Title	**Demonstrate knowledge of telecommunications customer copper network infrastructure**		
Level	**3**	**Credits**	**15**

Purpose	This unit standard is intended for technicians who require basic knowledge of copper telecommunication networks. People credited with this unit standard are able to demonstrate knowledge of: – customer copper networks – the structure and properties of telecommunications cables – telecommunications cable jointing practices – telecommunications building frames, cabinets and enclosures, and service entrance and termination practices – telecommunications cable fault-finding, test, and repair procedures – telecommunications outside plant plans, specifications, and documentation.

Classification	Telecommunications > Telecommunications - Service Delivery

Available grade	Achieved

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 any or all of copper cable, fibre optic cable, coaxial cable.
Industry practice refers to practices, which competent practitioners within the industry recognise as current industry best practice, including standard operating procedures.
Outside plant refers to the portion of the telecommunications network which generally extends from exchange switch to the point of entry at customers' premises.

PSTN refers to Public Switched Telephone Network.
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 customer copper networks.

Performance criteria

1.1 Customer copper networks are identified and described in terms of the services delivered.

Range cable systems, PSTN, data network services.

1.2 Customer copper networks are described in terms of their components.

Range aerial cable, underground cable, building frames, main distribution frames (MDFs), service entrances, pair gain systems, manholes and duct systems, cabinets.

Outcome 2

Demonstrate knowledge of the structure and properties of telecommunications cables.

Performance criteria

2.1 Physical properties of commonly used copper cables are described in non-mathematical terms.

Range cables – paper and plastic insulation, unit twin, quads, lead sheath, plastic sheath, aerial cable, drop wire;
physical properties – construction, structure, materials, wire and cable size, pair lay-up.

2.2 Electrical properties of copper cable pairs are described in non-mathematical terms with reference to one type of cable.

Range properties – loop resistance, insulation resistance, transmission loss, noise, variation of loss with frequency.

2.3 Coaxial cable is described with reference to construction, materials, physical and electrical properties.

2.4 The use of cable numbering systems is explained in accordance with industry practice.

Outcome 3

Demonstrate knowledge of telecommunications cable jointing practices.

Performance criteria

3.1 The preparation of cables for jointing is described in accordance with industry practice.

3.2 Pairs jointing and insulating is described in accordance with industry practice.

Range random jointing; sequence jointing; modular jointing using one type of tool.

3.3 The closing of the cable joint is described in accordance with industry practice.

Range heat shrink, lead wiping, re-enterable, pressure closure.

3.4 The jointing of one type of coaxial cable is described in accordance with industry practice.

Outcome 4

Demonstrate knowledge of telecommunications building frames, cabinets and enclosures, and service entrance and termination practices.

Performance criteria

4.1 Building frames, and cabinets and enclosures are identified and described in terms of their applications in outside plant networks in accordance with industry practice.

Range cable systems, PSTN, data network services.

4.2 Telecommunications service entrance and demarcation point termination practices are described in accordance with industry practice.

Range buried entrances, above ground entrances, demarcation points, single pair cable, multiple pair cable.

Outcome 5

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

Performance criteria

5.1 Coaxial cable fault-finding, test, and repair procedures are described in accordance with industry practice.

Range cable, service entrance, set top units.

5.2 Copper cable fault-finding, test, and repair procedures are described in accordance with industry practice.

Range cable, cabinets, building frames, service entrances.

Outcome 6

Demonstrate knowledge of telecommunications outside plant plans, specifications, and documentation.

Performance criteria

6.1 Plans and specifications are identified and described in terms of their role in outside plant construction and job specification.

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

6.2 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, PSTN, data services.

6.3 Plans are interpreted in terms of correct identification from the plans, type and location of plant, cable pair interconnections and terminations, in accordance with industry practice.

Range cable distribution plans, underground cable plans, duct and manhole.

Planned review date	31 December 2025

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

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.