



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **ICTCBL3069A Install network cable equipment**

**Release: 1**

## **ICTCBL3069A Install network cable equipment**

### **Modification History**

Not Applicable

## Unit Descriptor

<p><b>Unit descriptor</b></p>	<p>This unit describes the performance outcomes, skills and knowledge required to install network cable equipment in customer premises or service provider Access Networks. This may include communications applications in telephony, broadband, data, video, radio frequency identification (RFID), security and computer networks, including local area networks (LAN), wide area networks (WAN) and multimedia.</p> <p>Cable equipment is used for line and signal conditioning and may use optical or electronic technology in optical fibre hubs or hybrid fibre coaxial (HFC) housings.</p> <p>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.</p> <p>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.</p>
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## Application of the Unit

<p><b>Application of the unit</b></p>	<p>Technicians and lineman installers who install network cable equipment within the broadband infrastructure deployment apply the skills and knowledge in this unit.</p> <p>They may upgrade coaxial or optical fibre cables as part of an HFC network, a broadband access network or a large customer private network.</p> <p>Cabling equipment can be for indoor and outdoor installations within a customer premises or a service provider access network and may be a domestic,</p>
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	commercial or industrial installation.
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## Licensing/Regulatory Information

Refer to Unit Descriptor

## Pre-Requisites

<b>Prerequisite units</b>	

## Employability Skills Information

<b>Employability skills</b>	This unit contains employability skills.
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## Elements and Performance Criteria Pre-Content

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.
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## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for installation	<p>1.1. Obtain <i>relevant legislation, codes, regulations and standards</i> for the given work</p> <p>1.2. Scope the work by obtaining project plan from <i>appropriate personnel</i> and arrange for site access to comply with security arrangements</p> <p>1.3. Notify appropriate personnel of identified <i>safety hazards</i> at the worksite</p> <p>1.4. Determine cable route and type of <i>network cable equipment</i> from project plan and identify and avoid <i>other services</i></p> <p>1.5. Obtain <i>plant, tools and safety equipment</i> and material to perform tasks safely and efficiently</p> <p>1.6. Evaluate nature of job and infrastructure hierarchy from plan and obtain approval from customer on key features of installation to meet <i>customer requirements</i></p> <p>1.7. Coordinate <i>other parties</i> to minimise disruption to services and down time</p> <p>1.8. Segregate incoming and outgoing cables to facilitate access and avoid overlaying and backtracking of cable</p>
2. Install required cable and equipment support structure	<p>2.1. Evaluate existing equipment support structure and develop a plan for additional support structure provisioning</p> <p>2.2. Install additional cable support, equipment support structure and cable runs according to manufacturer's specifications, industry practice and occupational health and safety (<i>OHS</i>) and <i>environmental requirements</i></p> <p>2.3. Determine cable route between <i>rack</i> and sub-rack and cable termination point to comply with customer requirements, site limitations, equipment specifications and regulations</p> <p>2.4. Install <i>cabling infrastructure</i> to interface rack and subrack according to installation instructions</p> <p>2.5. Complete <i>cabling requirements</i> to support installation of equipment</p>
3. Install equipment and earthing protection	<p>3.1. Install lightning protection equipment where required, according to manufacturer's specifications and industry practice</p> <p>3.2. Install <i>earthing protection</i> and line conditioning</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>where required, according to relevant Australian Communications and Media Authority (ACMA), local power company and industry practice</p> <p>3.3. Install equipment component into rack and sub-rack and complete <b>connections</b> according to manufacturer's specifications and compliance with warranty requirements</p>
4. Perform tests	<p>4.1. Power-on test individual equipment items</p> <p>4.2. Visually check that all connections and interconnections are firm and sound</p> <p>4.3. Electrically test all terminations for continuity according to enterprise guidelines</p>
5. Complete project documentation	<p>5.1. Install labels to new equipment and radiation warning signs, where required, according to enterprise guidelines practice</p> <p>5.2. Record test results for future reference, complete reports on equipment installation and amend design to reflect existing cable layout and equipment according to enterprise requirements</p> <p>5.3. Recover obsolete materials and return to appropriate point for disposal</p> <p>5.4. Restore site according to the requirements of enterprise or approving authority and to customer satisfaction</p> <p>5.5. Notify appropriate personnel of job completion and obtain sign off</p>

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

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

#### Required skills

- analytical skills to interpret test equipment settings and readings
- communication skills to liaise with customers to ensure requirements are known and can be met within timeframes
- literacy skills to interpret technical specifications and related documentation
- numeracy skills to make calculations

**REQUIRED SKILLS AND KNOWLEDGE**

- planning and organisation skills to arrange site access and equipment delivery
- 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
- technical skills to:
  - correctly handle and connect test equipment for physical installation of equipment and related media

**Required knowledge**

- cabling types, connectors and cabling structures
- connections to carrier infrastructure or equipment, such as main distribution frame (MDF) or customer interface units (CIU)
- customer premises equipment
- electrical and or optical properties to be measured
- OHS considerations including:
  - electrical safety and lifting hazards
  - manufacturer's requirements for safe operation of equipment
- test methods and performance requirements
- typical issues and challenges that occur on site
- warranties and service level agreement

## Evidence Guide

<b>EVIDENCE GUIDE</b>	
<p>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.</p>	
<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>• prepare for installation of network cable equipment</li> <li>• provide cable infrastructure</li> <li>• install cable equipment support structure for power, alarms and interrogation requirements</li> <li>• install equipment, test and interpret test results</li> <li>• label equipment correctly</li> <li>• safely use any specialised hand or power tools and equipment</li> <li>• apply regulations and standards related to the installation</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 installation of network cable equipment may be conducted</li> <li>• use of installation equipment currently used in industry</li> <li>• relevant regulatory and equipment documentation that impact on installation 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>• direct observation of the candidate installing cable and equipment support structure</li> <li>• direct observation of the candidate installing network cable equipment and earthing protection</li> <li>• review of reports completed by the candidate outlining amended design of cable layout and test results</li> <li>• oral or written questioning to assess required knowledge.</li> </ul>
<b>Guidance information for</b>	Holistic assessment with other units relevant to the



<b>EVIDENCE GUIDE</b>	
<b>assessment</b>	<p>industry sector, workplace and job role is recommended, for example:</p> <ul style="list-style-type: none"> <li>• ICTCBL3049A Install systems and equipment on customer premises.</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>

## Range Statement

<b>RANGE STATEMENT</b>	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. <b>bold italicised</b> 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.</p>	
<b><i>Relevant legislation, codes, regulations and standards</i></b> may	<ul style="list-style-type: none"> <li>• Australian Communications Industry Forum (ACIF) standards and codes</li> </ul>

<b>RANGE STATEMENT</b>	
include:	<ul style="list-style-type: none"> <li>• appropriate licences:               <ul style="list-style-type: none"> <li>• crane</li> <li>• EWP</li> <li>• forklift</li> <li>• winch</li> </ul> </li> <li>• AS Communications Cabling Manual (CCM) Volume 1</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> <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>• cabling security codes and regulations</li> <li>• Environmental Protection Acts</li> <li>• ISO Draft 11801 (International)</li> <li>• OHS</li> <li>• regulated or industry codes of practice and include appropriate ACMA and AS/ACIF technical standards</li> <li>• relevant Institute of Electrical and Electronics Engineers (IEEE) standards</li> <li>• road and traffic control legislation and codes</li> <li>• technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.</li> </ul>
<i>Appropriate personnel</i> may be:	<ul style="list-style-type: none"> <li>• cable administrator</li> <li>• consultant</li> <li>• project engineer</li> <li>• project manager</li> <li>• site supervisor.</li> </ul>
<i>Safety hazards</i> 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>• contact with remote power feed</li> <li>• electrical supply and areas of earth potential rise (EPR) that require mandatory separation from communications cable</li> </ul>

<b>RANGE STATEMENT</b>	
	<ul style="list-style-type: none"> <li>• hazardous conduit as according to AS 1345:1995 conduit colours associated with a hazardous service</li> <li>• unsafe support structures: <ul style="list-style-type: none"> <li>• condemned poles</li> <li>• visible signs of decay or stress</li> </ul> </li> <li>• unsafe weather: <ul style="list-style-type: none"> <li>• heavy rains</li> <li>• high winds</li> <li>• severe heat or cold</li> <li>• thunderstorms.</li> </ul> </li> </ul>
<i>Network cable equipment</i> may be:	<ul style="list-style-type: none"> <li>• equipment connected at: <ul style="list-style-type: none"> <li>• carrier's premises</li> <li>• customers' premises</li> <li>• elevated joint</li> <li>• openable joint</li> <li>• pillar</li> </ul> </li> <li>• line conditioning</li> <li>• multiplexer</li> <li>• radio optical receivers</li> <li>• switching equipment</li> <li>• video processor.</li> </ul>
<i>Other services</i> may include:	<ul style="list-style-type: none"> <li>• availability and suitability of existing cabling trays and fixing systems</li> <li>• fire sprinkler systems</li> <li>• gas and water mains</li> <li>• high voltage (HV) power.</li> </ul>
<i>Plant, tools and safety equipment</i> may include:	<ul style="list-style-type: none"> <li>• plant: <ul style="list-style-type: none"> <li>• elevated platform vehicle</li> <li>• ladders</li> <li>• scissor lifts</li> <li>• wire raising tool (insulated)</li> </ul> </li> <li>• safety equipment: <ul style="list-style-type: none"> <li>• flashing lights</li> <li>• gas and other hazard detection equipment</li> </ul> </li> <li>• personal protective clothing: <ul style="list-style-type: none"> <li>• earmuffs</li> <li>• fall arrest systems</li> </ul> </li> </ul>

<b>RANGE STATEMENT</b>	
	<ul style="list-style-type: none"> <li>• gloves</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 barriers</li> <li>• trench guards</li> <li>• warning signs and tapes</li> <li>• test equipment: <ul style="list-style-type: none"> <li>• cable tester</li> <li>• continuity tester</li> <li>• passive optical network (PON) meter</li> <li>• LAN Cat tester</li> </ul> </li> <li>• tools: <ul style="list-style-type: none"> <li>• auger</li> <li>• fixing brackets</li> <li>• spanner.</li> </ul> </li> </ul>
<i>Customer requirements</i> may include:	<ul style="list-style-type: none"> <li>• equipment replacement</li> <li>• increase capacity</li> <li>• increase economic or cost efficiency</li> <li>• providing cable relief</li> <li>• providing new facilities or infrastructure to a customer or geographic area</li> <li>• providing new services.</li> </ul>
<i>Other parties</i> may include:	<ul style="list-style-type: none"> <li>• customer</li> <li>• equipment and materials suppliers</li> <li>• local government</li> <li>• statutory authorities</li> <li>• network operation centre.</li> </ul>
<i>OHS and environmental requirements</i> may relate to:	<ul style="list-style-type: none"> <li>• decommissioning and isolating worksite and lines prior to commencement</li> <li>• identifying other services, including power and gas</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> </ul> </li> </ul> </li> </ul>

<b>RANGE STATEMENT</b>	
	<ul style="list-style-type: none"> <li>• plastic</li> <li>• rubber</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> <li>• safe working practices, such as the safe use and handling of: <ul style="list-style-type: none"> <li>• asbestos</li> <li>• chemicals</li> <li>• materials</li> <li>• tools and equipment</li> <li>• work platforms</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>
<b>Rack</b> may include:	<ul style="list-style-type: none"> <li>• cable entries</li> <li>• frame</li> <li>• mesh tray</li> <li>• mounting supports</li> <li>• power supplies</li> <li>• ventilation.</li> </ul>
<b>Cabling infrastructure</b> may include:	<ul style="list-style-type: none"> <li>• catenary</li> <li>• conduit</li> </ul>

<b>RANGE STATEMENT</b>	
	<ul style="list-style-type: none"> <li>• ducting</li> <li>• trays.</li> </ul>
<i>Cabling requirements</i> may include:	<ul style="list-style-type: none"> <li>• inter-rack cabling and termination</li> <li>• power, alarm and interrogation requirements</li> <li>• rack and sub-rack to a distribution frame for network access.</li> </ul>
<i>Earthing protection</i> may include:	<ul style="list-style-type: none"> <li>• earth stake</li> <li>• equipment earthing</li> <li>• isolator</li> <li>• lightning conductor</li> <li>• link to multiple earth neutral</li> <li>• MDF bonding</li> <li>• over voltage</li> <li>• screen earth</li> <li>• screening</li> <li>• surge suppressors</li> <li>• surges and spikes</li> <li>• telecommunications reference conductors.</li> </ul>
<i>Connections</i> may be made to:	<ul style="list-style-type: none"> <li>• cable pair</li> <li>• digital distribution frame</li> <li>• feeder or antennae system</li> <li>• mainframe</li> <li>• optical fibre frame</li> <li>• optical fibre splicing frame.</li> </ul>

## Unit Sector(s)

<b>Unit sector</b>	Telecommunications
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## Co-requisite units

<b>Co-requisite units</b>		

## Competency field

Competency field	Cabling
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