

Title	Demonstrate knowledge of telecommunications optical fibre network infrastructure		
Level	3	Credits	15

Purpose	<p>This unit standard is intended for technicians who require basic knowledge of optical fibre telecommunication networks.</p> <p>People credited with this unit standard are able to demonstrate knowledge of:</p> <ul style="list-style-type: none"> – optical fibre networks – the structure and properties of optical fibre telecommunications cables – the structure and properties of ducts and cable installations – telecommunications optical fibre splicing practices – telecommunications OFDFs, enclosures, and service entrance and termination practices – telecommunications optical fibre fault-finding, test, and repair procedures – telecommunications optical fibre plant plans, specifications, and documentation.
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Classification	Telecommunications > Telecommunications - Service Delivery
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Available grade	Achieved
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Guidance Information

- 1 Learning and assessment within this unit standard must be carried out in accordance with the following legislation, guidelines, and codes of practice, as relevant to role, and any subsequent amendments:
 - New Zealand Telecommunications Forum Inc., *Customer Complaints Code*, available from <https://www.tcf.org.nz/industry/resources/publications/industry-standards-guides/>;
 - Health and Safety at Work Act 2015
 - Privacy Act 2020
 - Resource Management Act 1991
 - Telecommunications Act 2001, all available from <http://legislation.govt.nz/>.
- 2 Definitions

Basic knowledge refers to some operational and theoretical knowledge of the subject matter to interpret available information.

Cable refers to all of cable, fibre optic cable, coaxial cable.

Industry practice refers to practices that competent technicians within the industry recognise as current industry best practice.

OFDF refers to an optical fibre distribution frame which is a frame used to provide cable interconnections between communication facilities, and can integrate fibre splicing, fibre termination, fibre optic adapters and connectors and cable connections together in a single unit.

Outside plant refers to that portion of the telecommunications network which generally extends from exchange switch to the point of entry at customers' premises.

Specifications refer to detailed job specifications, drawings, and instructions; manufacturers' specifications and instructions; and industry codes of practice relating to the type of cabling system being installed.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of optical fibre networks.

Performance criteria

- 1.1 Optical fibre networks are identified and described in terms of the network types.
- Range may include but is not limited to – access, backhaul, transport, data centre, structured cabling.
- 1.2 Optical fibre networks are described in terms of their components.
- Range may include but is not limited to – fibre types (ITU-T Standards), cable types, enclosures (includes cabinets, closures, terminals, frames), connectivity (connectors, splices, adapters, splitters).

Outcome 2

Demonstrate knowledge of the structure and properties of optical fibre telecommunications cables.

Performance criteria

- 2.1 Physical properties of commonly used fibre optic cables are described.
- Range fibre makeup – core, cladding, coating, buffer;
cable make up – bundle, aramid yarn, strength member, water blocking tape, armouring, jacket;
physical properties – construction, structure, materials, cable size, conductor lay-up, minimum bending radius, tensile strength, impact strength.

- 2.2 Telecommunications optical fibre properties and impacts on their performance are described.

Range attenuation and causes, immunity to external electrical interference, bandwidth, bending radius, multi-mode versus single mode.

Outcome 3

Demonstrate knowledge of the structure and properties of ducts and cable installations.

Performance criteria

- 3.1 Properties and use of micro ducts are explained in terms of size, design, construction materials and correct application.

- 3.2 Blowing fibre using micro ducts is explained in terms of fibre type, tools, distance and method and techniques used.

- 3.3 Installation of duct or cable in the ground is described in terms of the methodology use.

Range trench, haul, blow, micro trench, mole plough, directional drilling and hydro excavation.

- 3.4 Aerial cable is described in terms of the methodology for installation.

Range fittings, risers, pole strength, span length, installation methods (lashing, pulleys).

Outcome 4

Demonstrate knowledge of telecommunications optical fibre splicing practices.

Performance criteria

- 4.1 Preparation methodology for splicing is described in accordance with industry practice.

- 4.2 Splicing and fibre management methodology is described in accordance with industry practice.

Range fibre identification, strip, clean, cleave, splice, heatshrink, tray management, labelling, fusion splicer (use of and settings).

- 4.3 Optical fibre cables entry into and securing within enclosure, and the enclosure closing are described in accordance with industry practice.

- 4.4 Fibre cable splicing methods are described in terms of core alignment, cladding alignment, ribbon, mechanical.

Outcome 5

Demonstrate knowledge of telecommunications OFDFs, enclosures, and service entrance and termination practices.

Performance criteria

- 5.1 OFDFs and enclosures are described in terms of their applications in outside plant networks in accordance with industry practice.

Range cross connect, splice, connectors.

- 5.2 Telecommunications service entrance and termination practices are described in accordance with industry practice.

Range buried entrances, above ground entrances.

Outcome 6

Demonstrate knowledge of telecommunications optical fibre fault-finding, test, and repair procedures.

Performance criteria

- 6.1 Optical fibre fault-finding, test, and repair procedures are explained in terms of industry practice.

Range optical time-domain reflectometer (OTDR), light source and power meter, visual light source, fibre inspection probes, live fibre identifier, fibre hygiene.

Outcome 7

Demonstrate knowledge of telecommunications optical fibre plant plans, specifications, and documentation.

Performance criteria

- 7.1 Network elements are identified and described in terms of their role in outside plant construction and job specification in relation to plans.

Range manholes, underground cable and duct plant, aerial plant, building frames, cabinets and enclosures.

- 7.2 Plans and documentation are identified and described in terms of their role in the provision of services, and in maintenance and fault finding.

Range cable systems, voice over internet protocol (VoIP), data services.

7.3 Fibre cable plans are interpreted in accordance with industry practice.

Range cable distribution plans, underground cable plans, fibre optic grid (FOG) plans.

Planned review date	31 December 2025
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	28 September 2017	N/A
Rollover and Revision	2	27 June 2019	N/A
Rollover and Revision	3	25 January 2024	N/A

Consent and Moderation Requirements (CMR) reference	0101
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council qualifications@waihangaararau.nz if you wish to suggest changes to the content of this unit standard.