ICTTEN3054B Provide infrastructure for telecommunications network equipment

Release 1

ICTTEN3054B Provide infrastructure for telecommunications network equipment

Modification History

Release	Comments
Release 2	This version first released with *ICT10 Integrated Telecommunications Training Package Version 3.0.* References to other units updated. Outcomes deemed equivalent.
Release 1	This version first released with *ICT10 Integrated Telecommunications Training Package Version 1.0.*

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to install supporting infrastructure for telecommunications equipment and associated hardware equipment. This includes carrier grade switching, transmission and access equipment and associated media, power and monitoring equipment and alarm systems.

Application of the Unit

Field officers, installation technicians or technical supervisors from carriers, contractors or other service providers apply the skills and knowledge in this unit.

This unit may apply to switching, transmission and radio networks and the various transmission paths including cable, optical fibre, radio, microwave and satellite.

Innovation and Business Skills Australia

Licensing/Regulatory Information

Licensing, legislative, regulatory and certification requirements apply to working at heights. If an elevated work platform (EWP) is required, verify state or territory law requirements for a licence to operate an EWP. Users should confirm requirements with the relevant federal, state or territory authority.

If working at heights, achievement of the unit 'CPCPCM2015A Work safely on roofs' from the CPC08 Construction and Plumbing Services Integrated framework training Package fulfils this requirement.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	Performance Criteria
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

Elements and Performance Criteria

1. Prepare for installation infrastructure work	1.1 Obtain *relevant legislation, codes, regulations and standards* for compliance when conducting work
	1.2 Notify *customer* to arrange site access and obtain installation plan and specifications
	1.3 Conduct a *site survey* to verify that *infrastructure* installation requirements can be met
	1.4 Identify site *hazards* and notify appropriate personnel to make site safe
	1.5 Notify customer of alterations required to installation design and make recommendations for possible solutions
	1.6 Obtain approval for alterations and update installation plan
	1.7 Develop an installation activity schedule to minimise disruption to the workplace and according to relevant regulation and standards
	1.8 Obtain *material supplies, safety equipment, resources, tools and test equipment* to be available when required for installation for safe work practice
2. Build network equipment infrastructure	2.1 Prepare for the given work according to occupational health and safety *(OHS) and environmental requirements*
	2.2 Build metal superstructure to house equipment according to manufacturer's specifications and to safety and electrical standards
	2.3 Build ducts and tray ways for signal and data cabling and optical cables according to plan and specification after consultation with operational staff
	2.4 Build busbars or power cabling infrastructure as specified on the plan
	2.5 Install cable distribution frames according to plan and manufacturer's specifications
	2.6 Install earthing to all metal infrastructures according to specifications
3. Install power infrastructure	3.1 Install batteries and rectifiers and connect according to manufacturer and OHS requirements
	3.2 Test and monitor battery discharge levels and obtain replacement batteries under warranty where required
4. Supervise DC power distribution	4.1 Coordinate and arrange for *power distribution work* to be performed by *qualified personnel* to meet electrical safety

	requirements and certifications
	4.2 Monitor electrical work to ensure compliance with installation plan
	4.3 Identify and rectify faults where possible or escalate according to enterprise policy
5. Restore site and complete documentation	5.1 Attach infrastructure *labels and designations* according to enterprise requirements
	5.2 Complete inspection sheets and declare asset ready for next stage of installation using appropriate sign off documentation
	5.3 Clean up and prepare site in readiness for next installation phase
	5.4 Notify customer and obtain sign off

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to compare and evaluate most effective technical solutions
- communication skills to:
    - liaise with customers to ensure requirements are known and can be met within timeframes
    - negotiate approvals and contract arrangements with suppliers and contractors
- literacy skills to:
    - document technical requirements and procedures
    - interpret technical specifications and related documentation
- numeracy skills to calculate budget requirements and limitations
- planning and organisation skills to:
    - make site access and equipment delivery arrangements
    - set out project requirements and priorities
- problem solving skills to account for unexpected variations to requirements
- technical skills to:
    - perform cabling and terminating work
    - use hand tools to:
        - affix supports, cable trays and racks to surfaces
        - assemble infrastructure
        - work with construction materials.
        -

Required knowledge

- cabling types, connectors and cabling structures
- common customer telecommunications applications and related equipment
- connections to carrier infrastructure or equipment
- current legislation relating to installation of telecommunications equipment and connection to carrier services
- environmental impacts including options for green ICT installations
- network topologies, interface and interconnect solutions
- OHS requirements for:
    - confined spaces
    - electrical safety
    - heights
    - lifting
    - materials handling
    - physical hazards
- overview knowledge of network and transmission equipment
- understanding of power requirements and electrical safety
- warranty information for equipment supplies and contractor work guarantees.

Innovation and Business Skills Australia

Evidence Guide

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

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • identify potential earthing locations cable routes, cables trays, data cabinets, telecommunication enclosures, distributors • build metal superstructure • install protective earth and functional earth installations • install power infrastructure • supervise DC power distribution.
Context of and specific resources for assessment	Assessment must ensure: • site where installation of supporting infrastructure may be conducted • use of plant, tools and equipment currently used in industry • relevant regulatory and equipment documentation that impact on work activities.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate building metal superstructure to house equipment • direct observation of the candidate installing protective earth and functional earth installations • review of installation activity schedule prepared by the candidate • oral or written questioning to assess knowledge of installation issues, types of systems and applications.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTCBL3009B Install, terminate and certify structured

	cabling installation • ICTCBL3010B Install and terminate optical fibre cable on customer premises. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

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, if used in the performance criteria, is detailed below. 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) may also be included.

Relevant legislation, codes, regulations and standards may include:	- appropriate licences: - crane - forklift - winch - AS Communications Cabling Manual (CCM) Volume 1 - AS/ACIF S008:2006 - AS/ACIF S009:2006 - AS/NZS 3000:2007 - AS/NZS 3080:2003 - AS/NZS 3084:2003 - AS/NZS 3085.1:2004 - AS/NZS IEC 61935.1:2006 - AS/NZS IEC 61935.2:2006 - AS/NZS ISO/IEC 14763.3:2007 - AS/NZS ISO/IEC 15018:2005 - AS/NZS ISO/IEC 24702:2007 - Australian Construction Industry Forum (ACIF) standards and codes - cabling security codes and regulations - Environmental Protection Acts - OHS Acts.
Customer may be:	- architect - asset manager - builder - nominated representative - project manager - service provider.
Site survey may include:	- cable tunnels - equipment bays - floor layout - floor loadings - lighting - preparation area

	• roof structures • ventilation • wall structures.
Infrastructure may include:	• air conditioning requirements • alarm panels • cable entries • distribution frames • duct and cable trays • equipment racks • power supplies • radio structure.
Hazards may include:	• building debris • earth potential rise (EPR): • event at a site, such as an electrical distribution substation, may expose telecommunications personnel, users or plant to hazardous voltages • glass fibre • live power lines • manual handling • mud and water • natural gas and other gas build up • needle stick injury • optical fibre cable may contain hazardous light • radio frequency (RF) equipment emitting radiation • remote power feeding services which operate at above telecommunications network voltage (TNV) • vermin.
Materials supplies may include:	• back shelf cards • cable racks • cable trays, nuts and bolts • distribution frames or blocks • earth terminal and rod • frames and cabinets • insulation blocks • iron support structures • jumper wire • lacing, twine and cable ties • patch panels • termination blocks.
Safety equipment may include:	• electrical isolators • EWP • harnesses

	• manual lifters • personal protective equipment: • acid proof clothing • earmuffs • face masks • gloves • head protection • kneepads • safety boots • safety glasses • safety barriers.
Resources may include:	• finance • labour • materials • tools and test equipment • vehicles.

Tools and test equipment may include:	• tools:
	  • anti-static wrist strap
	  • PC board or subrack removal tool
	  • pliers
	  • power drill
	  • screwdrivers
	  • sockets
	  • soldering iron
	  • spanners
	• test equipment:
	  • anti static testers
	  • cable testers
	  • displacement tools
	  • humidity and temperature testers
	  • insulation tester
	  • load testers
	  • multimeter
	  • optical fibre power meter
	  • oscilloscope
	  • tong meter
	  • volt meters.

OHS and environmental requirements may relate	• decommissioning and isolating worksite and lines prior to commencement • identifying other services, including power and gas

to:	• safety equipment:
	  • flashing lights
	  • gas and other hazard detection equipment
	  • safety barriers
	  • trench guards
	  • warning signs and tapes
	  • witches hats
	• safe working practices, such as the safe use and handling of:
	  • asbestos
	  • chemicals
	  • materials
	  • tools and equipment
	  • work platforms
	• special access requirements
	• suitable light and ventilation
	• environmental considerations:
	  • clean-up protection
	  • stormwater protection
	  • waste management.

Power distribution work may include:	• 240 V rectifier panels • backup motor generator set • certifying electrical installation • installation of power distribution panel and cables • termination and connection of power cables to equipment • testing of electrical cabling.
Qualified personnel may include:	• electrical contractor • internal electrician • power company staff.
Labels and designations may include:	• cabinets • cables • distribution panels • racks • vendor labels.

Unit Sector(s)

Telecommunications - Telecommunications networks engineering