



Australian Government

Department of Education, Employment and Workplace Relations

UETTD RTP28A Set-up and install transmission structure stubs

Release: 1

UETTD RTP28A Set-up and install transmission structure stubs

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This Competency Standard Unit covers the utilisation of geographical maps and site surveys to set out, excavate, prepare, align and install the foundation footings of a transmission tower and establish the tower stubs to ground level for the erection of a transmission towers. Survey processes and operation of survey equipment is associated with this unit.

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 safety and compliance, industrial relations, environmental protection, anti discrimination and training.

License to practice**3)**

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
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 for the setting of a transmission tower stub	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection. 1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites. 1.3 OHS policies and procedures related to requirements and established procedures for construction activities 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 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

ELEMENT**PERFORMANCE CRITERIA**

clear according to established procedures.

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|------|--|
| 1.6 | Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order. |
| 1.7 | Relevant work permits are obtained to access and perform work according to requirements and/or established procedures. |
| 1.8 | Relevant personnel at work site are confirmed current in First Aid, Rescue 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 where appropriate. |
| 2 | Carry out the setting of a transmission tower stub |
| 2.1 | OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures. |
| 2.2 | 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. |
| 2.3 | Lifting, climbing, working in excavations, and use of power tools/equipment, techniques and practices are safely followed and, currency |

ELEMENT	PERFORMANCE CRITERIA
	according to requirements confirmed.
	2.4 Essential knowledge and associated skills are applied in the survey and establishment of tower stubs to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.5 Unplanned events in the establishment of tower stubs are undertaken within the scope of established procedures.
	2.6 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.7 Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the setting of a transmission tower stub	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) are signed off where appropriate and returned in accordance with requirements.
	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 setting and transmission tower stub.

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

KS01-TTP28A Overhead transmission structure stubs

Evidence shall show an understanding of the setting-up and installation of transmission structure stubs to an extent indicated by the following aspects:

T1 Mathematics techniques encompassing:

- Calculations involving fractions, decimals, ratios, proportions
- Calculations involving area, volume, mass and density
- Calculations involving transposition and substitution of formulae
- Calculations involving simple trigonometric problems.

T2 Engineering mechanics encompassing:

- Identification of basic concepts, principles and applications - Application of velocity, acceleration, force, density, torque, and pressure
- Applications of the SI units
- The relationship between work, power and energy
- Behaviour of object under force - using a block and tackle under load, concept of mechanical advantage, determination of resultant forces and determining the sag in a catenary conductor and the force applied at each end
- Fundamentals of the basic laws of fluid mechanics.

T3 Materials properties encompassing:

- Identification and classification of engineering materials material properties
- Types and applications - properties of tensile strength, effects of temperature on the expansion of metals, ductibility, malleability, work hardening and annealing and the conditions that lead to corrosion and the properties of timbers.

T4 Operation of elevating work platform (EWP) encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements associated with EWP including relevant certification and licensing - safe working clearances, safe operation procedures and the mandatory wearing of harness/attachment requirements, safety observers, inspection and testing procedures prior to use, set-up, operate and shut down procedures for an EWP.
- Emergency procedures for an EWP - escape procedures for an EWP, rescuing procedures, mechanical failure procedures.
- Types of EWPs insulated/uninsulated.

REQUIRED SKILLS AND KNOWLEDGE

T5 Operation and maintenance of mobile plant, tools and equipment encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements associated with portable hydraulic equipment and portable pneumatic equipment, including relevant certification and licensing - safe working clearances, safe operation procedures, safety observers.
- Inspection and testing procedures prior to use
- Set-up, operate and shut down procedures
- Permit to work systems and isolation procedures

T6 Requirements for the use of enterprise vehicles such as, trucks and four wheel drives encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements associated with safe use of enterprise vehicles including relevant certification and licensing such as motor cars, light and heavy commercial trucks, heavy truck/trailer combination, four wheel drive vehicles.
- Compliance with regulations associated with the securing of loads prior for transportation.

T7 Requirements for the use of chain saws including relevant certification and licensing encompassing:

- Safety precautions, requirements and responsibilities
- Selection and use of appropriate personal protective equipment
- Chain saw operation - parts and function of components and ancillary equipment, pre-operational checks, starting procedures, safe use of chain saw under load.
- Safe transporting and storage procedures

T8 Procedure in providing store support encompassing:

- Classification and identification of equipment, components and tools
- Procedures for purchasing/ordering items, removing/dispatching items, stocktaking, security, bookkeeping/record keeping
- Material handling - warehouse/depot storage techniques, handling equipment, pallet lift trucks, forklifts, cable drum handling equipment.
- Safety procedures - storage and care of safety equipment, handling hazardous materials, storage of hazardous substances and dangerous goods, depot safety procedures.
- Manufacturers and suppliers information including material safety data sheets (MSDS)

T9 Filtering and sampling of insulating oil encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements associated with filtering and sampling such as - safe handling procedures, personal hygiene, storage and disposal procedures, Occupational Health and Safety hazards and precautions including use of appropriate personal

REQUIRED SKILLS AND KNOWLEDGE

protective equipment, environmental procedures, effects of contaminants.

- Properties of insulating oil - dielectric strength, moisture content, acidity, sludge.
- Locations where insulating oil is used - transformer, switchgear and oil filled cable.
- Filtering equipment – types, cleaning procedures, method of use.
- Techniques in filtering and sampling insulating oil - methods of sampling, methods of filtering, testing procedures on site, analysing oil effectiveness.
- Frequency of testing

T10 Powerline safety practices encompassing:

- Protective apparatus and apparel for linework - responsibilities for the selection, use, maintenance and storage of protective apparatus and apparel and the types of protective apparatus and apparel used for the line worker
- Requirements for the use of ladders - carrying, erecting, collapsing and lowering different types of extension ladder against a standing pole, maintenance checks on different types of ladders, renewal of extension ropes and the safety issues relating to clearances from overhead conductors
- Requirements for climbing and working aloft - methods used to identify a pole is safe to climb, methods used to inspect a line worker's body belt, application of knots and hitches appropriate to the requirements of a line worker, height safety principles including personal fall protection, prevention and related requirements, and the practical procedure of climbing an overhead structure and fitting a pole chair
- Traffic management - purpose of traffic management and a line 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
- Control of small fires - identification, selection and operation of the appropriate extinguishing mediums for various types of fires, general fire prevention methods and the precautions for personal protection when fighting small fires
- Rescue victims from heights and confined spaces - planning, identifying, the procedures, and establishing responses, developing techniques, involvement of external emergency services and practical demonstration/rehearsals of rescuing a person from heights and from confined spaces and emergency procedures for the rescue of an electric shock victim including CPR
- Requirements for aerial linework - planning, establishing and implementing relevant aviation authority clearances, determining system requirements, aircrew familiarisation with network operations and equipment, requirements for effective communications operations for aerial work.

T11 Environmental fundamentals encompassing:

- Environmental standards, codes, environmental legislation, supply authority regulations and or enterprise requirements applicable to the control of environment associated with the worksite - relevant federal legislation, relevant state/territory legislation, relevant local government by-laws, relevant government or quasi

REQUIRED SKILLS AND KNOWLEDGE

government policies and regulations, relevant community planning and development agreements (include land care agreements)

- Employer and employee responsibilities
- Methods of obtaining information on environmental issues and updates
- Methods of identifying environmental impacts from work related activities
- Meaning of environmental terms - identification, assessment and control of risks, compliance, best practice, sustainable energy.
- Procedures in implementing management plans to ensure compliance

T12 Material handling and the environment encompassing:

- Methods of obtaining updated environmental information and data sheets on the proper use and handling of equipment and materials
- Environmental standards, codes, environmental legislation, OHS legislation, hazardous substances/dangerous goods regulations, supply authority regulations and or enterprise requirements applicable environmental care when handling materials including provision of manufacturers and suppliers information such as material safety data sheets (MSDS)
- Types and application of personal protective equipment used for hazards substances
- Types and application of personal protective equipment used for hazards substances and dangerous goods
- Techniques in handling equipment to eliminate/reduce risks to the environment from spillages of oils, herbicides, pesticides and chemicals from such equipment - vehicle loading crane, chainsaw, enterprise vehicles, explosive power tools
- Procedures for handling and control of spillages of herbicides
- Methods of disposing and storage of herbicides, pesticides and chemicals
- Methods of cleaning mobile plant, equipment and tools
- Recording of data

T13 Principles of surveying encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements applicable to surveying in the electricity supply industry
- Survey principles measurement of ground levels, deviation angles, compass bearings
- Basic survey of short distribution line extension.

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	All of the following:	Survey techniques Set out and peg excavation markers Establish the tower stub to ground level
B	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 construction of lattice type tower stubs.

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 Transmission, Distribution and Rail Traction Industry. 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)**

There are no concurrent assessment recommendations for this unit.

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 construction of lattice type transmission towers.

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
- Diagnostic, testing and restoration
- 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.
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures

RANGE STATEMENT

- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field	11)
	Transmission Units