

# 22267VIC Diploma of Electrical Project Management

This course has been accredited under Parts 4.4 and 4.6 of the Education and Training Reform Act, 2006. It has been entered on the *State Register of Accredited Courses and Recognised Qualifications* and the National Training Register. [www.training.gov.au](http://www.training.gov.au) .

The period of accreditation is from :  
1<sup>st</sup> January 2014 to 31<sup>st</sup> December 2018

**Extension Granted by VRQA: 1 January 2019 – 31 December 2019**





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## Section A: Copyright and course classification information

<b>1. Copyright owner of the course</b>	<p>Copyright of this document is held by the Department of Education and Early Childhood Development, Victoria. © State of Victoria.</p>
<b>2. Address</b>	<p>Department of Education and Early Childhood Development Higher Education and Skills Group Executive Director Training Participation and Facilitation Division GPO Box 4367 Melbourne VIC 3001</p> <p><u>Day to day contact:</u> Engineering Industries Curriculum Maintenance Manager CMM Number: 5128 Box Hill Institute of TAFE 465 Elgar Road Box Hill Victoria 3128 Postal address:</p> <p><u>Private Bag 2014</u> Box Hill Victoria 3128 Email: g.adda@bhtafe.edu.au Telephone: (03) 9286 9880 Facsimile: (03) 9286 9991</p>
<b>3. Type of submission</b>	<p>The course is submitted for reaccreditation. It replaces and has equivalent outcomes to:</p> <ul style="list-style-type: none"> <li>• 21957VIC Diploma of Electrical Project Management</li> </ul>
<b>4. Copyright acknowledgement</b>	<p>Copyright of the following units of competency from nationally endorsed training packages is administered by the Commonwealth of Australia. © Commonwealth of Australia</p> <p>Units of competency from nationally endorsed training packages can be accessed from Training.gov at <a href="http://www.training.gov.au">www.training.gov.au</a></p> <p>Endorsed units of competency have been imported into this course from the following Training Packages and State accredited courses:</p> <p><b>BSB07 Business Services Training Package</b> BSBCUS402B Address customer needs BSBPMG518A Manage project procurement BSBWRK510A Manage employee relations BSBWRT401A Write complex documents BSBWHS504A Manage WHS hazards and risks BSBPUR402B Negotiate contracts BSBWOR502B Ensure team effectiveness</p>

	<p><b>CPC08 Construction, Plumbing and Services Training Package</b> CPC080505A Select and manage building and construction contractors</p> <p><b>MSS11 Sustainability Training Package</b> MSS404060A Facilitate the use of planning software systems in a work area or team</p> <p><b>PSP12 Public Sector Training Package</b> PSPGOV511A Provide leadership</p> <p><b>TLI10 Transport and Logistics Training Package</b> TLIL4005A Apply conflict/grievance resolution strategies</p> <p><b>UEE11 Electrotechnology Training Package</b> UEENEEC005B Estimate electrotechnology projects UEENEEC006B Prepare tender submissions for electrotechnology projects UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace UEENEEG169A Manage large electrical projects</p> <p>The State of Victoria, on behalf of the Crown, holds copyright for the following courses and units, published by the Department of Education and Early Childhood Development, Victoria.</p> <p><b>22228VIC-22229VIC Diploma &amp; Advanced Diploma of Engineering Technology</b> VU21156 Use computer aided drafting systems</p> <p><b>21876VIC Course in Electrical Energy Efficiency</b> VU21582 Apply energy efficient LED lighting principles</p>
<p><b>5. Licensing and franchise</b></p>	<p>This work is licensed under a Creative Commons Attribution-NoDerivs 3.0 Australia licence <a href="http://creativecommons.org/licenses/by-nd/3.0/au/">http://creativecommons.org/licenses/by-nd/3.0/au/</a>). You are free to use, copy and distribute provided you attribute the State of Victoria (Department of Education and Early Childhood Development) as the copyright owner, and you license any derivative work you make available under the same licence.</p> <p>Request for other use should be addressed to : Department of Education and Early Childhood Development Higher Education and Skills Group Executive Director Pathways Participation and Youth Division PO Box 266 Melbourne VIC 3001</p>

	<p>Copies of this publication can be downloaded free of charge from the Training Support Network website at:  <a href="http://trainingsupport.skills.vic.gov.au">http://trainingsupport.skills.vic.gov.au</a>.</p> <p>Copies can also be purchased from the Engineering Industries Curriculum Maintenance Manager by contacting  <a href="mailto:g.adda@bhtafe.edu.au">g.adda@bhtafe.edu.au</a>.</p>	
<b>6. Course accrediting body</b>	Victorian Registration and Qualifications Authority (VRQA)	
<b>7. AVETMISS information</b>	AVETMISS classification codes	
	<b>ANZSCO</b> [ <i>Australian and New Zealand Standard Classification of Occupations</i> ]	233311 Electrical Engineers
	<b>ASCED Code – 4 digit</b> ( <i>Field of Education</i> )	0313 Electrical and Electronic Engineering and Technology
	<b>National course code</b>	<i>To be provided by the course accrediting body once the course is accredited</i>
<b>8. Period of accreditation</b>	<p>1 January 2014 to 31 December 2018</p> <p>Extension granted by VRQA: 1 January 2019 – 31 December 2019</p>	

## Section B: Course information

<b>1. Nomenclature</b>		<b>Standard 1 AQTF Standards for Accredited Courses</b>
<b>1.1 Name of the qualification</b>	Diploma of Electrical Project Management	
<b>1.2 Nominal duration of the course</b>	388-500 hours	
<b>2. Vocational or educational outcomes</b>		<b>Standard 1 AQTF Standards for Accredited Courses</b>
<b>2.1 Purpose of the course</b>	Successful completion of the Diploma of Electrical Project Management provides participants with knowledge and skills required to manage a variety of electrical projects effectively.	
<b>3. Development of the course</b>	<b>Standards 1 and 2 AQTF Standards for Accredited Courses</b>	
<b>3.1 Industry / enterprise/ community needs</b>	<p>The Diploma of Electrical Project Management was initially developed on behalf of the National Electrical and Communications Association of Australia (NECA) following extensive consultation with employer groups throughout Australia. Consultation took place at a national leadership forum and was followed by employer workshops in the ACT, Victoria, Western Australia and NSW. Employers identified the need for workers within the electrotechnology industry to have access to a national qualification in electrical project management</p> <p>The qualification is needed primarily to prepare individuals for employment as electrical project managers. Training opportunities are needed for licensed electricians as well as others who come from a non-trade background such as electrical engineers or individuals in middle management roles in medium and large organisations.</p> <p>Employment websites surveyed in 2013 indicated 500-800 vacancies for electrical project managers Australia wide. One website advertised 115 vacancies in Melbourne. The qualification will support the development of individual career pathways in the industry.</p> <p>Employers noted that although there are a number of existing qualifications in UEE11 Electrotechnology Training Package at higher levels, these did not reflect the needs of employers for project management training. Higher level qualifications in UEE11 are not being taken up by individuals seeking skills development in project management.</p> <p>The Diploma of Electrical Project Management does not duplicate any existing national Training Package qualification.</p> <p>Consultation with employers identified a range of competencies that are needed for the role of an electrical project manager (See Appendix 1)</p>	





<i>Transition Table</i>		
<b>Units in superseded course</b>	<b>Units in current course</b>	<b>Relationship</b>
BSBCUS402A Address customer needs	BSBCUS402B Address customer needs	Equivalent
BSBHRM604A Manage employee relations	BSBWKR510A Manage employee relations	Not equivalent
BSBITU301A Create and use databases		No equivalent unit
BSBITU304A Produce spreadsheets		No equivalent unit
BSBITU306A Design and produce business documents	BSBWRT01A Write complex documents	Not equivalent
BSBMGT605B Provide leadership across the organisation	PSPGOV511A Provide leadership	Not equivalent
BSBOHS504B Apply principles of OHS risk management	BSBWHS504A Manage WHS hazards and risks	Not equivalent
BSBPMG502A Manage project scope		No equivalent unit
BSBPMG504A Manage project costs		No equivalent unit
BSBPMG505A Manage project quality		No equivalent unit
BSBPMG509A Manage project procurement	BSBPMG518A Manage project procurement	Equivalent
BSBPMG510A Manage projects	UEENEEG169A Manage large electrical projects	Not equivalent
BSBPUR402B Negotiate contracts	BSBPUR402B Negotiate contracts	Same unit
BSBWOR502A Ensure team effectiveness	BSBWOR502B Ensure team effectiveness	Equivalent
BCGBC5005A Select and manage building and construction contractors	CPCBC5005A Select and manage building and construction contractors	Equivalent
ICA2006B Operate computing packages	MSS404060A Facilitate the use of planning software systems in a work area or team	Not equivalent
TLIL507D Apply conflict/grievance resolution strategies	TLIL4005A Apply conflict/grievance resolution strategies	Equivalent
	UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	No equivalent unit
VBQU449 Estimate electrotechnology projects	UEENEEC005B Estimate electrotechnology projects	Not equivalent

<i>Transition Table</i>		
<b>Units in superseded course</b>	<b>Units in current course</b>	<b>Relationship</b>
VBQU448 Prepare specifications for the supply of materials and equipment for electrotechnology projects	UEENEEC006B Prepare tender submissions for electrotechnology projects	Not equivalent
VBQU450 Provide quotations for installation or service jobs	VU21526 Provide quotations for installation or service jobs	Equivalent
VBQU451 Conduct an electrical contracting business	VU21527 Conduct an electrical contracting business	Equivalent
VBP235 Use 2D computer aided drafting systems	VU21156 Use computer aided drafting systems	Unit updated 17 June 2013
VPAU283 Advise on electrical energy management	VU21531 Advise on electrical energy management	Equivalent
VPAU284 Implement energy efficient systems	VU21532 Implement energy efficient systems	Equivalent
VPAU718 Conduct electrical project scheduling	VU21525 Conduct electrical project scheduling	Equivalent
VPAU719 Interpret building and electrical drawings and diagrams	VU21528 Interpret building and electrical drawings and diagrams	Equivalent
VPAU720 Comply with relevant regulatory information and building codes	VU21529 Comply with relevant regulatory information and building codes	Equivalent
VPAU721 Conduct electrical efficiency assessments	VU21530 Conduct electrical efficiency assessments	Equivalent
VU20393 Apply energy efficient LED lighting principles	VU21582 Apply energy efficient LED lighting principles	Equivalent

<b>4. Course outcomes</b>	<b>Standards 1, 2, 3 and 4 AQTF Standards for Accredited Courses</b>
<b>4.1 Qualification level</b>	<p>This course is consistent with the AQF level V as defined in the Australian Qualifications Framework 2011. The Diploma of Electrical Project Management qualifies individuals who apply integrated technical and theoretical concepts in a broad range of contexts to undertake advanced skilled or paraprofessional work and as a pathway for further learning.</p> <p><b>Knowledge</b></p> <p>Graduates of the Diploma of Electrical Project Management will have technical and theoretical knowledge and concepts, with depth in some areas within a field of work and learning such as electrical contracting</p>

## **Skills**

Graduates of the Diploma of Electrical Project Management will have:

- cognitive and communication skills to identify, analyse, synthesise and act on information from a range of sources such as calculating resource requirements and acquiring them
- cognitive, technical and communication skills to analyse, plan, design and evaluate approaches to unpredictable problems and/or management requirements such as planning and managing projects in respect to time, cost, quality and resource management
- specialist technical and creative skills to express ideas and perspectives such as producing a wide range of reports and charts to document project progress, milestones and outcomes
- communication skills to transfer knowledge and specialised skills to others and demonstrate understanding of knowledge such as managing the work of others through positive leadership

## **Application of knowledge and skills**

Graduates of the Diploma of Electrical Project Management will demonstrate the application of knowledge and skills:

- with depth in some areas of specialisation, in known or changing contexts such as monitoring and tracking projects
- to transfer and apply theoretical concepts and/or technical and/or creative skills in a range of situations such as using technology to assist the management of information and the planning process
- with personal responsibility and autonomy in performing complex technical operations with responsibility for own outputs in relation to broad parameters for quantity and quality such as taking responsibility as required by work role and ensuring all organisational policies and procedures are followed
- with initiative and judgement to organise the work of self and others and plan, coordinate and evaluate the work of teams within broad but generally well defined parameters such as consulting with stakeholders and others on developing a range of project management related plans

## **Volume of learning**

The Diploma of Electrical Project Management incorporates structured and unstructured learning.

Structured learning activities develop electrical project management skills and knowledge in relation to managing, monitoring, scheduling and costing electrical projects

Unstructured learning activities are an integral part of the total training and include on-the-job activities where participants will research and evaluate work place electrical management projects, using project work, self-directed learning activities and methodologies used in their workplace. It is recommended that these learning activities be undertaken with the guidance of an experienced mentor working in the industry.

This course has been designed for participants to manage a variety of electrical projects effectively and the volume of learning is typically 1 – 2 years.

<p><b>4.2 Employability skills</b></p>	<p><b>Diploma of Electrical Project Management</b></p> <p><u>Communication</u></p> <ul style="list-style-type: none"> <li>• Participating in negotiations</li> <li>• Managing conflict situations</li> <li>• Managing employee relations</li> <li>• Producing reports</li> </ul> <p><u>Teamwork</u></p> <ul style="list-style-type: none"> <li>• Ensuring team effectiveness</li> <li>• Assigning individual project roles</li> <li>• Setting and monitoring team goals</li> </ul> <p><u>Problem solving</u></p> <ul style="list-style-type: none"> <li>• Establishing and managing business and legal requirements</li> <li>• Establishing and managing contracts</li> <li>• Conducting risk management</li> </ul> <p><u>Initiative and enterprise</u></p> <ul style="list-style-type: none"> <li>• Developing a budget</li> <li>• Managing projects</li> <li>• Providing quality services to customers</li> </ul> <p><u>Planning and organisation</u></p> <ul style="list-style-type: none"> <li>• Compiling project schedules</li> <li>• Managing the input of sub-contractors to the project</li> <li>• Managing project contingencies</li> </ul> <p><u>Self-management</u></p> <ul style="list-style-type: none"> <li>• Managing personal and work priorities</li> <li>• Establishing professional networks</li> <li>• Providing leadership</li> </ul> <p><u>Learning</u></p> <ul style="list-style-type: none"> <li>• Conducting research</li> <li>• Maintaining technical knowledge and skills</li> <li>• Developing and applying electrical industry knowledge</li> </ul> <p><u>Technology</u></p> <ul style="list-style-type: none"> <li>• Operating common information and communication equipment, such as telephones and computers</li> <li>• Producing computer-aided drawings</li> <li>• Using the Internet</li> <li>• Using planning software</li> </ul>
<p><b>4.3 Recognition given to the course</b></p>	<p>Not applicable</p>
<p><b>4.4 Licensing/ regulatory requirements</b></p>	<p>Not applicable</p>

5. Course rules		Standards 2, 6, 7 and 9 AQTF Standards for Accredited Courses		
<p><b>5.1 Course structure</b></p> <p>To be eligible for the award of a Diploma of Electrical Project Management, learners must successfully complete a total of 9 units comprising:</p> <ul style="list-style-type: none"> <li>• 5 core units</li> <li>• 4 elective units</li> </ul> <p>Learners who do not successfully complete all the required units for the qualification will be issued with a Statement of Attainment listing the completed units.</p>				
Unit of competency code	Field of Education code	Unit of competency title	Pre-requisite	Nominal hours
<b>Core units</b>				
UEENEEE101A		Apply Occupational Health and Safety regulations, codes and practices in the workplace	None	20
UEENEEG169A		Manage large electrical projects	UEENEE E101A	40
BSBWWRK510A		Manage employee relations	None	80
PSPGOV511A		Provide leadership	None	50
BSBWRT401A		Write complex documents	None	50
<p><b>Elective units - Select four elective units.</b></p> <p>A minimum of four units must be selected from the list below. The range of elective units may be increased by the addition of units from national training packages or modules/units from accredited courses providing they are packaged no lower than AQF level 5 and are consistent with the vocational outcomes of the qualification.</p>				
<b>Contracting</b>				
CPCBC5005A		Select and manage building and construction contractors	None	40
BSBPUR402B		Negotiate contracts	None	50
UEENEEC005B		Estimate electrotechnology projects	None	40
UEENEEC006B		Prepare tender submissions for electrotechnology projects	UEENEE C005B	60
VU21525	080399	Conduct electrical project scheduling	None	40
VU21526	031399	Provide quotations for installation or service jobs	None	60
VU21527	031399	Conduct an electrical contracting business	None	40

<b>Business</b>				
BSBCUS402B		Address customer needs	None	50
BSBWOR502B		Ensure team effectiveness	None	60
BSBPMG518A		Manage project procurement	None	40
TLIL4005A		Apply conflict/grievance resolution strategies	None	40
<b>Technical</b>				
MSS404060A		Facilitate the use of planning software systems in a work area or team	None	50
VU21156	039999	Use computer aided drafting systems	None	80
VU21528	080399	Interpret building and electrical drawings and diagrams	None	40
<b>Legal/regulatory</b>				
BSBWHS504A		Manage WHS hazards and risks	None	50
VU21529	080399	Comply with relevant regulatory information and building codes	None	40
<b>Energy sustainability</b>				
VU21530	080399	Conduct electrical efficiency assessments	None	40
The following three units count as one elective				
VU21531	031399	Advise on electrical energy management	None	4
VU21532	031399	Implement energy efficient electrical systems	VU21531	16
VU21582	031399	Apply energy efficient LED lighting principles	VU21532	8
<b>Nominal duration</b>			<b>388 – 500 hours</b>	

<b>5.2 Entry requirements</b>	<p>The following is a general guide to entry in relation to the language, literacy and numeracy skills of learners aligned to the Australian Core Skills Framework (ACSF), details of which can be accessed from:  <a href="http://www.deewr.gov.au/skills/Programs/LitandNum/ACSF">www.deewr.gov.au/skills/Programs/LitandNum/ACSF</a></p> <p>Learners are best equipped to achieve the course outcomes in the Diploma of Electrical Project Management if they have minimum language, literacy and numeracy skills that are equivalent to Level 4 of the ACSF.</p> <p>Entrants to the Diploma of Electrical Project Management will generally be qualified electricians or individuals with demonstrated experience in the electrotechnology industry who want to undertake or who are required to undertake electrical project management responsibilities.</p> <p>There are no barriers to entry on the grounds of age, gender, political or cultural background.</p>
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**6.1 Assessment strategy**

Course assessment must be consistent with the requirements of the relevant AQTF Standards (Element 1.5) Essential Conditions and Standards for Continuing (or Initial) Registration or Standards for NVR Registered Training Providers (SNR 15.1).

Assessment methods should be flexible, valid, reliable and fair. Assessment of units requires evidence of satisfactory performance being sought for each element and its performance criteria and the required skills and knowledge through a variety of tasks depending on the criteria specified.

The following principles should be used as a guide to the assessment approach:

- assessment tasks/activities should be grounded in a relevant context and not be culturally biased
- students should be assessed across a wide range of tasks integrated into practice, in order to increase reliability and validity of assessment. One-off assessment tasks do not provide a reliable and valid measure of competence
- instructions for assessment tasks should be clear, explicit and ordered. Students must know what is expected and the criteria by which they will be judged
- time allowed to complete a task should be reasonable and specified, and should allow for preparation and re-drafting as appropriate to the task
- assessment should be validated. Moderation is likely to be a critical tool in validation. A range of validation strategies should be used, for example, mentoring, client satisfaction surveys, peer review and co-assessments
- appropriate reference materials should be available to students during assessment, e.g. personal word lists, dictionaries, thesaurus, calculators.

Assessment tools must meet the rules of evidence. To meet the rules, evidence must be:

- valid, for example, address the elements and performance criteria, reflect the skills and knowledge described in the unit of competency, show application in the context described in the Range Statement
- current, for example, demonstrate the candidate's current skills and knowledge
- sufficient, for example, demonstrate competence over a period of time, demonstrate repeatable competence, not inflate the language, literacy and numeracy requirements beyond those required in performing the task and
- authentic, for example: be the work of the learner, be corroborated / verified.

A variety of assessment methods and evidence gathering techniques may be used with the overriding consideration being that the combined assessment must stress demonstrable performance by the student.



The Critical Aspects of Evidence section of each unit provides essential guidance on acceptable evidence.

Assessment must include the demonstration of practical skills and may also include:

- oral or written questioning
- presentations
- folios
- written reports
- research assignments and projects
- practical application and demonstration of skills
- written/oral examinations

Where appropriate, training providers are encouraged to take a holistic approach to assessment, by assessing more than one element concurrently, or combining the final assessment for more than one unit.

When assessing units of competency from Training Packages, the evidence gathering and assessment must be carried out in accordance with the relevant Training Package guidelines. The assessment guidelines include the necessary qualifications for those conducting assessments and provide for situations where more than one person may contribute to the assessment and where the required technical and assessment competencies may not all be held by any one person.

All participants can seek recognition for any competencies held and for any relevant qualifications or experience. Recognition decisions should be based on the principles of assessment and rules of evidence as defined in the AQTF or NVR Standards.

On the completion of each assessment task, students will be provided with qualitative feedback as well as a 'competent/not competent' result for the unit being assessed.

Arrangements should be made for retesting or reasonable adjustment as required.

<p><b>6.2 Assessor competencies</b></p>	<p>The National Skills Standards Council (NSSC) is responsible for setting the requirements for assessors consistent with Standard 1, Element 1.4 of the AQTF: Essential Conditions and Standards for Initial/Continuing Registration, or the Standard 15.4 of the Standards for NVR Registered Training Providers</p> <p>Accordingly, the NSSC has determined that from 1 July 2013, assessors must:</p> <ul style="list-style-type: none"> <li>i. hold the <i>TAESS00001 Assessor Skill Set</i>, or be able to demonstrate equivalence of competencies; and</li> <li>ii. be able to demonstrate vocational competencies at least to the level being assessed; and</li> <li>iii. be able to demonstrate how they are continuing to develop their VET knowledge and skills as well as maintaining their industry currency and assessor competence.</li> </ul> <p>Note: If a person does not have all the assessment competencies as defined in (i), (ii) and (iii) then one or more persons with the combined expertise in (i), (ii) and (iii) may work together to conduct the assessment.</p>
<p><b>7. Delivery</b> <span style="float: right;"><b>Standards 11 and 12 AQTF Standards for Accredited Courses</b></span></p>	



<p><b>7.1 Delivery modes</b></p>	<p>All units of competency in the courses may be delivered in a variety of modes: classroom delivery, workplace projects, practical work, self-paced learning, case studies, role plays and guest speakers.</p> <p>On-the-job learning is an integral part of the total training and should be conducted with an experienced mentor working in the industry. The provider will coordinate the assessment of workplace demonstration, according to the relevant Training Package requirements. It is recommended that the course be conducted using workplace project-based delivery and assessment methods to maximise opportunities for learners to have learning experiences, which are as close as possible to a real workplace environment.</p> <p>Delivery options, including grouping of learners and learning activities, should recognise the varying learning needs, educational backgrounds, preferred learning styles and constraints of the individual learner and the specific requirements of each unit.</p> <p>Some areas of content may be common to more than one unit and therefore integration may be appropriate. Delivery strategies should actively involve the learner and learning should be experiential, relevant and age appropriate.</p> <p>This course is available for full or part-time study. Providers should be flexible in the way the training is delivered to ensure they meet the needs of the client group.</p> <p>Units of competency may be contextualised to meet the needs of different groups of students and employers. Contextualisation of imported units must be consistent with the assessment guidelines of the relevant Training Package or accredited course.</p>
<p><b>7.2 Resources</b></p>	<p>The minimum resources required to conduct the course includes:</p> <ul style="list-style-type: none"> <li>• classrooms</li> <li>• library</li> <li>• access to electrical projects in the workplace</li> <li>• case study materials</li> <li>• computer and relevant software (including but not limited to Microsoft Office suite, Web search and design, CAD software)</li> <li>• workplace resources, such as current legislation, regulations and codes and Australian building standards</li> </ul> <p><b>Qualifications of Trainers</b></p> <p>The National Skills Standards Council (NSSC) is responsible for setting the requirements for trainers consistent with Standard 1, Element 1.4 of the AQTF: Essential Conditions and Standards for Initial/Continuing Registration, or the Standard 15.4 of the Standards for NVR Registered Training Providers</p>

	<p>Accordingly, the NSSC has determined that from 1 July 2013, trainers must:</p> <ul style="list-style-type: none"> <li>i. hold the <i>TAE40110 Certificate IV in Training and Assessment</i> from the TAE10 Training and Education Training Package as a minimum qualification, or be able to demonstrate equivalence of competencies; and</li> <li>ii. be able to demonstrate vocational competencies at least to the level being delivered and assessed; and</li> <li>iii. be able to demonstrate how they are continuing to develop their VET knowledge and skills as well as maintaining their industry currency and trainer/ assessor competence.</li> </ul> <p>Persons delivering training under the supervision of a trainer must:</p> <ul style="list-style-type: none"> <li>i. work under the supervision of a trainer with the <i>TAE40110 Certificate IV in Training and Assessment</i>, or of a person who has demonstrated equivalence of competencies; and</li> <li>ii. holds either the <i>TAESS00007 Enterprise Trainer – Presenting Skill Set</i>, or be able to demonstrate equivalence of competencies, or the <i>TAESS00008 Enterprise Trainer – Mentoring Skill Set</i>, or be able to demonstrate equivalence of competencies within two years of commencing to deliver training while under supervision; and</li> <li>iii. be able to demonstrate vocational competencies at least to the level being delivered and assessed as well as maintaining their industry currency.</li> </ul>
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## 8. Pathways and articulation

### *Standard 8 for accredited courses*

Completion of imported units of competency gives individuals automatic recognition for those units within a range of training packages and accredited courses. Individuals will receive recognition for units in qualifications within the following Training Packages and accredited courses:

- BSB07 Business Services Training Package
- CPC08 Construction, Plumbing and Services Training Package
- MSS11 Sustainability Training Package
- PSP12 Public Sector Training Package
- TLI10 Transport and Logistics Training Package
- UEE11 Electrotechnology Training Package
- 21876VIC Course in Electrical Energy Efficiency
- 21767VIC Certificate IV in Electrical
- 22228VIC Advanced Diploma of Engineering Technology
- BSB60707 Advanced Diploma of Project Management

At present there are no formal articulation arrangements into higher education courses.

Registered Training Organisations should refer to the AQF Qualifications Pathways Policy on the following web site, when negotiating articulation to higher education qualifications.

[http://www.aqf.edu.au/wp-content/uploads/2013/05/AQF\\_pathways\\_jan2013.pdf](http://www.aqf.edu.au/wp-content/uploads/2013/05/AQF_pathways_jan2013.pdf)

Entrants to the course will receive credits through the national recognition process for any of the imported units of competency, they may have gained elsewhere.

**9. Ongoing monitoring and evaluation**

*Standard 13 for accredited courses*

Ongoing evaluation and validation of this course is the responsibility of the Curriculum Maintenance Manager, Engineering Industries. This course will be monitored and maintained by an Industry Advisory Committee with representatives from:

- National Electrical and Communications Association (NECA) (Victorian Chapter)
- enterprises
- industry associations or peak bodies
- RTOs delivering the course.

The following methods will be used to provide data to the Industry Advisory Committee:

- student surveys
- employers surveys
- trainer/assessor feedback

The CMM - Engineering Industries will meet with the Industry Advisory Committee at least once in the middle of the accreditation period and more frequently if necessary, to:

- review the implementation of the program;
- provide advice on changing program requirements;
- monitor and evaluate course standards, delivery and assessment;
- determine whether the course should be replaced by an endorsed Training Package qualification.

Recommendations for any significant changes will be reported through the Curriculum Maintenance Manager, Engineering Industries to the Victorian Registration and Qualification Authority (VRQA).

Course maintenance and review procedures will also indicate that the course should be expired if a suitable qualification becomes available through the endorsement of a Training Package.

## Section C: Units of competency

### Core units

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEG169A	Manage large electrical projects
BSBWRK510A	Manage employee relations
PSPGOV511A	Provide leadership
BSBWRT401A	Write complex documents

Elective units that are Nationally Accredited are available on the national data base – <http://training.gov.au/> To access a copy of individual core units enter the unit code in the window of the Nationally recognised training quick search section of the data base.

Units that have a Unit Code commencing with the letter “V” are Victorian Accredited and are reproduced in the following pages of this document.

### Elective units Part 1 (Victorian units)

VU21526	Provide quotations for installation or service jobs
VU21527	Conduct an electrical contracting business
VU21156	Use computer aided drafting systems
VU21531	Advise on electrical energy management
VU21532	Implement energy efficient electrical systems
VU21582	Apply energy efficient LED lighting principles
VU21525	Conduct electrical project scheduling
VU21528	Interpret building and electrical drawings and diagrams
VU21529	Comply with relevant regulatory information and building codes
VU21530	Conduct electrical efficiency assessments

### Elective units Part 2 (Endorsed units)

CPCBC5005A	Select and manage building and construction contractors
BSBPUR402B	Negotiate contracts
UEENEEC005B	Estimate electrotechnology projects
UEENEEC006B	Prepare tender submissions for electrotechnology projects
BSBCUS402B	Address customer needs
BSBWOR502B	Ensure team effectiveness
BSBPMG518A	Manage project procurement
TLIL4005A	Apply conflict/grievance resolution strategies
MSS404060A	Facilitate the use of planning software systems in a work area or team
BSBWHS504A	Manage WHS hazards and risks

## VU21526

## Provide quotations for installation and service jobs

### Unit Descriptor

This unit of competency sets out the knowledge and skills required to provide quotations for installation and service work. This includes understanding job specifications, using suppliers' catalogues, making enquiries by telephone or email, selecting materials complying with the job requirements, estimating direct and indirect costs; completing quotation documentation and maintaining good customer relations.

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

### Employability Skills

This unit contains Employability Skills

### Application of the Unit

The unit applies to contractors in the electrotechnology industry where competitive quotations for installation and service jobs are 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 Establish the extent of the work

- 1.1 **OH&S requirements** and **environmental requirements** for a given work area are obtained and understood.
- 1.2 Established OHS risk control measures and procedures are followed.
- 1.3 The extent of installation or service work is determined from discussions with the customer, or **appropriate personnel**, or both and job specifications.
- 1.4 The extent of **installation or service work** to be quoted on is documented as a job specification and agreement sought with the customer, or appropriate personnel, or both.
- 1.5 OH&S and other regulatory requirements are incorporated in the extent of work on which the quotation is based.
- 1.6 Requests for alterations to the job specification are negotiated with the customers, or appropriate personnel, or both and within the constraints imposed by regulatory requirements, if required.
- 1.7 The date by which the quotation is to be submitted is agreed with the customer, or appropriate personnel, or both.
- 1.8 Activities are planned to meet scheduled timeframe in consultation with others involved in the work.

### 2 Develop quotations

- 2.1 OH&S requirements for carrying out the work are followed.
- 2.2 Material take offs are performed accurately and checked against job specification.
- 2.3 Materials, labour and other costs are determined from industry standard labour rates, enterprise costing arrangements and materials suppliers.



- 2.4 Quotations are checked for accuracy in costing and against job specification.
- 2.5 Solutions to unplanned events are implemented consistent with **enterprise procedures**.
- 3 Provide quotations.
  - 3.1 OH&S requirements for completing the work are followed.
  - 3.2 Quotation is documented in accordance with enterprise procedures.
  - 3.3 Quotation is submitted to customer or appropriate personnel, or both within by an agreed date.

## REQUIRED SKILLS AND KNOWLEDGE

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

### *Required skills:*

- analysing installation or service job requirements and allied information;
- achieving set timelines for submission of quotations;
- selecting the most appropriate estimation method for the task;
- calculating materials take-offs accurately;
- estimating direct, indirect and management cost of job;
- writing and submitting completed quotes;
- communicating technical requirement to others;
- working with others;
- adapt to changes in work.

### *Required knowledge:*

- labour costs, direct and indirect;
- materials costs;
- waste;
- chargeable and non-chargeable hours;
- labour productivity;
- scheduling;
- insurance;
- overhead costs;
- profit;
- job changes;
- costing software packages.

## 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*

***OH&S requirements*** may include:

- legislation
- protective equipment
- material safety management systems
- hazardous substances and dangerous goods code
- local safe operation procedures
- awards provisions

***Environmental requirements*** such as:

- liquid waste
- solid waste
- gas, fume, vapour, smoke emissions, including fugitive emissions, dust
- excessive energy and water use
- excessive noise

***Appropriate personnel*** may include:

- supervisor
- leading hand
- foreman
- manager
- site engineer
- trainer
- mentor
- teacher
- team member

***Installation or service work*** may include, but is not limited to:

The term 'installation and service work' is related to the electrotechnology industry and includes the following disciplines:

- automation technology
- computer and computer networks
- electrical
- electrical machines
- electronics
- fire protection
- instrumentation
- refrigeration and air conditioning
- renewable/sustainable energy
- security technology

- Enterprise procedures** such as:
- the use of tools and equipment
  - instructions, including job sheets, cutting lists, plans, drawings and designs
  - reporting and communication
  - manufacturers' specifications
  - operational procedures

## EVIDENCE GUIDE

*The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the accreditation submission.*

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

- Assessors should gather a range of evidence that is valid, sufficient, current and authentic.
- Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment.
- Assessment should also reinforce the integration of the Employability Skills.
- In particular this shall incorporate evidence that shows a candidate is able to:
  - implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range;
  - provide quotations for installation and service work on more than one occasion and in different contexts. The demonstration of competence must show:
    - establishing the extent of the required work;
    - determining required materials accurately;
    - costing jobs;
    - checking quotations;
    - documenting quotations and
    - submitting quotations.

### **Context of and specific resources for assessment**

- This unit may be assessed on the job, off the job, or a combination of both on and off the job.
- Where assessment occurs off the job, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

- The candidate will have access to all tools, equipment, materials and documentation required. The candidate will be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

### Method of assessment

- Assessment must include the demonstration of practical skills and may also include:
  - observation of processes and procedures;
  - oral and/or written questioning on required knowledge and skills;
  - testimony from supervisors, colleagues, clients and/or other appropriate persons;
  - inspection of the final product or outcome;
  - a portfolio of documentary evidence.
- Where performance is not directly observed and/or is required to be demonstrated over a period of time and/or in a number of locations, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons.
- Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.

## VU21527

## Conduct an electrical contracting business

### Unit Descriptor

This unit of competency sets out the knowledge and skills required to ensure regulatory, technical, occupational and workplace relations requirements are met in conducting a contracting business. It includes applying knowledge of business practices, technical regulations and standards, legislated obligations in relation to safety, the environment, heritage sites, employment and human resources.

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

### Employability Skills

This unit contains Employability Skills

### Application of the Unit

The unit applies to the electrical contracting industry where licensed electrical trades persons are operating a business as independent contractors.

## ELEMENT

*Elements describe the essential outcomes of a unit of competency.*

### 1. Set up an electrical contracting business

## 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.*

- 1.1 Factors influencing the performance of a contracting business are investigated and evaluated.
- 1.2 Information and advice is sought on the effects of **legislated requirements and standards** on the operation of a contracting business.
- 1.4 Formal processes to meet technical, managerial, occupational and workplace relations' obligation in a contracting business are clearly identified
- 1.5 Possible legal options for the business structure are identified.
- 1.6 Focus of the business is established from investigation of market opportunities and financial climate in which it is to operate.
- 1.7 Systems are established to ensure the legal rights and responsibilities of the business are identified, and the business is adequately protected, especially in regard to **Occupational Health and Safety**, business registration and environmental requirements.
- 1.8 Insurance requirements are identified and adequate cover is acquired.

- |   |  |   |
|---|--|---|
| 2 | Operate an electrical contracting business | <p>2.1 Policies are established to ensure occupational aspects of work undertaken by the business met all legislated requirements and standards.</p> <p>2.2 Policies are established to ensure technical aspects of work undertaken by the business meet all legislated requirements and standards.</p> <p>2.3 Policies are established to ensure managerial and workplace relations aspects of work undertaken by the business, meet all legislated requirements and standards.</p> <p>2.4 Procedures and processes are developed to give effect to the established business policies, including maintenance of currency in changes, developments and requirements.</p> <p>2.5 Methods are incorporated in the business procedures to maintain currency with occupational, technical, managerial and workplace relations developments.</p> <p>2.6 Policies, plans and procedures are reviewed in consultation with appropriately competent person(s) and changes made where agreed as necessary.</p> <p>2.7 Plans, policies and procedures are documented in accordance sound management practice.</p> |
|---|--|---|

## REQUIRED SKILLS AND KNOWLEDGE

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

### *Required skills:*

- identify factors that affect the performance of a small business;
- preparing marketing plans for a small contracting business;
- estimating overhead and labour costs;
- preparing quotes;
- predicting profit margins with reasonable accuracy;
- analysing tender documents and their specifications;
- preparing small tenders;
- analysing and evaluating basic contracts;
- preparing project plans;
- applying appropriate regulation to electrical work;
- interpreting standards and regulations;
- complying with electricity distributors' supply requirements;
- arranging electrical inspections;
- keeping business and technical records;
- complying with OH&S requirements in relation to managing a small business;
- assessing and mitigating risk;
- adapting to changes in work.

*Required knowledge:*

- business performance and structures
  - strength and weakness analysis
  - entrepreneurial characteristics
  - common business structures
- markets and marketing
- costing, estimating and budgeting
- taxation
- tendering
  - documentation
  - specifications
- contracts
  - legal requirements
  - essential features
  - capacity
  - terms and conditions
- overview of the following:
  - project management
  - technical standards, regulations and codes for general electrical installations
  - electricity distributors, supply requirements
  - electricity regulatory safety requirements
  - Occupational Health and Safety, enterprise responsibilities

**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*

**Legislative requirements and standards** may include:

- acts of parliament
- regulations
- Orders in Council
- code of practices
- guidelines
- Australian and international standards

**Occupational Health & Safety** such as:

- legislation
- protective equipment
- material safety management systems
- hazardous substances and dangerous goods code
- local safe operation procedures
- awards provisions
- establishing hazard management arrangements
- OH&S record keeping arrangements
- risk control measures
- OHS Duty of Care responsibilities (knowledge of legislation)



## EVIDENCE GUIDE

*The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the accreditation submission.*

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

- Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment.
- Assessment should also reinforce the integration of the Employability Skills.
- In particular, this shall incorporate evidence that shows a candidate is able to:
  - implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range;
  - manage the operation of a small electrical contracting business on more than one occasion and in different contexts. In particular, demonstrate:
    - evaluating business performance;
    - complying with legal, commercial and regulatory requirements;
    - establishing an appropriate business focus;
    - evaluating and preparing of tenders; and
    - preparing accurate costing.

### **Context of and specific resources for assessment**

- This unit may be assessed on the job, off the job or a combination of both on and off the job.
- Where assessment occurs off the job, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
- The candidate will have access to all tools, equipment, materials and documentation required. The candidate will be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.



**Method of assessment**

- Assessment must include the demonstration of practical skills and may also include:
  - observation of processes and procedures;
  - oral and/or written questioning on required knowledge and skills;
  - testimony from supervisors, colleagues, clients and/or other appropriate persons;
  - inspection of the final product or outcome;
  - a portfolio of documentary evidence.
- Where performance is not directly observed and/or is required to be demonstrated over a period of time and/or in a number of locations, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons.
- Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
- Assessment should reinforce the integration of the Key Competencies.

## VU21156

## Use computer aided drafting systems

### Unit Descriptor

This unit of competency sets out the knowledge and skills required to apply computer aided drafting (CAD) using 2D techniques for engineering applications. This includes complex and advanced applications of CAD systems.

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

### Employability Skills

This unit contains employability skills.

### Application of the Unit

This unit of competency is intended to apply to any recognised development program that leads to the acquisition of a formal award at AQF level 5 or higher. The drawing task is typically related to prototype and complex 2D drawings using the CAD systems at an advanced level in an engineering environment.

## ELEMENT

*Elements describe the essential outcomes of a unit of competency. Elements describe actions or outcomes that are demonstrable and assessable.*

### 1. Prepare for drawing

## PERFORMANCE CRITERIA

*Performance criteria describe the required performance needed to demonstrate achievement of the element – they identify the standard for the element. Where bold/italicised text is used, further information or explanation is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.*

- 1.1 **OH&S** and **environmental requirements** for a given work area are obtained and understood.
- 1.2 Established OH&S requirements and risk control measures and procedures in preparation for the work area are followed.
- 1.3 Safety hazards, which have not previously been identified, are documented and risk control measures devised and implemented in consultation with **appropriate personnel**.
- 1.4 The extent of **drawing task** is determined from documentation or reports and from discussion with appropriate personnel.
- 1.5 Appropriate personnel are consulted to ensure the work is co-ordinated effectively with others involved at the work site.
- 1.6 **Resources** for the drawing task are obtained in accordance with **enterprise procedures**.
- 1.7 **Equipment** is checked for correct operation and safety.
- 2.1 Relevant OH&S requirements for carrying out the work are followed.
- 2.2 Equipment/machines/plant are checked as being isolated where necessary in strict accordance with OH&S requirements.
- 2.3 Drawing task is carried out to industry standards and in accordance with enterprise procedures.

### 2. Perform drawing

- |    |                                     |      |  |
|----|-------------------------------------|------|--|
| 3. | Complete and report on drawing task | 2.3  | Decisions for dealing with unexpected situations are made from discussions with appropriate personnel, job specifications and enterprise procedures. |
|    |                                     | 2.4  | Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes.                                      |
|    |                                     | 3.1  | Relevant OH&S requirements for completing the work are followed.   |
|    |                                     | 3.2  | Work site is made safe in accordance with established safety procedures.   |
|    |                                     | 3.3  | Equipment is shut down according to enterprise procedures.   |
|    |                                     | 3.3. | Drawing task is documented and appropriate personnel notified accordance with enterprise procedures.   |

## REQUIRED SKILLS AND KNOWLEDGE

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

### *Required Skills:*

- Coordinate with others
- Obtain drawings and documents
- Perform drawing tasks
- Create/update documentation

### *Required Knowledge:*

- CAD software
  - screen display areas, setting basic parameters, selecting command input and methods
- Geometric construction methods
  - angles, circles, arcs, polygons, tangents
- CAD drawings and system use
  - simple drawing production
  - save/update drawings (nominated drive/directory)
  - access/edit drawings
  - plot drawings (pre-set parameters)
  - exiting/shutting down
- Specific procedures
  - creating symbols for library files
  - program specific commands
  - configuring the digitising tablet
- Methodology for creating layers
  - name, colour, line type
- Methodology for drawing variables
  - limits, grid, snap, dimensions, text, units
- ISO drawing sheets
- Advanced drawing

## 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.*

**OH&S requirements** may include:

- legislation
- protective equipment
- material safety management systems
- hazardous substances and dangerous goods code
- local safe operation procedures
- awards provisions

**Environmental requirements** may include:

- liquid waste
- solid waste
- gas, fume, vapour, smoke emissions, including fugitive emissions
- excessive energy and water use
- excessive noise

**Appropriate personnel** may include:

- supervisor
- leading hand
- foreman
- manager
- site engineer
- trainer
- mentor
- teacher
- team member

**Drawing task** involves:

- complex 2D engineering drawings requiring the use of a wide range of features typically found in commercial drawing packages

**Resources** may include:

- computer software
- library files
- stationery
- drawing standards
- software reference documentation

**Enterprise procedures** may include:

- the use of tools and equipment
- instructions, including job sheets, cutting lists, plans, drawings and designs
- reporting and communication
- manufacturers' specifications
- operational procedures

**Equipment** includes:

- computer hardware
  - printers, plotter, digitisers, etc.

## EVIDENCE GUIDE

*The evidence guide provides advice on assessment and must be read in conjunction with the Elements, Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the Accreditation Submission.*

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

- Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment.
- Specifically they must be able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range
  - Demonstrate the required knowledge and skills as described in this unit;
  - Use computer aided drawing techniques to produce complex 2D drawings for a range of engineering applications. Drawings should include the applications of a representative range of drawing and modelling skills such as:
    - a wide range of geometric shapes;
    - efficient use of library files;
    - application of the appropriate drawing standards;
    - selection of most relevant drawing techniques;
    - hard copies of drawing.

### Context of and specific resources for assessment

- This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
- Resources required for assessment include:
  - OH&S policy and work procedures and instructions.
  - Access to workplace or work real environment and a variety of conditions
  - Operational access to relevant machines, tools, materials and consumables
  - Access to relevant plans, drawings and instructions and manufacturer's specifications/manuals

### Methods of assessment

- For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

- Evidence must involve demonstration of practical skills and may also include:
  - observation of processes and procedures
  - oral and/or written questioning on required knowledge and skills
  - testimony from supervisors, colleagues, clients and/or other appropriate persons
  - inspection of the final product or outcome
  - a portfolio of documentary evidence.
- Where performance is not directly observed and/or is required to be demonstrated over a period of time and/or in a number of locations, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons.
- Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.

## VU21531

## Advise on electrical energy management

### Unit Descriptor

This unit of competency sets out the knowledge, skills and applications required for ~~an~~ advising on electrical energy efficiency practice. This includes an understanding of current legislative settings and codes of practice, market factors that will impact on electrical energy use and differentiation between the market drivers for the residential, commercial and industrial sectors.

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

### Employability Skills

This unit contains Employability Skills

### Application of the Unit

The unit applies to qualified electrical trades persons and electrical engineers that install and maintain electrical systems and are providing advice to clients on optimum electrical management solutions.

## 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.*

- |   |  |   |
|---|--|---|
| 1 | Determine electrical energy management issues  | 1.1 Established <b><i>OH&amp;S requirements</i></b> and risk control measures and procedures for the work area are followed.<br>1.2 The extent of the electrical energy management issue is clarified and discussed with <b><i>clients</i></b> .<br>1.3 General information on the environmental effects of gas and electricity generation, including greenhouse gases, is provided to clients.<br>1.4 Advice on the benefits of electrical energy management is provided to clients, including possible government incentives. |
| 2 | Determine electrical energy management options | 2.1 Options are developed with respect to the context of the work requirements and the <b><i>energy consumption sector</i></b> .<br>2.2 Different options are compared for efficiency and effectiveness<br>2.3 The most appropriate option and its implementation strategy are chosen in discussion with clients.<br>2.4 Contingencies are discussed and agreed to with clients, if applicable.   |
| 3 | Document electrical energy management advice   | 3.1 A summary of the energy management advice and recommended strategies for energy use reduction are recorded.<br>3.2 A report on electrical energy management is forwarded to clients.  |

## REQUIRED SKILLS AND KNOWLEDGE

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

### *Required skills:*

- distinguishing between residential, commercial and industrial energy consumption sectors
- calculating costs of various energy management options
- providing feasible solutions to electrical energy management issues
- making recommendations based on analysis and evidence
- communicating verbally and in writing effectively
- working effectively with others

### *Required knowledge:*

- the greenhouse effect and its impact on climate change
- greenhouse gas emission profile
- greenhouse gas reduction strategies
- whole of Government broad policy approach for energy efficiency
- relevant environmental legislation, regulation and codes of practice
- principles of energy efficiency
- energy measurement and assessment techniques
- energy ratings for buildings, equipment and appliances
- energy efficiency technologies
- occupational health and safety principles

## 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*

***OH&S requirements*** may include:

- legislation
- protective equipment
- material safety management systems
- hazardous substances and dangerous goods code
- local safe operation procedures
- awards provisions

***Clients*** may include:

- customers (internal, external)
- local government
- regulators
- other statutory authorities

***Energy consumption sector*** includes:

- residential
- commercial
- industrial

## EVIDENCE GUIDE



*The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the accreditation submission.*

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

- Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment.
- Assessment should also reinforce the integration of the Employability Skills.
- In particular this shall incorporate evidence that shows a candidate is able to:
  - implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures;
  - provide sound advice on electrical energy management;
  - provide advice on electrical energy management for two **energy consumption sectors** taking into account current legislative settings, codes of practice, market factors and market drivers.

**Context of and specific resources for assessment**

- This unit may be assessed on the job, off the job or a combination of both on and off the job.
- Where assessment occurs off the job, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- The assessment environment should not disadvantage the candidate.
- Evidence should show competency working in a realistic environment and a variety of conditions.
- The candidate will have access to all tools, equipment, materials and documentation required. The candidate will be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

**Method of assessment**

- Assessment must include the demonstration of practical skills and may also include: observation of processes and procedures;
  - oral and/or written questioning on required knowledge and skills;
  - testimony from supervisors, colleagues, clients and/or other appropriate persons;
  - inspection of the final product or outcome;



- a portfolio of documentary evidence.
- Where performance is not directly observed and/or is required to be demonstrated over a period of time and/or in a number of locations, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons.
- Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.

## VU21532

# Implement energy efficient electrical systems

### Unit Descriptor

This unit of competency sets out the knowledge, skills and applications required to promote and implement energy efficiency in electrical systems. This includes the application of best practice in the use of lighting, motors, pumps, fans, heating and cooling systems, and the use of photo-voltaic cells

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

### Employability Skills

This unit contains Employability Skills

### Pre-requisite Unit

VU21531 - Advise on electrical energy management

### Application of the Unit

The unit applies to qualified electricians and electrical engineers who design, install and maintain electrical systems and are providing advice to clients on energy efficiency and regulatory requirements.

## 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 | Determine clients' electrical system requirements.        | 1.1 | Established <b><i>OH&amp;S requirements</i></b> and risk control measures and procedures for the specific work area are followed.                     |
|   |   | 1.2 | The extent of the system requirements is clarified from work request and discussions with <b><i>clients</i></b> .                                     |
|   |   | 1.3 | <b><i>Electrical system</i></b> requirements are checked against energy saving design principles and best practice.                                   |
|   |   | 1.4 | System requirements are checked for compliance with <b><i>environmental regulatory provisions</i></b> .   |
| 2 | Promote energy efficient alternative solutions to clients | 2.1 | Electrical system requirements are analysed and energy efficient options, which are compliant with <b><i>relevant standards</i></b> , are identified. |
|   |   | 2.2 | Different options appropriate to the application are compared for efficiency and effectiveness  |
|   |   | 2.3 | The most appropriate option and its implementation strategy is chosen in discussion with clients.   |
|   |   | 2.4 | Contingencies are discussed and agreed to with clients, if applicable.  |

- |   |   |     |  |
|---|---|-----|--|
| 3 | Advise clients on future maintenance to maintain energy efficiency. | 3.1 | <b>Further energy efficient techniques</b> for the electrical system installation are identified and discussed with clients. |
|   |   | 3.2 | Clients are informed of the <b>ramifications</b> of not maintaining the electrical system properly.                          |
|   |   | 3.3 | Clients are informed on maintenance requirements and techniques to maintain the energy efficiency of the installation.       |

## REQUIRED SKILLS AND KNOWLEDGE

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

### Required skills:

- identifying potential energy savings
- advising on most appropriate systems based on efficiency and suitability for the application
- communicating environmental legislation and regulation requirements to clients. In particular, the energy requirements (watts/sq metre) nominated in the Building Code of Australia (BCA)
- selecting appropriate energy- saving devices
- making recommendations based on analysis and evidence. An energy assessment may be necessary as a starting point.
- communicating effectively verbally and in writing, with reliable evidence that the proposed solution can be substantiated
- working effectively with others to provide a total energy efficient solution

### Required knowledge:

- occupational health and safety principles
- energy ratings of different electrical systems
- the performance of the total system, once electronics are introduced
- energy saving accessories
- energy saving strategies
- relevant government legislation and regulations, including the Building Code of Australia (BCA) and state and local government regulations.
- Minimum Energy Performance Standards (MEPS).
- Minimum Energy Performance Requirements (MEPR)

## 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*

**OH&S requirements** may include:

- legislation
- protective equipment
- material safety management systems
- hazardous substances and dangerous goods code
- local safe operation procedures

- Clients** may include:
- awards provisions
  - customers (internal, external)
  - local government
  - regulators
  - other statutory authorities
- Electrical system** must include:
- Lighting
  - Centrifugal pumps and fans
  - Motors
  - Heating and cooling systems
  - Photo-voltaic cells
- Environmental regulatory provisions** includes:
- Building Code of Australia
  - Relevant Australian standards and State regulations
  - Local government regulations
- Relevant standards** such as:
- Building Code of Australia
  - Australian standards and State regulations
  - Australian lighting standards – AS/NZS1680
- Further energy efficient techniques** relates to:
- Energy management systems that will deliver further efficiencies
- Ramifications** may involve:
- System failure
  - Energy wastage
  - Increased costs
  - Major maintenance
  - Increased atmospheric emissions

## EVIDENCE GUIDE

*The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the accreditation submission.*

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

- Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment.
- Assessment should also reinforce the integration of the Employability Skills.
- In particular this shall incorporate evidence that shows a candidate is able to

- implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures ;
- Implement energy efficient systems
- demonstrate competency within a timeframe typically expected of the discipline, work function and industrial environment;
- provide accurate and practical advice to clients on energy efficient **electrical systems**;
- promote and implement energy efficient practices to reduce emissions.

**Context of and specific resources for assessment**

- This unit may be assessed on the job, off the job or a combination of both on and off the job.
- Where assessment occurs off the job, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- The assessment environment should not disadvantage the candidate.
- Evidence should show competency working in a realistic environment and a variety of conditions.
- The candidate will have access to all tools, equipment, materials and documentation required. The candidate will be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

**Method of assessment**

- Assessment must include the demonstration of practical skills and may also include:
  - observation of processes and procedures;
  - oral and/or written questioning on required knowledge and skills;
  - testimony from supervisors, colleagues, clients and/or other appropriate persons;
  - inspection of the final product or outcome;
  - a portfolio of documentary evidence.
- Where performance is not directly observed and/or is required to be demonstrated over a period of time and/or in a number of locations, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons.
- Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.



## VU21582

## Apply energy efficient LED lighting principles

### Unit Descriptor

This unit of competency sets out the knowledge, skills and applications required to promote energy efficient LED lighting systems. This includes the application of best practice in the selection and use of LED lighting to suit specific applications in addressing clients' needs.

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

### Employability Skills

Not applicable

### Pre-requisite Unit

VU21532 Implement energy electrical systems

### Application of the Unit

The unit applies to qualified electricians that design, install and maintain LED lighting systems and are providing advice to clients on energy efficiency and regulatory requirements.

## 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 | Determine clients' LED lighting system requirements | <p>1.1 Established <b><i>OH&amp;S requirements</i></b> and risk control measures and procedures for the specific work area are followed.</p> <p>1.2 The LED lighting <b><i>design and application requirements</i></b> is clarified from work request and discussions with <b><i>clients</i></b>.</p> <p>1.3 <b><i>LED lighting system</i></b> requirements are checked against energy saving design principles and best practice.</p> <p>1.4 LED lighting system requirements are checked for compliance with <b><i>environmental regulatory provisions</i></b>.</p> |
| 2 | Promote energy efficient LED lighting system        | <p>2.1 The LED lighting system plan and products is designed and developed in accordance with the client needs and application requirements.</p> <p>2.2 Energy efficient options, appropriate to the application are considered for efficiency, effectiveness and for compliance with environmental regulatory provisions.</p>  |



- 2.3 The most appropriate option and implementation strategy is recommended and selected in consultation with clients.
  - 2.4 The **advantages** of LED lighting systems over existing lighting options are explored and highlighted to clients.
  - 2.5 Energy efficient techniques for the LED lighting system installation are communicated to clients.
  - 2.6 Contingencies are planned for and agreed to with clients, where applicable.
- 3 Advise on LED lighting system maintenance
- 3.1 Clients are informed of the need for maintenance of LED lighting system installation to ensure optimal performance and energy efficiency.
  - 3.2 The maintenance plan and proposed schedule for the LED lighting system installation is developed and agreed to with clients.
  - 3.3 The relevant maintenance plan and proposed schedule is recorded for reference in accordance with organisational requirements, where appropriate.

## REQUIRED SKILLS AND KNOWLEDGE

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

- Required skills
- identifying potential energy savings
  - advising on most appropriate systems based on efficiency and suitability for the application
  - communicating environmental legislation and regulation requirements to clients.
  - selecting appropriate energy- saving devices
  - making recommendations based on analysis and evidence.
  - communicating effectively verbally and in writing, with reliable evidence that the proposed solution can be substantiated
  - working effectively with others to provide a total energy efficient solution

- Required knowledge
- occupational health and safety principles
  - the four (4) basics of light
  - LED historical contexts and basic concepts
  - construction of an LED lighting system
  - Thermal management and life
  - LED lighting Lumen maintenance requirements
  - Quality differentiation

- energy saving strategies
- relevant government legislation and regulations, including the Building Code of Australia (BCA), Australian lighting standards – AS/NZS1680, National Australian Built Environment Rating Systems (NABERS) and state and local government regulations.
- Minimum Energy Performance Standards (MEPS).
- Minimum Energy Performance Requirements (MEPR)

## 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*

The following variables may be present and may include, but are not limited to, the examples listed under the scope. All work is undertaken to state or territory legislative requirements.

- OH&S requirements** includes:
- legislation
  - personal protective equipment
  - material safety management systems
  - hazardous substances and dangerous goods code
  - local safe operation procedures

- Design and application requirements** includes:
- situational context and design issues for consideration
  - Building Code of Australia
  - product capability and application
  - lighting needs
  - operating characteristics eg. lumen depreciation
  - lighting performance analysis
  - dimming and colour variation
  - electrical connection and compatibility with management systems
  - wiring options
  - future technology eg. remote phosphor technology & OLED Flat Panel Technology (Organic LED)

- Clients** includes:
- customers (internal, external)
  - local government
  - regulators
  - other statutory authorities

**LED lighting system** must include:

- components
- operating cost
- low heat output
- lamp life
- reliability

**Environmental regulatory provisions** includes:

- Building Code of Australia
- Relevant Australian standards and State regulations
- Local government regulations

**Advantages** include:

- operating cost
- low heat output
- lamp life
- reliability

## EVIDENCE GUIDE

*The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the accreditation submission.*

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

- Assessors must be satisfied that the candidate can:
  - implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures ;
  - demonstrate required knowledge and skills necessary to determine the most efficient and effective LED lighting system requirements for a range of client needs and applications
  - design and develop suitable LED lighting systems and installation strategies for the clients' application requirements;
  - provide accurate and practical advice to clients on LED lighting system maintenance requirements and develop appropriate maintenance schedules for clients;
  - promote energy efficient LED lighting systems.

**Context of and specific resources for assessment**

- Evidence should show competency working in a realistic environment and a variety of conditions.
- The candidate will have access to all tools, equipment, materials and documentation required. The candidate will be permitted to refer to any relevant workplace procedures, product

and manufacturing specifications, codes, standards, manuals and reference materials.

- This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

### **Method of assessment**

- Evidence shall be gathered through a variety of ways with a minimum of two methods below:
  - observation of processes and procedures;
  - oral and/or written questioning on required knowledge and skills;
  - testimony from supervisors, colleagues, clients and/or other appropriate persons;
  - inspection of the final product or outcome;
  - a portfolio of documentary evidence.
- Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.

**VU21525****Conduct electrical project scheduling****Unit Descriptor**

This unit specifies the knowledge and skills required to schedule electrical projects effectively. It covers implementing the project schedule and assessing time management outcomes.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication, although the application of the unit necessitates adherence to relevant State or Territory electrical safety and regulatory requirements.

**Employability skills**

This unit contains Employability Skills.

**Application of the Unit**

This competency would be applied by electrical project managers to effectively manage time and thereby minimise costs associated with various projects. It involves setting and implementing schedules for work and assessing the outcomes.

**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 Determine project schedules.

- 1.1 The duration and effort, sequence and interdependencies of tasks are established from the project scope definition.
- 1.2 Relevant State/Territory **legislation, regulations, codes and building standards** are considered in setting up the project schedule.
- 1.3 **Key stakeholders** are consulted for input to and approval of the project schedule.
- 1.4 A **risk analysis** is undertaken for the project and appropriate contingency arrangements are established.
- 1.5 **Methods, techniques and tools** are selected and used within **delegated authority** to establish the preferred schedule, **time management plans**, resource allocation and financial requirements.
- 1.6 Approval of the schedule is obtained from the **higher project authority** and communicated to all stakeholders to provide the basis for measuring progress.

- |   |                                 |   |
|---|---------------------------------|---|
| 2 | Implement project schedule      | <p>2.1 Progress of activities in relation to the agreed schedule and plans are measured, recorded and reported.</p> <p>2.2 Ongoing analysis of options is conducted to identify variances and forecast the impact of changes to the schedule.</p> <p>2.3 Progress is reviewed throughout the project and agreed schedule changes are introduced to ensure consistency with changing scope, objectives and constraints related to time and resource availability.</p> <p>2.4 Responses to perceived, potential or actual schedule changes are developed, agreed by a higher project authority and actioned to achieve project objectives</p> |
| 3 | Assess time management outcomes | <p>3.1 Data is collected to measure and record project progress.</p> <p>3.2 Project outcomes are reviewed from the available data to determine the effectiveness of the time management activities.</p> <p>3.3 Time management issues and recommended improvements are identified, documented and passed on to a higher project authority for application in future projects.</p>   |

## REQUIRED SKILLS AND KNOWLEDGE

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

### *Skills:*

- Communication skills to relate to people from a range of social, cultural and ethnic backgrounds and abilities
- Project management
- Time management for effective use of resources
- Planning and organising labour and materials
- Negotiating with clients and other stakeholders
- Problem-solving to overcome contingencies
- Leadership and personnel management skills
- Evaluation of project progress
- Risk analysis to minimise or eliminate potential problems

### *Knowledge:*

- Relevant State/Territory legislation, regulations, codes and building standards
- Interdependency of time, costs and resources to the project schedule
- Project responsibilities
- Use of the project schedule as a control mechanism
- Time management techniques

## 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.*

**Legislation, regulations, codes and building standards** includes:

- Award and enterprise agreements and relevant industrial instruments
- Relevant State/Territory legislation from all levels of government that affects business operation, especially in regard to
  - Occupational Health & Safety
  - Equal opportunity
  - Industrial relations
  - Anti-discrimination
  - Electrical project management
- Relevant industry codes of practice
- State/Territory building standards

**Key stakeholders** include:

- Employers
- Clients
- Sub-contractors
- Suppliers
- Unions
- Managers
- Employees
- Other workforce members

**Methods, techniques and tools** may include:

- Using personal experience and/or subject experts
- Conducting or supervising qualitative and/or quantitative time analysis, such as schedule simulation, decision analysis, contingency management and alternative strategy development
- Using specialist time analysis tools to assist in the decision making process
- Cost-to-complete

**Risk analysis** may include:

- OH & S
- Opportunities
- Contractual obligations
- Appropriately skilled personnel
- Site access
- Dependence on other contractors
- Environmental problems
- Industrial relations issues
- Equipment limitations

- Resource problems
- Delivery problems

**Time management plans** involve:

- Project schedules and sub-schedules
- Risk analysis
- List of milestones
- Schedule management strategies and actions, standardised formal arrangements, responsibility assignment, contingency plans and assigned schedules management responsibilities

**Delegated authority** means:

- Working within the boundaries of responsibility set for the project manager's position
- Following the approved lines of communication for the project
- Working with key stakeholders to maximise the success of the project

**Higher project authority** may include:

- Local regulatory authority
- Company executives
- Site Manager
- Contract Manager

## EVIDENCE GUIDE

*The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the accreditation submission.*

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

. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment.

Assessment should also reinforce the integration of the Employability Skills.

In particular this shall incorporate evidence that shows a candidate is able to:

- implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range;
- demonstrate competence within a timeframe typically expected of the discipline, work function and industrial environment;
- and specifically they must be able to:



- Establish project schedules in consultation with key stakeholders
- Measure progress and the achievement of project objectives
- Conduct risk analysis and establish appropriate contingency plans
- Implement project schedules and adapt if necessary, based on data feedback on project progress
- Assess the effectiveness of the scheduling activities.

**Context of and specific resources for assessment**

The assessment of this unit should be conducted over a period of time through workplace or simulated workplace projects.

Resources required for the assessment of the unit include:

- Relevant legislation, regulations, codes and building standards
- Access to electrical projects in a real or simulated environment
- Electrical project case studies
- Access to workplace documentation

**Method of assessment**

Assessment must include the demonstration of practical skills and may also include:

- Case study analysis
- Project schedules
- Log of consultation on establishing the project schedule
- Risk analysis
- Written tests
- Reports on electrical project outcomes

## VU21528

## Interpret building and electrical drawings and diagrams

### Unit Descriptor

This unit specifies the knowledge and skills required to gather relevant job information for electrical projects from building and electrical drawings. It covers sourcing the drawings, analysing the information and passing it on to the relevant contractors in order to achieve the project goals.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication, although the application of the unit necessitates adherence to relevant State or Territory building regulations and standards, as well as electrical safety and regulatory requirements.

### Employability skills

This unit contains employability skills.

### Application of the Unit

This competency would be applied by project managers to gather and analyse relevant job information from building and electrical drawings associated with various electrical projects. It involves familiarity with drawings symbols, scales and codes in order to source the information and pass it on to the relevant contractors in order to achieve the project goals.

### 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 Source relevant building and electrical drawings or diagrams.

- 1.1 The sources of **relevant drawings and diagrams** pertaining to the project are identified.
- 1.2 **Appropriate protocols** are followed to access the drawings and/or diagrams.
- 1.3 Selection of drawings/diagrams is managed and version control is maintained.
- 1.4 Established OH & S risk control measures and procedures are followed.
- 1.5 Relevant State/Territory **legislation, regulations, codes and building standards** are considered in selecting the drawings and/or diagrams.
- 1.6 **Key stakeholders** are consulted for their input to the interpretation of the drawings/diagrams in relation to the project goals.

2 Use drawings and diagrams to obtain relevant job information.

- 2.1 Drawings and/or diagrams are selected appropriate to the work being undertaken.
- 2.2 Drawings and diagrams are analysed using knowledge of drawing layouts, conventions and symbols.
- 2.3 Dimensions are extracted from drawings and diagrams for application to the work being undertaken.

- 2.4 Location of equipment is determined from location diagrams
- 3 Convey relevant job information from drawings and diagrams to project contractors.
- 3.1 **Drawing conventions** are used in neat freehand drawings to convey information and ideas to others involved in the project.
- 3.2 Drawing conventions are used to neatly correct freehand original job drawings to show final “as installed” arrangement.
- 3.3 Corrected drawings are forwarded to appropriate person(s) in accordance with established protocols.

## REQUIRED SKILLS AND KNOWLEDGE

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

### Skills

- Communication skills to relate to people from a range of social, cultural and ethnic backgrounds and abilities
- Project management to ensure efficient work progress
- Analysing information provided by drawings and diagrams
- Planning and organising to ensure effective use of resources
- Problem-solving, in terms of adjusting drawings or diagrams, as required to reflect emerging job needs
- Risk analysis to minimise or eliminate potential problems

### Knowledge:

- Relevant State/Territory legislation, regulations, codes and building standards
- Safe working practices
- Project responsibilities
- Drawing layouts, symbols and conventions
- Project protocols

## 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.*

**Relevant drawings and diagrams** includes, but is not limited to:

- Architectural drawings
- Mechanical and duct layout
- Building Plans
- Electrical circuit diagrams
- Equipment location diagrams

**Appropriate protocols** may relate to:

- Project site rules
- Lines of communications
- Industrial relations
- Regulatory requirements

**Legislation, regulations, codes and building standards** includes:

- Award and enterprise agreements and relevant industrial instruments
- Relevant State/Territory legislation from all levels of government that affects business operation, especially in regard to
  - Occupational Health & Safety
  - Equal opportunity
  - Industrial relations
  - Anti-discrimination
  - Electrical project management
- Relevant industry codes of practice
- Building Codes of Australia
- Electrical Wiring Regulations (Australian standards and service standards)

**Key stakeholders** include:

- Employers
- Clients
- Unions
- Managers
- Employees
- Other contractors

**Drawing conventions** relate to:

- Current industry practice and Australian and other relevant standards

## EVIDENCE GUIDE

*The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the accreditation submission.*

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

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment.

Assessment should also reinforce the integration of the Employability Skills.

In particular this shall incorporate evidence that shows a candidate is able to:

- implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range;
- demonstrate competence within a timeframe typically expected of the discipline, work function and industrial environment;

- and specifically they must be able to:
  - Establish the source of drawings and diagrams relevant to the project work;
  - Recognise and interpret drawing conventions and symbols;
  - Extract pertinent information from drawings and diagrams to facilitate the achievement of the project goals
  - Transmit relevant information from drawings and diagrams to other workers on the project;
  - Adjust drawings and diagrams using appropriate protocols, to accommodate emerging job needs

**Context of and specific resources for assessment**

The assessment of this unit should be conducted over a period of time through workplace or simulated workplace projects.

Resources required for the assessment of the unit include:

- Relevant legislation, regulations, codes and building standards
- Access to electrical projects in a real or simulated environment
- Building and electrical drawings and diagrams
- Access to workplace documentation

**Method of assessment**

Assessment must include the demonstration of practical skills and may also include:

- Case study analysis
- Workplace projects
- Written tests
- Summaries of pertinent information from drawings and diagrams

## VU21529

# Comply with relevant regulatory information and building codes

### Unit Descriptor

This unit specifies the knowledge and skills required to maintain the currency of regulatory information relating to electrical project management. It covers identifying the sources of information and the importance of compliance.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication, although the application of the unit necessitates adherence to relevant State or Territory electrical safety and regulatory requirements.

### Employability skills

This unit contains Employability Skills.

### Application of the Unit

This competency would be applied by electrical project managers to research sources of regulatory information and ensure the compliance of the project with these requirements.

It involves identifying relevant legislation, regulations, codes and standards, disseminating the information to key stakeholders and ensuring the compliance of the project team and the project with the requirements.

## 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 | Establish sources of regulatory information. | <p>1.1 The range of <b>legislation, regulation, codes and building standards</b> relating to electrical project management is clarified.</p> <p>1.2 Relevant legislation, regulations, codes and building standards specific to the State/Territory are identified</p> <p>1.3 <b>Sources of information</b> for relevant regulatory information are identified</p> <p>1.4 The contact details for the relevant State/Territory regulatory body are determined</p> <p>1.5 Responsibility for maintaining the currency of information is confirmed.</p> |
| 2 | Disseminate accurate regulatory information. | <p>2.1 <b>Key stakeholders</b> for regulatory information pertaining to electrical project management are identified</p> <p>2.2 Regulatory information is distributed to the key stakeholders on a regular basis.</p> <p>2.3 <b>Local regulatory authorities</b> are used to clarify any areas of confusion in relation to regulatory requirements.</p>   |

- |   |   |     |  |
|---|---|-----|--|
| 3 | Comply with relevant regulatory requirements. | 3.1 | The importance of compliance with relevant regulatory information is emphasised to all stakeholders. |
|   |   | 3.2 | Regulatory requirements are built into all electrical project management plans.                      |
|   |   | 3.3 | Adherence to current regulatory requirements is monitored on an ongoing basis.                       |
|   |   | 3.4 | Implications of non-compliance with regulatory requirements are clarified to stakeholders.           |
|   |   | 3.5 | Corrective action is taken promptly to rectify any areas of non-compliance that are identified.      |

## REQUIRED SKILLS AND KNOWLEDGE

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

### Skills:

- Communication skills to relate to people from a range of social, cultural and ethnic backgrounds and abilities
- Research skills to locate sources of information
- Analytical skills to identify pertinent aspects of legislation, regulation, codes and building standards for the electrical project
- Monitoring skills to maintain compliance

### Knowledge:

- Relevant Federal/State/Territory legislation, regulations, codes and building standards
- Sources of regulatory information
- Regulatory authorities
- Implications of non-compliance with relevant legislation, regulations, codes and building standards

## 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.*

**Legislation, regulations, codes and building standards** includes:

- Award and enterprise agreements and relevant industrial instruments
- Relevant State/Territory legislation from all levels of government that affects business operation, especially in regard to
  - Occupational Health & Safety
  - Equal opportunity
  - Industrial relations
  - Anti-discrimination
  - Electrical project management
- National Electricity Law
- National Electricity Rules
- Relevant industry codes of practice
- Building Codes of Australia

**Sources of information** may include:

- National Wiring Rules
- State/Territory Government Office
- Internet
- National Electrical and Communications Association (NECA)
- Australian Energy Market Commission (AEMC)
- Australian Energy Regulator (AER)

**Key stakeholders** include:

- Employers
- Clients
- Unions
- Managers
- Employees
- Other workforce members

**Local regulatory authorities** may include:

- Energy Safe Victoria, or its equivalent in other States/Territories
- Local Municipal offices
- Worksafe Victoria or its equivalent
- Environmental regulatory authorities

## EVIDENCE GUIDE

*The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the accreditation submission.*

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

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment.

Assessment should also reinforce the integration of the Employability Skills.

In particular this shall incorporate evidence that shows a candidate is able to:

- implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range;
- demonstrate competence within a timeframe typically expected of the discipline, work function and industrial environment;
- and specifically they must be able to:
  - Identify the sources of current information on regulatory requirements;
  - Disseminate relevant regulatory information to key stakeholders
  - Identify local regulatory authorities



- Monitor compliance with regulatory requirements

**Context of and specific resources for assessment**

The assessment of this unit should be conducted over a period of time through workplace or simulated workplace projects.

Resources required for the assessment of the unit include:

- Relevant legislation, regulations, codes and building standards
- Access to local regulatory authorities
- Access to the Internet for research purposes
- Access to workplace documentation

**Method of assessment**

Assessment must include the demonstration of practical skills and may also include:

- Case study analysis
- Research reports on regulatory information sources
- Strategies for the dissemination of regulatory information to key stakeholders
- Written tests

**VU21530****Conduct electrical energy efficiency assessments****Unit Descriptor**

This unit specifies the knowledge and skills required to conduct energy audits related to electrical project management. It covers identifying the sources of electrical energy and incorporates principles of energy sustainability.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication, although the application of the unit necessitates adherence to relevant State or Territory electrical safety and regulatory requirements.

**Employability skills**

This unit contains Employability Skills

**Application of the Unit**

This competency would be applied by electrical project managers to conduct audits of energy use and potential savings associated with various projects. It involves identifying sources of energy wastage and suggesting alternative energy saving devices.

**ELEMENT**

*Elements describe the essential outcomes of a unit of competency.*

1 Prepare to conduct an energy assessment.

2. Conduct the energy assessment.

**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.*

- 1.1 Relevant OH & S requirements are clarified for the scope of the project.
- 1.2 Sources of information on energy use are identified within the scope of the project.
- 1.3 **Sources of information** for electrical energy saving are identified.
- 1.4 Advice is sought from **key stakeholders** to ensure that the assessment is coordinated effectively.
- 1.5 Sources of materials and equipment that may be required for the assessment are identified and accessed, in accordance with established routines and procedures.
- 1.6 Tools, equipment and testing devices needed to conduct the assessment are obtained and checked for calibration and safety.
- 2.1 Established OH & S risk control measures and procedures for conducting the energy assessment are followed.
- 2.2 **Appropriate persons** are interviewed in relation to the energy assessment.
- 2.3 The need to test or measure live is determined in strict accordance with OH & S requirements and when

- necessary conducted within established safety procedures.
- 2.3 Circuits/machines/plant are checked as being isolated where necessary, in strict accordance with OH & S requirements and procedures.
  - 2.4 Retrieval of performance data is carried out safely and to prescribed routines and procedures.
  - 2.5 Energy usage data is gathered and collated within the scope of the project.
  - 2.6 Sources of energy wastage are identified.
- 3 Prepare an energy assessment report.
- 3.1 Assessment results and findings against the assessment objectives are presented to the client and the reporting arrangements clarified.
  - 3.2 Key stakeholders for the assessment report are identified.
  - 3.3 The report is prepared in accordance with established assessment report format and enterprise requirements.
  - 3.4 Potential energy saving devices are suggested, where appropriate.
  - 3.5 Consequences of the energy assessment report are clarified and followed up.

## REQUIRED SKILLS AND KNOWLEDGE

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

### *Skills:*

- Communication skills to:
  - listen to and question clients and other assessment team members
  - relate to people from diverse cultural backgrounds and abilities
  - report effectively on the assessment findings
- Organisational and planning skills to sequence tasks, meet timelines, conduct inspections and arrange meetings

### *Knowledge:*

- Audit codes of practice or ethics
- Auditing methods and techniques
- Relevant Federal/State/Territory legislation, regulations, codes and building standards
- Sources of energy information
- Industry, product and/or service knowledge
- Research skills to locate sources of energy information
- Analytical skills to identify energy wastage points within the scope of the project
- Problem solving techniques
- Teamwork requirements
- Technology skills to use a range of equipment to conduct an energy assessment

## 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.*

### **Sources of information**

may include:

- Internal documentation
- Reports from external sources
- Inspection of records
- Interviews
- Observations
- Measurements
- Local regulatory authority

### **Key stakeholders** include:

- Employers
- Clients
- Unions
- Managers
- Employees
- Other workforce members

### **Appropriate persons** may include:

- Persons from different levels within the organisation, such as managers, supervisors, maintenance personnel, machine operators etc
- Persons performing activities or tasks under consideration in the assessment process

## EVIDENCE GUIDE

*The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the accreditation submission.*

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

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment.

Assessment should also reinforce the integration of the Employability Skills.

In particular this shall incorporate evidence that shows a candidate is able to:

- implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range;

- demonstrate competence within a timeframe typically expected of the discipline, work function and industrial environment;
- and specifically they must be able to:
  - Identify the sources of current information on energy management
  - Prepare materials and personnel to conduct energy assessments
  - Consult with key stakeholders to coordinate the assessment
  - Identify local regulatory authorities
  - Collate information from various sources to prepare an energy assessment report
  - Present the assessment findings to the client in verbal and written form
  - Follow up the recommendations of the assessment report

**Context of and specific resources for assessment**

The assessment of this unit should be conducted over a period of time through workplace or simulated workplace projects.

Resources required for the assessment of the unit include:

- Relevant legislation, regulations, codes and building standards
- Access to local regulatory authorities
- Access to the Internet to research energy management information
- Access to various levels of personnel within the client's organisation
- Access to workplace documentation

**Method of assessment**

Assessment must include the demonstration of practical skills and may also include:

- Case study analysis
- Research reports on energy management sources
- Assessment report
- Written tests

## Appendix I – Summary of Skills and Knowledge Survey

### Diploma of Electrical Project Management – Reaccreditation Project Skills and Knowledge Survey Findings

The Diploma of Electrical Project Management provides individuals with the skills and knowledge required to manage projects. It was been designed for electricians and other experienced individuals who are required as part of their job role to undertake project management.

Legend	1 = not important	2 = less important
3= important	4 = very important	5 = critical

Skills and Knowledge	5	4	3	2	1
1 Define the scope of a project	33%	44%	22%		
2 Develop a project plan	33%	44%	22%		
3 Keep project records and produce project reports	55%	33%	11%		
4 Produce a project budget	66%	33%	11%		
5 Monitor and control project costs	77%	22%			
6 Schedule project activities	66%	22%			
7 Monitor project timelines	11%	88%			
8 Read building and electrical drawings for project related information	22%	55%	11%		
9 Implement and manage employee relations	22%	44%	33%		
10 Build and support teams	22%	66%		11%	
11 Lead and facilitate teamwork	33%	55%		11%	
12 Use effective communication and interpersonal skills	33%	44%	11%	11%	
13 Manage the selection, engagement and monitoring of sub-contractors		77%	22%		
14 Negotiate terms of contracts	22%	33%	44%		
15 Prepare and finalise contracts	11%	55%	22%	11%	
16 Assist clients to articulate their needs		55%	44%		
17 Manage ongoing relationships with clients	44%	44%	11%		
18 Determine project quality requirements	22%	22%	55%		
19 Implement quality control and assurance processes	11%	33%	55%		
20 Conduct procurement activities		22%	66%		
21 Use appropriate conflict resolution strategies	11%	55%	33%		
22 Operate commercial software packages (eg. word processing, spreadsheets, databases)	11%	33%	55%		
23 Manage work health and safety risks	66%	33%			
24 Source regulatory information (eg. legislation, regulations, codes, building standards)	22%	55%	33%		
25 Comply with regulatory requirements	11%	55%	22%	11%	
26 Conduct an energy assessment			11%	77%	11%
27 Principles of energy sustainability			22%	55%	22%
28 Write technical specifications for project materials and equipment		22%	22%	55%	
29 Estimate costs for competitive quotations and tenders	22%	44%	33%		
30 Prepare a quotation for a job	22%	55%	22%		
31 Run a small contracting business		22%	44%	11%	22%
32 Legal obligations for safety, environmental protection, heritage sites, employment		55%	33%	11%	
33 Advise on energy efficiency strategies		11%	33%	33%	22%
34 Implement energy efficient electrical systems		11%		77%	11%
<b>Additional Items</b>					
35 Understand the cost to complete	1				
36 Manning based on cost to complete		4			

## Comments provided by survey respondents

### Comment 1

I would like to see the key points covered within “Manage work health and safety risks” as this element has the potential to be the greatest risk to a contracting business. Coverage must include the following of: -

- *Site Specific Risk Assessments*
  - *Building a risk assessment form that suits the specific site*
  - *Assessing the risk on site*
  - *Frequency of review i.e.; weekly*
- *Site Specific Safe Work Method Statements*
  - *Building a site specific SWMS that reflects the conditions on the day*
  - *Assessing the adequacy of control measures to mitigate the risk*
  - *Frequency of review i.e.; daily, weekly*
- *Project Safety Procedures/JSAs*
  - *Building PSPs that cover all tasks that don't change from job to job*
  - *Assessing the adequacy of control measures to mitigate risk*
- *Reporting*
  - *Notifying Workcover when trenching 1.5m deep and greater prior to commencement*
  - *Near Miss reporting*
  - *Accident & Incident reporting (internally & externally)*
  - *Medical Treatment Injury process and reporting*
  - *Process Improvement Notifications*
  - *Return to work*

### Comment 2

Whilst some of the above mentioned are vitally important for the success of a project. I have down rated them due to the fact that our business has sufficient training and procedures to cover this element. Furthermore our handover process covers a number of these elements in detail.

### Comment 3

Managing teams and people is the most important thing for our up and coming Supervision.

### Comment 4

Contractors today require skills in all areas

### Comment 5

Know when to ask for help, Attitude – keeping a positive attitude, Communication with workforce, Productivity – getting the team to work together.

### Comment 6

We ask a lot of these people with each of the above being very important – yes they need all these skills. However, as a PM they also need to have the right team around them to deliver the job. Typically when we have a project failure we have made the wrong appointment not because of the lack of technical knowledge but because of the EQ and understanding their leadership role.

### Comment 7

Recognising we are a large business we focus on having the right team with everyone understanding their cog in the wheel.

### Comment 8

1. To have good Negotiation skills
2. Have the ability to complete costs to complete on a project
3. Understand your cost base on a project
4. Understand your contract and produce your own timeline program
5. Work with your end customer to build a relationship for the future
6. Understand your scope of work on a project to ensure you maximise the growth on the project
7. Understand the risk on the project and manage your risk through a risk management plan
8. Provide a safe workplace and make sure your team goes home to their family as they came to work in the morning
9. Lead and share your knowledge to your team
10. Good communication and literacy skills