Australian Government

ICTBWN3090B Install lead-in module and cable for fibre to the premises

Release 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

ICTBWN3090B Install lead-in module and cable for fibre to the premises

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 a lead-in module and its associated cable for a fibre to the premises (FTTP) installation.

Optical networks and FTTP are part of the strategies by service providers using wave division multiplexing (WDM) to deliver very high speed broadband capacity through the Access Network for the National Broadband Network (NBN) initiative.

FTTP services can be underground or aerial and may include hybrid fibre coaxial (HFC) installations.

Assessment by a TITAB registered assessor is recommended.

Application of the Unit

Technicians and cable installers who install and maintain optical network cables and equipment in Access Networks apply the skills and knowledge in this unit to provide services in Next Generation Networks (NGN) using emerging technologies.

NGN services include internet protocol TV (IPTV), video on demand (VoD), interactive TV, mesh networks and cloud computing.

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. Set up and prepare for installation	1.1 Obtain ***relevant legislation, codes, regulations and standards*** for compliance when conducting work 1.2 Scope the work by obtaining project plan from ***appropriate personnel*** and arrange for site access to comply with security arrangements 1.3 Notify appropriate personnel of identified ***safety hazards*** at the work site 1.4 Determine type of ***lead-in module*** and cable from project plan and identify ***installation requirements*** using work instructions 1.5 Obtain ***tools and safety equipment*** and material to perform tasks safely and efficiently 1.6 Select and use required protective equipment and make site safe and secure for installation work 1.7 Obtain lead-in module and visually inspect for ***lead-in module damage*** and replace if necessary
2. Install lead-in module in enclosure	2.1 Follow occupational health and safety ***(OHS) and environmental requirements*** for the given work and identify and avoid ***other services*** 2.2 Identify position in ***enclosure*** to secure module and install mounting bracket according to manufacturer's specifications 2.3 Splice lead-in module tail to distribution joint 2.4 Attach lead-in module to mounting bracket and secure in position
3. Install optical fibre lead-in cable to premises	3.1 Unpack and prepare lead-in cable according to manufacturer's specifications 3.2 Haul optical fibre lead-in cable to premises observing ***maximum strain*** on cable for underground installation 3.3 Coil excess cable length within enclosure 3.4 Install aerial lead-in using catenary and bearer wire to meet relevant height and minimum sag requirements
4. Terminate the lead-in cable at the premises	4.1 Access the optical network terminating (ONT) unit to expose lead-in cable to retrieve fibre and connector 4.2 ***Clean ONT adapter and connector*** according to manufacturer's specifications 4.3 Mate fibre connector with ONT adapter ensuring free of ***contaminants***

	4.4 Route fibre cable within ONT and secure in position 4.5 Test operation of lead-in at the ONT for optical power levels at the designated operating ***WDM optical wavelength*** 4.6 Record connections, test results and park unused fibre leads for safety reasons according to organisational policy
5. Clean up work site	5.1 Seal ONT and enclosure 5.2 Remove installation waste and debris from worksite and dispose of according to environmental requirements 5.3 Notify appropriate personnel of job completion and obtain sign off

Required Skills and Knowledge

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

Required skills

- communication skills to work effectively within a group
- literacy skills to interpret work instructions
- numeracy skills to gather and record data from measurements
- 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:
  - clean optical end face
  - connect optical fibre to feeder port
  - operate WDM test equipment and optical power meter
  - recognise optical devices in a communication system
  - splice optical fibre lead in tail to distribution joint.
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Required knowledge

- licence requirements for working at heights
- organisational policy and procedures
- personal safety issues
- propagation of light in optical communication systems
- role of transmitters and receivers in optical communication systems
- site engineering
- specific OHS requirements relating to the handling of optical fibre and the use of laser light sources
- WDM applications
- workplace and industry environment.

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: • use optical power test equipment • measure optical signals at three WDM wavelengths • install lead-in module in the enclosure for both an aerial and underground installation • demonstrate successful completion of the procedures • complete connection recording • comply with all related OHS requirements and work practices.
Context of, and specific resources for assessment	Assessment must ensure: • access to a telecommunications operations site where installation of lead-in module and cable for FTTP may be conducted • a fibre lead-in module, distribution pit, premises conduit and relevant ONT • use of tools, equipment and personal protective equipment currently used in industry • relevant regulatory and equipment documentation that impacts on work 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: • direct observation of the candidate installing lead-in module and cable for FTTP applying all related OHS requirements and work practices • direct observation of the candidate measuring optical signals at three WDM wavelengths • oral or written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplaces and job role is recommended, for example:

	• ICTBWN3088B Install optical fibre splitters in fibre distribution hubs • ICTBWN3100B Work safely with live fibre to test and commission a fibre to the x installation. 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:
	  • winch
	  • crane
	  • forklift
	  • EWP
	• 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 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
	• cabling security codes and regulations
	• Environmental Protection Acts
	• OHS
	• road and traffic control legislation and codes
	• technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.

Appropriate personnel may be:	• consultant • project engineer • project supervisor • site supervisor.

Safety hazards may refer to:	• access points that may contain:
	  • hazardous light (non-visible laser)
	  • radio frequency (RF) emission
	• active lasers with no safety labels
	• active optical fibres
	• contact with remote power feed
	• electrical supply that require mandatory separation from

	communications cable
	• exposed fibres
	• unsafe support structures
	• unsafe weather:
	  • heavy rains
	  • high winds
	  • severe heat or cold
	  • thunderstorms.

Lead-in module may include:	• 1310 nm • 1490 nm • 1550 nm.
Installation requirements may refer to:	• aerial • underground • combination of underground and aerial.

Tools and safety equipment may include:	• personal protective equipment
	• safety equipment
	• test equipment:
	  • passive optical network (PON) meter
	  • optical time domain reflectometer (OTDR)
	  • local area network (LAN) Cat tester
	  • network analyser
	• tools:
	  • fibre cleaning kit
	  • fibre splicer
	  • labeller
	  • screw drivers
	  • spanners
	  • tagging tool.

Lead-in module damage may include:	• cuts in fibre sheathing • end caps on connectors • kinks in fibre leads • physical damage to module body.

OHS and environmental requirements may relate to:	• identifying other services, including power and gas
	• personal protective equipment:
	  • earmuffs
	  • gloves:
	  • leather
	  • plastic
	  • rubber

	• head protection • masks • protective suits • safety boots • safety glasses • safe working practices, such as the safe use and handling of: • chemicals • materials • tools and equipment • safety equipment: • flashing lights • safety barriers • warning signs and tapes • witches hats • special access requirements • environmental considerations: • clean-up protection • stormwater protection • waste management.
Other services may include:	• alarms • electrical services • fire sprinkler systems • gas and water mains • high voltage (HV) power • other service provider networks.
Enclosure may include:	• cabinet • FTTP cabinet • HFC housing • housing • pit.
Maximum strain may relate to:	• typically 600 nm • verify with manufacturer's for specific value.
Clean ONT adapter and connector may use:	• dry clean • lint-free swabs • lint-free wipes • wet clean.
Contaminants may include:	• chips • dry residue • dust • liquids

	• scratches.
WDM Optical wavelength is one of:	• 1310 nm • 1490 nm • 1550 nm.

Unit Sector(s)

Telecommunications - Broadband and wireless networks