

Chorus UFB Services Agreement
Bitstream Services: Service Description for
Small Business Fibre

Reference Offer

May 2025

Document Version History

Version	Date	Author	Description of Change
1.0	August 2019	Alan Mitford-Taylor	Launch of version of small business fibre based on original bitstream 2 accelerate UFB contract document
2.0	November 2021	Alan Mitford-Taylor Peter Coleman	General update Updated to reflect speed changes for 100mbps plans
3.0	March 2024	Peter Coleman	Plan name changes and addition of grandfathering notes
4.0	May 2025	Peter Coleman	Increased in CIR

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1 Interpretation

- 1.1 References to clauses or sections are references to clauses or sections in this Service Description unless expressly provided otherwise. The definitions set out in the General Terms and the Operations Manual apply to this Service Description unless expressly provided otherwise.
- 1.2 References to the Operations Manual are references to the Operations Manual for the Bitstream Services.

2 The Small Business Fibre Service

- 2.1 The Small Business Fibre Service is a multi-class Bitstream Service suitable for accessing a wide range of internet and bespoke applications and content delivered over a point to multipoint fibre access. Small Business Fibre is part of the UFB family of Bitstream Services:

Bitstream 2	Based on the TCF Mass Market service.
Bitstream 2 Accelerate	Based on the TCF Mass Market service with enhanced low priority options.
Bitstream 2 SFP	Based on the TCF Mass Market service with an SFP ONT
Small Business Fibre	Based on the TCF Mass Market service with enhanced low priority options and Enterprise assure service level.
Bitstream 3	Based on the TCF Business service.
Bitstream 3 Accelerate	Based on the TCF Business service.
Bitstream 3P2P	Based on the TCF Business service.
Bitstream 3a	Based on the TCF Business service with Low Priority options.
Bitstream 3a Accelerate	Based on the TCF Business service with Low Priority options.
Bitstream 3aP2P	Based on the TCF Business service with Low Priority options.
Bitstream 3a SFP	Based on the TCF Business service with an SFP ONT
Bitstream 4	Based on the TCF Business Premium service.
Enhanced Bitstream 4	Based on the TCF Business Premium service.
UFB Handover Connection	Based on the TCF E-NNI specification.
100Gbps UFB Handover Connection	Based on the TCF E-NNI specification, 100Gbps interface
Multicast	Based on the TCF Ethernet Multicast Access (EMA) service.
ATA Voice	An analogue telephone access service.
UNI Voice (128/128)	Low speed Bitstream service for telephony access service.

- 2.2 A diagram of the configuration for the Small Business Fibre Service is set out in Appendix A. The Small Business Fibre Service provides one Access Ethernet Private Line (Access-EVPL) Operator Virtual Circuit (OVC) from the UNI at the End User Premises, Service Provider Premises or NBAP (as applicable) to the UFB Handover Connection Service located at the local or, when using the NGA Tail Extension service, regional POI that enables a Service Provider to access and interconnect with the LFC Network.
- 2.3 The Small Business Fibre Service is an input service which a Service Provider can combine with other LFC services (or with the Service Provider's own network or wholesale services provided by other service providers) to provide fibre-based telecommunications services to End Users.
- 2.4 The Small Business Fibre Service has the following key characteristics:
- 2.4.1 The Small Business Fibre Service includes an Ethernet Access-EVPL bitstream services delivered in conjunction with Baseband over GPON. In particular:
- (a) the Access-EVPL bitstream service provides a single VLAN between the UNI and the E-NNI; and
 - (b) the Baseband service supports up a single instance of the ATA Voice Service by providing a Voice-EVPL service between the ATA and the E-NNI.
- 2.4.2 Support for two classes of traffic, High Priority and Low Priority:
- | Traffic Class | CIR | EIR |
|---------------|-----|-----|
| Low Priority | ≥ 0 | ≥ 0 |
| High Priority | ≥ 0 | = 0 |
- 2.4.3 A range of Service Template packages are offered. Clause 3.7.5 provides an overview of the Service Templates that are initially offered, each consisting of a single Ethernet bitstream and one ATA Voice Service packages.
- 2.4.4 Supports tagged or untagged frames at the UNI.
- 2.4.5 Optionally inserts Circuit ID information in DHCP (Version 4) and PPPoE traffic.
- 2.4.6 Complies with the Mass Market service specified in the *TCF UFB Ethernet Access Service Description v33, 11 May 2017*.

3 Small Business Fibre Service and implementation activities

Installation Services

- 3.1 The Small Business Fibre Service includes a Standard Install¹ as set out in the Operations Manual. The LFC will provide Non-Standard Installs as an ancillary service.

Termination Point

- 3.2 The Small Business Fibre Layer 1 and Layer 2 termination points are set out in the Operations Manual.

Testing

- 3.3 The LFC will test the Fibre Lead-in from the termination point at the Premises, as referred to in the Operations Manual, to the Central Office where the access node is located to ensure the fibre is within the technical specification for fibre set out in Appendix B.
- 3.4 The LFC will perform a functional test of the Small Business Fibre Service at the Layer 2 termination point at the Premises referred to in the Operations Manual.

¹ Standard Install parameters may differ between LFCs

Additional Services

- 3.5 If the Service Provider requires additional services such as:
- 3.5.1 a Non-Standard Install which includes (where required):
 - (a) the installation of the Fibre Lead-in where there is no existing fibre cabling and the installation is outside the parameters set out in the Operations Manual; or
 - (b) installation of specialised termination equipment in an NBAP; or
 - (c) installation of Fibre-Lead-in diversity at an End User Premises, Service Provider Premises or NBAP (as applicable) (from the FAP to the ETP or OFDF as applicable);
 - 3.5.2 provision of diversity to End User Premises, Service Provider Premises or NBAP (as applicable) (when the second or subsequent instance of a Primary Small Business Fibre Service is purchased);
 - 3.5.3 any Premises wiring services; or
 - 3.5.4 installation and testing of Service Provider equipment and services,
- then the LFC may be able to provide items (b), (c) and (d) on request subject to terms to be agreed between the LFC and the Service Provider. Items in (a) are available on terms as set out in this Agreement.

Core Small Business Fibre Service

- 3.6 The core bitstream services provided as part of the Small Business Fibre Service are as follows:
- 3.6.1 One Access-EVPL, consisting of:
 - (a) A single 802.1q VLAN on a designated UNI on the ONT at the End User Premises or Service Provider Premises or NBAP (as applicable).
 - (b) A single 802.1ad VLAN (Service VLAN ID/ Customer VLAN ID) on the E-NNI at the local or, with NGA Tail Extension, regional POI.
 - (c) A QOS bandwidth profile that describes how traffic is carried between these points.
 - 3.6.2 Bandwidth overhead for Low Priority to compensate for higher protocol encapsulation overheads.

This bandwidth overhead does not guarantee End Users will experience the headline speed as their experience is dependent on a number of external factors including, but not limited to, End User applications and local network, the Service Provider network and location of the content they are accessing.
- 3.7 The Small Business Fibre Service includes the options, exercised by Service Request, to:
- 3.7.1 Set the UNI as a tagged or untagged interface.
 - 3.7.2 Enable Circuit ID insertion for PPPoE or DHCPv4 as follows:
 - (a) Off – Product Instance ID will not be inserted in any frames;
 - (b) PPPoE – Product Instance ID will be inserted into the Remote Station ID; or
 - (c) DHCP – Product Instance ID will be inserted into the DHCPv4 Option 82 Remote ID field;
 - 3.7.3 Specify the following attributes per Access-EVPL:
 - (a) The Access-EVPL E-NNI;
 - (b) The E-NNI S- C-VLAN Identifier; and

If these are not specified then the default values will be assigned by the LFC;

- 3.7.4 Enable Tail Extension Service as an Ancillary Service. The Tail Extension Service allows a Bitstream Service (Access-EVPL or Voice-EVPL Service) to be delivered to a POI outside the End User's local UFB Coverage Area.
- 3.7.5 The Tail Extension Service for an Access-EVPL or Voice-EVPL service is requested by selecting an E-NNI located outside the End User's local UFB Coverage Area as part of a Connect, Move, Transfer or Modify Service Request;
- 3.7.6 If the UNI is set to untagged:
- (a) Untagged frames sent from the End User are 802.1q tagged and marked as Low Priority;
 - (b) Tagged frames sent from the End User are treated as set out in 3.7.7 below; and
 - (c) 802.1q tags will be removed from downstream frames and presented as 802.3 Ethernet frames at the UNI.
- 3.7.7 If the UNI is set to tagged:
- (a) Frames sent from the End User that do not have 802.1q tags will be tagged and marked as Low Priority;
 - (b) Tagged traffic sent from the End User or Service Provider are treated as follows:
 - (i) Frames tagged with PCP = 5 will be treated as High Priority.
 - (ii) Frames tagged with PCP = 0 will be treated as Low Priority.
 - (iii) Frames tagged with PCP = 1, 2, 3, 4, 6 or 7 will be remarked as PCP 0 and treated as Low Priority.
 - (iv) Frames will be treated as follows:

Type	Ingress	Transport
Low Priority	CIR \geq 0 EIR \geq 0 Policed at ingress based on CBS/EBS	Queued and weighted fairly under congestion conditions Frames classified as EIR dropped first
High Priority	CIR \geq 0 EIR = 0 Policed at ingress based on CBS	Strictly prioritised

- (v) Downstream traffic class is determined using the s-tag PCP setting although it is recommended that both the s-tag and c-tag is set to the same value.

3.7.8 The following initial Service Templates are available consisting of a Baseband Service with one instance of the ATA Voice Service and one Access-EVPL Bitstream service as follows:

Template	ATA ¹ ports	Headline ^[2]				Low Priority PIR ^[3] (Mbps)		Low Priority Downstream				Low Priority Upstream				High Priority Downstream				High Priority Upstream			
		Low Priority (Mbps)		High Priority (Mbps)				EIR	EBS	CIR	CBS	EIR	EBS	CIR	CBS	EIR	EBS	CIR	CBS	EIR	EBS	CIR	CBS
		Down	Up	Down	Up	Down	Up	Mbps	kB	Mbps	kB	Mbps	kB	Mbps	kB	Mbps	kB	Mbps	kB	Mbps	kB	Mbps	kB
Small Business Fibre 500	1	500	500	5	5	550	550	547.5	250	2.5	32	547.5	180	2.5	32	0	0	5	32	0	0	5	32
Small Business Fibre 920	1	920	500	5	5	1000	550	997.5	250	2.5	32	547.5	180	2.5	32	0	0	5	32	0	0	5	32

^[1] The ATA service is as described in the ATA Voice Service Description except that the High Priority frames are tagged with PCP 5.

^[2] The headline rate is the Layer 2 bandwidth prior to the addition of the overhead described in section 3.6.2.

^[3] Low Priority 'Peak Information Rate', which is the headline rate plus the bandwidth overhead described in clause 3.6.2, is the sum of Low Priority CIR and Low Priority EIR.

^[4] Small Business Fibre Service Templates are primary, i.e. include Baseband. A primary Service Template does not require the End User connection to consume any other Service Templates in order for the service to be provided.

3.7.9 An additional Service Template can be added as an additional service to an End User who is already consuming a Small Business Fibre Service Template. The Small Business Fibre Service Levels only apply to the Small Business Fibre Service Template.

3.7.10 The Small Business Fibre Service has similar characteristics to the other services within the UFB family of Bitstream services as identified below:

Attribute	Small Business Fibre	Bitstream 2 Bitstream 2 Accelerate	Bitstream 3 Bitstream 3 Accelerate	Bitstream 3a Bitstream 3a Accelerate	Bitstream 4	Enhanced Bitstream 4
Bitstream	Access-EVPL	Access-EVPL	Access-EPL	Access-EPL	Access-EPL	Access-EPL
High Priority	Yes	Yes	Yes	Yes	Yes	Yes
Low Priority	Yes	Yes	No	Yes	Yes	Yes
OAM CFM	No	No	No	No	No	Yes (NID only)
Birth Certificate	No	No	No	No	No	Yes (NID only)
MTU	2000 Bytes at ENNI 1996 Bytes at UNI	2000 Bytes at ENNI 1996 Bytes at UNI	2000 Bytes at ENNI 1996 Bytes at UNI	2000 Bytes at ENNI 1996 Bytes at UNI	9100 Bytes at ENNI 9096 Bytes at UNI	9100
MAC addresses	16	16	64	64	Unlimited	Unlimited
Number of available UNIs	4 standard	4 standard	4 standard	4 standard	1 with a second UNI available on request	NID: 2 1000/100 Base-T + 2 SFP Sockets standard Glass: 1 with a second UNI available on request
L2CP support	No	No	No	No	Limited	Limited
Diversity	Lead-in diversity only available on request with limited availability	Lead-in diversity only available on request with limited availability	Lead-in diversity only available on request with limited availability	Lead-in diversity only available on request with limited availability	Available to Priority Users in selected areas	Available to Priority Users in selected areas

The Bandwidth options for each Bitstream Service are detailed in appropriate Bitstream Service Description. Clause 3.7.8 above lists options for Small Business Fibre and further options can be developed using the Product Development Process.

UNI – NNI characteristics

- 3.7.11 All Small Business Fibre Services (Access-EVPLs) on a UNI must belong to the same Service Provider and must connect to an E-NNI belonging to that Service Provider. However each Small Business Fibre Service can connect to a different E-NNI at the same or different POI within a Coverage Area.
- 3.7.12 The sum of High and Low Priority traffic profiles of all services delivered at a UFB Handover Connection Service can exceed the UFB Handover Connection Service line rate. If there is insufficient line rate to deliver the traffic then frames will be randomly discarded, based on their Class of Service precedence, and Service Levels for that Class of Service do not apply. It is therefore the Service Provider's responsibility to shape and queue traffic appropriately.

Operations, Administration and Maintenance

- 3.8 The Small Business Fibre Service will support Service Provider remote access to the ONT via a service management gateway for appropriate management.
- 3.9 The Small Business Fibre Service will support Ethernet Service Operations and Maintenance (OAM) for service integrity testing, fault diagnostics and performance measurement using ITU Y.1731. OAM capability will be phased in as the functionality is developed and deployed in scale and may be updated or amended by the LFC from time to time.

Service Requirements

- 3.10 To use the Small Business Fibre Service the Service Provider must have the capability to access and interconnect with it, by one of the following:
 - 3.10.1 co-locating Service Provider equipment at the POI using the UFB Handover Connection Service and Central Office and POI Co-location Service;
 - 3.10.2 connecting to third party co-location space at the POI using the UFB Handover Connection Service, and with the third party taking the Central Office and POI Co-location Service;
 - 3.10.3 connecting to a backhaul service at the POI; or
 - 3.10.4 by using the Direct Fibre Access Service to connect to Service Provider equipment at a remote location within the Central Office area.

The location of the POIs is detailed in the Operations Manual appendices.

Additional Service Characteristics

- 3.11 The technical specification of the Small Business Fibre Service is set out in Appendix B.
- 3.12 The LFC will provide certain support and other assistance as part of the Small Business Fibre Service including:
 - 3.12.1 an automated facility for Service Requests;
 - 3.12.2 an automated facility for fault notifications; and
 - 3.12.3 a tool to assist the Service Provider in determining the location and availability of the Small Business Fibre Service (pre-qualification),
 each as more particularly set out in the Operations Manual.

- 3.13 The Small Business Fibre Service specifically excludes:
- 3.13.1 the UFB Handover Connection Service;
 - 3.13.2 provision or maintenance of any cabling or connection or active device:
 - (a) beyond the Service Demarcation Points described in clauses 4.1 and clause 5.1; and
 - (b) between the jack terminating the LFC provided Fibre Lead-in and the ONT where that cabling or connection is not provided by the LFC and the LFC has not agreed to take responsibility for that cabling or connection;
 - 3.13.3 configuration, monitoring, operation, on-going support or maintenance of Service Providers' or End User's applications, equipment or networks; and
 - 3.13.4 supply of AC mains & UPS power, accommodation space, heating, ventilating, and air conditioning and facilities at the POI or End User Premises or Service Provider Premises or NBAP (as applicable).
 - 3.13.5 The resale or resupply beyond the relevant End User Premises connected by the ONT or the use of the Small Business Fibre Service for mobile or wireless site backhaul ("Prohibited Purposes"). Should the Small Business Fibre Service be used for any Prohibited Purposes Chorus reserves the right in its sole discretion, after notification to the Service Provider and a reasonable period to remedy the issue:
 - (a) to assess your usage as being more appropriate to another Chorus service and to move you to that alternative service; or
 - (b) to restrict, suspend, or cancel in whole or in part any Small Business Fibre Service.

4 Service Demarcation Point at End User Premises or Service Provider Premises or NBAP (as applicable)

- 4.1 The Service Demarcation Point at the End User Premises or Service Provider Premises or NBAP (as applicable) is the 100/1000Base-T UNI on the ONT.
- 4.2 The Small Business Fibre Service excludes the End User Premises or Service Provider Premises or NBAP (as applicable) wiring. If a fault reported by the Service Provider is found to be caused by the End User Premises or Service Provider Premises or NBAP (as applicable) equipment (CPE) or the wiring at the End User Premises or Service Provider Premises or NBAP (as applicable) beyond the Service Demarcation Point, then the Service Provider may be charged the "No fault found" Ancillary Charge in the Price List. Note the wiring should comply with the industry standard Premises wiring requirements which are available at www.tcf.org.nz.

5 Service Demarcation Point at POI

- 5.1 Where no Tail Extension Service is used, the POI Service Demarcation Point is:
 - 5.1.1 The physical Service Demarcation Point is the MOFDF in the Local POI, which is part of the UFB Handover Connection Service, and
 - 5.1.2 logically, the single S-VLAN per Access-EVPL or Voice-EVPL on the E-NNI at the Local POI, which is part of the UFB Handover Connection.
- 5.2 Where Tail Extension Service is used, the POI Service Demarcation Point is:
 - 5.2.1 The physical Service Demarcation Point is the MOFDF in the National POI, which is part of the UFB Handover Connection Service, and
 - 5.2.2 Logically the single S-VLAN per Access-EVPL or Voice-EVPL on the UFB Handover Connection located at the National POI.

- 5.2.3 The logical demarcation between the Small Business Fibre Access service and Tail Extension Service is the middle of the Ethernet Aggregation Switch at the local POI. There is no physical demarcation point and the E-AVPL is provisioned as a single entity

6 Service Prerequisites

- 6.1 The UFB Handover Connection Service is a separate service and is a prerequisite to the supply of the Small Business Fibre Service i.e. Service Provider's must first purchase and then continue to maintain a UFB Handover Connection Service at all times while taking the Small Business Fibre Service.

7 LFC and Service Provider Responsibilities

- 7.1 Other LFC and Service Provider responsibilities are detailed in the General Terms and the Operations Manual.

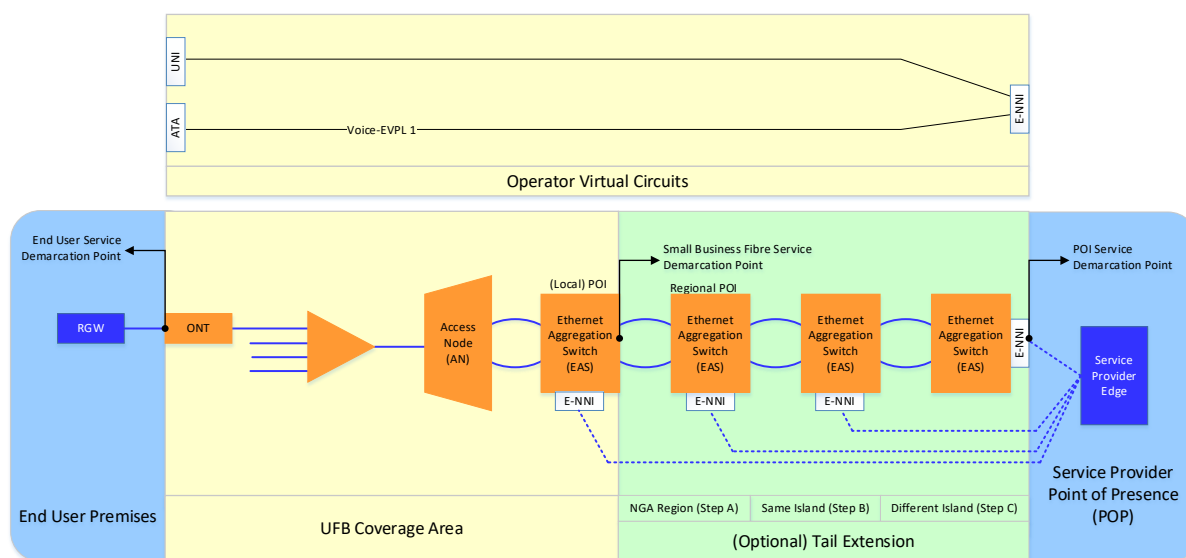
8 Fibre Diversity

- 8.1 The Small Business Fibre Service provides a single service instance at the End User Premises, Service Providers Premises or NBAP (as applicable).
- 8.2 Diversity for Small Business Fibre Service is limited to a second or subsequent instance of the Small Business Fibre Service and does not include route diversity or Central Office diversity. A diverse lead-in between the Fibre Access Point and the Premises may be available as an option for some but not all Premises. Standard Installation Charges and Service Levels do not apply to the provision of the diverse products that involve diverse access to the End User Premises or Service Provider Premises or NBAP (as applicable). Each instance of the Small Business Fibre Service, primary and diverse, will be treated as an individual line for the purpose of availability Service Levels.

9 Small Business Fibre Service Levels

- 9.1 Service Levels for both the Layer 1 and Layer 2 components of the Small Business Fibre Service are set out in the Service Level Terms for the Bitstream Services.
- 9.2 It should be noted that the Small Business Fibre Service is subject to the Small Business Service Level for Fault Restoration as described in the Service Level Terms for the Bitstream Services.

Appendix A – Diagram



This is a generic diagram showing the standard configuration and Service Demarcation Points. It is not intended to represent every situation or detailed physical architecture. The following points should be noted:

- The Small Business Fibre Service and pricing applies from the UNI to the logical demarcation point at the local POI.
- Service Levels (availability, network performance) apply from UNI to the E-NNI at the local POI.
- The tail extension service, service levels, and pricing applies from the local POI to the E-NNI where the service is handed over.
- Access node and aggregation interconnection may use redundant links to meet Service Level requirements.

The Bitstream services support simultaneous delivery of multiple Service Templates from the same or multiple Service Providers as follows:

- Multiple Access-EVPLs can be delivered to the same UNI.
- A Voice-EVPL can be considered an Access-EVPL with an ATA Voice port at the End User interface. The class and bandwidth characteristics of this Access-EVPL are optimised for voice.
- All services delivered to a UNI must belong to the same Service Provider but can be mapped to the same or different E-NNIs.
- The initial Small Business Fibre Service Templates contain a single Access-EVPL and one ATA Voice Service.

Appendix B – Technical Specification

Technical Specification	
UNI	<p>Ethernet II or 802.3 untagged interface; or 802.1q tagged interface with</p> <ul style="list-style-type: none"> • VLAN id = 10 • 802.1p = 0, 1, 2, 3, 4, 6, 7 (Low Priority) • 802.1p = 5 (High Priority) <p>The standard ONT supports:</p> <ul style="list-style-type: none"> • 4 x UNI • 1 or 2 x ATA Voice ports • Optional additional ports: <ul style="list-style-type: none"> ○ Wi-Fi <p>Per UNI:</p> <ul style="list-style-type: none"> • 100/1000Base-T
UFB Handover Connection (E-NNI)	<p>Ethernet:</p> <ul style="list-style-type: none"> • 802.1ad VLAN (SVID, CVID); or • Double tagged QnQ. <p>Other Ether types on request</p>
VLAN	<p>Point-to-Point (Access-EVPL) UNI MTU 1996 bytes E-NNI MTU 2000 Bytes Unicast Frame Delivery = passed within service CIR/EIR Multicast Frame Delivery = passed within service CIR/EIR Broadcast Frame Delivery = passed within service CIR/EIR Layer 2 Control Protocols Processing = Initially none (but may be amended by LFC from time to time)</p>
Fibre	<p>External fibre must comply with ITU-T specification G.652.D or 657A. Internal building fibre cables must meet appropriate fire regulations i.e. be Flame-Retardant, Non Corrosive, Low Smoke, Zero Halogen (FRNC/LSZH).</p>
Connector Type	<p>Fibre terminations must be SC/APC type connectors (complying with the IEC 61754-4 standard) or alternatively LC/APC also known as LCA type connectors (complying with the IEC 61754-20 standard) as appropriate.</p>
Optic Path	<p>Laser types and path characteristics are expected to be designed to a minimum standard which are contained in either IEEE 802.3 Section 5 standard or ITU-T G.984 (GPON) standards.</p>
Fibre Testing Layer 1	<p>All commissioning Layer 1 network testing (LFC site OFDF to end of Communal Network) is by OTDR at two wavelengths, 1310nm and 1550nm using Bi-Directional method in accordance with Chorus standard described in ND0556.</p> <p>The methodology used will be based on bi-directionally testing all fibres in the Communal Network required to complete the service.</p> <p>Network test results are provided by agreement verifying performance features. Refer to the Direct Fibre Services Operations Manual for details.</p>

Technical Specification	
	<p>All Layer 1 network restoration testing will be LFC site OFDF to Premises termination point.</p> <p>Testing for power loss will be at either 1310 or 1550 nm.</p> <p>In the event of a fault restoration testing will be to the standard in Optical Performance table below.</p> <p>The wavelengths of 1625 nm and 1650nm are reserved for network maintenance testing purposes, (live GPON network) compliant with ITU-T L.41.</p>
Optical Path performance	<p>Communal Network performance</p> <p>Total GPON Insertion Loss (ITU-T G984) = $\leq 28.5\text{db}$</p> <p>Network Return Loss = $\geq 32\text{db}$</p> <p>LFC GPON system margin (lifetime ageing factor) = 1.5db</p> <p>Total GPON insertion Loss OLT to ONT design target is = $\leq 27.0\text{db}$ (28.5db – 1.5db)</p> <p>Optical Fibre Attenuation Co-Efficient (L) (ITU-T G.652. & G657.A) = $\leq 0.4\text{db/km}$</p> <p>Splice Loss (S) = $\leq 0.15\text{db}$</p> <p>Mated Connector loss (C) = $\leq 0.3\text{db}$</p> <p>Mated Connector Reflection = $\geq 55\text{db}$</p> <p>Total Insertion Loss of network (IL) is calculated from $IL = 0.4L + 0.15S + 0.3C$ (excluding PON splitter)</p> <p>Splitter performance</p> <p>1:32 = $\leq 17\text{db}$</p> <p>1:16 = $\leq 14\text{db}$</p> <p>1:8 = $\leq 11\text{db}$</p> <p>1:4 = $\leq 7.3\text{db}$</p> <p>1:2 = $\leq 4.0\text{db}$</p>
Network Testing Layer 2	<p>Network test results will meet the performance criteria listed in the Bitstream Service Level Terms (for the relevant service).</p>