



**Australian Government**

# **ICTCBL2008B Terminate metallic conductor customer cable**

**Release 1**

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### Modification History

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

### Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to terminate metallic conductor cable for indoor and outdoor installations within customer premises. It also applies to joining cable in a terminating block.

The activity may be a new cable installation or upgrade of cable capacity for an existing network or subsystem, or cabling infrastructure for convergence to Next Generation Networks (NGN).

Assessment by a TITAB registered assessor is recommended.

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

Technical staff who terminate metallic conductor cable apply the skills and knowledge in this unit.

This unit applies to all communications applications, digital and analog, telephony, data, video, digital broadcasting, computer networks, local area networks (LAN), wide area networks (WAN) and multimedia. It may be applied to domestic, commercial or industrial installations.

## 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

<p>1. Prepare cable termination</p>	<p>1.1 Arrange access to the site according to required procedure</p> <p>1.2 Prepare for <i>cable terminating work</i> within the <i>regulatory environment, cabling environment, cable type, cable identification, termination systems, earthing and protection, records</i> and <i>relevant legislation, codes, regulations and standards</i></p> <p>1.3 Select correct <i>termination</i> for installation according to <i>strategies to manage infrastructure</i> and relevant legislation, codes, regulations and standards</p> <p>1.4 Notify appropriate personnel of identified <i>safety hazards</i> at cabling worksite</p> <p>1.5 Identify remote power feeding services which operate at above telecommunications network voltage (TNV) inside customer premises and risks posed by contact with remote power feed</p> <p>1.6 Remove all <i>contaminants</i> from worksite that may adversely affect termination and prepare worksite to ensure adequate visibility to minimise errors and reduce eye strain</p> <p>1.7 Design <i>cable and block</i> location within frame with capacity for expansion where possible</p> <p>1.8 Segregate incoming and outgoing cables for ease of access and to minimise overlaying and backtracking of cable</p>
<p>2. Terminate cable</p>	<p>2.1 Remove cable sheath to allow for conductor length and installation requirements</p> <p>2.2 Layer out cable to manufacturer's <i>coding system</i> to ensure correct terminating sequence and unique identification where appropriate</p> <p>2.3 Install over-voltage protection devices to all cables with metallic component where required</p> <p>2.4 Install terminating modules to frame according to manufacturer's specifications</p> <p>2.5 Fan cable pairs neatly to termination equipment to facilitate accurate termination</p> <p>2.6 Terminate cable following occupational health and safety (<i>OHS</i>) and <i>environmental requirements</i> to manufacturer's specifications using correct tool</p> <p>2.7 Earth cable shield to manufacturer's specifications and industry standards</p>

3. Test termination	3.1 Conduct a visual inspection to confirm that the termination colour code sequence has been followed 3.2 Test termination to satisfy performance specifications and record results
4. Complete records and clean up site	4.1 Label cable pairs clearly to provide an accurate identification according to manufacturer's, industry and client standards 4.2 Update records and plans with <b><i>cabling details</i></b> to provide an accurate record according to industry codes of practice and AS/ACIF S009:2006 4.3 Complete telecommunications cabling advice (TCA) forms and notify customer 4.4 Remove installation waste and debris from worksite and dispose of according to environmental requirements to maintain safe worksite conditions

## Required Skills and Knowledge

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

### Required skills

- communication skills to liaise with work associates, supervisors, team members and clients
- literacy skills to interpret:
  - technical documentation, such as equipment manuals, specifications and requirements for metallic cable termination
  - related regulations and industry codes
  - review relevant plans to identify and verify cable terminations
- 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
  - check environmental conditions are suitable for termination
  - identify remote power feeding services in a range of commonly encountered circumstances
  - 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 and adherence to all safety requirements
  - confirm an inventory of tools and materials necessary to terminate cable according to work specifications and schedules
- technical skills to:
  - perform fault clearance
  - read and interpret drawings related to:
    - cable coding system and identifiers
    - cable locations
    - frame locations
    - layouts and terminations
    - outlet location
  - use diagnostic equipment
  - use hand and power tools.
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### Required knowledge

- features and operating requirements of testing equipment

- information required to operate appropriate terminating and testing equipment according to specifications
- legislation, codes of practice and other formal agreements that impact on the work activity
- manufacturer's requirements for safe operation of equipment
- specific OHS requirements relating to the activity and site conditions
- termination 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.*

<b>Overview of assessment</b>	
<b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b>	<p>Evidence of the ability to:</p> <ul style="list-style-type: none"> <li>• terminate systems at both distributor and outlet locations</li> <li>• terminate one jumperable distributor (campus distributor or building distributor) with a capacity of 100 pair or greater and one non-jumperable distributor (local distributor) and a patch panel</li> <li>• terminate at least one 50 pair, one 4 pair, and one Ethernet cables; including accurate completion of installation records, drawing alterations and compliance forms</li> <li>• use correct methods to terminate a range of cables</li> <li>• conduct and interpret cable test results and a minimum of three different lead-in fault remediation</li> <li>• interpret and apply relevant legislation, codes, regulations and standards</li> <li>• update records and plans to show pair locations</li> <li>• comply with all related OHS requirements and work practices.</li> </ul>
<b>Context of, and specific resources for assessment</b>	<p>Assessment must ensure:</p> <ul style="list-style-type: none"> <li>• sites where metallic conductor cable may be terminated</li> <li>• use of testing equipment currently used in industry</li> <li>• relevant regulatory and equipment documentation that impact on cable terminating activities.</li> </ul>
<b>Methods of assessment</b>	<p>A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:</p> <ul style="list-style-type: none"> <li>• review of a hands-on project completed by the candidate</li> <li>• review of an oral or written report with completed documentation</li> <li>• direct observation of the candidate terminating at least one 50 pair, one 4 pair, and one Ethernet cables.</li> </ul>



<b>Guidance information for assessment</b>	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:</p> <ul style="list-style-type: none"><li>• ICTCBL2006B Place and secure customer cable.</li></ul> <p>Aboriginal people and other people from a non-English speaking background may have second language issues.</p> <p>Access must be provided to appropriate learning and assessment support when required.</p> <p>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.</p> <p>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.</p> <p>Where applicable, physical resources should include equipment modified for people with special needs.</p>
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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.*

<b><i>Cable terminating work</i></b> refers to:	<ul style="list-style-type: none"> <li>• cabling work:             <ul style="list-style-type: none"> <li>• aerial and underground</li> <li>• performed only in relation to a customer's premises</li> </ul> </li> <li>• customer metallic cabling that terminates on a socket or network termination device or patch panel.</li> </ul>
<b><i>Regulatory environment</i></b> refers to:	<ul style="list-style-type: none"> <li>• accredited registrars and registration</li> <li>• ACMA</li> <li>• Certified Components List</li> <li>• Communications Alliance</li> <li>• labelling requirements</li> <li>• Telecommunications Act 1997.</li> </ul>
<b><i>Cabling environment</i></b> may refer to:	<ul style="list-style-type: none"> <li>• indoor environments, including concealed locations:             <ul style="list-style-type: none"> <li>• ceilings and false ceilings</li> <li>• internal wall space</li> <li>• modular workstations</li> <li>• under floor</li> </ul> </li> <li>• outdoor environments ,including cable installations:             <ul style="list-style-type: none"> <li>• aerial telecommunications cabling for restricted cabling work but does not include installations on poles shared with low voltage (LV) or high voltage (HV) electrical power cables or terminations</li> <li>• external walls</li> <li>• underground cabling in an exclusive trench or shared trench with electrical LV cables and other utilities.</li> </ul> </li> </ul>
<b><i>Cable type</i></b> may include:	<ul style="list-style-type: none"> <li>• aerial or underground</li> <li>• coaxial cable</li> <li>• copper twisted pair</li> <li>• indoor or external</li> <li>• structured data cable:             <ul style="list-style-type: none"> <li>• Category 5, 6, 6A, 7 or 7A</li> </ul> </li> </ul>
<b><i>Cable identification</i></b> refers to:	<ul style="list-style-type: none"> <li>• cable conductor identification codes:             <ul style="list-style-type: none"> <li>• banded</li> <li>• colour coded</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• lettered</li> <li>• numbered.</li> </ul>
<b>Termination systems</b> may include:	<ul style="list-style-type: none"> <li>• distribution frames</li> <li>• Krone block</li> <li>• patch panel</li> <li>• socket</li> <li>• termination strip.</li> </ul>
<b>Earthing and protection</b> must include:	<ul style="list-style-type: none"> <li>• earthing for protection</li> <li>• surge suppression.</li> </ul>
<b>Records</b> may include:	<ul style="list-style-type: none"> <li>• building, cabling and equipment location plans</li> <li>• cable plans</li> <li>• labelling of: <ul style="list-style-type: none"> <li>• distributor pairs</li> <li>• distributor verticals</li> <li>• equipment closets</li> <li>• network termination device (NTD) record cards</li> <li>• patch panels</li> <li>• rooms</li> <li>• telecommunication outlets</li> </ul> </li> <li>• record books and cards: <ul style="list-style-type: none"> <li>• campus distributors (CD)</li> <li>• building distributors (BD)</li> <li>• floor distributors (FD)</li> <li>• local distributors (LD)</li> </ul> </li> <li>• TCA conforming with AS/ACIFS009:2006: <ul style="list-style-type: none"> <li>• cable drawings</li> <li>• record books</li> <li>• record cards</li> <li>• TCA1 sign off form</li> <li>• TCA2 form.</li> </ul> </li> </ul>
<b>Relevant legislation, codes, regulations and standards</b> may include:	<ul style="list-style-type: none"> <li>• Australian Communications Industry Forum (ACIF) standards and codes</li> <li>• AS Communications Cabling Manual (CCM) Volume 1</li> <li>• AS/NZS 3000</li> <li>• AS/NZS 3000:2007</li> <li>• AS/NZS 3080:2003</li> <li>• AS/NZS 3084:2003</li> <li>• AS/NZS 3085.1:2004</li> <li>• AS/NZS IEC 61935.1:2006</li> </ul>

	<ul style="list-style-type: none"> <li>• AS/NZS IEC 61935.2:2006</li> <li>• AS/NZS ISO/IEC 14763.3:2007</li> <li>• AS/NZS ISO/IEC 15018:2005</li> <li>• AS/NZS ISO/IEC 24702:2007</li> <li>• Australian Standard: AS/ACIF S008:2006 and Australian Standard: AS/ACIF S009:2006</li> <li>• cabling security codes and regulations</li> <li>• communications cabling manual (restricted)</li> <li>• ISO Draft 11801 (International)</li> <li>• regulated or industry codes of practice and appropriate ACMA technical standards</li> <li>• technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.</li> </ul>
<b>Termination</b> may include:	<ul style="list-style-type: none"> <li>• cable termination at a frame or outlet location</li> <li>• cable termination usually done individually</li> <li>• termination systems that may be manufacturer's proprietary systems.</li> </ul>
<b>Strategies to manage infrastructure</b> may refer to:	<ul style="list-style-type: none"> <li>• appropriate separations, fastening techniques and correct use of cable trays and support systems</li> <li>• back-mount or outlet layout conforms to manufacturer's specifications</li> <li>• layout allows for adequate workspace to ensure ease of access for installation and service purposes</li> <li>• terminating equipment layout systematically and following relevant industry codes of practice, standards and customer requirements where appropriate.</li> </ul>
<b>Safety hazards</b> may refer to:	<ul style="list-style-type: none"> <li>• access points that may contain: <ul style="list-style-type: none"> <li>• hazardous light (non-visible laser)</li> <li>• radio frequency (RF) emission</li> </ul> </li> <li>• electrical supply and areas of earth potential rise (EPR) that require mandatory separation from communications cable</li> <li>• hazardous conduit as according to AS 1345:1995 conduit colours associated with a hazardous service.</li> </ul>
<b>Contaminants</b> may include:	<ul style="list-style-type: none"> <li>• asbestos</li> <li>• building debris</li> <li>• dust</li> <li>• paint</li> <li>• water.</li> </ul>
<b>Cable and block</b> include:	<ul style="list-style-type: none"> <li>• cable support bock</li> <li>• mounting bracket</li> <li>• terminating block</li> <li>• ropes and anchors.</li> </ul>

<b><i>Coding system</i></b> may be:	<ul style="list-style-type: none"> <li>• banded</li> <li>• colour coded</li> <li>• lettered</li> <li>• numbered.</li> </ul>
<b><i>OHS and environmental requirements</i></b> may relate to:	<ul style="list-style-type: none"> <li>• identifying other services, including power and gas</li> <li>• need for decommissioning and isolating worksite and lines prior to commencement</li> <li>• personal protective clothing: <ul style="list-style-type: none"> <li>• earmuffs</li> <li>• gloves: <ul style="list-style-type: none"> <li>• leather</li> <li>• plastic</li> <li>• rubber</li> </ul> </li> <li>• head protection</li> <li>• kneepads</li> <li>• masks</li> <li>• protective suits</li> <li>• safety boots</li> <li>• safety glasses</li> <li>• safety harness</li> <li>• safety line</li> </ul> </li> <li>• safe working practices, such as the safe use and handling of: <ul style="list-style-type: none"> <li>• tools and equipment</li> <li>• materials</li> <li>• chemicals</li> <li>• work platforms</li> <li>• asbestos</li> </ul> </li> <li>• safety equipment: <ul style="list-style-type: none"> <li>• flashing lights</li> <li>• gas and other hazard detection equipment</li> <li>• safety barriers</li> <li>• trench guards</li> <li>• warning signs and tapes</li> <li>• witches hats</li> </ul> </li> <li>• special access requirements</li> <li>• suitable light and ventilation</li> <li>• environmental considerations: <ul style="list-style-type: none"> <li>• clean-up protection</li> <li>• stormwater protection</li> <li>• waste management.</li> </ul> </li> </ul>

<i>Cabling details</i> may include:	<ul style="list-style-type: none"><li>• cable location and type</li><li>• cable infrastructure pair locations</li><li>• interconnections</li><li>• pair numbering and labelling.</li></ul>
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## Unit Sector(s)

Telecommunications - Cabling