



Australian Government

Department of Education, Employment and Workplace Relations

ICTOPN4117A Prepare activity plans and specifications for a fibre to the x installation

Release: 1

ICTOPN4117A Prepare activity plans and specifications for a fibre to the x installation

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to prepare the activity plans and specifications required by field technical staff to deploy a fibre to the x (FTTx) installation for optical access networks. Planning involves provisioning underground and aerial cable work, construction of fibre enclosures and providing specification details for installation and construction teams. Optical networks and FTTx are part of 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. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.
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Application of the Unit

Application of the unit	Technical cable supervisors apply the skills and knowledge in this unit when planning the installation activities for the deployment of broadband Access Networks using optical technologies. FTTx services can be underground or aerial and may include hybrid fibre coaxial (HFC) installations. Optical access networks with FTTx installations 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.
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	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 FTTx planning tasks	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. Obtain tools and safety equipment and material to perform tasks safely and efficiently 1.5. Select and use required protective equipment and make site safe and secure for installation work 1.6. Identify and select plant and machinery for installation work activities
2. Plan FTTx activities and develop specifications	2.1. Follow occupational health and safety (OHS) and environmental requirements for the given work and identify and avoid other services 2.2. Inspect proposed cable route visually according to cable plan and identify barriers to the cable installation 2.3. Modify cable plan, if required, and notify appropriate personnel 2.4. Prepare installation activities for FTTx provisioning according to project plan 2.5. Prepare installation specifications according to safe work practices and manufacturer's instructions to include optical fibre cable size, distribution area (DA), distribution joint including lead-in multiport serving area (DLMSA), enclosures, location of optical network terminations (ONT), location and type of fibre distribution hub (FDH) and optical splitter provisioning 2.6. Verify cable length from customer access network fibre centre to end user ONT is within 20 km operating limit 2.7. Consult with appropriate personnel to confirm project scope, installation requirements and installation specifications according to project plan
3. Complete documentation and obtain sign off	3.1. Complete and present updated planning activities documentation to authorised personnel 3.2. Complete and provide updated specification documentation to vendors for supply of material and resources 3.3. Submit documentation to appropriate person for

ELEMENT	PERFORMANCE CRITERIA
	approval and sign off

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- communication skills to:
 - interact with senior project staff and equipment vendors
 - work effectively within group
- literacy skills to:
 - prepare reports given a specific format
 - read and interpret technical and non-technical documentation
- numeracy skills to analyse and confirm installation requirements
- PC skills to carry out word processing and desktop research
- planning and organisational skills to:
 - make site access and equipment delivery arrangements
 - plan work activities according to project requirements and priorities
- problem solving skills to account for unexpected variations to requirements
- task management skills to work logically and systematically with required attention to detail
- technical skills to:
 - prepare FTTx specifications
 - prepare line drawings relevant to organisation
 - record design specifications in centralised system relevant to organisation

Required knowledge

- properties of passive optical devices including splitters and couplers
- FTTx installation equipment including tools and safety equipment
- FTTx specifications
- legislative privacy, safety and environmental requirements:
 - specific OHS requirements relating to handling of optical fibre and using laser optical sources
 - other personal safety issues
 - plant and equipment safety to be used in installation plans
 - options for green ICT installations

REQUIRED SKILLS AND KNOWLEDGE
• manufacturer's requirements for safe operation of equipment • operation of optical transmitters and receivers • organisational policy and procedures • propagation of light in optical communication systems • role of optical transmitters and receivers in optical communication systems • concept of wavelength division multiplexing (WDM) • site engineering • typical issues and challenges that occur in preparing activity plans and on site • workplace and industry environment

Evidence Guide

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: - inspect proposed cable route visually - prepare installation activities for FTTx provisioning - prepare and document FTTx designs and specifications.
Context of and specific resources for assessment	Assessment must ensure: - sites on which FTTx installations may be designed and prepared - vendor product information and installation guides - relevant regulatory and equipment documentation that impact on installation activities.
Method 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 carrying out preparation and design for FTTx installation within an optical distribution network - review of FTTx designs and specifications completed by the candidate - oral and written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: ICTOPN4116A Use advanced optical test equipment. 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

EVIDENCE GUIDE

	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**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:

- 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

RANGE STATEMENT	
	AS/ACIF S009:2006.

RANGE STATEMENT	
<i>Scope the work</i> may include:	• cable: • route • types • supports • distribution areas (DA) • enclosures • equipment required: • fibre hubs • optical splitters • project type: • large residential • medium residential • standard residential or small business.
<i>Appropriate personnel</i> may be:	• consultant • project engineer • project supervisor • site supervisor.
<i>Safety hazards</i> 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 requires mandatory separation from communications cable • exposed fibres • unsafe support structures • unsafe weather: • heavy rains • high winds • severe heat or cold • thunderstorms.
<i>Tools and safety equipment</i> may include:	• personal protective equipment • safety equipment • test equipment: • local area network (LAN) Cat tester • network analyser • optical time domain reflectometer (OTDR)

RANGE STATEMENT	
	• passive optical network (PON) meter • tools: • fibre cleaning kit • fibre splicer • labeller • screw drivers • spanners • tagging tool.

RANGE STATEMENT	
<i>Plant and machinery</i> may include:	• back hoes • bobcats • cable hauling equipment • cable lifters • diggers • elevated work platforms • excavators • jacks and trolleys • tensioning equipment.
<i>OHS and environmental requirements</i> 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.
<i>Other services</i> may include:	• alarms

RANGE STATEMENT	
	• electrical services • fire sprinkler systems • gas and water mains • high voltage (HV) power • other service provider networks.

RANGE STATEMENT	
<i>Installation activities</i> may include:	• aerial cable installation • cable hauling • cable terminations • construction work for underground enclosures • end-to-end testing of cable system • excavation work • installation of enclosures • installation of FDH • installation of optical devices • marking out cable route and location of equipment • site surveys.
<i>Optical fibre cable size</i> may include:	• 12F • 24F • 36F • 48F • 60F • 72F.
<i>Distribution area (DA)</i> may include:	• expected type of buildings • number of service addresses • staging of development • types of service required.
<i>Distribution joint including lead-in multiport serving area (DLMSA)</i> may include:	• limit of 1 distribution joint including lead-in multiport (DLM) per pit • 4 or 6 way lead-in modules • avoid spurs and optimise cable hauling • reduce lead-in module tail lengths • 11 lead-ins per 12F tube. • lead-in cable lengths of 20, 40, 75 or 100 metres.
<i>Enclosures</i> may include:	• cabinet • FTTx cabinet • HFC housing • pit.
<i>Optical network terminations (ONT)</i> may include:	• standard residential or small business = 1 • medium residential = 2 - 30 • large residential = >30.
<i>Location and type of fibre distribution hub (FDH)</i> may	• location: • standard residential or small business,

RANGE STATEMENT	
include:	external FDH • medium residential, external FDH • large residential, internal FDH • type: • type 144 - 100 service addresses • type 288 - 220 service addresses • type 432 - 340 service addresses.
Optical splitter may include:	• 4 x 32 way • 8 x 32 way • 12 x 32 way.

Unit Sector(s)

Unit sector	Telecommunications
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Optical networks
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