Northpower Fibre UFB Services Agreement: Service Description for Hyperfibre

Version 1.0 March 2022

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 Hyperfibre Service

2.1 The Hyperfibre Service is a high-speed 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:

2.2 Hyperfibre comes in two service variants:

2.2.1 Hyperfibre 2 Service: A Bitstream 2a-like A-EVPL bitstream service that connects a UNI or Open Access Gateway function in the End User premises to a single S-VLAN/C-VLAN on a UFB Handover Connection service located at the POI;

2.2.2 Hyperfibre 3B Service: A Bitstream 3B-like Access-EPL bitstream service that connects a UNI in the End User premises to a single S-VLAN on a UFB Handover Connection service located at the POI,

Where the UFB Handover Connection enables a Service Provider to access and interconnect with the LFC Network

2.3 A diagram of the configuration for the Hyperfibre Service is set out in Appendix A.

2.4 The Hyperfibre 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.

2.5 The Hyperfibre Service has the following key characteristics:

2.5.1 Support for two traffic classes, High Priority and Low Priority Traffic Class:

Traffic Class	CIR	EIR
Low	= 0 Mbps	8000 ≥ 0 Mbps
High	100 ≥ 0 Mbps	= 0 Mbps

2.5.2 Supports tagged or untagged traffic at the UNI

2.5.3 Delivered using XGS-PON technology over the LFC's Point-to-Multipoint fibre network

2.5.4 The Hyperfibre services may be combined (using Co-Existent elements) with existing GPON services, where possible

2.6 The Hyperfibre 2 Service variant has the following key characteristics:

2.6.1 2 A-EVPLThe Hyperfibre 2 Service includes one Ethernet A-EVPL Bitstream Service that allows a single VLAN between the 10G RJ-45 UNI and the E-NNI to be passed transparently to the Service Provider

2.6.2 Clause 3.7.6 provides an overview of the Service Templates that are initially offered, each consisting of a single A-EVPL bitstream service with a predefined bandwidth on the 10G RJ-45 UNI

2.6.3 Optionally inserts Circuit ID and Remote ID information in DHCP (Version 4) and PPPoE traffic upstream.

2.6.4 Complies with, and a variant of, the Mass Market service specified in the *TCF Ethernet Access Service Description v33, 11 May 2017*

2.7 The Hyperfibre 3B Service variant has the following key characteristics:

2.7.1 The Hyperfibre 3B Service includes one Ethernet A-EPL Bitstream Service that allows up to

4050 VLANs between the 10G RJ-45 UNI and the E-NNI, to be passed transparently to the Service Provider

2.7.2 Clause 3.7.6 provides an overview of the Service Templates that are initially offered, each consisting of a single Ethernet-AVPL bitstream service with a predefined bandwidth on the 10G RJ-45 UNI.

2.7.3 Complies with, and a variant of, the Business service specified in the *TCF Ethernet Access Service Description v33, 11 May 2017*

3 Hyperfibre Service and implementation activities

Installation Services

3.1 The Hyperfibre Service includes a Standard Install* as set out below (in each case to the extent that the relevant provisioning works are not already complete for the relevant Service Order).[1]

3.2 The Hyperfibre Service includes a standard migration from GPON to Hyperfibre, where applicable, which includes:

Provisioning at Single Dwelling Unit End User's Premises

There is an existing GPON Service active/intact at SDU

3.2.1 The Hyperfibre Service includes a standard migration of the service from GPON to Hyperfibre, where applicable, which includes;

(a) Removal of the current GPON ONT and the Power adapter

(b) Supply and installation of the Hyperfibre ONT and new Power adapter. The Hyperfibre ONT has a different footprint to the existing GPON ONTs and the technician will decide on wall mount or pedestal option, as required

(c) Reconnection of the fibre pigtail or install a Fibre Lead-in from the ETP

(d) Supply of the XGS-PON Port with its splitter or combiner(Co-Existence element), if required, in the LFC network; and

(e) Reconfiguration, if applicable, of the Central Office/Splitter cabinet fibre pigtail to enable connection to the XGS-PON port on the OLT

For new Hyperfibre Service installs

3.2.2 A Standard Install* for the Hyperfibre Service to a Single Dwelling Unit includes:

(a) A Fibre Lead-in from the Fibre Access Point to an ETP at the closest convenient point on the End User Premises, as agreed with End User, where the Fibre Lead-in utilises no more than:

(i) 100m of approved conduit or open trench (already in place at the time of installation); or

(ii) a double span of aerial drop lead on existing poles from the Fibre Access Point (this will include road crossings and is available only in areas where there is overhead deployment); or

(iii) 30m of buried lead-in (available only in areas where there is underground deployment); and

(b) An extension of the Fibre Lead-in up to 10m radius from the ETP (there will not necessarily be a break in the Fibre Lead-in at the ETP) to:

(i) a suitable mounted SC/APC connector at a secure location inside the

* Standard Install parameters may differ between LFCs.

End User Premises; or

(ii) if there is an OFDF beyond the ETP, a splice or LCA connector on the OFDF.

3.2.3 The LFC will provide Non-Standard Installs for the Hyperfibre Service to Single Dwelling Units as an Ancillary Service.

Provisioning at MDU End User's Premises

There is an existing GPON Service active/intact at MDU

3.2.4 The Hyperfibre Service includes a standard migration of the service from GPON to Hyperfibre, where applicable, which includes;

(a) Removal of the current GPON ONT and the Power adapter

(b) Supply and installation of the Hyperfibre ONT and new Power adapter. The Hyperfibre ONT has a different footprint to the existing GPON ONTs and the technician will decide on wall mount or pedestal option, as required

(c) Reconnection of the fibre pigtail or install a Fibre Lead-in from the ETP

(d) Supply of the XGS-PON Port with its splitter or combiner in the LFC network;and

(e) Reconfiguration, if applicable, of the Central Office/Splitter cabinet fibre pigtail to enable connection to the XGS-PON port on the OLT

For new Hyperfibre Service installs

3.2.5 A Standard Install for the Hyperfibre Service to an End User that is within a MDU (i.e. an End User Tenancy) includes:

(a) a Fibre Lead-in from the Fibre Access Point to the OFDF or equivalent at the closest convenient point within the MDU, as agreed with the MDU owner or their agent, where the Fibre Lead-in utilises no more than:

(i) 100m of approved conduit or open trench (already in place at the time of installation); or

(ii) a double span of aerial drop lead on existing poles from the Fibre Access Point (this will include road crossings and is available only in areas where there is overhead deployment); or

(iii) 30m of buried lead-in (available only in areas where there is underground deployment); and

(b) where the fibre cabling in a MDU to the End User Tenancy is not already in place at the time of installation of the Hyperfibre Service, fibre cabling within the MDU to extend the Fibre-Lead-in from the OFDF or equivalent to the End-User Tenancy; and

(c) either:

(i) a further extension of the Fibre Lead-in up to 10m radius from the ETP at the End User Tenancy (there will not necessarily be a break in the Fibre Lead-in at the ETP) to:

(A) a suitable mounted SC/APC connector at a secure location; or
(B) if there is an OFDF beyond the ETP, a splice or LCA connector on the OFDF, within the End User Tenancy; or

(ii) if there is not an ETP at the End User Tenancy as contemplated by clause 3.1.5(c)(i), a further extension of the Fibre Lead-in up to 10m radius from the boundary of the End User Tenancy to:

(A) a suitable mounted SC/APC connector at a secure location; or

(B) if there is an OFDF beyond the boundary, a splice or LCA connector on the OFDF, within the End User Tenancy.

3.2.6 The extended LFC Network fibre within the MDU is the Fibre Lead-in to an End User Tenancy, whether currently in use or not. The Fibre Lead-in is only available for use by the LFC.

3.2.7 The LFC will provide Non-Standard Installs for the Fibre Lead-in to End User Tenancies within MDUs as an Ancillary Service.

Single Dwelling Unit Termination Point

3.2.8 For a Single Dwelling Unit, the termination point of the Layer 1 component of the Hyperfibre Service for the purposes of the Connection at the End User's Premises, and the network demarcation point between the LFC Network and the Premises wiring is, as applicable, either:

(a) the SC/APC connector on the end of the Fibre Lead-in from the ETP (which is the connector); or

(b) if there is an OFDF beyond the ETP, a splice or LCA connector on the OFDF,

provided that any ONT installed by the LFC as part of the Hyperfibre Service will also be part of the LFC Network.

3.2.9 The termination point of the Layer 2 component of the Hyperfibre Service is either the 10GBase-T UNI on the ONT.

MDU Termination Point

3.2.10 For MDUs, the termination point of the Layer 1 component of the Hyperfibre Service for the purposes of the Connection at the End User's Tenancy, and the network demarcation point is as applicable, either:

(a) the SC/APC connector on the end of the Fibre Lead-in (which is the jack); or

(b) if there is an OFDF beyond the ETP or End User Tenancy boundary, a splice or LCA connector on the OFDF,

within the End User Tenancy, provided that any ONT installed by the LFC as part of the Hyperfibre Service will also be part of the LFC Network.

3.2.11 The termination point of the Layer 2 component of the Hyperfibre Service is 10GBase-T UNI on the ONT.

Alternative Termination Points

3.2.12 The LFC and the Service Provider may agree on a different termination point as part of a Non-Standard Install. This may be necessary where, for example, there is installation to a NBAP. A Non Standard Install for a Hyperfibre Service within a Multi Dwelling Unit will not include termination in a building common area or other facility made available by the owner to service the Multi Dwelling Unit, where a Fibre Lead-in has not been extended from the OFDF to the inside of an End User Tenancy.

Installation of XGS-ONT

3.2.13 A Standard Install for the Hyperfibre Service includes installation of an ONT including:

(a) supply and fixing of the ONT to the structure (or pedestal setup where required) of the End User Premises (in the case of a Single Dwelling Unit) or an End User Tenancy (in the case of an MDU);

(b) supply and connection of fibre pigtail up to 1m long between the Fibre Lead-in termination point and the ONT if required; and

(c) testing from the UNI port of the ONT to ensure the Hyperfibre Service is within the technical specification set out in Appendix B.

3.2.14 The Service Provider must ensure the End User provides a suitably located mains power outlet for the XGS-ONT power supply which is provided as part of a Standard Installation and specific

to the XGS-ONT installed. The End User may not install their own power adapter, as this could potential damage ONT

3.2.15 The LFC will not provide space and power at any End User Premise for the ONT. These are the responsibility of the End User. The location of the ONT must be a suitable environment for electronic equipment being generally a dry, clean indoor area with adequate ventilation.

Testing

3.3 The LFC will test the Fibre Lead-in from the termination point at the End User's Premises referred to in clauses 3.1.8, 3.1.10 or 3.1.12 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 Hyperfibre Service at the Layer 2 termination point at the premises if there is a suitable CPE device connected on the UNI at the time of installation

3.5 The LFC will also perform an industry standard test such as Service Activation or Throughput tests using our own test equipment to confirm the services between the UNI and the E-NNI

Additional Services

3.6 If the Service Provider requires additional services such as:

3.6.1 A Non-Standard Install which includes (where required):

(a) an extension of the Fibre Lead-in over the maximum distances specified in clauses 3.1.2 (in relation to Single Dwelling Units) or 5 (in relation to End User Tenancies within MDU's);

(b) installation to a NBAP utilising specialised termination equipment; or

(c) installation of Fibre-Lead-in diversity at an End User's Premises (from the FAP to the ETP or OFDF as applicable);

3.6.2 Premises wiring services; or

3.6.3 Installation and testing of Service Provider equipment and services,

then the LFC may be able to provide the services on request, subject to terms to be agreed between the LFC and the Service Provider. (Including any applicable charged)

Core Hyperfibre Service

3.7 The core Bitstream Services provided as part of the Hyperfibre Service are as follows:

3.7.1 For Hyperfibre 2, One A-EVPL, each consisting of:

(a) a single 802.1q VLAN on a designated UNI on the ONT at the End User Premises;

(b) a single 802.1ad or QinQ VLAN (Service VLAN ID/Customer VLAN ID) on the E-NNI at the POI; and

(c) a QOS bandwidth profile that describes how traffic is carried between these points.
(d) Untagged traffic sent from the End User is tagged and marked as Low Priority
(e) Tagged Traffic is treated as follows:
  (i) Traffic tagged with PCP = 5 will be treated as High Priority.
  (ii) Traffic tagged with PCP = 0 will be treated as Low Priority
  (iii) Traffic tagged ingressing the E-NNI with a SVLAN PCP = 1, 2, 3, 4, 6 or 7 will be remarked as PCP 0 and treated as Low Priority.
  (iv) Traffic tagged ingressing the UNI with PCP = 1, 2, 3, 4, 6 or 7 will be encapsulated with a SVLAN having a PCP of 0 and treated as Low Priority

3.7.2 For Hyperfibre 3B, One A-EPL, each consisting of:

(a) Transparent pass-through of 802.1q VLAN on a designated UNI on the ONT at the End User Premises;

(b) Delivered over a single 802.1ad SVLAN on the E-NNI at the POI

(c) A QOS bandwidth profile that describes how traffic is carried between these points.

(d) Tagged Traffic is treated as follows:

(i) Untagged traffic sent from the End User is tagged and marked as Low Priority

(ii) Traffic tagged with PCP = 0 will be treated as Low Priority

(iii) Traffic tagged with PCP = 1, 2, 3, 4, 5, 6 or 7 will be remarked and treated as High Priority.

(iv) Downstream frames will us the SVLAN PCP value for Traffic Classification and Upstream frame will use the CVLAN PCP if applicable.

3.7.3 Five percent (5%) bandwidth overhead for Low Priority EIR traffic (downstream & upstream) to compensate for higher protocol encapsulation overheads on Hyperfibre service templates are set out in Clause 3.5.6 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, End User devices that are capable of reaching the bandwidth that exceeds 1G in general and local network, the Service Provider network and location of the content they are accessing.

3.7.4 The Hyperfibre Service includes the options, exercised by Service Request, to:

(a) set the UNI as an untagged interface. If this feature is requested then the network will remove all 802.1q tags from downstream traffic and present it as 802.3 Ethernet frames from the UNI; and

(b) enable Circuit ID and Remote ID per A-EVPL, as specified in Broadband Forum TR-101/TR-156, per tail. If this feature is requested TR-101 information will be embedded in DHCP or PPPoE traffic. The Circuit ID format may differ slightly from the examples provided in TR-101/TR-156.

3.7.5 The maximum bandwidths obtainable by an End User are limited by the physical connection speed they connect to the Hyperfibre ONT, as detailed below;

(a) The Hyperfibre ONT has a single 10G Ethernet Port where the CPE will connect to the 10G Ethernet at 1Gbps, 2.5Gbps or 10Gbps using Auto Negotiation

(b) The Hyperfibre ONT currently supports 1 x 10G and no other port speed supported at this stage. Further ports for 1GE or ATA ports to be confirmed

(c) Peak TCP/IP throughput is typically 80-90% of the physical connection port speed due to higher-layer packet encapsulation, Ethernet preamble, frame delimiters and inter-frame gaps

(d) Hyperfibre Services include a bandwidth overhead for Low Prirority Traffic to compensate for higher protocol encapsulation overheads. These overhead would not be observable to a device that is connected at a physical line rate below the speed. I.e. A CPE connected at 1Gbps port will be limited to the 1Gbps physical connection speed

(e) This maximum bandwidth (including the additional overhead rates) does not guarantee End Users will observe the provisioned speed for a sustained period of time, as their experience depends on a number external factors including, but not limited to, End User devices and the applications, local network connection, the Service Provider network and the location of the content they are accessing

(f) The QOS bandwidth profiles treat the traffic as follows, based on the individual frame priority;

Traffic Priority Type	Ingress	Transport
Low Priority	CIR = 0 EIR = 0 – 8000Mbps EIR + CIR Policed at Ingress	Queued and weighted fairly under congestion conditions
High Priority	CIR = 0 – 100Mbps EIR = 0 CIR Policed at Ingress	Prioritised

3.7.6 Initial Hyperfibre Service Templates are as follows:

Template	Headline Rates[1]		Low Priority PIR[2] (Mbps)		Low Priority[5]				High Priority			
	Low (Gbps Down/ Up)	High Gbps (Down/ Up)	Down	Up	EIR Mbps	EBS kB	CIR Mbps	CBS kB	EIR Mbps	EBS kB	CIR Mbps	CBS kB
Home Hyperfibre2000[3]	2/2	0	2100	2100	2100	550	0	0	0	0	2.5	32
Home Hyperfibre4000[3]	4/4	0	4200	4200	4200	1100	0	0	0	0	2.5	32
Home Hyperfibre8000[3]	8/8	0	8200	8400	8400	2200	0	0	0	0	2.5	32
Small Business Hyperfibre2000[4]	2/2	2.5/2.5	2100	2100	2200	550	0	0	0	0	2.5	32
Small Business Hyperfibre4000[4]	4/4	2.5/2.5	4200	4200	4200	1100	0	0	0	0	2.5	32
Small Business Hyperfibre8000[4]	8/8	2.5/2.5	8400	8400	8400	2200	0	0	0	0	2.5	32
Business Hyperfibre2000[4]	2/2	10/10	2100	2100	2100	1100	0	0	0	0	10	32
Business Hyperfibre4000[4]	4/4	10/10	4200	4200	4200	1100	0	0	0	0	10	32
Business Hyperfibre8000[4]	8/8	10/10	8400	8400	8400	2200	0	0	0	0	10	32

[1] The headline rate is the Layer 2 bandwidth prior to the addition of the Low Traffic Class overhead (refer to Low Priority PIR[2])

[2] Low Priority 'Peak Information Rate' (PIR) is the headline rate plus the bandwidth overhead described in section 3.5.3 plus the Low Priority CIR(Low Priority PIR = Low Priority EIR + Low Priority CIR)

[3] Available for Residential Connections only.

[4] Available for Residential and Business Connections with appropriate connection charges and SLAs as applicable

[5] These values are the layer 2 bandwidths and include the additional overhead compensation described in section 3.5.3 and Hyperfibre profile settings are symmentric (i.e. identical Upstream/Downstream bandwidth profile)

3.7.7 The Hyperfibre Service has similar characteristics to the other services within the UFB family of Bitstream Services as identified below:

Attribute	Bitstream 2a	Hyperfibre 2	Bitstream 3a	Hyperfibre 3B
Bitstream	A-EVPL	A-EVPL	A-EPL	A-EPL
High Priority	Yes	Yes, 0 or 2.5Mbps	Yes	Yes
Low Priority	Yes	Yes	Yes	Yes
Service Bandwidths (Reference Offer)*	Low Priority from 30/10 Mbps up to 100/50 Mbps Low Priority + High Priority up to 110/52.5 Mbps	Low Priority from 2/2 – 8/8	100/100 Mbps with High Priority from 2.5Mbps	Low Priority 2/2 up to 8/8G Symmetrical on 10 GigE port High Priority up to 100/100 Mbps
MTU	2000 Bytes	2000 Bytes	2000 Bytes	2000 Bytes
MAC addresses	16	16	64	64
Number of available UNIs	4 standard	1 x 10GE	4 standard	1x 10GE Port
L2CP support	No	No	No	No
Diversity	On request with limited availability	On request with limited availability	On request with limited availability	On request with limited availability

UNI - NNI characteristics

3.7.8 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 Hyperfibre 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

3.9 To use the Hyperfibre Service the Service Provider must have the capability to access and interconnect with it, by one of the following:

3.9.1 Co-locating Service Provider equipment at the POI using the UFB Handover Connection Service and Central Office and POI Co-location Service;

3.9.2 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;

3.9.3 Connecting to a backhaul service at the POI;

3.9.4 By using the Direct Fibre Access Service to connect to Service Provider equipment at a remote location within the Central Office area; or

3.9.5 co-locating Service Provider equipment at the POI using the UFB Handover Connection Service and a third party co-location service.

Additional Service Characteristics

3.10 The technical specification of the Hyperfibre Service is set out in Appendix B.

3.11 The LFC will provide certain support and other assistance as part of the Hyperfibre Service including:

3.11.1 An automated facility for Service Requests;

3.11.2 An automated facility for fault notifications; and

3.11.3 A tool to assist the Service Provider in determining the location and availability of the Hyperfibre Service (pre-qualification), each as more particularly set out in the Operations Manual.

3.12 The Hyperfibre Service specifically excludes:

3.12.1 The UFB Handover Connection Service;

3.12.2 Provision or maintenance of any cabling or connection or active device:

(a) beyond the service demarcation points described in clause 4.1 and clause 5.1

(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;

3.12.3 Configuration, monitoring, operation, on-going support or maintenance of Service Providers' or End Users' applications, equipment or networks; and

3.12.4 Supply of AC mains & UPS power, accommodation space, heating, ventilating, and air conditioning and facilities at the POI or End User Premises.

3.12.5 The resale or resupply beyond the relevant End User Premises connected by the ONT or the use of the Hyperfibre Service for mobile or wireless site backhaul ("Prohibited Purposes"). Should the Hyperfibre Service be used for any Prohibited Purposes Northpower Fibre 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 Northpower Fibre service and to move you to that alternative service; or

(b) to restrict, suspend, or cancel in whole or in part any Hyperfibre Service

4 Service Demarcation Point at End User Premises

4.1 The service demarcation point at the End User's Premises is the 10GBase-T UNI interface on the Hyperfibre ONT.

4.2 The Hyperfibre Service excludes the End User Premises wiring. If a fault reported by the Service Provider is found to be caused by the End User Premises equipment (CPE) or the wiring at the End User's Premises beyond the service demarcation point, then the Service Provider may be charged the no fault found fee 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 The Hyperfibre Service is delivered as a single VLAN (the logical service demarcation point) on the UFB Handover Connection located at the POI.

5.2 The physical service demarcation point is the MOFDF in the POI, which is part of the UFB Handover Connection Service.

5.3 The UFB Handover Connection Service is a separate service and is a prerequisite to the supply of the Hyperfibre 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 Hyperfibre Service.

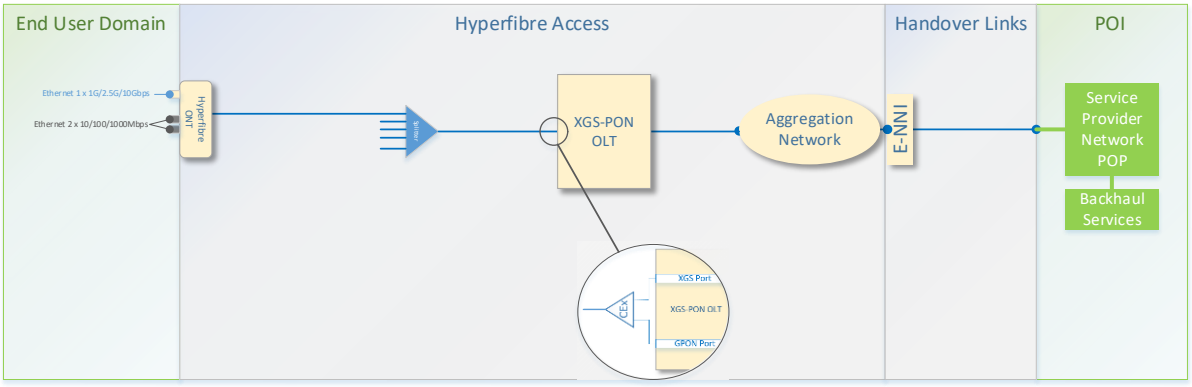
6 LFC and Service Provider Responsibilities

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

7 Hyperfibre Service Levels

7.1 Service Levels for both the Layer 1 and Layer 2 components of the Hyperfibre Service are set out 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 Hyperfibre Service and pricing applies from the UNI to the E-NNI at the POI, i.e. there is no incremental charge from the Intermediate POI to the POI.
- Service Levels (availability, network performance) only apply to UNI to the E-NNI at the POI.
- Access node and aggregation interconnection may use redundant links to meet Service Level requirements.

The Hyperfibre 2 Service supports a single A-EVPL service that connects the UNI with a VLAN located at the E-NNI

The Hyperfibre 3B Service supports a single A-EPL OVC that connects the UNI with the VLAN located at the E-NNI

Appendix B - Technical Specification

Technical Specification	
Ethernet	Ethernet II or 802.3 untagged interface; or 802.1q tagged interface with: • VLAN id = as agreed with Service Provider; • 802.1p = 0, 1, 2, 3, 4, 6, 7 (Low Priority); or • 802.1p = 5 (High Priority).
UNI	Hyperfibre ONT supports: • 1 x 10G UNI. Per UNI: • 10 G UNI Supports /1000/2500/10000 Base-T
UFB Handover Connection (E-NNI)	Ethernet: • 802.1ad VLAN (SVID, CVID); or • Double tagged QnQ.
VLAN	Point-to-Point (A-EVPL). 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).
Fibre	External fibre must comply with ITU-T specification G.652D. Internal building fibres may comply with ITU-T G.657A but must meet appropriate fire regulations. Fibre terminations must be SC/APC type connectors (complying with the IEC 61754-4 standard) or alternatively LC/APC type connectors (complying with the IEC 61754-20 standard) as appropriate. Laser types and path characteristics expected to be designed to a minimum standard which are contained in the documents IEEE 802.3 Section 5 standard OR distance specifications as per the ITU-T G.984 (GPON) standard as appropriate. Testing for power loss will be at either 1310 or 1550 nm. 1625 nm and 1650nm are reserved for non-disruptive network maintenance testing.
Network Testing Layer 2	Network test results will be limited, but a Service Activation test results will be provided at the time of ONT installation and service activation. Hyperfibre ONT or XGS-PON diagnostics are not available through the Fibre ONT Diagnostics on the portal