Chorus UFB Services Agreement
Bitstream Services:
Operations Manual

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PART 1 - DOCUMENT INFORMATION

1 Introduction

1.1 This Operations Manual (**Manual**) is part of the WSA and sets out the operational processes and procedures for supply of the Bitstream Services.

1.2 This Manual should be read in conjunction with the other documents which make up the WSA, in particular the General Terms.

1.3 This Manual may be changed in accordance with the change mechanism set out in clause 24 of the General Terms.

1.4 The LFC will make the current version of this Manual available on the LFC website accessible by the Service Provider.

1.5 References to Service Level Terms are references to the Service Level Terms for Bitstream Services.

1.6 References to clauses or sections are references to clauses or sections in this Manual unless expressly provided otherwise. The Glossary (Appendix A) sets out definitions for terms contained in this Manual that are not defined in the General Terms. Otherwise, the definitions set out in the General Terms apply.

2 People and Contact Details

2.1 Immediately following the issue of the first Service Request for a Bitstream Service by the Service Provider, the Service Provider and the LFC must provide each other with the people and contact details set out in clause 2.2. Any change to the people or contact details must be advised in writing to the other party's principal point of contact. All people and contact details will remain valid until a party has advised the other in writing of a change (and provided an updated list of people and contact details).

2.2 People and Contact Details

Contact and detail required	***Purpose***
Both parties provide Principal point of contact for Bitstream Services. (This must include the principal point of contact's email address, mobile and work telephone numbers.)	This is the person responsible for the overall relationship between the parties with respect to the Bitstream Service. For the LFC this will usually be the Account Manager for the relevant Service Provider.
The LFC only provides Service Delivery Manager. (This must include the Service Delivery Manager's email address, mobile and work telephone numbers.)	This is the person responsible for service delivery of the Bitstream Service to the Service Provider.

Contact and detail required	***Purpose***
The LFC only provides Provisioning Manager. (This must include the Provisioning Manager's email address, mobile and work telephone numbers.)	This is the person responsible for the provisioning of the Bitstream Service to the Service Provider.
The LFC only provides Email address for submission of Forecasts.	This is the email address to which the Service Provider must send Forecasts.
Service Provider only provides Provisioning and Forecasting Manager. (This must include the provisioning and forecasting manager's email address, mobile and work telephone numbers.)	This is the Service Provider's counterpart to the LFC provisioning manager.
Service Provider only provides Names and email addresses of one or two people to become OSS/BSS and OSS/BSS user administrators.	These people will manage the creating and disabling of Service Provider staff accounts to access the OSS/BSS and OSS/BSS websites.
Service Provider only provides People who are authorised to download eBill files.	These are the people who will be set up with access to the LFCs secure web portal from which the Service Provider's eBills can be viewed and downloaded.
Service Provider only provides People who are authorised to download the Price List file.	These are the people who will be set up with access to the LFCs secure web portal where the Bitstream Price List file can be viewed and downloaded.
Service Provider only provides Service Requests confirmation email address.	This is the email address to which the LFC will send confirmation of Service Requests in cases where the Service Provider has submitted a provisioning request via email.

Contact and detail required	***Purpose***
The LFC only provides Fault reporting contact details. (This must include an 0800 fault reporting service number.)	These are the contact details the Service Provider must use for the reporting of faults in instances where the LFC has advised that OSS/BSS is unavailable under clause 11.5 below.
The LFC only provides Business continuity email address.	This is the email address to send forms to under clauses 7.19 to 7.22.
The LFC only provides Billing team email address.	This is the email address to which the Service Provider will send billing queries under clause 21.7.
Service Provider only provides Name, email address, mobile and work telephone number of person the LFC should respond to for billing queries.	This is the email address to which the LFC will respond in relation to billing queries.
Service Provider only provides Contact for faults. (This must include a name, email address and mobile and work telephone numbers.)	This is the contact the LFC will deal with in respect of faults.
Service Provider only provides Contact for Service Level and any other performance reports generated by the LFC. (This must include a name, email address and mobile and work telephone numbers.)	This is the contact the LFC will send Performance Reports to.

3 Technical Manuals and User Guides

3.1 This Manual refers to various technical manuals (including published New Zealand and international standards) and user guides that contain technical and procedural detail. Such reference is necessary for both the Service Provider and the LFC so that:

3.1.1 uniform standards of best practice are set;

3.1.2 the performance of the LFC Network can be maintained;

3.1.3 the health and safety of the Service Provider's and the LFCs employees, contractors and other agents can be protected;

3.1.4 systems are in place for the management of outages, faults and any work the Service Provider or the LFC need to undertake; and

3.1.5 the Service Provider's and the LFCs employees, contractors and other agents have access to uniform technical instructions.

3.2 To the extent that this Manual creates any obligation to comply with a technical manual or user guide, the Service Provider and the LFC must:

3.2.1 apply the technical manual or user guide under the terms of the Agreement in good faith;

3.2.2 interpret the technical manual or user guide consistently with the terms of the Agreement; and

3.2.3 comply with the technical and/or procedural detail the technical manual or user guide contains.

3.3 Electronic copies of all the relevant the LFC technical manuals and user guides will be made available to the Service Provider via the LFC website as soon as practicable after the issue of the first Service Request for a Bitstream Service by the Service Provider or following an earlier request from the Service Provider. New Zealand and international standards are available from appropriate suppliers in New Zealand and around the world

4 Good Faith and Dispute Resolution

4.1 The parties will deal with each other in good faith in relation to this Manual. The parties will act co-operatively and in good faith to facilitate the processes and procedures required for supply of the Bitstream Services.

4.2 Any dispute, question or difference that arises between the parties must be dealt with in accordance with the Escalation Protocol in Appendix B. The parties must use all reasonable endeavours to resolve the issue in this way before giving a notice under clause 20.2 of the General Terms, subject to clause 4.3.

4.3 In some parts this Manual provides that any dispute in relation to a particular issue will be of a technical, operational or implementation nature, which requires significant investigation of factual matters. The most efficient mechanism for resolving these issues is escalation in accordance with Appendix B, but neither party is precluded from issuing a dispute notice under clause 20.2 of the General Terms at any time.

5 Prerequisites

5.1 In addition to the commercial prerequisites set out in clause 2.2 in the General Terms, the Service Provider must satisfy the following operational prerequisites in relation to the Bitstream Service.

5.1.1 Execution of the WSA;

5.1.2 Set up of the OSS/BSS so Service Requests can be placed;

5.1.3 Service Provider staff trained in use of OSS/BSS to place and track Service

Requests and faults;

5.1.4 Build of first handover connection and associated direct fibre, backhaul or tie cable (if required);

5.1.5 Build of first co-location footprint (if required); and

5.1.6 Place a forecast of expected demand (optional).

5.2 The Service Provider and the LFC may enter into a non-disclosure agreement covering discussions prior to the Service Provider placing a Service Request for a Bitstream Service (but neither the LFC nor the Service Provider will be under any obligation to do so).

5.3 The Service Provider Operational Readiness Process in part 10 will be followed for the set up of a new Service Provider involving (as required) the establishment of commercial relationships, co-location, OSS/BSS interfaces, interconnection links and layer two interoperability.

5.4 Prior to placing each individual Service Request with the LFC, the Service Provider must ensure the Technical Interface Specification set out in Appendix D is complied with.

5.5 The Service Provider must ensure that the prerequisites specified in this clause are complied with on an ongoing basis (including, where applicable, in respect of each Bitstream Service) while that Service Provider continues to receive the Bitstream Service.

PART 2 – FORECASTING

6 Service Provider Forecasting

Introduction

6.1 This section 6 provides for a rolling monthly volume forecast by each Service Provider, through the completion and submission to the LFC of Forecasting Reports in accordance with clause 11 of the General Terms and as further described in this section 6.

6.2 The Service Provider must use all reasonable endeavours to provide the LFC with accurate Forecasts.

6.3 The Service Provider's Forecasts are Confidential Information for the purposes of clause 15 of the General Terms

Forecasting Reports

6.4 Within the period of 10 Business Days preceding Month End, but no less than 2 Business Days prior to Month End, the Service Provider will submit to the LFC a Forecasting Report, in the form prescribed by the LFC from time to time (a sample is attached as Appendix C).

6.5 Each Forecasting Report is to set out, for each of the 6 calendar months following Month End, the Service Provider's forecast for use of the Bitstream Service by reference to each applicable Candidate Area (each a **Forecast Coverage Area**). Months 1 to 6 are mandatory and 7 to 12 are optional and will be treated as indicative by the LFC.

6.6 In this section 6:

Forecast Service Request means a future Service Request that the Service Provider is forecasting it will make in the Service Request Month, as reported in a Forecasting Report;

Month [x] means the calendar month that is x calendar months before a Service Request Month;

Service Request Month means the calendar month in which a Forecast Service Request is forecast to become a Service Request; and

Previous Forecast means, in relation to a Service Request Month, as applicable:

- the total number of Forecast Service Requests for that Service Request Month as set out in the last Forecasting Report submitted to the LFC prior to the Service Request Month; or
- where clause 6.17 has been applied to the last Forecasting Report, the total number of Forecast Service Requests deemed to have been made for that Service Request Month in the last Forecasting Report submitted to the LFC prior to the Service Request Month in accordance with clause 6.17.

Bulk Service Request Forecasts

6.7 A Bulk Service Request is either:

6.7.1 A Bulk Transfer which is the transfer, in a coordinated manner with project

management oversight, of multiple End Users onto services based on the Bitstream Service supplied to the Service Provider; or

6.7.2 A Bulk New Connection which is the connection, in a coordinated manner with project management oversight, of multiple new connection Service Requests for a single or multiple End Users to be processed in a coordinated manner.

6.8 As Bulk Service Requests are carried out in accordance with an agreed plan negotiated with the Service Provider they are treated as Service Provider negotiated terms with respect to the provisioning Service Levels set out in the Service Level Terms.

6.9 For any proposed Bulk Service Request the Service Provider must notify the LFC of a Bulk Service Request requirement at least three months before the date which the Service Provider proposes the Bulk Service Request to commence to enable the actual date to be mutually agreed with between the LFC and Service Provider.

6.10 Forecasts for Bulk Service Requests must be included in the Forecasting Report.

Submission of Forecasting Reports

6.11 The Service Provider will submit Forecasting Reports to the LFC:

6.11.1 in the manner advised by the LFC from time to time;

6.11.2 using the template prescribed by the LFC, which must be completed in full by the Service Provider (including the date that the Forecasting Report is submitted to the LFC); and

6.11.3 by the dates specified in paragraph 6.4.

6.12 The LFC may make a reasonable request that the Service Provider provide additional information to the LFC in support of a Forecasting Report already provided. Following receipt of such a request, the Service Provider will prepare the requested information with reasonable care and provide it within a reasonable period.

Variations in forecast volume distribution

6.13 If a Forecasting Report does not specify a weekly or daily Forecast Service Request volume for any Forecast Coverage Area, Forecast Service Requests for that Forecast Coverage Area will be deemed to be evenly spread across the applicable Service Request Month for the purpose of determining service level performance.

6.14 If the Service Provider is aware that volume is not likely to be evenly distributed within a Forecast Coverage Area over a Service Request Month, it should ensure that the Forecasting Report for that Service Request Month itemises Forecast Service Requests on a per week or per Business Day basis (as applicable and to the extent required to reflect the forecast variation in distribution of volume).

6.15 Where the Service Provider fails to submit the required Forecasts, the LFC will deem the forecast to equal the level of Service Orders from the previous month and the LFC will be obliged to meet the applicable Service Levels for that volume of orders.

Accuracy of forecasting

6.16 A Service Provider may forecast any level of Forecast Service Requests it considers appropriate to accurately reflect anticipated volume, subject to clause 6.17. The intent of

the following provisions is to progressively increase the accuracy of forecasts and to limit variations in the volume of Forecast Service Requests forecast during the 6 month period leading up to the Service Request Month. To assist with planning the LFC would prefer 12 month forecasts but the provisions in this Part 2 will only apply for the 6 month period referred to in clause 6.17.

6.17 If, in a Forecast Report, the Service Provider provides 40 or more Forecast Service Requests in a Forecast Coverage Area for any Service Request Month, the aggregate number of Forecast Service Requests for that Forecast Coverage Area in that Service Request Month will be, when aggregated for all Forecast Coverage Areas (**Total Forecast Service Requests**):

6.17.1 for each of Month 5 and Month 6:

- if the Total Forecast Service Requests is greater than 120% of the Previous Forecast, deemed to be 120% of the Previous Forecast; and
- if the Total Forecast Service Requests is less than 80% of the Previous Forecast, deemed to be 80% of the Previous Forecast;

6.17.2 for Month 4:

- if the Total Forecast Service Requests is greater than 115% of the Previous Forecast, deemed to be 115% of the Previous Forecast; and
- if the Total Forecast Service Requests is less than 85% of the Previous Forecast, deemed to be 85% of the Previous Forecast;

6.17.3 for each of Month 2 and Month 3:

- if the Total Forecast Service Requests is greater than 110% of the Previous Forecast, deemed to be 110% of the Previous Forecast; and
- if the Total Forecast Service Requests is less than 90% of the Previous Forecast, deemed to be 90% of the Previous Forecast;

6.17.4 for Month 1 (the month before the Service Request Month):

- if the Total Forecast Service Requests is greater than 105% of the Previous Forecast, deemed to be 105% of the Previous Forecast; and
- if the Total Forecast Service Requests is less than 95% of the Previous Forecast, deemed to be 95% of the Previous Forecast.

6.18 The LFC will notify the Service Provider of each instance of the application of the deeming effects of paragraph 6.17, so that the Service Provider is aware of the deemed Total Forecast Service Requests (notwithstanding the Total Forecast Service Requests forecast by the Service Provider in the Forecasting Report).

6.19 The volume of Service Requests actually made in a Service Request Month should, for each Forecast Coverage Area, be no greater than 105% of the Previous Forecast (including having regard to any deeming under clause 6.17) for that Forecast Coverage Area for Month 1.

6.20 The volume of Service Requests actually made on a Business Day of a Service Request Month should, for each Forecast Coverage Area, be no greater than 130% of the

Previous Forecast (including having regard to any deeming under clause 6.17), for that Forecast Coverage Area for that same Business Day of Month 1. If the Previous Forecast does not itemise Forecast Service Requests by day in accordance with paragraph 6.14, the 130% threshold will be calculated by dividing the Total Forecast Service Requests for the Forecast Coverage Area by the number of Business Days in the Service Request Month and rounding to the nearest whole number.

6.21 If the volume of Service Requests for a Forecast Coverage Area actually made by the Service Provider exceeds the thresholds in 6.19 and/or 6.20 in the relevant Service Request Month or Business Day (as applicable), then the LFC will make reasonable endeavours to complete the Service Requests but the Service Levels will only apply to the volume of Service Requests that fall below the thresholds set in 6.19 and/or 6.20 (whether that threshold be calculated based on volumes as actually set out in the last Forecasting Report or deemed in accordance with clause 6.17).

6.22 If the volume of Service Requests for a Forecast Coverage Area actually made by the Service Provider in a Service Request Month (excluding any Service Requests cancelled or rejected at the end of the Service Request Month) is less than 75% of the Previous Forecast for that Forecast Coverage Area for that Service Request Month (including having regard to any deeming under clause 6.17), then if requested by the LFC, the Service Provider will pay to the LFC the sum of $20 per Forecast Service Request in the Previous Forecast that did not become a Service Request in the Service Request Month up to the 75% threshold.

6.23 The LFC will notify and, to the extent practicable, consult with, the Service Provider if it fails to meet a Service Level due to the volume of Service Requests actually made in a Service Request Month being greater than the thresholds set in paragraphs 6.19 and 6.20.

PART 3 - PRE-QUALIFICATION AND PROVISIONING

7 The OSS/BSS System

Overview

7.1 OSS/BSS allows the Service Provider to log on to a secure site for the placing and monitoring of Service Requests and Service Orders with the LFC.

7.2 Subject to the provisions below relating to business continuity all Service Requests for the Bitstream Service must be placed using OSS/BSS. Except as expressly provided elsewhere in this Manual, any Service Request that the Service Provider attempts to place by other means (for example, by email or by fax) will be invalid and may be disregarded by the LFC. The LFC will use all reasonable endeavours to notify the Service Provider if such invalid Service Requests have been received.

7.3 OSS/BSS allows the Service Provider to:

7.3.1 submit and track the status of Service Requests; and

7.3.2 update existing Service Requests (up to the time they are accepted and become Service Orders).

7.4 Service Providers requesting project management of Bulk Service Requests as described in clause 6.7, must contact their LFC Service Delivery Manager to agree the date of the scheduled work. Project management of multiple coordinated Service Orders will be charged at the rate in the Price List.

B2B

7.5 The Service Provider can choose to directly integrate its systems with OSS/BSS via the OSS/BSS Business to Business Web Services Interface (B2B). If the Service Provider is interested in B2B it can contact its Account Manager for documentation describing the development required to interact with B2B. A trial agreement must be signed before access to a test site, after which an Integration Access Agreement is required to be executed prior to migrating to a production instance.

Training and Support

7.6 The LFC will provide reasonable initial set up training on OSS/BSS as part of the Operational Readiness Process detailed in Part 10.

Access to OSS/BSS

7.7 The Service Provider will provide the LFC with the names of one or two people to become OSS/BSS user administrators. These people will then manage the creating and disabling of Service Provider staff accounts to access OSS/BSS.

7.8 On request from the Service Provider, the LFC will reset, disable or alter the user administrator accounts.

7.9 Subject to clause 7.10 the LFC may restrict or prohibit access to OSS/BSS if any of the Service Provider's staff or systems:

7.9.1 perform malicious or unintentional actions that damage or may potentially damage OSS/BSS; or

7.9.2 use OSS/BSS in an unauthorised manner or in such a way that causes or may cause material performance issues; or

7.9.3 use OSS/BSS in an unauthorised manner or in such a way to gain information they have no lawful right to access.

provided that the LFC will restrict or prohibit access to the minimum extent practicable to protect OSS/BSS and any related system.

7.10 The LFC must use all reasonable endeavours to provide the Service Provider with reasonable prior notice of such restrictions or prohibitions. Where this is not practicable in the circumstances, the LFC will give the Service Provider notice of the restriction or prohibition as soon as practicable after the event.

Additional Functionality or Enhancements to OSS/BSS

7.11 Where the LFC creates any additional functionality within OSS/BSS or makes any enhancement to it, the LFC will notify the Service Provider. The Service Provider will modify its own provisioning systems and/or operational procedures to the extent required. The LFC must consult with the Service Providers before notifying Service Providers of any additional functionality or enhancements to OSS/BSS which affect the use of OSS/BSS in relation to the Bitstream Services.

7.12 The Service Provider will utilise the additional functionalities or enhancements to OSS/BSS as notified by the LFC from the date specified in the LFC's notice (at the latest).

7.13 The Service Provider is responsible for ensuring that its own systems are configured in accordance with its use of OSS/BSS and comply with the requirements in the LFC Web Services Interface Software Development Kit and the OSS/BSS User Guide.

OSS/BSS Costs

7.14 The LFC will be solely responsible for the LFC's costs of designing and developing OSS/BSS, including any modifications and enhancements.

7.15 Service Providers will be solely responsible for the costs of modifying their systems and processes to interface with OSS/BSS and B2B and for participating in the consultation and implementation process.

Terms of Use

7.16 The Service Provider must only use OSS/BSS for purposes authorised by the LFC.

7.17 The LFC will use all reasonable endeavours to ensure that OSS/BSS is available to Service Providers 24 hours a day, 7 days a week.

7.18 The LFC must take all reasonable steps to prevent the introduction of viruses or other destructive features to OSS/BSS, but the LFC does not guarantee that it is free of such viruses or other destructive features.

Business Continuity

7.19 If the LFC advises the Service Provider OSS/BSS is unavailable the Service Provider may submit provisioning requests by emailing the relevant form to the LFC as outlined

below.

7.20 The LFC will make the following business continuity forms available to the Service Provider:

7.20.1 Pre-qualification/ Site Investigation form;

7.20.2 Bitstream:

- Transfer form;
- New Connection form;
- Plan Change form;
- Handover Connection; and
- Relinquishment form.

7.21 All business continuity forms submitted in accordance with this clause should come from a generic mailbox. This mailbox must include the Service Provider's name in the email subject line as below:

[Bitstream Form Name] - [Service Provider Name] - [Service Provider reference number]

7.22 Once completed, business continuity forms must be sent to the business continuity email address advised by the LFC in accordance with section 2.

8 Pre-qualification

Pre qualification

8.1 Pre-qualification is a service that enables the Service Provider to:

8.1.1 confirm if the given address is within the area of geographical coverage of the applicable Bitstream Service; and

8.1.2 determine when the applicable Bitstream Service will be available in the future for areas outside of the current coverage.

8.2 There are two types of pre-qualification:

8.2.1 Automated Pre-qualification (addresses or Service Identifiers); and

8.2.2 Special Manual Pre-qualification Investigation (addresses).

8.3 Automated Pre-qualification will be provided through OSS/BSS. In addition to this, the B2B interface will provide pre-qualification functionality. Pre-qualification Service Requests will be processed as set out below.

Information Supplied – Automated Pre-qualification

8.4 The Service Provider will supply the item to be pre-qualified. That item may either be an existing service address or an existing Service Identifier.

8.5 For an existing service address entry to be pre-qualified, a single address needs to be identified by selection from the existing LFC address list using OSS/BSS.

Information Returned– Automated Pre-qualification

8.6 The information returned by OSS/BSS may include:

8.6.1 Service Identifier /address not found;

8.6.2 Service Identifier in invalid format;

8.6.3 search could not be done;

8.6.4 Central Office identifier;

8.6.5 The type of Premises e.g. MDU or Single Dwelling Unit;

8.6.6 the optical budget for this query (actual optical budget if there is existing fibre to the address or estimated optical budget if there is no existing fibre to address);

8.6.7 if the requested address is within the Candidate Area but service is not available , the date it is expected to be available;

8.6.8 list of Bitstream Services available at the End User Premises for the address or Service Identifier submitted, and notes on whether there is a limitation on the throughput available to the End User due to the infrastructure available; and/or

8.6.9 whether further investigation is required to determine if the applicable Bitstream Service can be provided. If the Service Provider chooses to request such further investigation this can be done using the Special Manual Pre-qualification process described in clause 8.7.

Special Manual Pre-qualification

8.7 A special Manual Pre-qualification investigation is carried out in circumstances where the Service Provider wishes to obtain information about a new address or where a Service Provider wishes to carry out further investigation after an Automated Pre-qualification Service Request.

8.8 For Special Manual Pre-qualification the Service Provider must submit the item to be pre-qualified via OSS/BSS or by email as outlined in clauses 7.19 to 7.22. If it is a new address, all address elements must be provided (street name, number etc).

8.9 The information returned will include:

8.9.1 Central Office identifier;

8.9.2 The type of Premises e.g. MDU or Single Dwelling Unit;

8.9.3 the optical budget for this query (actual optical budget if there is existing fibre to address or estimated optical budget if there is no existing fibre to address);

8.9.4 list of Bitstream Services available at the End User Premises for the address or Service Identifier submitted, and notes on whether there is a limitation on the throughput available to the End User due to the infrastructure available; and/or

8.9.5 whether the applicable Bitstream Service can be provided.

8.10 For each Pre-qualification Service Request that is received by the LFC, the LFC will provide the Service Provider with acknowledgement of receipt of the Service Request.

8.11 Charges for Pre-qualification are set out in the Price List.

Initial delivery

8.12 Initially the LFC may not have inventory systems that will enable automation of the pre qualification process and the LFC will therefore provide the geographic availability information in a more manual form.

8.13 The LFC will provide the Service Provider with geographic availability and roll out information in the form of spreadsheets, databases and geo-mapping shape files, containing Premises addresses.

8.14 These initial information sources will be undated on a monthly basis until an automated process is available.

Site Investigation

8.15 A Site Investigation is carried out in circumstances where the Service Provider wishes to obtain information about an address.

8.16 For Site Investigation the Service Provider must submit the item to be investigated via OSS/BSS or by email as outlined in clauses 7.19 to 7.22. If it is a new address, all address elements must be provided (street name, number etc).

8.17 The information returned will be, where possible, responses to requests made by the Service Provider.

8.18 For each Site Investigation Service Request that is received by the LFC, the LFC will provide the Service Provider with acknowledgement of receipt of the Service Requests.

8.19 Charges for Site Investigation are set out in the Price List.

9 Service Requests Processing

9.1 The following types of Service Requests may be submitted using the relevant web form in OSS/BSS:

9.1.1 Pre-qualification / Site Investigation;

9.1.2 New Connection;

9.1.3 Transfer;

9.1.4 Change Plan;

9.1.5 Relinquishment; and

9.1.6 Handover Connection.

9.2 These Service Requests will be processed as outlined below.

9.2.1 For each Service Request that is submitted either via OSS/BSS or by email as outlined in clauses 7.19 to 7.22, the Service Provider must complete all of the fields on the relevant form that are marked as mandatory.

9.2.2 The LFC will acknowledge receipt of each Service Requests.

Business Hours

9.3 Service Requests will only be processed by the LFC during Business Hours except

where explicitly required by the Service Level Terms.

9.4 All Service Requests entered into OSS/BSS by Service Providers outside of Business Hours on any Business Day will be deemed to have been received in the first Business Hour on the next Business Day and Service Levels will be calculated accordingly.

Service Request Validation

9.5 A Service Request will be deemed invalid and may be rejected by the LFC if:

9.5.1 it is not submitted in accordance with this Manual; or

9.5.2 one or more of the rejection reasons (a list of which will be available on the LFC website) apply; or

9.5.3 the Service Provider does not have capability at the required Handover Point to access and interconnect with the applicable Bitstream Service.

9.6 The LFC will perform a validation check of each Service Request that it receives. That validation check will determine whether the Service Request complies with the requirements of clause 9.5.

9.7 If a Service Request is rejected, the LFC will advise the Service Provider of that rejection and provide the Service Provider with the applicable rejection reason.

9.8 The LFC will waive immaterial irregularities and process Service Requests where the intention is unambiguous. Examples of such irregularities include:

9.8.1 use of different conjunctions (e.g. '&' instead of 'and');

9.8.2 improper application or omission of apostrophes;

9.8.3 variations in letter case;

9.8.4 use of initials instead of first names, or vice versa; and

9.8.5 names where letters have been accidentally transposed but the meaning is still clear (e.g. Dominoin = Dominion).

Service Start Date

9.9 If a Service Request is accepted and becomes a Service Order, the LFC will either:

9.9.1 advise the Service Provider of an expected Service Start Date, where applicable for the type of Service Order involved; or

9.9.2 confirm with the Service Provider the expected Service Start Date is the date they have requested; or

9.9.3 where there are infrastructure capacity constraints, advise the Service Provider the Service Order is a 'waiter' and provide an approximate Service Start Date. The existence of an infrastructure constraint does not affect the operation of the Service Levels as set out in the Service Level Terms. When infrastructure becomes available the Service Provider will be advised of an expected Service Start Date.

9.10 If the Service Start Date agreed between the LFC and the Service Provider in clause 9.9 is outside the standard lead-time applicable to the type of Service Order involved, this does not constitute a failure to meet the standard lead-time Service Levels. Completion

of the Service Request by the LFC on the Service Start Date agreed between the LFC and the Service Provider will not constitute a failure to meet the Service Level for meeting the expected Service Start Date in the Service Level Terms.

9.11 The LFC will use all reasonable endeavours to meet the notified expected Service Start Date as provided in clause 9.9.

9.12 Where the LFC becomes aware that it will be unable to meet the expected Service Start Date agreed under clause 9.9, the LFC will advise the Service Provider of a revised expected Service Start Date. In that situation the Service Levels in the Service Level Terms will continue to apply to the original notified expected Service Start Date, rather than the revised expected Service Start Date.

Updating Service Requests and Service Orders

9.13 A Service Request or Service Order may be cancelled at any time.

9.13.1 For a new connection where a Service Order is cancelled within 3 Business Days of the Service Start Date for residential and within 5 Business Days of the Service Start Date for business connections, the LFC may charge the Service Provider, in accordance with the charges set out in the Price List, for costs it has incurred in processing the Service Requests (including any truck roll).

9.13.2 For a plan change involving a site visit where a Service Order is cancelled within 1 Business Day of the Service Start Date, the LFC may charge the Service Provider, in accordance with the charges set out in the Bitstream Price List, for costs it has incurred in processing the Service Order (including any truck roll).

9.14 The Service Provider may change an existing Service Request or Service Order that has been submitted using OSS/BSS provided that changes to an existing Service Request or Service Order by a Service Provider can only be made within 3 Business Days of the Service Start Date for residential and 5 Business Days of the Service Start Date for business connections if the LFC has given its consent in writing to the change, that consent not to be unreasonably withheld. The LFC may charge a Service Provider, in accordance with the charges set out in the Price List, for costs it has incurred to date in processing the Service Order (including any truck roll).

9.15 If the Service Provider changes an existing Service Request or Service Order under clause 9.14:

9.15.1 the LFC will notify the Service Provider of a revised expected Service Start Date (where applicable to the type of Service Request or Service Order involved); and

9.15.2 all of the relevant Service Levels for that Service Request or Service Order, as defined in the Service Level Terms, will be restarted and measured as from the revised Service Start Date.

Completion of a Service Order

9.16 The LFC will provide the Service Provider with confirmation that the Bitstream Service has been activated which may be before a Service Order has been completed if

additional commercial work is being carried out.

9.17 Service Order confirmations submitted to the Service Provider outside of Business Hours will be deemed to have been received by the Service Provider in at the beginning of the first Business Hour of the following Business Day.

9.18 Service Order confirmations for Bitstream Services submitted to the Service Provider will contain at least the following information:

9.18.1 Handover Point ID(s);

9.18.2 E-NNI Service VLAN ID(s);

9.18.3 E-NNI Customer VLAN ID(s) (where applicable);

9.18.4 Service Identifier(s);

9.18.5 UNI Port identifier(s) (where not defaulted in the Service Template);

9.18.6 UNI VLAN Identifier(s) (where applicable**,** and not defaulted in the Service Template); and

9.18.7 Circuit Identifier(s) (where applicable).

Testing

9.19 At the completion of a Bitstream Service installation the LFC will perform an end to end test of the fibre from the Central Office to the End User Premises to determine the optical loss of the circuit and ensure it is within specification. The LFC will provide the Service Provider with a copy of the test output if requested.

Charges

9.20 Charges for all the transactions, processes and services referred to in this section are set out in the Price List. Charges may only be made for valid Service Requests or Service Orders following the validation provided for in clause 9.6.

Authorisation for Transfer Service Requests

9.21 Transfer Service Requests where an End User is transferring from one Service Provider (or Service Providers as the case may be) to another Service Provider are subject to clauses 9.22 and 9.23.

9.22 Service Providers must obtain Customer Authorisation to these transfers, in accordance with the terms of the Customer Transfer Code, before the relevant Service Request is submitted.

9.23 The LFC is entitled to rely on the Transfer Service Request as evidence that a valid Customer Authorisation has been obtained in accordance with the Customer Transfer Code. The LFC is not liable in the event that authorisation is found to be invalid or not in accordance with the Customer Transfer Code.

9.24 The LFC and the Service Provider will comply with the Customer Transfer Code.

Submitting Bulk Service Requests

9.25 Bulk Service Requests enable a Service Provider to transfer or connect large volumes of

End Users to the Bitstream Service in a co-ordinated manner.

9.26 Service Providers should contact their LFC Service Delivery Manager to discuss the requirements and timeframes of any Bulk Service Requests before placing a Bulk Service Request.

9.27 Once a Bulk Service Request has been placed, the LFC and the Service Provider will agree on a plan that describes how the Bulk Service Requests will be managed and carried out (including details of the dates on which the relevant batches of individual transfers will take place and, where appropriate, the resources to be used).

Relinquishment Requests

9.28 Each Bitstream Service is subject to a Minimum Service Term. A Service Provider that terminates or relinquishes a Bitstream Service prior to the expiry of the Minimum Service Term may be required by the LFC to pay early termination charges in accordance with the Price List.

Multiple Service Providers:

9.29 In clauses 9.30 to 9.33:

Primary Service Provider means a provider of a Residential Service to an End User, either directly or via a Reseller, that uses a UFB Standard Wholesale Service as an input;

Secondary Service Provider means a provider of a service (such as Multicast) to the same End User, either directly or via a Reseller, as the Primary Service Provider that uses the same physical infrastructure as the UFB Standard Wholesale Service purchased by the Primary Service Provider;

Residential Service means a bitstream service provided to residential End Users, or to Resellers for provision to residential End Users; and

UFB Standard Wholesale Service means a Wholesale Service of a standard that meets or exceeds the minimum standard for the residential Wholesale Service (being 30Mbps downstream, 10 Mbps upstream with 2.5 Mbps CIR symmetrical).

9.30 If a Primary Service Provider requests cancellation of the UFB Standard Wholesale Service for an End User or Reseller, the LFC will notify the Secondary Service Provider that the Primary Service Provider has cancelled the UFB Standard Wholesale Service.

9.31 Upon receipt of the notification under clause 9.30 the Secondary Service Provider may, by notifying the LFC, within 5 Business Days:

9.31.1 Become the Primary Service Provider for the End User or Reseller and provide Residential Service that uses a UFB Standard Wholesale Service as an input to that End User or Reseller; or

9.31.2 Cancel the Wholesale Service that the Secondary Service Provider was purchasing to service that End User.

9.32 If the Secondary Service Provider does not make an election within the timeframe required under clause 9.31 the LFC may cancel the Secondary Service Provider's Wholesale Service in respect of the relevant End User or Reseller on 5 Business Day's notice.

9.33 If the Secondary Service Provider's Wholesale Service is cancelled under clause 9.31.2 or 9.32 no early termination charges shall apply.

PART 4 - PROBLEM MANAGEMENT

10 OSS/BSS

10.1 The LFC has a web-based fault management system as part of the OSS/BSS described in section 7 above. In addition to processing Service Requests and Service Orders the OSS/BSS allows Service Providers to:

10.1.1 create a new trouble ticket;

10.1.2 retrieve a trouble ticket; and

10.1.3 update a trouble ticket.

10.2 OSS/BSS allows the Service Provider to log on to a secure site for reporting and monitoring faults with the LFC.

11 Faults

11.1 The LFC is only responsible for faults that are within the LFC's responsibility, as set out in clause 6 of the General Terms. If the LFC investigates and no fault is found or no fault for which the LFC is responsible is found, the LFC will charge the Service Provider the No Fault Found fee as set out in the Price List. Where the LFC is responsible for the fault, a No Fault Found fee will not be charged.

11.2 It is the Service Provider's responsibility to provide initial fault diagnosis on all faults reported to it by its End Users.

11.3 The requirements for this initial fault diagnosis are set out in clause 6.2 of the General Terms.

Reporting Faults to the LFC

11.4 Subject to clause 11.5 the Service Provider must use OSS/BSS for reporting all faults regarding the Bitstream Service. If the Service Provider uses any other method to report a fault, the Service Levels as defined in the Service Level Terms will not apply to that fault.

11.5 Where the OSS/BSS is unavailable, the Service Provider must submit fault reports to the LFC by calling the 0800 fault reporting service number provided by the LFC. The LFC must use all reasonable endeavours to advise Service Providers immediately upon becoming aware that the OSS/BSS is unavailable.

11.6 Once the Service Provider has provided initial fault diagnosis, complied with clause 6.1 of the General Terms and determined that it requires the LFC's assistance to resolve the fault, the following information is required when reporting a fault:

11.6.1 contact name and phone number of the Service Provider staff member logging the fault;

11.6.2 contact name, phone number, and alternate phone number of the End User experiencing the fault (where reasonably required);

11.6.3 End User's Service Identifier for service that is experiencing the fault (where appropriate);

11.6.4 fault type and description;

11.6.5 time the fault occurred;

11.6.6 address and contact details for the site of the fault (where appropriate);

11.6.7 confirmation that the initial fault diagnosis has been completed; and

11.6.8 any other relevant information reasonably required.

11.7 If any of the above information in clauses 11.6.1 to 11.6.6 is not provided, the Service Levels will not apply.

11.8 The LFC is responsible for the repair of faults in the UFB Handover Connection, including faulty termination at the MOFDF.

Hours of Operation

11.9 Faults can be logged 24 hours a day, seven days a week.

11.10 Faults that are the LFC's responsibility will be fixed by the LFC representatives during Fault Restoration Hours. If a fault is logged outside of those hours, it is possible the LFC will only start working on the fault as from 7.00am the following day. Extended fault restoration hours apply for enhanced service levels and emergency faults.

11.11 When a fault report is received, the LFC will advise the Service Provider, acknowledging receipt of the fault report.

Fault Tracking

11.12 All faults will be logged in OSS/BSS and the Service Provider will be given a fault reference number and an expected fault restoration time. The expected fault restoration time will be provided in accordance with the LFC's fault prioritisation systems.

11.13 The LFC will use all reasonable endeavours to meet the notified expected fault restoration time as provided in clause 11.12.

11.14 Where the LFC has allocated an expected fault restoration time to a fault and it subsequently becomes apparent that the fault restoration time cannot be met, the LFC will advise the Service Provider of a revised fault restoration time. In that situation the Service Levels in the Service Level Terms will continue to apply to the originally notified expected restoration time, rather than the revised fault restoration time.

11.15 The Service Provider will be able to check the progress of a fault via OSS/BSS. The fault reference number is to be used in all communications regarding the fault.

11.16 If the LFC identifies the need to send a faults contractor, the LFC will update OSS/BSS.

11.17 The Service Provider's helpdesk is responsible for coordinating site access and any required outage window with the End User.

Fault Closure

11.18 Once the fault has been resolved, the LFC will notify the Service Provider via OSS/BSS (or other means) that the fault has been resolved, confirm the reference number and, where possible, provide the cause of the fault and any actions taken to reach resolution.

Planned Outages

11.19 The LFC may suspend supply of the Direct Fibre Access Service for the purpose of conducting works, routine maintenance, remedial work or upgrades to the LFC's Network (**Planned Outage**).

11.20 The LFC will use all reasonable endeavours to:

11.20.1 conduct any Planned Outage between the hours of 11.00pm to 6.00am inclusive, where the LFC believes that is practical (acting reasonably);

11.20.2 advise the Service Provider in advance of any Planned Outage; and

11.20.3 provide the following information:

(i) a brief explanation of the reason for the Planned Outage;

(ii) the intended date, time and duration of the Planned Outage;

(iii) a description of the Central Office and POI Co-location Service (or the relevant part of it) which will be affected by the Planned Outage; and

(iv) the name and contact details of the LFC's representative(s) who gave the advice.

Unplanned Outages

11.21 The LFC may suspend supply of the Direct Fibre Access Service:

11.21.1 due to any unplanned unavailability of the LFC's Network or the Direct Fibre Access Service; or

11.21.2 in order to provide or safeguard service to the emergency or other essential services,

(**Unplanned Outage**).

11.22 The LFC will use all reasonable endeavours to:

11.22.1 give the Service Provider as much advice as possible of the existence of any Unplanned Outage;

11.22.2 advise the Service Provider as soon as reasonably practical after the LFC becomes aware of any Unplanned Outage; and

11.22.3 answer any reasonable questions from the Service Provider about the extent and duration of any Unplanned Outage.

11.23 If the Service Provider becomes aware of any Unplanned Outage before it receives advice from the LFC under clause 11.22, the Service Provider will make reasonable efforts to notify the LFC as soon as reasonably practical.

Emergency Faults

11.24 Emergency and Core Network faults reported to the LFC outside of the Fault Restoration Hours will be treated on a case by case basis.

11.25 In the first instance, the LFC will propose a temporary solution. However, in the absence of a viable temporary solution, the LFC may schedule a callout to respond to Core Network faults, or to emergency faults relating to:

11.25.1 medical emergencies;

11.25.2 where the End User provides an essential community service (e.g. police or a doctor's residence); or

11.25.3 where there is a mass outage that impacts on 200 or more End Users.

11.26 The Escalation Protocol is provided in Appendix B.

PART 5 - PROCESS MULTI DWELLING UNIT (MDU) ON BOARDING

12 Multi Dwelling Unit (MDU) On Boarding

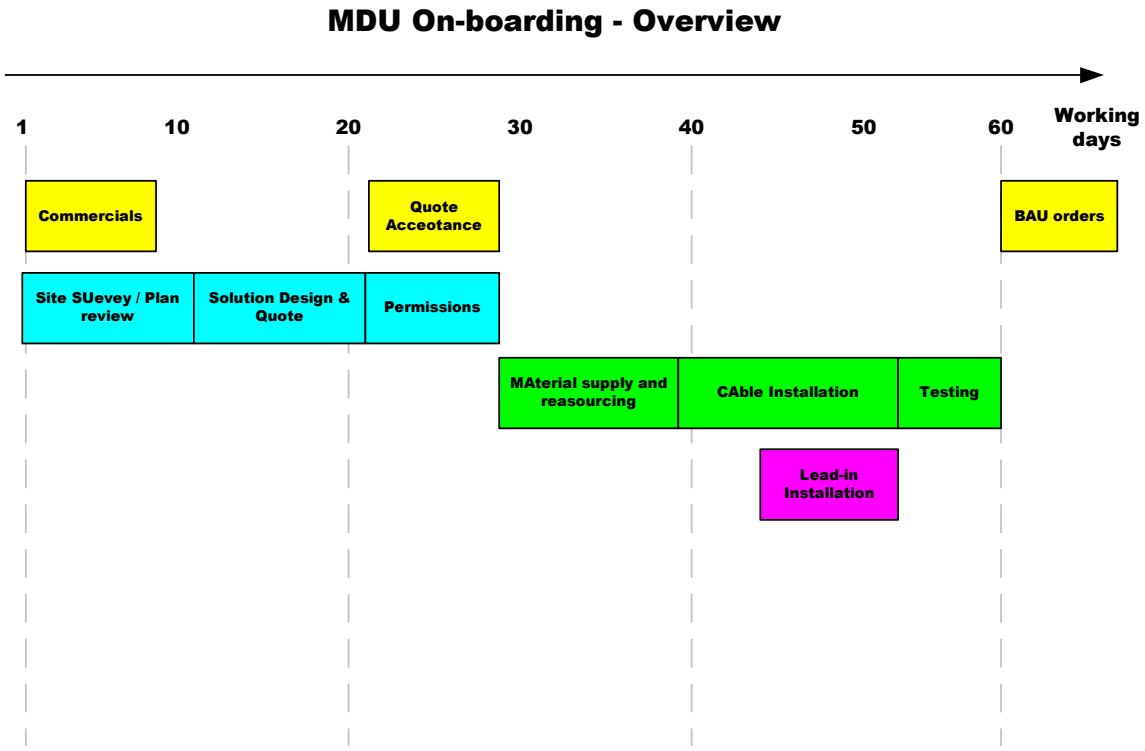
Introduction

12.1 The roll out of the fibre network by the LFC will provide sufficient cable to the FAP to meet the requirements of MDU located End Users, however the LFC is unlikely to provision backbone fibre cabling of a new or existing MDU unless an order is received from an End User or it is approached by the building owner, developer or their agent.

12.2 The Service Provider will provide the LFC with details of the MDU building owner or their agent with any applications for Wholesale Services by End Users within the MDU. The LFC will then use reasonable endeavours to apply for the necessary permissions and consents from the MDU building owner or their agent within five Business Days of receiving a properly completed order and all the necessary information from the Service Provider.

12.3 If the MDU building owner or their agent fails to respond or declines permission for the LFC to cable the MDU, the LFC may chose to exercise its rights under the Telecommunications Act 2001 to require access to cable the MDU and provide Wholesale Services within the MDU.

12.4 The backbone fibre cabling of a new or existing MDU involves the establishment of commercial relationships, reticulation design, standards compliance, authority approvals and fibre cable installation and testing. The LFC will undertake an on-boarding process that follows a plan detailing work required to design and install cabling with appropriate service levels, milestones, LFC and Service Provider requirements. The diagram below provides an overview of the plan.



New MDU Requirements

12.5 The LFC will need to undertake the specified work with in lead-times set out below. The LFC must:

12.5.1 execute a commercial agreement with the Service Provider, building owner, developer or their agent to cable building;

12.5.2 provide a detailed design of proposed building cabling including riser and floor access for approval by building owner, developer or their agent;

12.5.3 obtain all necessary permissions from authorities;

12.5.4 source materials and complete installation work; and

12.5.5 test cabling against fibre specification in Appendix F.

Existing MDU Requirements

12.6 If the MDU has no suitable cabling in place then it will be treated as a new building although the design and installation times may be longer as existing infrastructure is factored into design.

12.7 If the MDU cabling is suitable or can be economically brought up to the LFC standard then the LFC must:

12.7.1 execute a commercial agreement with the Service Provider, building owner, developer or their agent to purchase or lease the building cable;

12.7.2 provide a detailed design of any proposed changes to the building cabling including riser and floor access for approval by building owner, developer or their agent;

12.7.3 obtain all necessary permissions from authorities;

12.7.4 source materials and complete installation work; and

12.7.5 test cabling against fibre specification in Appendix E.

Service Requests for MDU with no LFC Cable

12.8 If a Service Request is received from a Service Provider before suitable cable is in place, the LFC and the Service Provider will need to undertake the specified actions to avoid unnecessarily extending lead-times set out below. The Service Provider must:

12.8.1 execute a commercial agreement with the LFC to cable building, or ensure the LFC has done so with building owner, developer or their agent;

12.8.2 assist LFC to obtain all necessary permissions from authorities by providing information, access to inspectors, etc.; and

12.8.3 ensure LFC has all plans, specifications, approvals and accesses related to the MDU required to undertake design and carry out installation work.

Cabling Process

12.9 The various steps in the process the LFC will need to undertake include a number of components each with its own specified time frame and these are listed below with target completion time and requirements.

Task	Target completion time (Business Days)	Activities	Requirement
1. Signing of an agreement for MDU cabling	5	Checking of supplied documentation for accuracy, internal sign off, contract execution, set up of accounts and allocation of resource	Service Provider and or building owner needs to have credit guarantee and contact information for WSA
2. Site Survey / Plan Review	10	For an existing building a detailed site survey will be required to determine best possible method of cabling, location of risers, common equipment and entry points. For a new building a detailed plan review will be required to determine best possible method of cabling, location of risers, common equipment and entry points.	Building owner or their agent needs to provide access to site and or plans.
3. Solution Design & Quote	10	Detailed design of backbone and horizontal cabling, entry points and common equipment.	Designer may need further information and or site access.
4. Permissions	Unknown	Application for and receipt of Fire, building, roadway, tree, etc. permissions	Authority may need further information and or site access.
5. Quote Acceptance	5	Acceptance by Service Provider and or building owner of costs and agreement to pay.	Service Provider or Building Owner may need further information and or redesign.
6. Material Supply and resource allocation	10	Service Requests and supply of cables, frames and consumables. Scheduling of labour resource.	Materials on stock and labour available
7. Installation of cables	10~15	Installation of cabling and associated hardware, fire sealing penetrations, restoration of surfaces.	No unforeseen issues, no waiting for other trades. Actual time will depend on MDU complexity.
8. Installation of lead-in	6	Installation of lead-in cabling from FAP to building	Roadway permissions
9. Testing	5	Cable testing from central office to ETP	

PART 6 – HANDOVER CONNECTION AND TIE CABLE INSTALLATION

13 Handover Connection

Overview

13.1 Service Providers will require one or more UFB Handover Connections at the Handover Point to pickup the applicable Bitstream Services for the Coverage Area. The UFB Handover Connection will deliver the traffic to the MOFDF at the appropriate Central Office POI requested by the Service Provider.

Connection Options

13.2 When the Service Provider places a UFB Handover Connection Service Request the LFC will supply and install a Handover Connection from the Handover Point to the MOFDF. The Service Provider will also need to request an additional service to get the traffic to its network and/or equipment. The additional services available from the LFC are an extension of the Handover Connection at the MOFDF to:

13.2.1 a Tie Cable to the Service Provider Footprint provided under the Central Office and POI Co-location Service; or

13.2.2 a Tie Cable between a Service Provider or third party network outside and adjacent to the the Central Office manhole and the MOFDF described in clause 14.2.3 provided under the Central Office and POI Co-location Service; or

13.2.3 a Direct Fibre Access Service between the Central Office MOFDF and the Service Provider POI within the Central Office Coverage Area provided under the Direct Fibre Access Service.

13.3 The LFC responsibilities:

13.3.1 the LFC will name all UFB Handover Connections and record these in the LFC's system for managing fibre inventory;

13.3.2 the LFC will terminate the UFB Handover Connection on the MOFDF (including its splice or connection to the options in clause 13.2 above); and

13.3.3 the LFC is responsible for the repair and/or replacement of faults in the UFB Handover Connection and faulty termination at the MOFDF.

14 Tie Cable Installation

Introduction

14.1 To use a Bitstream Service in conjunction with equipment co-located in their Footprint in the Central Office or elsewhere a Service Provider will need to have a Tie Cable between the MOFDF and their equipment. To provide services over the Direct Fibre Access Service the Service Provider may also need to have a Tie Cable between the MOFDF and their Footprint.

Types of Tie Cables

14.2 There are three types of Tie Cable available for Service Providers who take the Bitstream Services:

14.2.1 an internal Tie Cable from the Central Office MOFDF to the Service Provider footprint;

14.2.2 an internal Tie Cable from one Service Provider Footprint to another Service Provider Footprint provided under the UFB Co-location Service (the footprints can be same or different Service Providers or a third party backhaul provider); or

14.2.3 an external Tie Cable from the Central Office MOFDF to a third party network manhole outside and adjacent to the Central Office manhole.

These Tie Cables can be used to connect Bitstream Services or UFB Handover Connections or backhaul to the Footprint and are provided under the Central Office and POI Co-location Service.

14.3 A Service Provider may supply its own Tie Cables or the Service Provider may ask the LFC to supply Tie Cables. In either case the Tie Cables must meet the specification set out in the LFC's Cable Specification document.

14.4 The Tie Cable Service installation charges set out in the Price List will apply.

14.5 The Tie Cable Service is described further in the Central Office and POI Co-location Service Description and the Central Office and POI Co-location Service Operations Manual.

14.6 For the avoidance of doubt only the LFC contractors' may undertake work on the MOFDF or anywhere else in Central Office outside of Service Provider's Footprint.

PART 7 –SERVICE TEMPLATES AND THE PRODUCT DEVELOPMENT PROCESS

15 Service Templates

Overview

15.1 The Bitstream 2, Bitstream 3 and Bitstream 3a Services support a set of modular and reusable components, which are either already included in existing Service Templates set out in the relevant service descriptions or can be easily combined, or modified, by Service Providers to create new Service Templates. The Product Development Process set out in this Part 7 does not apply to the Bitstream 4 Service.

15.2 A Service Template is a composite of these reusable components, the attributes associated with these reusable components and the attributes' values that when combined result in a new variant of the Bitstream 2, Bitstream 3 or Bitstream 3a Service.

15.3 Service Templates may include one or combinations of the following changes:

1.1.1 New composites of standard building blocks (reusable components);

1.1.2 Modified values of existing attributes of these building blocks;

1.1.3 New attributes of existing building blocks with new values; and / or

1.1.4 New components, e.g. introduction of new technology or features as agreed between the LFC and the Service Provider.

15.4 The Service Templates model is based on creating Product Offers using a Product Service Resource (PSR) model that is premised on the TM Forum Shared Information (SID) model

16 Building Blocks

Overview

16.1 The standard building blocks are a set of modular and reusable components, which can be added to an existing Service Template or combined as to create new Service Templates.

Building Blocks

16.2 These building blocks include layer 1 components, access speeds, VLANs, ATA and UNI ports, and Multicast. The standard building blocks are detailed in the table below:

Building Block	Description	Associations and restrictions
GPON E-APL	GPON based Ethernet Virtual Private Line that supports discrete VLANs. Attributes include: - High Priority CIR (increments of 2.5 Mbps upstream and/or downstream); - Low Priority EIR (increments of 10 Mbps upstream and/or downstream).	Requires the End User to consume an input service that includes Baseband plus requires UFB Handover Connection for delivery to Service Provider.

Building Block	Description	Associations and restrictions
GPON E-APL	GPON based Ethernet Private Line that supports transparent VLAN. Attributes include: - High Priority CIR (increments of 2.5 Mbps upstream and/or downstream); - Low Priority CIR (increments of 2.5 Mbps upstream and/or downstream); - Low Priority EIR (increments of 10 Mbps upstream and/or downstream).	Requires the End User to consume an input service that includes Baseband plus requires a UFB Handover Connection for delivery to Service Provider.
P2P E-APL	GPON based Ethernet Private Line that supports transparent VLAN. Attributes include: - Line rates of 100 Mbps, 1 Gbps or 10Gbps. - High Priority (increments of 10 Mbps symmetrical) - EIR (increments of 100 Mbps symmetrical)	Requires a UFB Handover Connection for delivery to Service Provider.
HD video channel	10 Mbps Multicast HD video channel with signalling back channel. Can be incremented in blocks of 10 Mbps multicast bandwidth.	Can be delivered on same UNI Ethernet Port as E-AVPL when delivered through one Service Provider but requires separate port on E-APL services or where the Service Provider is different to the Service Provider using the existing E-AVPL UNI. Requires the End User to consume an input service that includes Baseband plus requires Multicast Domain for delivery to Service Provider.
ATA Voice	A Voice service, delivered using SIP and a G.711a codec with an RJ11 ATA port on ONT.	Requires the End User to consume an input service that includes Baseband plus requires a UFB Handover Connection for delivery to Service Provider. Baseband includes one ATA Voice service.
Second Ethernet port	Additional RJ45 Ethernet port on ONT. This can then be used for: - E-AVPLs; and/or - Multicast; or - E-APL	Requires the End User to consume an input service that includes Baseband plus requires a UFB Handover Connection for delivery to Service Provider.
Wi-Fi port	Wi-Fi port on ONT connected to a bitstream service. Attributes to be defined.	Requires either same or additional GPON access link and UNI port plus requires E-NNI port for delivery to Service Provider.
Multicast Domain	A geographic area that supports Multicast streams. Attributes include: - Number of Multicast channels. - Business rules around	Requires UFB Handover Connection for delivery to Service Provide. Multicast requires tight coupling with Service Provider media broadcast platforms and will

Building Block	Description	Associations and restrictions
	delivery of Multicast streams.	require customisation and integration testing.
P2P Dark Fibre	P2P Dark Fibre from MOFDF or Footprint at Central Office to End User Premises	Requires Footprint at either local or distant Central Office if associated with backhaul service.
Layer 1 enhanced SLA	Enhanced assurance Service Levels for layer one services either SLA 1, SLA 2 or SLA 3	Applies to fibre component of GPON and P2P services.
Layer 2 enhanced SLA	Enhanced assurance Service Levels for layer two services either SLA 1 or SLA 2	Applies to bitstream component of GPON and P2P services.
Diversity	Provision of a second instances of a P2P or P2MP based service with special physical characteristics either one, some or all of following: • Diverse route; • Diverse End User Premises access; • Diverse Central Office access; or • Diverse Central Office.	Applies to fibre component of P2P or P2MP services as diversity to the primary service.
Co-location footprint	Provision of a 600x400mm footprint in an LFC Central Office	Includes building access for authorised personnel, 19" rack up to 2.7m high and environmental support.
Co-location power	Single 48V DC supply to Footprint	Requires Footprint.
RF overlay	Delivery of video programming to designated end user ONT RF port. This will only be developed based on demand.	Requires either same or additional GPON or P2P access link and special ONT with RF port and injection port for delivery to Service Provider.

16.3 Non-standard building blocks may be requested and will be provided if they meet the prioritisation criteria below. It is expected that the standard building block list will be increased over time as Service Providers utilise the Product Development Process.

16.4 The following are examples of default Service Templates:

Access Speed	Bitstream Type	Plan				ATA Voice
		Low Priority		High Priority (CIR)		High Priority CIR
		Upstream	Downstream	Upstream	Downstream	
30M/10M	E-AVPL	10M	30M	2.5M	2.5M	Includes Baseband with one ATA Voice service
	E-AVPL	10M	30M	2.5M	10M	
	E-AVPL	10M	30M	5M	5M	
100M/50M	E-AVPL	50M	100M	2.5M	10M	
0M	ATA Voice only	0M	0M	0M	0M	
100M/100M	E-APL	2.5M CIR (upstream & downstream), EIR to Access Speed		CIR options (symmetrical) are incremental, starting at 2.5M and 10M; from 10M there are additional increments of 10M up to 100M, e.g. 20M, 30M, etc.		
100M/100M	E-APL	N/A				
Education 30M/30M	E-AVPL	30M	30M	10M	10M	

17 Product Development Process

17.1 A Service Provider may request that the LFC create additional Service Templates as follows:

17.1.1 Using combinations of one more of the set of standard building blocks listed in the table above.

17.1.2 Using other services or attributes requested by the Service Provider and agreed by the LFC.

17.2 Service Templates can be added incrementally to an existing service offer, or supplied as a stand-alone package. In particular:

17.2.1 Stand alone packages must include Baseband. Stand alone packages mean that the End User connection does not need to consume any other Service Templates in order for services to be provided.

17.2.2 Incremental packages can be added as an additional service to an End User who is already consuming one or more Service Templates.

17.2.3 Baseband is a required service for all End User connections. If the Service Template that includes Baseband is removed from an End User connection and an incremental Service Template remains, then Baseband will be added to the incremental Service Template for that End User.

Product Development Process

17.3 The Product Development Process will be further detailed in the Service Provider Guide. At a high level it will proceed as follows:

17.3.1 Service Provider submits request for an additional Service Template, outlining all of the reusable or custom components that will be required;

17.3.2 The LFC will confirm the prioritisation, requirements and commercials.

Standard building blocks will have published prices in the price book;

17.3.3 Iterative and cooperative prototyping and testing of the template using the Integrated Test Facility. The degree of testing will vary, particularly if custom components are requested;

17.3.4 Following completion of testing and both parties' acceptance, an agreed deployment schedule based on the prioritisation process and available resources; and

17.3.5 The Service Template will move into a production environment.

17.4 Deployment of an additional Service Template will require:

17.4.1 Successful completion of the prototyping and testing; and

17.4.2 Agreed commercials and pricing.

18 Prioritisation Process

Overview

18.1 Requests for additional Service Templates will be implemented and delivered through the Product Development Process. The Product Development Process includes determination of pricing, development, testing and implementation.

18.2 The LFC will comply with the Service Provider's request under clause [17.1?] in a timely manner. In the event that demand for new Service Templates exceeds the LFC's agreed capacity to deliver the new Service Templates then the LFC may prioritise the Service Template requests.

Prioritisation

18.3 Prioritisation of access to the laboratories will be on a first come first served basis.

18.4 Prioritisation of additional Service Templates will be non-discriminatory and based on the following criteria:

18.4.1 Expected and forecast demand for the Service Template;

18.4.2 Complexity and resources available to build the Service Template;

18.4.3 Development and implementation of any custom building blocks; and

18.4.4 Resources available to deploy the Service Template into the production fulfil, assure, billing and network environments.

18.5 Higher priority will be given to the development of additional Service Templates that are requested by multiple service providers and require the minimum of system changes.

19 Integrated Test Facility.

Overview

19.1 The Integrated Test Facility (ITF) comprises the laboratories described below and services that support Service Providers in development and testing of new and existing Service Templates.

19.2 The ITF is designed to foster research and development through collaboration and testing of new and existing Service Templates.

19.3 The ITF will enable Service Providers to have practical experience and thus educate themselves on fibre technology and applications.

Layer 2 Development Laboratory

19.4 The Layer 2 Development Laboratory provides a GPON bitstream service prototyping and testing facility.

19.5 The laboratory environment allows Service Providers to connect remotely between their internal test facilities and the laboratory providing between their premises and the Layer 2 Development Laboratory:

19.5.1 One or more GPON fibre connections; and

19.5.2 A Direct Fibre Access Service connecting to a UFB Handover Connection in the Layer 2 Development Laboratory.

19.6 The Layer 2 Development Laboratory supports:

19.6.1 the testing of agreed in-production Service Templates, e.g. for the purposes of integration testing with Service Provider networks or CPE;

19.6.2 the prototyping of new Service Templates or combinations as part of the Product Development Process.

Layer 1 Test Laboratory

19.7 The Layer 1 Test Laboratory provides a site for Layer 1 technical training, particular around home wiring and installation.

Network Integration Laboratory

19.8 The Network Integration Lab (NIL) provides a site for technical laboratory for the purposes of technical and formal testing.

19.9 The NIL is suitable for:

19.9.1 Detailed Technical Acceptance Testing;

19.9.2 Business Acceptance Testing;

19.9.3 Prototyping new technology, where the Layer 2 development Lab is not appropriate;

19.9.4 Detailed fault finding; and

19.9.5 Provides pre-staging and staging environments for the layer 2 production networks.

OSS/BSS Test Stub

19.10 The OSS/BSS Test Stub is a managed and supported intelligent stub test on boarding environment to support Service Providers B2B development.

19.11 The OSS/BSS Test Stub covers both fulfil and assure schemas and contains the core transactions.

19.12 The OSS/BSS Test Stub environment is able to deal with future and current releases to allow Service Providers to test for what the LFC is planning on releasing as well as when a Service Provider makes changes in their environment and needs to retest against the current schema.

PART 8 – FIBRE DIVERSITY

20 Diversity via additional service instances

Overview

20.1 Each Bitstream Service is provided over a single fibre between the LFCs Central Office and the End User's Premises. Diversity (a second or subsequent instance of the Bitstream Service between the Fibre Access Point and the Central Office) will be available to End Users as a separate instance of the applicable Bitstream Service. Service Levels relating to installation and provisioning do not apply to diversity products and each instance is treated as an individual line for the purpose of availability Service Levels.

20.2 Diversity will be available to Priority Users taking Bitstream 4 on request for premises located in major health-care facilities, secondary or tertiary education centres, central business districts, industrial parks, business parks and strip malls.

20.3 Diversity is designed as a value added service for customers who require high reliability connectively for critical business applications. Diversity begins with the design during the network build process, with a targeted architecture approach based on the type of area covered, and at the highest level will include on-going management to ensure core network paths remain diverse.

20.4 The diverse optical paths will be in separate fibre cable sheaths, have separate MOFDF termination shelves, and if requested in separate cable routes. The diverse cable routes will be a minimum of the width of a street apart, and should not share any manholes or access points. Separate entries into the Central Office will be used where available. Diversity that is not on separate cable routes is simply a second order for the UFB fibre service.

20.5 Service providers can also request diverse access to End User Premises or access to diverse Central offices as part of a Non-Standard Install; however this will not be available in all cases.

20.6 Where practical the LFC will also provide diversity for Bitstream 2, Bitstream 3 and Bitstream 3a, and Bitstream 4 in situations other than those listed in the Bitstream 4 Service Description on request as an additional service

20.7 There may be practical limitations to providing full physical diversity to some sites. The provision of a separate entry to a LFC Central Office will have unique site specific engineering considerations and may attract additional costs.

Ordering of diverse Direct Fibre Access Services

20.8 To order a diverse Direct Fibre Access Service the Service Provider must include the following information with the Service Request:

20.8.1 indicate that it is a request for a diverse circuit;

20.8.2 which fibre access it is diverse to; and

20.8.3 the level of diversity required.

20.9 The LFC will advise the installation cost of the diversity request.

Types of Diversity

20.10 There are 4 main types of diversity:

20.10.1 Single Central Office redundancy with diverse route;

20.10.2 Single Central Office redundancy with diverse route and diverse access to End User Premises;

20.10.3 Single Central Office redundancy with diverse route, diverse access to End User Premises and diverse access to Central Office; and

20.10.4 Dual Central Office redundancy with diverse route, diverse access to End User Premises and access to a separate Central Office.

Single Central Office redundancy with diverse route

20.11 Single Central Office redundancy with diverse route requires 2 fibres, on separate routes, from the End User Premises to a single Central Office. This option has the following characteristics:

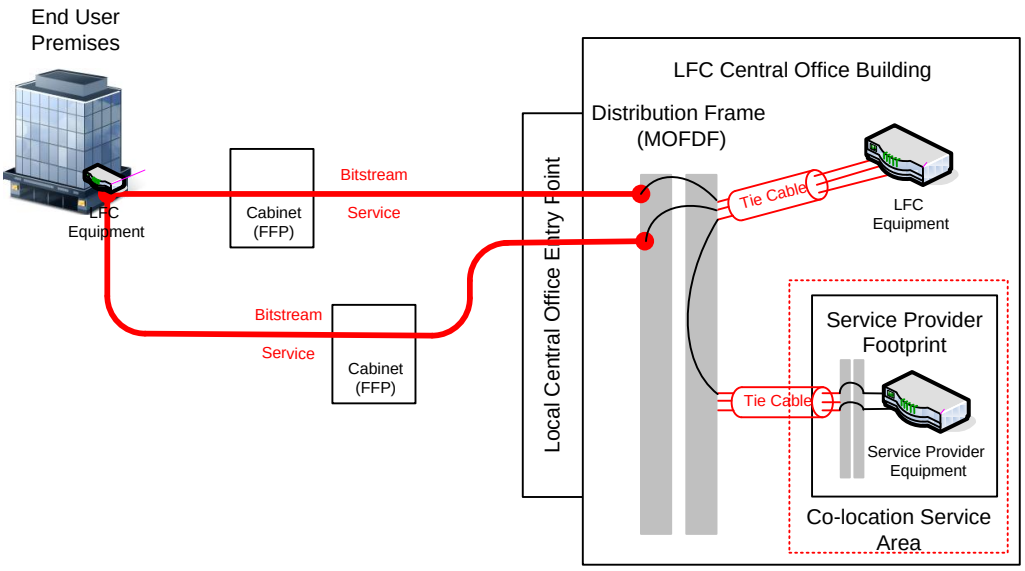
20.11.1 The fully diverse routes will converge at the common FAP;

20.11.2 The LFC will design for redundancy within defined business areas and will offer diverse feeder fibres as far as the FAP only as a basic service;

20.11.3 Each fibre access service will be priced at the rate in the Price List; and

20.11.4 Each fibre access service will have assure Service Levels. Enhanced Service Levels may be offered and charged for at the rate in the Price List.

20.12 The diagram below shows Single Central Office redundancy with diverse route:



Single Central Office redundancy with diverse route and diverse access to End User Premises

20.13 Single Central Office redundancy with diverse route and diverse access to End User Premises requires 2 fibres, on separate routes, from the End User Premises to a single Central Office and a second lead-in to End User Premises. This option has the following

characteristics:

20.13.1 Each fully diverse routes will have its own lead-in from a separate FAP to the ETP, OFDF or equivalent;

20.13.2 The LFC will design for redundancy within defined business areas;

20.13.3 Each fibre access service will be priced at the rate in the Price List; and

20.13.4 Each fibre access service will have assure Service Levels. Enhanced Service Levels may be offered and charged for at the rate in the Price List.

20.14 The diagram below shows Single Central Office redundancy with diverse route and diverse access to End User Premises:

Single Central Office redundancy with diverse route, diverse access to End User Premises and diverse access to Central Office

20.15 Single Central Office redundancy with diverse route, diverse access to End User Premises and diverse access to Central Office requires 2 fibres, on separate routes, from the End User Premises to a single Central Office with a separate manhole and OFDF at the Central office and a second lead-in to End User Premises. This option has the following characteristics:

20.15.1 Each fully diverse routes will have its own lead-in from a separate FAP to the ETP, OFDF or equivalent;

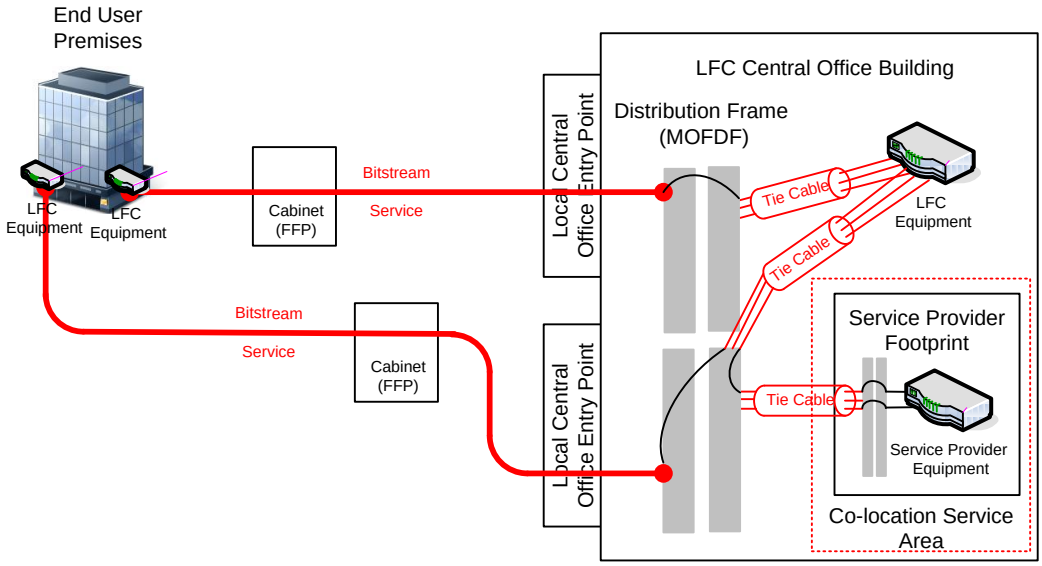
20.15.2 Each fully diverse routes will have its own manhole and entrance to a separate OFDF at the Central Office;

20.15.3 The LFC will design for redundancy within defined business areas;

20.15.4 Each fibre access service will be priced at the rate in the Price List; and

20.15.5 Each fibre access service will have assure Service Levels. Enhanced Service Level Terms s may be offered and charged for at the rate in the Price List.

20.16 The diagram below shows Single Central Office redundancy with diverse route, diverse access to End User Premises and diverse access to Central Office:



Single Central Office redundancy with diverse route, diverse access to End User Premises and access to a separate Central Office

20.17 Single Central Office redundancy with diverse route, diverse access to End User Premises and access to a separate Central Office requires 2 fibres, on separate routes, from the End User Premises to a second Central Office with a separate manhole and OFDF at the Central office and a second lead-in to End User Premises. This option has the following characteristics:

20.17.1 Not available in locations with only one Central Office;

20.17.2 Each fully diverse routes will have its own lead-in from a separate FAP to the ETP, OFDF or equivalent;

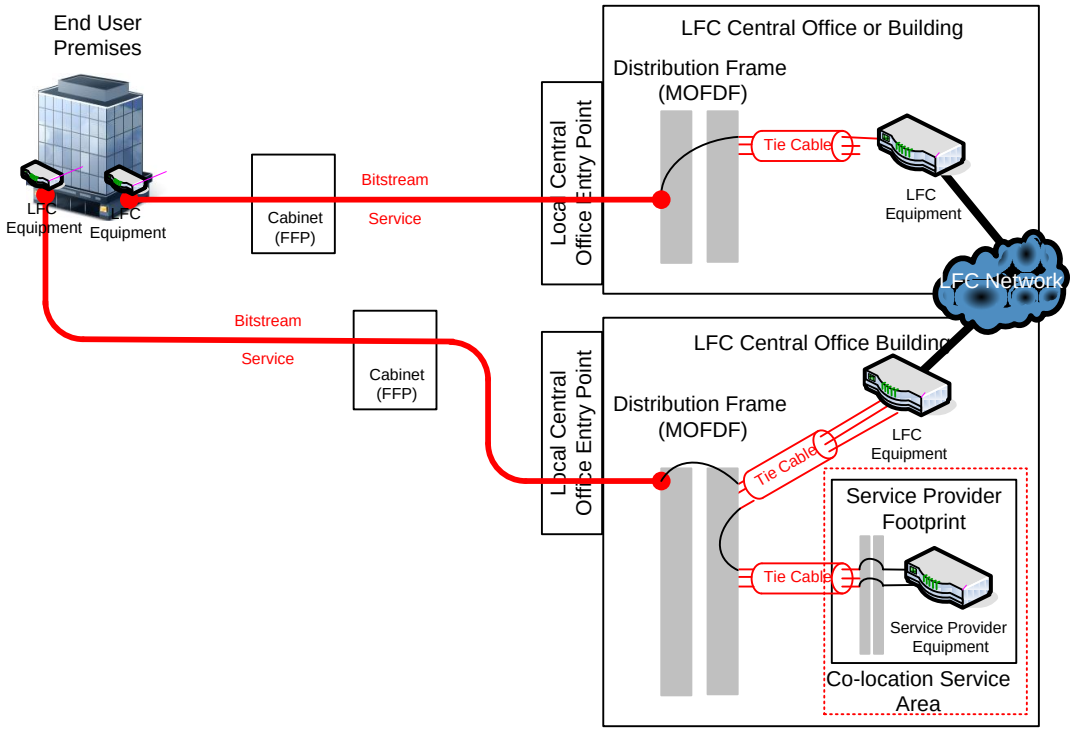
20.17.3 Each fully diverse routes will have its own Central Office;

20.17.4 the LFC will design for redundancy within defined business areas;

20.17.5 Each fibre access service will be priced at the rate in the Price List; and

20.17.6 Each fibre access service will have an assure Service Levels. Enhanced Service Level s may be offered and charged for at the rate in the Price List.

20.18 The diagram below shows Single Central Office redundancy with diverse route, diverse access to End User Premises and diverse access to a separate Central Office:


End User Premises
LFC Equipment
LFC Equipment
Cabinet (FFP)
Bitstream Service
Bitstream Service
Cabinet (FFP)
Local Central Office Entry Point
Local Central Office Entry Point
LFC Central Office or Building
Distribution Frame (MOFDF)
Tie Cable
LFC Equipment
LFC Network
LFC Central Office Building
Distribution Frame (MOFDF)
LFC Equipment
Tie Cable
Tie Cable
Service Provider Footprint
Service Provider Equipment
Co-location Service Area

PART 9 - BILLING

21 Billing

Invoicing

21.1 The LFC will invoice the Service Provider for all charges on the basis specified in the Price List. Invoices will be in an electronic bill format (eBill). eBill will replace the provision of a paper invoice, except that a printed GST summary will be provided to the Service Provider. A hard copy paper invoice will be available to Service Providers at the price set out in the Bitstream Price List.

21.2 The eBill must include the following information:

21.2.1 Service Identifier;

21.2.2 Fault or Service Order identifier;

21.2.3 Any Core Service Rebates; and

21.2.4 Type of fee.

21.3 The LFC will transmit the eBill using a secure web portal. The eBill can be accessed through a web browser. Alternatively, the Service Provider can arrange with the LFC to write scripts and access the eBill through a script platform.

21.4 The Service Provider will provide the LFC with the list of people that are authorised to download the eBill file. The LFC will set up access rights for these people on a secure web portal.

21.5 The LFC will provide the eBill and the printed GST summary to the Service Provider free of charge.

21.6 The LFC will maintain one or more separate Service Provider accounts for services provided to the Service Provider. The LFC may alter the account structure as it considers appropriate.

Billing Enquiries

21.7 If the Service Provider wishes to raise a billing enquiry, it may do so by emailing the LFC billing team in the first instance at the billing email address supplied by the LFC under section 2.

21.8 The email must include the following information:

21.8.1 a header reading 'Billing Query'; and

21.8.2 a completed Billing Enquiry Form.

21.9 The LFC will acknowledge the query and will use all reasonable endeavours to respond within the current billing period. Any billing enquiries submitted without the use of a Billing Enquiry Form will be rejected.

21.10 Additional billing information, over and above that reasonably required to assist Service Providers in interpreting invoices, will be charged in accordance with the Bitstream Price List. The Service Provider may require the LFC to provide a quote for any such request for further information.

21.11 The process set out in this clause is an informal enquiry process that does not limit the General Terms. If the Service Provider wishes to claim an Invoice Error in an invoice, it must follow the procedure set out in clause 7 of the General Terms.

PART 10 – OPERATIONAL READINESS PROGRAMME

22 Service Provider on Boarding

22.1 The Operational Readiness Programme is the programme of work to be undertaken jointly by the LFC and the Service Provider as part of an on boarding process as the Service Provider prepares for connection to the LFC Network, including;

22.1.1 the establishment of commercial relationships;

22.1.2 set up of OSS/BSS interfaces;

22.1.3 build of Footprints (if required);

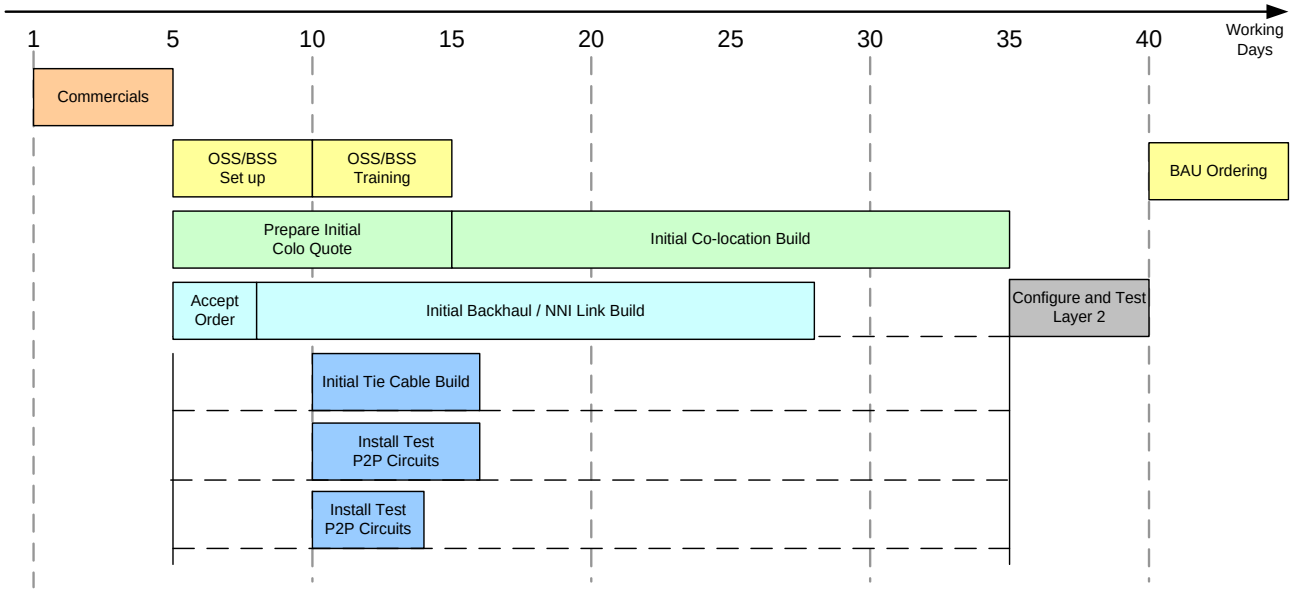
22.1.4 build of UFB Handover Connections and associated circuits (if required);

22.1.5 training as per clauses 22.9 and 22.10; and

22.1.6 the testing and commissioning of processes, products and interfaces (including layer 2 interoperability).

22.2 Each task within the on-boarding plan has appropriate service levels, milestones, the LFC and Service Provider requirements. The diagram below provides an overview of the plan.

Residential Service Provider On Boarding - Overview



Commercials

22.3 The Service Provider needs to sign a WSA and meet the requirements of the General Terms before they can take the Bitstream Services.

22.4 The Service Provider must provide all information required in a timely manner as any delay will extend the service level time. This information includes details of insurance, credit guarantee and contact information for the WSA.

OSS/BSS

22.5 The LFC's OSS/BSS is required to enable the Service Provider to place and track Service Requests and Service Orders for UFB Services, to report faults and to obtain other operational information.

22.6 The Service Provider needs to have the B2B/SSP system in place and staff available for training.

22.7 Set up of the OSS/BSS requires the LFC to allocate passwords and test interfaces including processing trial Service Requests.

22.8 The LFC will provide training to the Service Provider staff which includes:

22.8.1 Explanation of guides, products, processes, procedures and tools;

22.8.2 submission of test Service Requests;

22.8.3 handling exceptions; and

22.8.4 Q&A.

22.9 The LFC will provide reasonable initial set up training consisting of a workshop held at a location determined by the LFC. The workshop will address:

22.9.1 overview of forecasting templates;

22.9.2 overview of forms for Service Requests;

22.9.3 basic details of OSS/BSS (including demonstration of the system);

22.9.4 overview of billing and accounts; and

22.9.5 Q&A.

22.10 The Service Provider will ensure that a reasonable number of staff (up to a maximum number of 10 per session) attend any training provided.

22.11 Any additional training required by the Service Provider beyond reasonable initial set up training (up to 50 hours) will be charged for by the LFC in accordance with the Price List.

Co-location

22.12 If a Service Provider requires co-location space they can place an initial Service Request with all required information when signing the WSA or they can wait until the OSS/BSS is in place and their staff are trained in its use.

22.13 The LFC will provide quotes for co-location build, once these are accepted build will commence subject to the provision of any materials or information required from Service Provider. On acceptance of the build the footprints will be handed over to the Service Provider.

Handover Connection or backhaul

22.14 If a Service Provider requires a UFB Handover Connection and/or backhaul they can place an initial Service Request with all required information when signing WSA or they can wait until the OSS/BSS is in place and their staff are trained in its use.

22.15 The LFC will commence build subject to the provision of any materials or information required from Service Provider. On completion of joint testing the links will be handed over to the Service Provider.

Tie Cables

22.16 If a Service Provider requires Tie Cables for their co-location space they can place initial Service Requests with all required information when signing the WSA or they can wait until the OSS/BSS is in place and their staff are trained in its use.

22.17 The LFC will provide quotes for Tie Cable build, once these are accepted build will commence subject to the provision of any materials or information required from Service Provider. On completion of the build the Tie Cables will be handed over to the Service Provider.

Testing

22.18 If a Service Provider requires test circuits they can place initial Service Requests with all required information when signing the WSA or they can wait until the OSS/BSS is in place and the Service Provider's staff are trained in its use. The LFC will provide test circuits for Service Provider and if required trial fault and relinquish them.

22.19 If a UFB Handover Connection Service has been requested, once it is installed and the Service Provider has all their equipment installed and available for testing. The LFC will undertake a series of end to end layer 2 testing scenarios with the Service Provider. The service level assumes all test milestones passed on first attempt with no remedial work required.

Integrated Test Facility

22.20 As an alternative to test circuits to their premises the Service Provider can request access to the Integrated Test Facility.

22.21 Initially this facility is limited to GPON services. Operational requirements for the Integrated Test Facility are not included in this Manual and will be discussed with Service Providers on a case by case basis.

BAU

22.22 Once on boarding and testing is successfully complete the Service Provider can place Service Requests for Bitstream Services.

PART 11 – OTHER

23 Requirements for End User Site Visits by the LFC

23.1 Fault and provisioning related site visits by the LFC to the End User Premises will be arranged by appointment under OSS/BSS. The LFC will not be required to consult the Service Provider or any End User when work at a site does not require entry to premises or contact with an End User. Where entry to a premises or contact with an End User is required then the Service Provider will make arrangements for the site visit with the End User and the relevant LFC representative. The LFC or its representative may contact End Users if required to facilitate the LFC's or its representatives attendance at the End User's Premises for appointments arranged through the Service Provider.

23.2 The LFC representatives will carry LFC identification and wear appropriate clothing.

23.3 The LFC representative will use all reasonable endeavours to start all visits to an End User's site at the scheduled time.

23.4 When interacting with any End User, the LFC representatives will always act in a professional and courteous manner, and they will not use that interaction for sales and marketing purposes.

23.5 At the completion of all site visits, the relevant the LFC representative will record the details in appropriate systems.

23.6 When for any reason outside the LFC's control it is unable to complete a visit at the scheduled time (e.g. an End User is unavailable), the LFC will charge the Service Provider an abortive End User site visit charge in accordance with the Price List.

24 Premises Wiring, ONT and Approved CPE Installation

24.1 In association with an installation of the Bitstream Service the LFC may, on request, carry out additional work. For example, for an additional charge the LFC may agree to wire Premises and install accredited Service Provider CPE (e.g. routers, gateways or battery back-up).

24.2 Service Providers should ensure installation of the premises wiring at each End User's Premises is correct and in accordance with the TCF premises wiring code.

24.3 When monitored alarms and/or other line grabbing devices e.g. medic alarms or SKY digital service are installed at an End User's premises and the Service Provider takes the Bitstream Services, the Service Provider must advise its End User to ensure that the necessary arrangements are made to ensure the services continue to operate, or alternatively the End User should be advised alternative arrangements are required to retain existing functionality.

24.4 If a fault is found to be caused by non-compliant wiring or equipment, then the Service Provider will be liable for the No Fault Found charge as set out in the Price List.

25 Premises Lead-in Fibre Installation

25.1 The limits of the Standard Installation are described in the Service Descriptions. Additional work required to provide a Connection may be carried out at same time for an

additional charge and that work will not be subject to the Service Levels.

25.2 The installation of conduits and lead-in pipes at each End User's Premises will be in accordance with the LFC work practises and the TCF Premises wiring code. Any existing conduits or Lead-in pipes that are reused must also conform to the same standards.

25.3 The End User may elect to have a lower standard Fibre Lead-in provided e.g. a conduit attached to a fence rather than buried. However if that lower standard is found to contribute to a fault in the future it will be treated as a 'No Fault Found', excluded from availability Service Levels and its repair may attract additional cost.

26 Marketing Support and Roll out Plans

26.1 Raising awareness about the LFC's enhanced network and the benefits of fibre to End-Users will be an essential step in the transition process so that End Users are motivated to change to fibre access based services and the LFC achieves the uptake rates they are targeting.

26.2 Assisting in the increasing awareness of the LFC network will be deployment information in the form of maps and address lists provided by the LFC to the Service Providers to enable them to plan their marketing.

26.3 To augment the broader awareness and marketing initiatives, the LFC will have a sales channel, which will:

- own the Service Provider relationship;
- develop an intimate understanding of their Service Provider's requirements;
- champion Service Provider requirements within the LFC to ensure Service Provider issues are understood and services are fit-for-purpose;
- ensure Service Provider understand the LFC offerings and can drive fibre uptake on a retail basis; and
- identify gaps/opportunities in the NZ market and short to medium term fibre growth areas.

This team will be supported by the service delivery teams who manage the more operational aspects of the Service Provider relationship.

APPENDIX A – GLOSSARY

Term	Definition
802.1ad	means an Ethernet standard that supports Ethernet frames with two VLAN tags. These VLAN identifiers are referred to as: (a) Service VLAN ID or SVID. Outer tag. (b) Customer VLAN ID or CVID, Inner tag.
802.1p	means an Ethernet standard that uses the 3-bit PCP field in 802.1q VLAN tags to advise the network as to what class of service should be applied to the transport of the frame.
802.1q	means an Ethernet standard that allows the support of multiple independent logical networks through the use of an 802.1q header. This allows up to 4094 virtual networks to be identified through the VLAN id field. The 802.1q header also supports a 3-bit PCP field which is used to indicate the class of service the frame belongs to.
802.3/Ethernet II	Ethernet standards that define the format of standard untagged Ethernet frames
Access Rate	means the Access Rate is a logical maximum upstream and downstream speed that a Bitstream 3 or Bitstream 3a Service Template can achieve, i.e. $\sum CIR + \sum EIR \leq$ Access Rate
Availability Period	means the shorter of: (a) the period of the previous 12 months; and (b) the period of months since the LFC last failed to meet the relevant Service Level.
Automated Pre-qualification	means the automated delivery of information on the availability of services at a given address via the OSS/BSS.
ATA Voice Service	means the service described in the ATA Voice Service Description.
B2B	means the OSS/BSS Business to Business Web Services Interface that allows Service Providers to integrate their front end systems with the LFC's ordering and service management systems.
Baseband	means the service described in the Baseband Service Description.
BAU	means business as usual – the ongoing, every day operation of business, processes and systems.
Bitstream Services	means the services described in the Service Descriptions for Bitstream 2, Bitstream 3, Bitstream 3a, Bitstream 4, ATA Voice, Multicast and UFB Handover Connection.
Best Industry Practice	means the exercise of the skill, diligence, prudence, foresight and judgement, as determined by reference to good international practice generally applied in OECD countries, which would be expected from a highly skilled and experienced person under the same or similar circumstances to those applicable under the UFB Services.

Term	Definition
Bulk Service Request	means a transfer or new connection of a large volume of service instances as more particularly described in the relevant Operations Manual
Build Cost	means the cost for the LFC to build the co-location Footprint requested
Build Time	means the time for the LFC to build the co-location Footprint requested measured from the time the Quote is accepted
Business	means any undertaking that is carried on, whether for gain or reward or otherwise.
Business Connection	means a Connection requested by a Service Provider in relation to an End User that is a Business (but excluding an NBAP Connection)
Central Office	means the building which terminates local access fibres and may house both LFC and Service Provider equipment required for providing services over the access fibre network.
Central Office and POI Co-location Service	means a service that provides co-location facilities for a Service Provider's equipment, and access to a Handover Point, at the LFC's Central Office solely for the purposes of providing access to, and interconnection with, the LFC Network as described in the Central Office and POI Co-location Service description
Central office ID	means a unique alphanumeric identifier assigned by the LFC to an Central Office.
Central Office Entry Point	means the congregation point for all ducts and cables that enter a Central Office that is nominated by the LFC as the Central Office entry point, usually a manhole.
Co-location Build	means the build work required by the LFC to provide the co-location footprint requested by the Service Provider
CIR	means committed Information Rate. This is the amount of guaranteed throughput – frames submitted within this throughput will be considered discard ineligible by the network.
Communal Infrastructure	means any fibre network infrastructure in the Coverage Area which is deployed independently of any End-User Specific Infrastructure and which is not located on Premises, including any of the following within the Coverage Area: (a) Interconnection Points; (b) Central Offices; (c) cabinets and/or fibre cross connection points; (d) intra-Coverage Area backhaul fibre connecting the interconnection points, Central Offices and cabinets; (e) distribution fibre running along each street, past Premises; (f) feeder fibre running from Central Offices to cabinets or fibre cross connection points; (g) associated ducts and other fixed civil infrastructure required to deploy fibre; and (h) passive optical equipment installed in the LFC cabinet and/or a Central Office.

Term	Definition
Connection	means (a) the cable joining the Fibre Access Point to the External Termination Point of a Premises, with such cable to be either from the pit on the adjoining boundary of two properties where the Fibre Access Point is located in underground deployment, or from the pole nearby to a number of premises in aerial deployment; and (b) all other infrastructure (excluding Communal Infrastructure) necessary to enable the provision of the Wholesale Services (including layer 1 and layer 2 services) to the relevant End User, and "Connected" will be construed accordingly.
Coverage Area	means, as the context requires, either (a) the area comprising all Candidate Areas or (b) the geographic area serviced by a given Handover Point; or (c) the geographical area served by a Data Switch. There are multiple tiers: • First Data Switch – typically an Intermediate POI or POI • POI. Consists of the aggregate of all First Data Switches served by the POI. In many cases this will only be the POI itself.
CPE	means Customer Premises Equipment. This is equipment used by the End User or provided by the Service Provider at the End User site to use or interface with the Bitstream service.
Customer Authorisation	means a valid authorisation for a Transfer Service Requests by a customer or a customer's duly appointed agent that meets the requirements of the Customer Transfer Code.
Customer Transfer Code	means the Code for the Transfer of Telecommunications Services approved by the Commission on 12 October 2006 and/or endorsed by the TCF on 3 November 2006, as applicable, and any equivalent replacement Code or Codes.
CVID	means Customer VLAN ID. This is the VLAN identifier contained in the inner 802.1ad tag delivered on the E-NNI.
DHCP	means Dynamic Host Configuration Protocol. A Layer 3 protocol used to auto-configure basic IP settings. Optional for Service Providers. Bitstream 2 has a configurable option to insert Circuit ID information into DHCP configuration requests as defined in TR-101/156.
Direct Fibre Access	means the service described in the Direct Fibre Access Service Description.
Deemed Acceptance Time	means the time which is four Business Hours after the Receipt Time of a valid Service Request. To avoid doubt, a Service Request may still be rejected notwithstanding a deemed acceptance.
Downtime	means the length of time that an End User is without service, measured from the time that a fault is detected, either by an End User fault report or by an LFC Network surveillance system, to the time the fault is resolved and the service is restored. Downtime excludes service interruptions as a result of End User, Reseller or Service Provider actions, and ONT outages due to power failure;

Term	Definition
EAS	Ethernet Aggregation Switch.
E-APL	Means an Ethernet Access Private Line. An Ethernet operator virtual circuit (OVC) that does not support service multiplexing, i.e. all service frames at the UNI are mapped to a single E-APL.
E-AVPL	Ethernet Access Virtual Private Line. This is a MEF standard for providing an OVC (Operator Virtual Circuit) from the UNI to an E-NNI.
eBill	means invoices provided in an electronic format.
EIR	Excess Information Rate. This is the amount of un-guaranteed throughput – frames submitted within this throughput will be considered discard eligible by the network.
EMA	Ethernet Multicast Access. A service that supports the transmission of multicast traffic from a Service Provider to multiple UNIs simultaneously.
End User Tenancy	Is the premises of an End User (i.e. apartment, townhouse, office, shop etc.) in a Multi Dwelling Unit to which the Service Provider directs the LFC to provide services.
End User-Specific Infrastructure	means the infrastructure in the Coverage Area separate from, and connecting with, the Communal Infrastructure and the Layer 2 Communal Infrastructure to provide service to End User connections, including the following: (a) fibre from a Premises to the Communal Infrastructure already in place outside the boundary of a Premises; (b) any electronic and/or optical equipment the LFC may be required to install on Premises; (c) associated ducts and other fixed civil infrastructure required to deploy the End User-specific fibre assets; (d) any capitalised investment directly associated with each marginal End User (for example, the value of any software licences that might be supplied to the LFC on a "per End User" basis); and (e) any active electronic equipment installed in a Premises required to provide the layer 2 Wholesale Services.
E-NNI	External Network-to-Network Interface. This is a MEF standard interface that allows connectivity between two Ethernet networks. It provides the Ethernet demarcation between the LFC and the Service Provider.
ETP	means a suitable fibre termination facility located as an attachment to an external structure located at the End-User's Premises, the End User Tenancy or at the NBAP non building access point. It is not mandatory for the fibre to be broken and terminated at that point, although it will serve as an access point for breaking and testing should the need arise.
Fault Restoration Hours	means 7:00am to 7:00pm, seven days a week and Fault Restoration Hour means one hour within this period.
FFP	Fibre Flexibility Point. A roadside cabinet where the feeder fibre from the Central Office is connected or patched to the distribution fibre to the End User Premises. In the case of GPON services it is also likely to house the passive optic splitters.
Fibre Access Point or FAP	A point on the End User Premises boundary where the Fibre Lead-in connects to the distribution network, either from the pit on the adjoining boundary of two properties where the Fibre Access Point is located in underground deployment, or from the pole nearby to a number of Premises in aerial deployment to provisioning.
Fibre Lead-in	The fibre from the Fibre Access Point to a jack inside the End User's Premises or OFDF.

Term	Definition
First Data Switch	The term applied to the first EAS after the access node. This is the first Layer 2 Handover Point at which a Service Provider can connect to the Chorus network, although Tail Extension can be used to extend the service beyond this point.
Footprint	Means a space at any Chorus Central Office that is allocated to the Service Provider for the installation of its equipment but excludes any space occupied by the Service Provider's Tie Cables.
Forecast	means any or all (as the context requires) of the Forecasts required to be provided by the Service Provider in any Operations Manual.
Forecast Service Requests	means a forecast Service Requests, as reported in a Forecasting Report
Forecasting Template	means the template provided by the LFC either as; (a) Excel spreadsheet with a separate worksheet for each Forecast type, an example of which is attached as Appendix D; or (b) A web based template for each Forecast type.
Frame Delay	This is a measurement of how long an Ethernet Frame takes to traverse part of the network, typically UNI to the POI. It measures the one-way delay and uses a 1500 byte Ethernet frame as a baseline.
Frame Delay Variation	This is the amount at which the Frame Delay is allowed to vary across multiple Frame Delay measurements.
Frame Loss	This is the amount of in-profile frames that are dropped between ingress and the point of measurement, typically the POI. Measured in %.
GPON	Gigabyte Passive Optical Network. This is a fibre standard that supports point-to-multipoint delivery of fibre to multiple Premises.
Handover Point	This is the exchange where the bitstream service is handed over from Chorus to the Service Provider. The Service Provider can connect the service to their site, to collocation space in the Handover Point exchange or use a backhaul service to deliver the service to a different location.
High Priority class	This is a class, defined in the TCF ELAS Service Description, which is intended for the delivery of high performing applications and content. All frames marked as high priority are considered discard ineligible. - CIR > 0. - EIR = 0 High Priority Network Performance Service Levels are set out in the Service Level Terms for the Bitstream Services
Integrated Test Facility	The Integrated Test Facility (ITF) is a collection of labs and services that support Service Providers in development of new and existing UFB services
ITU Y.1731	An ITU Ethernet standard that supports protocols and practices for OAM across Ethernet platforms.
LC Connector	LC APC connector type complying with the IEC 61754-20 standard.
Layer 2	means layer 2 of the OSI Model, being active fibre optic network infrastructure

Term	Definition
Layer 2 Communal Infrastructure	means the following Communal Infrastructure, each to the extent required to provide the Layer 2 Wholesale Services: (a) electronic and/or optical equipment installed in the LFC's cabinet, Central Office or POI; and (b) active electronic equipment installed in a Central Office or cabinet in the Coverage Area;
Law	means: (a) any statute, regulation, by law, ordinance or subordinate legislation in force from time to time to which a party is subject; (b) the common law and the law of equity as applicable to the parties from time to time; (c) any binding court order, judgment or decree; (d) any applicable industry code, policy or standard enforceable by law; or (e) any applicable direction, policy, permission, consent, licence rule or order that is binding on a party and that is made or given by any governmental, legal or regulatory body having jurisdiction over a party or any of that party's assets, resources or business, in any jurisdiction that is applicable to the WSA, including all applicable district or regional plans, district council bylaws, district council codes of practice and development manuals for roading and New Zealand Transport Agency guidelines and standards.
LFC Build	Means the build work carried out by the LFC to provide the co-location Footprint requested by the Service Provider
Low Priority class	This is a class, defined in the TCF ELAS Service Description, which is intended for the delivery of internet grade applications and content. All frames marked as low priority are considered discard eligible. - CIR = 0. - EIR > 0 Low Priority Network Performance Service Levels are set out in the Service Level Terms [for the Bitstream Services].
MEF	Metro-Ethernet Forum. An international industry consortium that creates standards for carrier Ethernet networks and services.
MEG	Maintenance Entity Group. This is a point in the network that supports OAM management functions.
MEP	MEG End Point. This is a maintenance functional entity located at each end of an end-to-end path and provides a point that can be used to initiate OAM tests or reflect OAM requests.
MIP	MEG Intermediate Point. This is a maintenance functional entity located at intermediate points along the end to end path. It reacts and responds to OAM frames.
MOFDF	means the main optical fibre distribution frame being a facility in the relevant office for terminating access fibres
Month [x]	means the calendar month that is [x] calendar months before an Service Requests Month
Move Address Service Requests	means an Service Requests where an End User requests the relocation of their Service Provider telecommunications services to another physical address.

Term	Definition
MTU	Maximum Transmission Unit. The maximum Ethernet frame, including headers, which can be supported by the service.
Multi Dwelling Unit or MDU	Includes semi-detached, apartments, townhouses, gated communities and assisted-living facilities that share a common property boundary. MDU facilities may be under a single roof or they may consist of multiple buildings on a residential campus. MDUs may include only residential units or they may have residential units along with commercial and retail spaces. The BICSI defines 3 types of MDUs: 1. Low-rise MDUs: Each unit has access to the ground level and also has a roof line such as townhouses and semi detached dwellings. 2. Mid-rise MDUs: These include duplexes, two storey apartments and other building styles in which units are stacked upon one another. 3. High-rise MDUs: High-rise MDUs most closely resemble large commercial buildings with few units having direct access to the roof line or ground floor.
Multicast	means the service described in the Multicast service description.
Multi-Dwelling Unit Infrastructure or Multi-Business Unit Infrastructure	means the individual fibre connection from the point that the End User-Specific Infrastructure terminates at the Premises to an individual residence or commercial tenancy in a multi-tenant building or if the LFC has provide backbone and floor cabling within MDU the individual fibre connection from the point that the End User-Specific Infrastructure enters the Premises to an individual residence or commercial tenancy in a multi-tenant building;
NID	means Network Interface Device. An active device at the End User Premises that terminates the fibre and provides an electrical interface to the End User.
NOC	means Network Operations Centre.
Non-Building Access Point or NBAP	means a location for a Connection that either is not a premise (e.g. a cell site or pumping station) or does not have a physical address (e.g. a bus shelter or lamp post) other than a location that is a concentration point for a regulated backhaul service (for example, a fibre to the node cabinet owned or controlled by the Contractor);
Non – Standard Install	means in relation to a service means any work required to be performed by the LFC to install that service that falls outside the definition of Standard Install as set out in the relevant service description.
OAM	Operations, Administration and Maintenance. A set of processes, tools and activities based on ITU Y.1731 that allows testing and monitoring of the Ethernet network.
OFDF	Optical Fibre Distribution Frame. An optical fibre distribution frame installed in an MDU or End User premises used to terminate the Fibre Lead-in.
OLT	Optical Line Terminator. An access node that provides for the delivery of GPON accesses. It provides the network-side GPON functions.
ONT/ONU	Optical Network Terminal or Optical Network Unit. Provides the End User GPON functions and terminates the GPON/Bitstream Services in the End User premises.
OSS	means the LFC's operational support systems.
Passed	means when Premises have been passed with Communal Infrastructure (and, where the context requires, includes Layer 2 Communal Infrastructure) and is capable of Connection from the nearest point to the private boundary (if underground) or nearest pole (if aerial) (and Pass is to be interpreted accordingly).
PCP	Priority Code Point. A three bit field in the 802.1q header that identifies what class a particular frame is associated with.

Term	Definition
Permit to Work	check definition from STD.
POI	Point Of Interconnect. This is a logical point in the network where a Bitstream Service terminates. Each LFC POI shall be an LFC Central Office at which Chorus locates an aggregation switch.
POP	Point of Presence. This is the point at which a Service Provider provides a service – either directly or via a backhaul service.
PPPoE	Point-to-Point-Protocol over Ethernet. This is a protocol used for Layer 3 IP attribute assignment. It can be used as an alternative to DHCP. Bitstream 2 has a configurable option to insert Circuit ID information into PPPoE configuration requests as defined in TR-101/156.
Product Development Process	The Product Development Process is the process by which Chorus will develop new Service Templates requested by a Service Provider.
Priority Users	Priority Users means businesses (of any size, including private sector health providers), schools (including state, state integrated and independent schools) and health service providers (hospitals and significant health care provider sites, for example emergency and medical centres, and radiologists.
Premises	means a single building or structure located on a defined geographical site (such as may be evidenced by a certificate of title), which has a unique physical address recognised by NZ Post, and is occupied by or could readily be occupied by a potential End User and, for the avoidance of doubt: (a) a Premise does not include a NBAP; (b) a MDU only constitutes a single Premise; and (c) a Premise includes each such building or structure that is in, or that is from development activities reasonably anticipated in the near future to be in, a greenfields area or development site that is within or adjacent to the Coverage Area.
Previous Forecast	means, in relation to an Service Requests Month, the total number of Forecast Service Requests for that Service Requests Month as set out in the last Forecasting Report submitted to the LFC.
Priority Users	Priority Users means businesses (of any size, including private sector health providers), schools (including state, state integrated and independent schools) and health service providers (hospitals and significant health care provider sites, for example emergency and medical centres, and radiologists);
Product Development Process	The Product Development Process is the process by which the LFC will develop new Service Templates requested by a Service Provider.
QnQ	Q in Q is an industry standard protocol similar to 802,1ad. It supports stacked VLANs, i.e. multiple VLAN tags in an Ethernet frame. Chorus supports this as an alternative E-NNI standard to 802.1ad. The primary practical difference between QnQ and 802.1ad is the Ethertype field.
Quote	means an estimate provided by the LFC for services requested by Service Provider that do not have a set charge in the Price List.

Term	Definition
Receipt Time	means: (a) for Service Requests that are made using the OSS/BSS, the time that the electronic communication containing the Service Request enters the OOS/BSS; or (b) for Service Requests that are made by email, the time that a Service Request is received in the LFC designated inbox for receipt of such Service Requests, provided that where a Service Request is received outside Business Hours, the Receipt Time will be the start of the first Business Hour of the following Business Day.
Relinquishment	means the cessation of a service.
Relinquishment Service Requests	means an order for the cessation of a service.
Residential Connection	means a Connection requested by a Service Provider in relation to an End User that is not a Business or NBAP.
SC Connector	SC/APC connector type complying with the IEC 61754-4 standard.
Single Dwelling Unit	means a Premises containing within its boundaries only one residential or commercial tenancies
Service Area	means either: (a) the area served by the fibre terminated at an LFC Central Office, or (b) the area within a LFC Central Office set aside for the Central Office and POI Co-location service.
service demarcation point	Has the meaning given in the relevant Service Description as the context requires.
Service Identifier	means a unique alphanumeric identifier assigned by the LFC to a service.
Service Level	means a “Core Service Level” or “Ancillary Service Level” as those terms are defined in the Service Level Terms.
Service Level Default	means a failure by the LFC to meet a Service Level;
Service Order	means a Service Request where the Service Provider has accepted the LFC’s Quote.
Service Provider	A Service Provider is an entity that purchases the bitstream service from the LFC and, combined with its own network and services, provides a telecommunication service to an End User.
Service Provider Build	Means the build work carried out by the Service Provider to complete the co-location footprint requested by the Service Provider
Service Rebate	means a “Core Service Rebate” as defined in the Service Level Terms.
Service Request Month	means the calendar month in which a Forecast Service Request is forecast to become an Service Request.
Service Template	A Service Template is a preset combination of bitstream service components, such as VLANs, UNIs etc. that can be added incrementally to an existing service, or consumed as a package. Service Providers can consume the initial Service Templates as defined in the relevant Bitstream Services service descriptions, or request new Service Templates through the Product Development Process.

Term	Definition
Special Manual Pre-qualification Investigation	means the delivery of information on the availability of services at a given address following the visit to site by a technician (may include specially requested information).
SSP	means Self Service Portal – an OSS/BSS interface.
Standard Install	means in relation to a service, the work generally required to be performed by the LFC to install that service as more particularly set out in the relevant service description.
SVID	Service VLAN ID. This is the VLAN identifier contained in the outer 802.1ad tag delivered on the E-NNI.
Tagged traffic	This is Ethernet frames that include one or more 802.1q headers or tags.
Tail Extension	This is a service that extends the service attributes of the tail from the POI to a remote Handover Point. As this provides a backhaul service, the end-to-end service attributes will be different than a service that terminates at the POI.
Tie Cables	means cable provided on request to a Service Provider who taken a fibre access service and or a co-location footprint. Can be either: (a) An internal Tie Cable from the Central Office MOFDF to the Service Provider Footprint; (b) An internal Tie Cable from one Service Provider Footprint to another Service Provider Footprint (the footprints can be same or different Service Providers); or (c) An external Tie Cable from the Central Office MOFDF to a third party network outside and adjacent to the Central Office entry point.
TR-101/156	This is a Broadband Forum technical report that standardises how GPON can be supported using an Ethernet Aggregation Network.
Transfer Service Requests	means a Service Request by the Service Provider to transfer services submitted in accordance .
Trouble ticket	means the record of a fault report detailing fault and steps taken to rectify.
Truck roll	means the dispatch of a technician to construct or repair the LFC network including end user infrastructure.
UFB Arrangements	means the arrangements between Chorus, Crown Fibre Holdings Ltd and the Crown relating the Government's Ultrafast Broadband Initiative under which Chorus is required to construct, and deliver services over, a fibre optic access network in certain parts of New Zealand.
UFB Handover Connection Service	means the service described in the UFB Handover Connection Service Description.
UFB Services	means the Bitstream Services, Baseband Direct Fibre Access Services and the Central Office and POI Co-location Service.
UNI	User Network Interface. The interface specification facing the End User site.
UNI Port	A single Ethernet port on an ONT.
UPS	Uninterruptible Power Supply.
VLAN	A virtual LAN or local area network. A logical Ethernet network supported through 802.1q headers.
Week	means a seven-day period commencing Monday and ending Sunday.
WiFi	A common short range wireless network used for local connection to a WiFi hotspot. It is offered as a feature on the ONT as an alternative to house wiring, although throughput is limited by the WiFi bandwidth and the number of users on the shared network.

Term	Definition
WSA	means the “Agreement” as defined in the General Terms.
Y.1731	An ITU standard that defines protocols and practices for OAM on Ethernet networks including traffic performance measurements such as Frame Delay, Frame Delay Variation and throughput.

APPENDIX B - ESCALATION PROTOCOL

Rule No.	Escalation Rule	Further Explanation
1	Identify correct escalation path.	Before any issue is escalated, sufficient investigation should be undertaken to ensure that the functional group that will most likely be responsible for resolving the issue has been correctly identified.
2	Attempt to resolve issues at BAU level before escalating them.	Every effort should first be made to resolve an operational issue at the BAU level, i.e. direct communication between the originator and the recipient.
3	First escalation should be via e-mail.	In the first instance an escalation at BAU level should be received via e-mail and clearly labelled as such with the email subject line beginning with 'ESCALATION'. The email should contain the relevant history of the issue, including the escalation history and when applicable the customer name, Service Identifier/circuit numbers and fault/Service Request or Service Order numbers.
4	Level One and Two escalations shall be peer to peer.	If an operational issue cannot be resolved at the BAU level it must first be raised by the team member with their own team leader/manager. If the team leader/manager agrees that the issue warrants being escalated to the other party they shall contact their peer in the other organisation and endeavour to resolve the issue between them - this would normally be the level one escalation point. Under no circumstance should this step in the escalation path be bypassed unless every reasonable attempt to communicate with their peer in the other organisation has failed. Only then should the level one contact in party A attempt to escalate the issue to the level two contact in party B. Subject to the above, level two escalations should also be peer to peer.
5	A mutually agreed plan of action to resolve an issue shall not be interfered with by other individuals.	If a plan of action to address an escalated issue has been agreed to by both parties then no other individual from either organisation should attempt to interfere with that agreement. If another individual has a concern with an already agreed plan of action they should raise it in the first instance with the person in their own organisation that was party to the original agreement.
6	People who do not follow the above rules will be redirected to the correct point of escalation.	If, as part of an escalation, an individual is contacted by a person from the other company and it is discovered that that person has not followed the protocol described above, then that individual can at their discretion respectfully redirect that person to the correct escalation contact person.

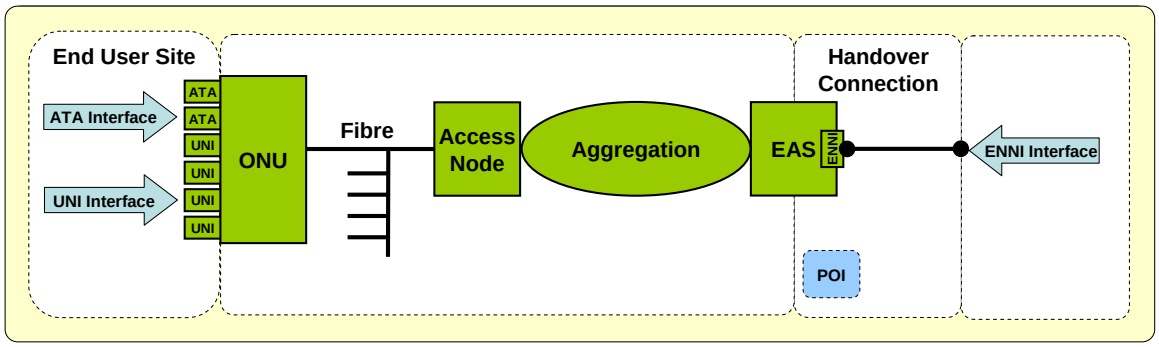
APPENDIX C - FORECASTING SPREADSHEET

The forecasting spreadsheet is available online at:
http://www.chorus.co.nz/operations_manual

APPENDIX D - TECHNICAL SPECIFICATION

Technical Specification for Bitstream 2

This section describes the technical specifications needed to connect End User or Service Provider equipment to the LFCs Bitstream service.



ATA Interface

Port	RJ11
Voice	G.711 Codec SIP For detailed codec and protocol specifications refer to the Service Provider guide.

UNI Interface

Ethernet – Bitstream 2	Ethernet II or 802.3 untagged interface; or 802.1q tagged interface with VLAN id = As agreed with Service Provider
Ethernet – Bitstream 3/3A	• IEEE 802.3 – 2005 • 802.1q supporting 4094 VLANs PCP Transparent (default, Bitstream 3) High Priority Bandwidth – as per plan Low Priority Bandwidth – none PCP Transparent OFF (Bitstream 3A) High Priority Bandwidth – as per plan. Low Priority Bandwidth – as per plan.
Ethernet - Bitstream 4	• IEEE 802.3 – 2005 • 802.1q supporting 4094 VLANs High Priority Bandwidth – as per plan Low Priority Bandwidth – none
UNI – Bitstream 2/3/3A	ONT supports: • 4 x UNI

	• 2 x ATA Voice ports
	
	• Optional additional ports:
	  ○ RF Overlay port
	  ○ WiFi
	
	Per UNI:
	• 100/1000Base-T

UNI – Bitstream 4	• RJ45
	  ○ 100 Mbps = 100BaseT
	  ○ 1 Gbps = 1000Base-T
	  ○ 10 Gbps = 10GBase-T
	• Optical Only
	  ○ 100 Mbps = 100Base-FX
	  ○ 1 Gbps = 1000Base-LX

VLAN – Bitstream 2	Point-to-Point (E-AVPL) High Priority Bandwidth – as per plan. Low Priority Bandwidth – as per plan. MTU 2000 Bytes Unicast Frame Delivery = as per plan Multicast Frame Delivery = discarded Broadcast Frame Delivery = discarded Layer 2 Control Protocols Processing = Initially none (but may be amended by the LFC from time to time)
VLAN – Bitstream 3/3A	Point-to-Point (E-APL) MTU 2000 Bytes PCP Transparent (default, Bitstream 3) • High Priority Bandwidth – as per plan • Low Priority Bandwidth – none PCP Transparent OFF (Bitstream 3A) • High Priority Bandwidth – as per plan. • Low Priority Bandwidth – as per plan. Unicast Frame Delivery = Unconditional as per plan Multicast Frame Delivery = Unconditional as per plan Broadcast Frame Delivery = Unconditional as per plan Layer 2 Control Protocols Processing = Initially none (but may be amended by the LFC from time to time)
VLAN – Bitstream 4	Point-to-Point (E-APL) MTU 9100 Bytes High Priority Bandwidth – as per plan. Low Priority Bandwidth – None. Unicast Frame Delivery = Unconditional as per plan Multicast Frame Delivery = Unconditional as per plan Broadcast Frame Delivery = Unconditional as per plan Layer 2 Control Protocols Processing = Limited (but may be amended by the LFC from time to time)

E-NNI Interface

UFB Handover Connection (E-NNI)	Ethernet:
	• 802.ad VLAN (SVID, CVID); or
	• Double tagged Q in Q.
	
	E-NNI
	• 1 GigE
	  ○ 1310 nm 1000BASE-LX
	• 10 GigE
	  ○ 1310 nm 10GBase-LW/LR
	  ○ 1550 nm 10GBase-EW/ER

Fibre

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 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.

APPENDIX F -– CANDIDATE AREAS

Zone	Central Office	Central Office Classification
F02	ALBANY	Bronze
F31	ALICETOWN	Steel
F05	ANDERSONS BAY	Bronze
F01	ASHBURTON	Bronze
F16	ATAWHAI	Steel
F02	AUCKLAND (AKCEN)	Silver
F02	AVONDALE	Bronze
F02	BEACHLANDS	Bronze
F31	BELMONT	Steel
F02	BIRKDALE	Bronze
F02	BIRKENHEAD	Silver
F03	BLENHEIM	Bronze
F02	BLOCKHOUSE BAY	Bronze
F05	BRIGHTON	Steel
F02	BROWNS BAY	Bronze
F19	CLOVERLEA	Steel
F05	CORSTORPHINE	Bronze
F31	COURTENAY PLACE	Silver
F02	DEVONPORT	Bronze
F05	DUNEDIN	Bronze
F02	EAST TAMAKI	Bronze
F31	EASTBOURNE	Bronze
F02	ELLERSLIE	Silver
F06	FEILDING	Bronze
F15	FLAXMERE	Steel
F02	FORREST HILL	Bronze
F07	GISBORNE	Bronze
F02	GLEN EDEN	Bronze
F02	GLENDOWIE	Bronze
F02	GLENFIELD	Bronze
F26	GLENITI	Bronze
F11	GORE	Bronze
F05	GREEN ISLAND	Bronze
F02	GREENHITHE	Steel
F08	GREYMOUTH	Bronze

Zone	Central Office	Central Office Classification
F05	HALFWAY BUSH	Bronze
F15	HASTINGS	Silver
F31	HATAITAI	Bronze
F15	HAVELOCK NORTH	Bronze
F02	HENDERSON	Bronze
F02	HIBISCUS COAST	Bronze
F02	HOWICK	Bronze
F11	INVERCARGILL	Bronze
F11	INVERCARGILL EAST	Bronze
F31	ISLAND BAY	Bronze
F19	JOHN F KENNEDY DR.	Steel
F31	JOHNSONVILLE	Bronze
F31	KARORI	Bronze
F31	KELBURN	Bronze
F19	KELVIN GROVE	Steel
F31	KHANDALLAH	Bronze
F31	KILBIRNIE	Bronze
F02	KUMEU	Bronze
F05	LEITH VALLEY	Bronze
F13	LEVIN	Bronze
F31	LOWER HUTT	Silver
F23	LYNMORE	Bronze
F07	LYTTON WEST	Bronze
F05	MACANDREW BAY	Steel
F02	MANGERE	Bronze
F02	MANUKAU CITY	Bronze
F02	MANUREWA	Bronze
F05	MAORI HILL	Bronze
F15	MAREWA	Bronze
F02	MASSEY	Bronze
F14	MASTERTON	Bronze
F11	MATAURA	Steel
F19	MAXWELLS LINE	Steel
F31	MIRAMAR	Bronze
F05	MORNINGTON	Bronze
F05	MOSGIEL	Bronze
F02	MT ALBERT	Silver
F02	MT EDEN	Silver
F02	MT ROSKILL	Bronze

Zone	Central Office	Central Office Classification
F02	MT WELLINGTON	Bronze
F31	NAENAE	Bronze
F15	NAPIER	Silver
F16	NELSON	Bronze
F02	NEW LYNN	Bronze
F23	NGONGOTAHA	Bronze
F05	NORTH EAST VALLEY	Bronze
F18	OAMARU	Bronze
F18	OAMARU NORTH	Bronze
F02	ONEHUNGA	Bronze
F02	OTAHUHU	Silver
F02	OTARA	Bronze
F12	PAEKAKARIKI	Bronze
F02	PAKURANGA	Bronze
F19	PALMERSTON NORTH	Silver
F02	PAPAKURA	Silver
F02	PAPATOETOE	Silver
F12	PARAPARAUMU	Bronze
F08	PAROA	Steel
F31	PETONE	Bronze
F31	PLIMMERTON	Bronze
F02	PONSONBY	Bronze
F31	PORIRUA	Bronze
F05	PORT CHALMERS	Bronze
F05	PORTOBELLO	Bronze
F20	PUKEKOHE	Bronze
F12	PUKERUA BAY	Steel
F21	QUEENSTOWN	Bronze
F12	RAUMATI	Bronze
F05	RAVENSBOURNE	Steel
F02	RED BEACH	Bronze
F02	REMUERA	Silver
F16	RICHMOND	Bronze
F23	ROTORUA	Silver
F02	RUNCIMAN	Steel
F05	SOUTH DUNEDIN	Bronze
F11	SOUTH INVERCARGILL	Bronze
F02	ST HELIERS	Bronze
F16	STOKE	Bronze

Zone	Central Office	Central Office Classification
F31	STOKES VALLEY	Bronze
F16	TAHUNANUI	Steel
F02	TAKAPUNA	Silver
F02	TAMAKI	Bronze
F15	TARADALE	Bronze
F24	TAUPO	Bronze
F31	TAWA	Steel
F02	TE ATATU	Bronze
F02	THREE KINGS	Bronze
F26	TIMARU	Bronze
F31	TITAHI BAY	Bronze
F02	TITIRANGI	Bronze
F02	TORBAY	Bronze
F19	TURITEA	Steel
F31	UPPER HUTT	Bronze
F31	UPPER HUTT NORTH	Bronze
F28	WAIHEKE	Bronze
F12	WAIKANAE	Bronze
F11	WAIKIWI	Bronze
F31	WAINUIOMATA	Bronze
F31	WAITANGIRUA	Bronze
F29	WAIUKU	Bronze
F21	WAKATIPU	Bronze
F26	WASHDYKE	Bronze
F31	WELLINGTON	Gold
F31	WELLINGTON SOUTH	Bronze
F32	WHAKATANE	Bronze
F02	WHENUAPAI	Bronze
F31	WHITBY	Steel