



Australian Government

ICTCBL2012B Install functional and protective telecommunications earthing system

Release 1

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Modification History

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

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to install telecommunications earthing system to metallic frames.

Assessment by a TITAB registered assessor is recommended.

Licensing, legislative, regulatory and certification requirements apply to telecommunications earthing systems.

The six unit competency set ICTCBL2005B, ICTCBL2006B, ICTCBL2008B, ICTCBL2012B, ICTCBL2017B and ICTCMP2022B, that meets the Australian Communications and Media Authority's (ACMA) requirements for Cabling Provider Registration (CPR), is generally used as part of a more specialised customer cabling qualification. This set is usually regarded as more suitable for new entrants where limited industry experience has been obtained and forms the major part of specialised qualifications such as ICT20313 Certificate II in Telecommunications Cabling. When these six units are undertaken as a set within state and territory funding approved programs, the two benchmark CPR units (ICTCBL2136B and ICTCBL2137B) are not required.

All customer cabling work in the telecommunications, fire, security and data industries must be performed by a registered cabler. All cablers are required to register with an ACMA-accredited registrar.

Application of the Unit

Telecommunications technicians and field officers who install earthing systems apply the skills and knowledge in this unit.

This unit may be applied to domestic, small office home office (SOHO), commercial or industrial installations and covers multi-storey and multi-site locations. It applies to indoor and outdoor installation of cabling and equipment within customer premises.

Communications applications include digital and analog, telephony, data, video, digital broadcasting, computer networks, LANs and WANs and multimedia.

Licensing/Regulatory Information

Refer to Unit Descriptor.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	Performance Criteria
<i>Elements describe the essential outcomes of a unit of competency.</i>	<i>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.</i>

Elements and Performance Criteria

1. Prepare to install telecommunications earthing system	1.1 Prepare for given work according to relevant legislation, codes, regulations and standards 1.2 Arrange access to the site according to required procedure 1.3 Calculate earthing requirements using relevant cable characteristics 1.4 Calculate the upper and lower limits of resistance for cable system earths 1.5 Establish location of earthing applications, minimising the risks posed by contact with remote power feeding services 1.6 Select route to minimise interference to system performance and according to safe working practices 1.7 Select earthing materials to comply with relevant industry standards
2. Install and secure earth cable	2.1 Maintain cable separations to meet performance requirements of application environment 2.2 Check earth cable insulation is undamaged to ensure integrity of earth provided 2.3 Isolate protective and functional earths at all times to ensure operation according to industry standards 2.4 Install and secure cable following occupational health and safety (OHS) and environmental requirements meeting manufacturer's specifications and industry standards
3. Terminate and test earth cable installation	3.1 Terminate earth with connectors recommended by manufacturer and according to industry standards 3.2 Maintain earth continuity at all times to ensure safe and reliable system operation 3.3 Maintain correct interface requirements with electrical systems according to industry standards 3.4 Test the earthing system according to manufacturer's specifications in a safe manner 3.5 Rectify earth system faults, where required, prior to re-testing
4. Complete task and documentation	4.1 Label earthing systems according to industry regulations 4.2 Complete documentation, including test records 4.3 Clean up and restore worksite 4.4 Notify customer and obtain sign off

Required Skills and Knowledge

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

Required skills

- communication skills to liaise with internal and external personnel on technical and operational matters
- literacy skills to interpret technical documentation, such as equipment manuals and specifications, competency requirements for telecommunications earthing systems
- numeracy skills to take and analyse measurements
- planning and organisational skills to organise and maintain equipment
- problem solving skills to solve equipment and logistics problems
- safety awareness skills to:
 - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
 - select and use required personal protective equipment conforming to industry and OHS standards
 - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- task management skills to work systematically with required attention to detail
- technical skills to use hand and power tools, diagnostic equipment and perform fault clearance.
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Required knowledge

- ACMA Competency Requirements for Telecommunications Cabling Provider Rules 2000, legislation, codes of practice and other formal agreements that impact on the work activity
- features and operating requirements of test equipment
- information required to operate equipment according to a test specification
- manufacturer's requirements for safe operation of equipment
- specific OHS requirements relating to the activity and site conditions
- test methods and performance requirements
- typical issues and challenges that occur on site.

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: • evaluate earthing needs for cable systems on customer premises and apply related OHS requirements • determine potential earthing locations • determine earth route and support system • install functional earth installations including equi-potential bonding • test and label earth installation • manage remote power feed services.
Context of, and specific resources for assessment	Assessment must ensure: • sites where installation of functional and protective telecommunications earthing system may be conducted • use of testing equipment currently used in industry • relevant regulatory and equipment documentation that impact on installation activities.
Methods of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • review of a hands-on project completed by the candidate • review of an oral and written report with completed documentation, such as test results, updated cable plans and records • direct observation of the candidate installing a functional and protective telecommunications earthing system.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTCMP2022B Organise and monitor cabling to ensure compliance with regulatory and industry standards.

	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.
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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 include:	• Australian Communications Industry Forum (ACIF) standards and codes • AS Communications Cabling Manual (CCM) Volume 1 • AS/NZS 3000:2007 • AS/NZS 3080:2003 • AS/NZS 3084:2003 • AS/NZS 3085.1:2004 • AS/NZS 3260:1993 • 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 building codes and regulations • cabling security codes and regulations • Environmental Protection Acts • fire regulations • National Association of Testing Authorities (NATA) requirements • OHS • technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.
Earthing requirements refers to:	• provision of safe operation of the installation and includes: • lightning conductor • link to multiple earth neutral (MEN) • over voltage • screening • surges and spikes.
Location refers to:	• cable routes • cable trays • communications earthing terminal (CET) • cross connects • data cabinets • final distribution point (FDP)

	• intermediate distribution frame (IDF) • main distribution frame (MDF) • telecommunications closures • telecommunications reference conductor (TRC).
Earthing applications may include:	• barriers • data rack • distributor (MDF) bonding • equipment earthing • exposed metal work • screen earth • TRC • telex earth (single function earth).
Functional earths refer to:	• earth systems with functionality to: • eliminate interference from electromagnetic, radio frequency (RF) and power sources • reduce interference from electromagnetic RF and power sources.
OHS and environmental requirements may relate to:	• identifying other services, including power and gas • need for decommissioning and isolating worksite and lines prior to commencement • safe working practices, such as the safe use and handling of: • asbestos • chemicals • materials • tools and equipment • work platforms • safety equipment • witches hats • flashing lights • safety barriers • trench guards • warning signs and tapes • gas and other hazard detection equipment • special access requirements • suitable light and ventilation • environmental considerations: • clean-up protection • noise, dust and clean-up management • stormwater protection • waste management.

Unit Sector(s)

Telecommunications - Cabling