



Australian Government

Department of Education, Employment and Workplace Relations

UETTDRCJ21A Lay ESI electrical cables

Release: 1

UETTDRCJ21A Lay ESI electrical cables

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This Competency Standard Unit covers the laying of cables for electrical purposes and includes the laying of ducts and/or conduit for such cables. It could include direct laying of cables in trenches, on racks, in troughs and /or in conduit or ducts. It also encompasses cable pulling methods, pulling tensions, minimum bending radii, reduction of frictional forces, use of supporting plant (e.g. dynamometers, rigging, winches), working on FRC, PVC, A/C ducted systems and the sealing of cables.

Application of the Unit

Application of the Unit 2)

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry

License to practice**3)**

safety and compliance, industrial relations, environmental protection, anti discrimination and training.
Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites**Prerequisite Unit(s)****4)****Competencies****4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL16A	Working safely near live electrical apparatus

Literacy and numeracy skills**4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”.

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills 5)

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to lay electrical cables	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received and confirmed, if necessary, by site inspection 1.2 Relevant requirements and established procedures for the work are discussed with other personnel and identified for all work sites 1.3 OHS policies and procedures related to requirements and established procedures for the laying of electrical cables are obtained and confirmed for the purposes of the work to be performed and communicated 1.4 Work is prioritised and sequenced following consultation with others for completion within

ELEMENT**PERFORMANCE CRITERIA**

		acceptable timeframes and in accordance with established procedures
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at work site are confirmed current in First Aid and other related work procedures according to requirements.
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
	1.12	Traffic management plan is identified and implemented.
2	Carry out the laying of electrical cables	2.1 OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimise waste are followed in accordance with requirements and/or established procedures.
		2.2 Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment,

ELEMENT	PERFORMANCE CRITERIA
	techniques and practices are safely followed and, currency according to requirements confirmed.
	2.3 Essential knowledge and associated skills are applied in the safe laying of electrical cables to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.4 Electrical cables are laid in accordance with the work schedule and requirements/established procedures.
	2.5 Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.6 Unplanned events in the laying of electrical cables are undertaken within the scope of established procedures.
	2.7 Known solutions to a variety of problems are applied using routine procedures.
	2.8 Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the laying of electrical cables	3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures.
	3.5 Relevant work permit(s), works completion records, reports, drawings and/or documentation

ELEMENT**PERFORMANCE CRITERIA**

and information are actually completed and appropriate personnel notified.

- 3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential knowledge and associated skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of laying ESI electrical cables.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TCJ21A Underground cable installation and safety

Evidence shall show an understanding of the installation of underground cable to an extent indicated by the following aspects:

T1 Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings

T2 Safety precautions specific to the installation of underground cable encompassing:

- Excavation and trench safety regulations
- Gas detection procedures
- Working in confined spaces
- Personal protective equipment
- Hazards for the use of LPG equipment for jointing of underground cable
- Gas bottle testing procedures
- Permit to work systems and isolation procedures
- Trench excavation and reinstatement procedures
- Rescue victims from confined spaces

Note: Examples include planning, identifying the procedures and establishing responses, developing techniques, involvement of external emergency services and practical demonstration/rehearsals of rescuing a person from confined spaces and emergency procedures for the rescue of an electric shock victim including CPR.

T3 Installation of underground cable procedures encompassing:

- Types of tools and equipment

T4 Methods of cable handling encompassing:

- Direct laid cables
- Duct laid cables
- Solid laid cables
- Cables supported in cleats or hangers
- Corrosion protection
- Minimum bending radius of cables

T5 Methods of cable sealing encompassing:

- Shorting of cables cores

REQUIRED SKILLS AND KNOWLEDGE

- Core of unterminated cables
- Methods of protection from corrosion
- Polymeric sheathed cables sealing with mastic lined
- Heat shrink caps buried sealed ends

T6 Methods of installing conduits

T7 Procedures for the safe use of LPG equipment for cable jointing

T8 Traffic management

Note: Examples include purpose of traffic management and a power worker's responsibilities in accordance with relevant statutory requirements and electricity supply industry requirements, demonstration of the procedure used to provide an effective traffic management scheme and the use of a two-way radio

T9 Procedures for purchasing/ordering items, removing/dispatching items, stocktaking, and record keeping

KS02-TCJ21A Underground cable construction

Evidence shall show an understanding of the construction and types of underground cables to an extent indicated by the following aspects:

T1 Safety precautions specific to handling underground cables

T2 Requirements for the use of enterprise manuals, system diagrams/plans and drawings

T3 Types and applications of underground cables

T4 Construction types and structures of underground cables

T5 Characteristics of different types of underground cables

T6 Ratings

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the performance criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

**Critical aspects
of evidence
required to
demonstrate
competency in
this unit** **9.2)**

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the “Assessment Guidelines – UET12”. Evidence shall also comprise:

- A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. 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; and
 - Apply sustainable energy principles and practices as specified in the performance criteria and range; and
 - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner’s performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
 - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
- Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	The minimum number of items on which skill is to	Item List

	be demonstrated	
A	At least one of the following:	HV polymeric HV paper insulated
B	At least one of the following:	LV polymeric LV paper insulated
C	At least one of the following:	Direct lay On racks In conduits
D	At least one cable pulling methods of the following:	Stocking pulling Bond pulling Armour pulling Nose pull attachments
E	At least two cable sealing methods of the following:	Heat shrinkable Pre-stretched materials Tin/lead wiping Pre-moulded components
F	At least one cable cutting methods of the following:	Hydraulic cutters Electric reciprocating Motorised Hand tools
G	At least four of the following:	Drum jacks Winches Spindles Capstans Bollards Cable trailers Rollers Lubricants Ropes Bell mouths

		Draw wires/rods
H	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment 9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this Competency Standard Unit.

In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment 9.4)

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills

described in this unit.

**Concurrent
assessment and
relationship with
other units**

9.5)

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with the following units:

UETTDRCJ2 2A Install and maintain de-energised low voltage underground paper insulated cables.

UETT DRCJ26A Install and maintain de-energised low voltage underground polymeric cables.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the laying of cables for electrical purposes and includes the laying of ducts and/or conduit for electrical cables.

The unit includes the laying of cables direct in trenches, on racks, in troughs and /or in conduit or ducts.

It also encompasses cable pulling methods, pulling tensions, minimum bending radii, reduction of frictional forces, use of supporting plant (e.g. dynamometers, rigging, winches, etc), working on FRC, PVC, A/C ducted systems and the cutting and sealing of cables.

The following constants and variables included in the element/performance criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Documenting detail work events, record keeping and or storage of information.
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification

RANGE STATEMENT

- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel

Unit Sector(s)

Not applicable.

Competency Field

Competency Field	11)
	Cable Jointing