workplace techniques, procedures, tools, equipment and materials, and in accordance with all legal work requirements.</p> <p>Assessment resources must include:</p> <ul style="list-style-type: none"> • a plumbing workshop or simulated workplace • basic plumbing power tools • materials and equipment for using plumbing power tools • manufacturers' instructions • job tasks, specifications, work instructions and workplace procedures.
Method of assessment	<p>A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:</p> <p>direct observation of the candidate in a real workplace setting or simulated environment</p> <p>written and oral questioning</p> <p>project activities that allow the candidate to demonstrate the application of skills and knowledge</p> <p>portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate.</p> <p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

VU23056 Use plumbing pipes, fittings and fixtures to simulate plumbing installations

Unit descriptor

This unit describes the performance outcomes, skills and knowledge 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.

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

This unit does not meet the requirements for a registered plumber.

Employability skills

This unit contains employability skills.

Prerequisite unit

Nil

Application of the unit

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.

The use of plumbing pipes, fittings and fixtures to simulate plumbing installation applies to a known workplace environment with established parameters. It involves following instructions for the use of plumbing pipes, plumbing fittings and fixtures for a range of simple plumbing tasks, the application of skills and knowledge within routine activities and exercising limited responsibility. 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.

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| <p>1. Identify pipes, fittings and fixtures</p> | <p>1.1 Use correct terminology when discussing properties and characteristics of pipes, fittings and fixtures, and when requesting component parts.</p> <p>1.2 Identify <i>principles of sustainability</i> related to plumbing task preparation.</p> <p>1.3 Select pipes, fittings and fixtures for suitability for a simple plumbing task.</p> |
| <p>2. Manage pipes, fittings and fixtures</p> | <p>2.1 Clarify plans and <i>specifications</i> for the task with the supervisor.</p> <p>2.2 Prepare <i>pipes, fittings and fixtures</i> for suitability for a simple plumbing task.</p> <p>2.3 Follow Australian Standards and <i>quality assurance</i> requirements in accordance with organisational procedures.</p> <p>2.4 Follow <i>Safety (WHS/OHS) and</i> workplace environmental requirements associated with manual handling.</p> <p>2.5 Apply principles of sustainability to the plumbing task.</p> |

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| 3. Work with pipes, fittings and fixtures | 3.1 Use pipes, fittings and fixtures according to manufacturers' recommendations and job task requirements. |
| | 3.2 Fix and secure pipes, fittings and fixtures in accordance with regulations, manufacturers' recommendations and job task requirements. |
| | 3.3 Apply pipes, fittings and fixtures in an appropriate sequence to the job task and in accordance with manufacturers' recommendations. |
| 4. Secure fasteners and fixings | 4.1 Identify purpose of materials or fixture to be fastened and assess tolerance. |
| | 4.2 Assess substrate and/or material to be fastened or fixed to, for compatibility to the task. |
| | 4.3 Assess material or fixture for its compatibility with proposed fasteners and fixings to be used. |
| | 4.4 Install fasteners and fixings according to the manufacturer specifications. |
| 5. Clean up the work area | 5.1 Clean work area and dispose or recycle waste in accordance with the state or territory legislation and workplace procedures. |
| | 5.2 Clean, check for serviceability and store tools and equipment in accordance with the workplace procedures. |
| | 5.3 Dispose, recycle or store materials and waste in accordance with the state or territory legislation and workplace procedures. |

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Communication skills to:
 - actively listen and question to obtain information about plumbing pipes, fittings and fixtures to simulate plumbing installations
 - receive and confirm task instructions and requirements
- Literacy skills to read and interpret documents, drawings and specifications.
- Problem solving skills to secure components.
- Self management skills to plan and organise work, including to obtain work instructions and sequence tasks
- Technology skills to use and maintain tools and equipment effectively and safely, including to assemble component parts.
- Team skills to 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 WHS/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
- safety data sheets (SDS)
- organisational work specifications and requirements, regulatory and legislative requirements, particularly:
 - WHS/OHS and environmental requirements
 - plumbing and gasfitting authority regulations.

Pipes must include:

- copper tube
- mild steel
- polymer pipes.

Pipes may include, but are not limited to:

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

Fittings may include:

- brass fittings
- copper fittings
- galvanised iron fittings
- cast iron fittings

- bends
- junctions
- ceramic fittings
- plastic fittings
- taps
- valves
- spindles
- handles
- washers and O rings
- filters.

Fixtures may include:

- baths
- basins
- sinks
- Toilets
- 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 (WHS/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
- access to 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.

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

The assessment must confirm the person is competent to:

- follow instructions
- identify plumbing pipes, plumbing fittings and plumbing fixtures, including fastening
- follow safety requirements
- assemble, fabricate and support plumbing pipes, plumbing fittings and plumbing fixtures in an appropriate sequence
- as part of a variety of simulated plumbing jobs (that is, jobs that will not actually have water or gas connected) work with and fasten pipes, fittings and fixtures.

Context of and specific resources for assessment

Assessment must be done in an actual or simulated plumbing workplace.

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

Assessment resources must include:

- 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

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

direct observation of the candidate in a real workplace setting or simulated environment

written and oral questioning to test underpinning knowledge and its application to the assembly, fabrication and support of plumbing pipes, plumbing fittings and plumbing fixtures, including fastening

project activities that allow the candidate to demonstrate the application of skills and knowledge

portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.