Australian Government

ICTCBL2138B Install, maintain and modify customer premises communications cabling: ACMA Lift Rule

Release 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

ICTCBL2138B Install, maintain and modify customer premises communications cabling: ACMA Lift Rule

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 safely install, maintain and modify customer premises communications cabling required according to Australian Communications and Media Authority's (ACMA) 'Lift' Cabling Provider Rule.

To be permitted to work with lift cabling, cablers are required to have completed the relevant Electrotechnology qualification such as the Certificate III in Electrotechnology Electrician or equivalent.

Lift cabling is used between the local distributor (LD) adjacent to the lift machine or motor room and the lift control cubicle and lift cars.

It involves customer cabling terminated on LDs in the installation, maintenance and modification of lift cabling.

Assessment by a TITAB registered assessor is recommended.

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 whose work involves customer cabling in relation to lift installations apply the skills and knowledge in this unit.

Customer cabling, for the purpose of this standard, may be used to connect devices for a range of applications including telecommunications phones, data including video, audio and alarms.

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

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**
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. Work within the constraints imposed by customer premises and ACMA regulatory environment	1.1 Prepare for ***lift cabling work*** according to the ***regulatory environment, cabling environment, cable type, cable identification, termination systems, earthing and protection, records*** and ***relevant legislation, codes, regulations and standards*** 1.2 Identify ***building infrastructure*** which places critical constraints on cabling when undertaking a typical lift cabling installation from LD to lift car socket 1.3 Develop strategies to manage other infrastructure in relation to cabling 1.4 Notify appropriate personnel of identified ***safety hazards*** at cabling worksite
2. Manage remote power feed	2.1 Identify and avoid the risks posed by contact with remote power feeding services when performing cabling activity 2.2 Make site safe by identifying remote power feeding services which operate at above telecommunications network voltage (TNV) inside customer premises
3. Install and modify cable support, earthing and termination infrastructure	3.1 Install fixings and ***cable support structures*** of adequate strength safely and align with the environment according to manufacturer's and customer's specifications 3.2 Secure catenary supports to building structure and tension where necessary to ensure cable weight can be carried in operating conditions with interference and safety segregation maintained including adherence to AS/ACIF S009:2006 3.3 Install protective earthing of metal work to industry standards where required 3.4 Inspect installed support structure to ensure cable will not be exposed to damage during installation and general operation 3.5 Position terminating equipment and fixing to accepted industry codes of practice, AS/ACIF S009:2006 and customer requirements 3.6 Inspect control cubicles, travelling cable supports, junction boxes, line isolator units, back-mount and outlet layout complying to manufacturer's specifications and allow adequate work space for ease of access and avoid overlaying 3.7 Segregate incoming and outgoing cables to ensure ease of access and avoid overlaying
4. Install cables and earth wires	4.1 Install a lift cable from LD to lift car socket 4.2 Install cables according to manufacturer's application

	specifications including tension and bending stress requirements 4.3 Identify and avoid sources of possible damage to cable including hot pipes, sharp edges and cable burn 4.4 Allow sufficient excess at cable ends to facilitate ***termination*** 4.5 Place and secure cable to maintain safety and interference segregation according to legislative and industry standards 4.6 Install cable ties with correct tension to prevent cable sheath damage or transmission impairment and trimmed flush to prevent risk of personal damage 4.7 Install aerial cables supported by catenaries in external environment to meet minimum above ground clearances and clearances from hazardous electrical services according to AS/ACIF S009:2006 4.8 Install and secure travelling cables to maintain safety and according to relevant legislative, industry and manufacturer's standards 4.9 Install local isolation units (LIU) as required by TS001 and AS/ACIF S009:2006 4.10 Install over-voltage protection devices to all cable pairs, where required, to suppress voltage surges, with the devices protectively earthed, and according to AS/ACIF S009:2006 4.11 Protect earth wire insulation against damage with protective earths segregated according to relevant industry and legislative standards
5. Terminate and test cables and earth wires	5.1 Remove cable sheath to allow for correct termination length and without damage to underlying conductors and their insulation 5.2 Install terminating modules according to manufacturer's specifications ensuring cable pairs are neatly and sequentially fanned for termination 5.3 Terminate conductors according to recommended colour code sequence using appropriate termination tools in the manufacturer's specified manner 5.4 Earth cable shield, if applicable, to manufacturer's specifications and relevant industry codes of practice, including AS/ACIF S009:2006 5.5 Undertake visual inspection to confirm termination colour code sequence has been followed, prior to end to end testing of wire and pair termination integrity

	5.6 Terminate earth wires with connectors recommended by manufacturer according to relevant industry codes of practice including AS/ACIF S009:2006 5.7 Maintain earth wire continuity throughout to meet interface requirements with electrical systems 5.8 Test earthing installation for continuity, insulation resistance and conductive resistance according to relevant industry standards including AS/ACIF S009:2006 5.9 Confirm compatibility of alterations with existing systems and test new work both in isolation and when integrated with existing systems
6. Inspect cable route to ensure correct separations	6.1 Inspect ***separations*** along entire cable route and rectify separations which do not comply with regulations 6.2 Install barriers to achieve separations where sufficient spatial separation cannot be met
7. Evaluate earthing needs for cable systems on customer premises	7.1 Locate existing customer earthing systems and analyse the earthing needs of cable systems 7.2 Calculate the upper and lower limits of resistance for a variety of cable system earths using relevant cable characteristics
8. Label earthing systems	8.1 Identify label requirements for all types of earthing systems 8.2 Attach label to earthing systems according to industry regulations
9. Create or update cable plans and records	9.1 Document ***installation details*** on record sheets and plans and store according to customer requirements 9.2 Label cable pairs clearly to provide accurate identification according to manufacturer's, industry and client standards 9.3 Record ***cabling details*** in cable pair record books to provide an accurate record according to industry codes of practice and AS/ACIF S009:2006 9.4 Complete telecommunications cabling advice (TCA) form
10. Monitor work activity	10.1 Maintain close supervision of cablers not holding appropriate registration for the task to ensure installation and maintenance activity is strictly according to legislative requirements and industry standards for safety and network integrity including AS/ACIF S008:2006 and AS/ACIF S009:2006

Required Skills and Knowledge

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

Required skills

- communication skills to liaise with team members, supervisors and customers on technical and operational matters
- literacy skills to interpret:
  - relevant legislation, codes, regulations and standards
  - technical documentation, such as equipment manuals and specifications
- 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:
  - check environmental conditions are suitable for installation
  - make site safe and secure for cable installation
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- task management skills to:
  - apply work practices which avoid cable damage
  - conform to work specifications and relevant industry standards
- technical skills to:
  - check cable route for obstructions and make clear using suitable methods
  - handle cable according to manufacturer's specifications so that conductors, sheath and insulation are not damaged during installation
  - read and interpret drawings related to:
    - cable coding system, identifiers and distributor locations
    - cable layouts
    - outlet location
  - select cabling system to meet customer performance needs and conform to work specifications and relevant industry standards
  - use diagnostic equipment
  - use hand and power tools.
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Required knowledge

- ACMA regulations and standards on lifts cabling
- features and operating requirements of test equipment
- information required to operate equipment according to a test specification
- legislation, codes of practice and other formal agreements that impact on the work activity
- manufacturer's requirements for safe operation of equipment
- protection earthing
- specific occupational health and safety (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: • install a lift cabling system from LD to lift car socket, including accurate completion of installation records, drawing alterations and compliance forms • read and interpret cable drawings and plans for locations and terminations • apply cable conductor identification codes • conduct and interpret cable test results • interpret and apply related regulations and industry codes • comply with all related OHS requirements and work practices.
Context of, and specific resources for assessment	Assessment must ensure: • a site on which lift communications cabling activities may be carried out • use of cabling and field equipment currently used in industry • licensing requirements and other site related documentation.
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: • direct observation of the candidate undertaking a lift cabling installation from LD to lift car socket • direct observation of the candidate applying cable conductor identification codes • oral or written questioning to assess interpretation of cable drawings and plans for locations and terminations • oral or written questioning to assess knowledge of cable test results, standards requirements and specific technical procedures.

Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, e.g. • ICTCBL2137B Install, maintain and modify customer premises communications cabling: ACMA Open Rule. 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.

Lift cabling work refers to:	• cabling used between the LD adjacent to the lift machine or motor room and the lift control cubicle and lift cars • communications cabling of the lift travelling cables and connections • communications customer cabling in lift installation.
Regulatory environment refers to:	• accredited registrars and registration • ACMA • AS 1979:1976 Travelling cables • Certified Components List • Communications Alliance • labelling requirements • Telecommunications Act 1997.
Cabling environment may include:	• inside and outside the lift car • lift machine or motor room • lift shaft.

Cable type may include:	• coaxial
	• copper twisted pair
	• data cables:
	  • Category 5, 6, 6A, 7 or 7A
	• optical fibre cable
	• travelling cable complying to Australian standards:
	  • circular
	  • flat.

Cable identification refers to:	• cable conductor identification codes:
	  • banded
	  • colour coded
	  • lettered
	  • numbered.

Termination systems may include:	• connectors • distributors • modules • sockets • travelling cable terminations.

Earthing and protection may include:	• earthing of screened cable, barriers and cable trays for the reduction or elimination of interference from electromagnetic, radio frequency (RF) and power sources • equi-potential bonding conductors to multiple earth neutral (MEN) and use of earth stakes • functional earths, including telecommunications reference conductor (TRC) and communications earthing system (CES) types to provide customer switching system facilities • protective earth barriers for segregation, cable tray, duct and metal equipment enclosures • protective earths for over voltage and surge or spike suppression according to AS/ACIF S009:2006.

Records may include:	• building, cabling and equipment location plans
	• labelling of:
	  • distributor pairs
	  • distributor verticals
	  • equipment closets
	  • network termination device (NTD) record cards
	  • patch panels
	  • rooms
	  • telecommunication outlets
	• record books and cards:
	  • campus distributors (CD)
	  • building distributors (BD)
	  • floor distributors (FD)
	  • local distributors (LD)
	• TAC forms (TCA1 and TCA2).

Relevant legislation, codes, regulations and standards may include:	• accredited registrars and registration • Australian Communications Industry Forum (ACIF) standards and codes • ACMA technical standards • AS/ACIF S008:2006 and AS/ACIF S009:2006 • AS/NZS 3000:2007 • AS1979:1976 Travelling cables • cabling security codes and regulations • Certified Components List (CCL) • labelling • Overview Telecommunications Act 1997 • AS Communications Cabling Manual (CCM) –Open.
Building infrastructure	• availability and suitability of existing cabling trays and fixing systems

may include:	• building hazards • elevated working • high voltage (HV) power • restricted access.
Strategies to manage infrastructure may include:	• appropriate separations • correct use of cable trays and support systems • fastening techniques.

Safety hazards may refer to:	• access points that may contain:
	  • hazardous light or non-visible laser
	  • RF emission
	• electrical supply and areas of earth potential rise (EPR) that require mandatory separation from communications cable
	• hazardous conduit as according to AS 1345:L1995 conduit colours associated with a hazardous service.

Cable support structures may include:	• cable ducts may be closed or open
	• cable trays may be:
	  • galvanised steel or PVC
	  • perforated with low or high side
	  • single or multi-channel
	• line poles
	• pits and pipes
	• suspension catenary wire
	• wall and island mounted patched and jumperable distributors:
	  • BD
	  • CD
	  • FD
	  • LD.

Termination may include:	• a jumperable distributor CD or BD • a non-jumperable distributor LD and a terminated patch panel • Ethernet connectors terminated at both ends of an Ethernet cable • travelling cable terminations.

Separations refer to:	• correct separations between communications cable and other services:
	  • HV single core
	  • HV multi-core
	  • low voltage
	  • open terminations

	• separations covered by AS/ACIF S009:2006.
Installation details may include:	• cable infrastructure • cable location and type.
Cabling details may include:	• interconnections • pair locations • pair numbering and labelling.

Unit Sector(s)

Telecommunications - Cabling