

<b>Title</b>	<b>Install, maintain and repair telecommunications optical fibre network infrastructure</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>25</b>

<b>Purpose</b>	<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:</p> <ul style="list-style-type: none"> <li>– read, interpret, and mark up telecommunications outside plant plans;</li> <li>– apply knowledge of the structure and properties of ducts and cable installations;</li> <li>– install telecommunications aerial, underground, surface mount and internal optical fibre cables;</li> <li>– splice optical fibre cables;</li> <li>– terminate optical fibre telecommunications cables;</li> <li>– test and fault-find telecommunications cables;</li> <li>– install internal optical fibre cables and structured data cabling;</li> <li>– handover telecommunications optical fibre plant and equipment to customer.</li> </ul>
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<b>Classification</b>	Telecommunications > Telecommunications - Service Delivery
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<b>Available grade</b>	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:
  - Health and Safety at Work Act 2015;
  - New Zealand Telecommunications Forum Inc., *Customer Complaints Code*, available from <https://www.tcf.org.nz/industry/resources/publications/industry-standards-guides/>;
  - Privacy Act 1993;
  - 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.

*Customers* refer to those internal or external to the organisation and may include end customers and clients of the organisation.

*Industry practice* refers to those practices, which competent practitioners within the industry recognise as current industry best practice, including standard operating procedures.

*Installation* refers to the installer who is supplied with design specifications and/or detailed instructions regarding the installation. Installation excludes system design or layout, contract negotiations, or commissioning and operational configuration adjustments required in complex network installations.

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

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

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

*Telecommunications outside plant plans* refer to the fundamental components which make up telecommunications customer access networks excluding the more complex equipment and complete or end-to-end systems.

- 3 Recommended unit standard for entry  
Unit 27913, *Demonstrate basic knowledge of telecommunications concepts.*

## Outcomes and performance criteria

### Outcome 1

Read, interpret, and mark up telecommunications outside plant plans.

Range underground network plans, fibre optic grid plans, cable distribution plans, schematics.

### Performance criteria

- 1.1 Plans are interpreted in terms of the network elements and plant locations they represent, in accordance with industry practice.

Range network elements may include but are not limited to – cable distribution, jointing details, cable types and sizes, details of jointing chambers, cabinets, enclosures, optical fibre distribution frames.

- 1.2 Plans are marked up to reflect changes and existing and proposed items are clearly identified in accordance with industry practice.

### Outcome 2

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

**Performance criteria**

- 2.1 The use of micro ducts is demonstrated in accordance with industry practice.
- Range terms of installation, jointing, stripping, management, bend radius, and enclosures.
- 2.2 The blowing of fibre using micro ducts is demonstrated in accordance with industry practice.
- 2.3 The installation duct or cable in the ground is demonstrated in accordance with industry practice.
- Range may include but is not limited to: trench, haul, micro trench, mole plough.
- 2.4 The installation of aerial lead-ins is explained in terms of the methods and fittings used.

**Outcome 3**

Install telecommunications aerial, underground, surface mount and internal optical fibre cables.

Range two installations for each of the four types of optical fibre cable.

**Performance criteria**

- 3.1 Materials are purchased or obtained from stock and assembled on site in accordance with company practice.
- 3.2 Permissions and/or permits are located and explained in terms of the access to site and/or infrastructure.
- 3.3 Pole mounted hardware is installed in accordance with specifications and industry practice.
- 3.4 Aerial, underground, external and internal cable is installed in accordance with specifications and industry practice.

**Outcome 4**

Splice optical fibre cables.

**Performance criteria**

- 4.1 Splicing materials and tools are drawn from stock or purchased in accordance with job specifications and instructions and assembled on site.
- 4.2 Site is prepared for splicing in accordance with job requirements and industry practice.

- 4.3 Cables are stripped and prepared for splicing in accordance with specifications and industry practice.
- 4.4 Fibres are identified, spliced, and managed in accordance with specifications and industry practice.
- 4.5 Optical fibre safety rules are followed during all aspects of splicing, waste fibre scraps are stored correctly and disposed of in accordance to industry practice.
- 4.6 Fibre enclosure is closed, sealed and secured in accordance with specifications and industry practice.
- 4.7 Site is reinstated and left safe and secure in accordance with industry practice.

### **Outcome 5**

Terminate optical fibre telecommunications cables.

Range present on a frame or terminate to connectors.

### **Performance criteria**

- 5.1 Materials are purchased or obtained from stock and assembled on site in accordance with company practice.
- 5.2 Site is prepared in accordance with job requirements and industry practice.
- 5.3 Cables are installed stripped and prepared for termination in accordance with specifications and industry practice.
- 5.4 Fibres are identified and spliced in accordance with specifications and industry practice.
- 5.5 Fibres are managed correctly with minimum radius bends being observed on all fibre connection trays.
- 5.6 Cable entries and cable ends are sealed in accordance with specifications and industry practice.
- 5.7 Testing confirms signal or power levels in accordance with specifications and network requirements.  
  
Range correct use of testing instruments, discrepancies from specification investigated and resolved, commissioning test records are completed.
- 5.8 Site is reinstated and left safe and secure in accordance with industry practice.

**Outcome 6**

Test and fault-find telecommunications cables.

**Performance criteria**

- 6.1 Acceptance tests for a cable installation are completed in accordance with specification and industry practice.
- 6.2 Testing establishes the location of optical faults using optical test equipment.
- 6.3 Faults are identified and located by logical interpretation of test results and rectified in accordance with industry practice.

**Outcome 7**

Install internal optical fibre cables and structured data cabling.

**Performance criteria**

- 7.1 Materials are purchased or obtained from stock and assembled on site in accordance with company practice.
- 7.2 Inspection confirms that site preparation has been completed in accordance with specifications and are suitable for placement of the cable.  
  
Range inspection may include but is not limited to – building penetrations, cable entry, reinstatement.
- 7.3 Terminating hardware, and protective devices where fitted, are installed in accordance with specifications and industry practice.

**Outcome 8**

Handover telecommunications optical fibre plant and equipment to customer.

**Performance criteria**

- 8.1 Plant and equipment is made available to the customer by the agreed date, and, in cases where it impacts upon a network or larger system, plans for the commissioning are agreed with the customer.
- 8.2 Handover documentation is completed in the agreed format, in accordance with customer and company requirements.
- 8.3 Job is closed off and plans and documentation submitted in the agreed format, in accordance with customer and company requirements.

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<b>Planned review date</b>	31 December 2022
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**Status information and last date for assessment for superseded versions**

<b>Process</b>	<b>Version</b>	<b>Date</b>	<b>Last Date for Assessment</b>
Registration	1	28 September 2017	N/A
Rollover and Revision	2	27 June 2019	N/A

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

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**Comments on this unit standard**

Please contact Connexis - Infrastructure Industry Training Organisation  
[qualifications@connexis.org.nz](mailto:qualifications@connexis.org.nz) if you wish to suggest changes to the content of this unit standard.