

28 February 2023

To: Chorus Limited
Level 10 Aon Centre
1 Willis Street
Wellington 6011

Attention: [REDACTED]
Head of Regulatory and Policy Affairs

Notice to supply information to the Commerce Commission under section 221 of the Telecommunications Act 2001 - Requirements for base capital expenditure, connection capex baseline expenditure, and operating expenditure proposals

Background

1. Since 31 December 2021, Chorus Limited (Chorus) has been subject to price-quality regulation under Part 6 of the Telecommunications Act 2001 (Act) in respect of the services specified in reg 6 of the Telecommunications (Regulated Fibre Service Providers) Regulations 2019. The Commerce Commission (Commission) must, before the end of the current regulatory period (31 December 2024, which is the end of the regulatory period we refer to as PQP1), make a determination under s 170 specifying how price-quality regulation applies to Chorus during the following regulatory period (starting on 1 January 2025, which we refer to as PQP2).¹

Purpose of this notice

2. The information sought in this request is necessary for the Commission to carry out its functions and exercise its powers under ss 194, 195 and 203 of the Act to determine Chorus' price-quality path for PQP2, and to apply the relevant input methodologies in doing so (as required by ss 175 and 203 of the Act).
3. One of the key requirements of the price-quality path is the maximum revenues that the Commission must determine, specified in the IM Determination as allowable revenue.² For PQP1, we determined allowable revenue using a building blocks model. To the extent any related matters are not set out in the IM Determination and/or a determination needs to be made, we have not made any such determinations for PQP2 (and this Notice should not be read as indicating any such determination).

¹ Telecommunications Act 2001, s 172(1)(a).

² Clause 3.1.1 of the "**IM Determination**", i.e. cl 3.1.1 of the *Fibre Input Methodologies Determination 2020* [2020] NZCC 21 (13 October 2020) and the subsequent amendments made as part of *Fibre Input Methodologies (initial value of financial loss asset) Amendment Determination 2020* [2020] NZCC 24 (3 November 2020), *Fibre Input Methodologies (base capex and connection capex baseline allowance determination dates) Amendment Determination 2021* [2021] NZCC 17 (29 September 2021), and *Fibre Input Methodologies Amendment Determination (No.2) 2021* [2021] NZCC 25 (29 November 2021).

4. The building blocks approach requires base capex allowances and connection capex baseline allowances, as set out in the capex IM,³ and also requires an opex allowance. These expenditure allowances would be based on a set of proposals from Chorus setting out forecast expenditure. This is similar to the approach we took for PQP1, including requiring an opex proposal from Chorus.
5. To determine the expenditure allowances consistent with the capex IM,⁴ and to ensure that they best give (or are likely to best give) effect to the purpose of Part 6 and, where relevant, to the promotion of workable competition in telecommunications markets for the long-term benefit of end-users of telecommunications services, as required under s 166(2) of the Act, we must evaluate the proposals Chorus provides, and require the information requested in this notice to do so.
6. As such, we require Chorus, under section 221 of the Act, to provide the information set out in Attachment A of this notice.

Timeframes for responding to this notice

7. Chorus must supply the information in respect of the “base capex information request”,⁵ “connection capex information request”,⁶ and “opex information request”, as specified in Attachment A of this notice by Tuesday 31 October 2023.

Variations, extensions and exemptions

8. The Commission may, on Chorus’ application, grant Chorus a variation to the information requirements set out in this notice to account for any practical limitations on Chorus’ ability to provide the specified information by the specified time. This is subject to what is specified in clause 12 below.
9. For the purposes of clause 8:
 - 9.1 if Chorus applies for a variation, its application must:
 - 9.1.1 be in writing;
 - 9.1.2 explain why Chorus considers that a variation to the information requirements is reasonably justified having regard to the circumstances; and
 - 9.1.3 be made no later than 15 working days before the applicable time limit is due to expire; and
 - 9.2 if the Commission decides to grant Chorus a variation, then:

³ IM Determination, clause 3.7.1(4)(a).

⁴ IM Determination, clauses 3.7.8(9), 3.7.9, 3.7.14(7) and 3.7.15.

⁵ We must issue a “base capex information request” to Chorus related to the base capex proposal for the second regulatory period. See clauses 3.7.8(9)(b) and 3.7.9 of the IM Determination.

⁶ We must issue a “connection capex information request” to Chorus related to the connection capex baseline proposal for the second regulatory period. See clauses 3.7.14(7)(b) and 3.7.15 of the IM Determination.

- 9.2.1 the approved form of the variation shall take effect by the Commission giving or posting written notice of the variation to Chorus; and
 - 9.2.2 the notice effecting the approved form of the variation must specify the reasons for the variation.
10. The Commission may, on Chorus' application, grant Chorus an extension to the timeframes set out in clause 7 of this notice. This is subject to what is specified in clause 12 below.
11. For the purposes of clause 10:
- 11.1 if Chorus applies for an extension, its application must:
 - 11.1.1 explain why Chorus considers that an extension to the time limit is reasonably justified having regard to the circumstances; and
 - 11.1.2 be made no later than 5 working days before the applicable time limit is due to expire; and
 - 11.2 if the Commission decides to grant Chorus an extension, then:
 - 11.2.1 the approved form of the extension shall take effect by the Commission giving or posting written notice of the extension to Chorus;
 - 11.2.2 the notice effecting the approved form of the extension must specify the period of the extension and the reasons for the extension.
12. In relation to information in response to this notice that is contained in the base capex proposal and connection capex baseline proposal, the Commission may not grant an extension beyond 31 October 2023, consistent with clauses 3.7.8(1)(a) and 3.7.14(1) of the IM Determination.
13. The Commission may, at any time, by way of written notice to Chorus:
- 13.1 exempt Chorus from any obligation in this notice, on such terms and conditions as the Commission specifies in the notice; and
 - 13.2 amend or revoke any such exemption.

Means of responding to this notice

14. In accordance with the timeframes in clause 7 above, Chorus must produce and provide the Commission with the information required by supplying the information to the Commission by uploading it to the Commission's box.com data room. Instructions for uploading the information to the box.com data room have been provided in the covering email to this notice.
15. Chorus must also notify the Commission when some or all of the information has been provided by email infrastructure.regulation@comcom.govt.nz (Attention: Manager, Fibre) with the subject line "Chorus – Response to section 221 Notice – Requirements for capital expenditure and operating expenditure information".

16. Narrative information is to be provided or published in searchable Adobe PDF format. Numerical information is to be provided or published in electronic form in an 'unlocked' MS Excel file format.

Use of supplied information and confidentiality

17. Where Chorus considers that any information it provides to the Commission in response to this notice is confidential or commercially sensitive, and that the Commission should not publish or publicly refer to any particular part of its response, Chorus must:
- 17.1 include that information in a separate appendix;
 - 17.2 provide both an unredacted version and a redacted version with the confidential/commercially sensitive information removed;
 - 17.3 clearly mark the information as confidential or commercially sensitive (as applicable) in both the redacted and unredacted version; and
 - 17.4 give clear reasons why Chorus considers that part of the response is confidential or commercially sensitive (as applicable).
18. If Chorus indicates that we should not publish or publicly refer to part of its response, we will discuss with Chorus before deciding whether to do so.
19. Please note that all responses we receive, including any parts that we decide not to publish, can be requested from the Commission under the Official Information Act 1982. This means, that if requested, we would be required to release material (whether published or not) unless good reason existed under the Official Information Act 1982 to withhold it. We would normally consult before releasing any material that Chorus has requested not be published.

Offences under section 103 of the Act

20. Sections 15(1)(l) and 15(4) of the Act provide that s 103 of the Commerce Act 1986 (Commerce Act) applies to notices made under s 221 of the Act.
21. Section 103 of the Commerce Act provides that no person shall:
- 21.1 without reasonable excuse, refuse or fail to comply with a notice under [section 221 of the Act];
 - 21.2 in purported compliance with such a notice, furnish information, or produce a document, or give evidence, knowing it to be false or misleading; or
 - 21.3 attempt to deceive or knowingly mislead the Commission in relation to any matter before it.
22. It is an offence to contravene section 103 of the Commerce Act. Any person who does so is liable on conviction to a fine not exceeding \$100,000 in the case of an individual or \$300,000 in any other case.

Dated at Wellington: 28 February 2023
Signed by:



Tristan Gilbertson
Telecommunications Commissioner

Attachment A Information required for “base capex information request”, “connection capex information request”, and “opex information request”

- A1 Under sections 221(1)(e), (f) and (g) of the **Act**, and consistent with clauses 3.7.9 and 3.7.15 of the **IM Determination**, **Chorus** must provide the following information in its **base capex proposal, connection capex baseline proposal, opex proposal, the integrated fibre plan** or any other documents **Chorus** submits in support of its **base capex proposal, connection capex baseline proposal, or opex proposal**.
- A2 **Chorus** must comply, where relevant, with the following parts of the **IM Determination** when responding to this notice:
- A2.1 Part 3 Subpart 2: Cost allocation;
 - A2.2 Part 3 Subpart 3: Asset valuation;
 - A2.3 Part 3 Subpart 6: Quality dimensions; and
 - A2.4 Part 3 Subpart 7: Capital expenditure.

Interpretation

- A3 Unless the context otherwise requires:
- A3.1 a word which denotes the singular also denotes the plural and vice versa;
 - A3.2 unless stated otherwise, any reference to “includes” means “includes, but is not limited to”;
 - A3.3 in the attachments to this notice, words or phrases in bold type have the meaning set out in the **IM Determination** or as set out below, with any meaning set out below taking precedence in the event of conflict with the meaning of that word or phrase set out in the **IM Determination**:
 - A3.3.1 **Act** means the Telecommunications Act 2001;
 - A3.3.2 **connection sub-type** means the connection sub-types set out in the column labelled “Connection sub-types” in Attachment B;

- A3.3.3 **cost escalator** means a measure applied to translate expenditure forecasts in constant prices of a base year to nominal dollars;
- A3.3.4 **direct fibre access service** means point-to-point **FFLAS** used to provide dedicated backhaul for fixed and mobile networks and in other business applications that **Chorus** assumes will be declared to be regulated under section 228 of the **Act**;
- A3.3.5 **end-user** has the same meaning as defined in s 5 of the **Act**;
- A3.3.6 **expenditure sub-categories** means the **base capex sub-categories** and **opex sub-categories** listed in Attachment B;
- A3.3.7 **FFLAS** has the same meaning as ‘fibre fixed line access service’ defined in s 5 of the **Act**, and includes:

Voice services: Services to enable the delivery of the telephony and low speed data services over a **fibre network** (including, anchor services, baseband, ATA voice);

BitstreamT PON services: Single or multi-class point-to-multipoint fibre access services (including anchor services, bitstream services, bitstream 2, 3, 3A, bitstream accelerate services, 10GPON, NGPON and multicast);

Unbundled PON services: Point-to-multipoint layer 1 fibre access services (including PON fibre access services and unbundled fibre services);

Point-to-point services: Single, multi-class or layer 1 point-to-point fibre access services (including bitstream 4, enhanced bitstream 4, HSNS, BFAS and **direct fibre access services**);

Transport services: Layer 1 or managed throughput fibre services provided over a **fibre network**, to transport voice and data traffic between central offices, including central offices that are also points of interconnection (including Intra Candidate Area Backhaul Services, tail extension service and other inter-CO fibre services; but excluding national / inter-candidate area backhaul services such as **Chorus** Regional Transpower);

Co-location and interconnection services: Network equipment accommodation and management services including network interconnection services (including Central Office and points of interconnection Co-location services, handover connections, Ethernet handover connections, tie-cables and jumpering); and

Connection services: Services to install and enable “FFLAS” between **communal fibre network** infrastructure and an **end-user’s** premises, building or other access point (including pre-wiring, cable and duct fit-out);

- A3.3.8 **fibre network** has the same meaning as defined in s 5 of the **Act**;
- A3.3.9 **historical** means for each of the calendar years in the period from 1 January 2016 to 31 December 2021;
- A3.3.10 **IM Determination** means the Fibre Input Methodologies Determination 2020 [2020] NZCC 21 (13 October 2020) and the subsequent amendments made as part of Fibre Input Methodologies (initial value of financial loss asset) Amendment Determination 2020 [2020] NZCC 24 (3 November 2020), Fibre Input Methodologies (base capex and connection capex baseline allowance determination dates) Amendment Determination 2021 [2021] NZCC 17 (29 September 2021), and Fibre Input Methodologies Amendment Determination (No.2) 2021 [2021] NZCC 25 (29 November 2021);
- A3.3.11 **operating cost** has the meaning in clause B1.1.1(2) of Schedule B in the **IM Determination**;
- A3.3.12 **opex** has the meaning of paragraph (b) of the definition of ‘operating expenditure’ in the **IM Determination**;
- A3.3.13 **opex information** means the information **Chorus** is required to provide in response to the information requirements under the heading ‘Opex information’ in this notice;
- A3.3.14 **opex proposal** means a written application submitted by **Chorus** to the **Commission** for approval of **opex** allowances;
- A3.3.15 **opex sub-category group** means the opex categories set out in the column labelled “Opex category groups” in Attachment B;
- A3.3.16 **opex sub-category** means the opex categories set out in the column⁷ labelled “Opex sub-category groups” in Attachment B;

⁷ Commerce Commission “Fibre information disclosure and price-quality regulation – Proposed process and approach for the first regulatory period” (15 September 2020), Chapter 6.

A3.3.17 **PQ FFLAS scope** means the scope of **PQ FFLAS** based on the following Commission emerging views on the scope of **PQ FFLAS**, and means:

in areas where it is arguable whether the other **LFC** has installed a **fibre network** under the **UFB initiative, regulated FFLAS** supplied by **Chorus** to **end-users** should be subject to ID-only regulation;

and that any additional **FFLAS** that Chorus constructs after 1 January 2022 within another **LFC's** "geographical area" will be exempt from PQ regulation and subject to ID regulation only;

A3.3.18 **PQP1** has the meaning of 'first regulatory period' in the **IM Determination**;

A3.3.19 **PQP2** has the meaning of 'second regulatory period' in the **IM Determination**;

A3.3.20 **priority base capex sub-category** means the **base capex sub-categories** set out in the column labelled 'priority base capex sub-categories' in Attachment B;

A3.3.21 **priority opex sub-category** means the **opex sub-categories** set out in the column labelled 'priority opex sub-categories' in Attachment B;

A3.3.22 **proposed connection type** means the connection types that are proposed to be the 'connection types' as set out in the **IM Determination**, as set out in the column labelled "Connection type" in Attachment B;

A3.3.23 **quality dimensions** means the mandatory quality dimensions and optional quality dimensions set out in clauses 3.6.1-3.6.2 of the **IM Determination**;

A3.3.24 **UFB FFLAS** means any **FFLAS** provided by a **regulated fibre service provider** under the **UFB initiative** for the **financial loss period**; and

A3.3.25 **UFB initiative** has the meaning as set out in s 5 of the **Act**.

A4 Where **Chorus** provides any financial information other than in **regulatory templates**, it must:

- A4.1 identify whether this information is provided in nominal terms or constant-price terms; and
- A4.2 state the base year (where applicable).

General information

Summary information

- A5 Provide a summary document that:
 - A5.1 lists the name of each file provided in response to the requirements set out in this notice and a brief description of the information each file contains;
 - A5.2 shows where the **Commission** can find the information provided by **Chorus** in response to each requirement set out in this notice; and
 - A5.3 includes a glossary of key terms used by **Chorus** in its response to this notice where the terms are not defined in this notice or the **IM Determination**.
- A6 Provide a summary of the parts of **Chorus'** company structure that are involved in the delivery of **PQ FFLAS**, including:
 - A6.1 a current company structure map, including:
 - A6.1.1 **Chorus** and all of its related companies and subsidiaries;
 - A6.1.2 a high-level description of the main functions of each company and subsidiary and their relationship with **Chorus**; and
 - A6.1.3 any proposed material changes planned to be made to **Chorus'** company structure for or in **PQP2**;
 - A6.2 a current organisation chart, including:
 - A6.2.1 a description of each operating unit;
 - A6.2.2 the relationships between the operating units; and
 - A6.2.3 staff numbers for each operating unit; and
 - A6.3 any already-confirmed material changes planned to be made to **Chorus'** company or organisational structure for or in **PQP2** that can be expected to alter **opex** or **capex** for **PQP2**.

Overall expenditure information

- A7 Provide the following information:
- A7.1 **Chorus'** asset management policy; and
 - A7.2 **Chorus'** strategic asset management plan.
- A8 Provide **Chorus' integrated fibre plan**, as required by clause 3.7.7 of the **IM Determination**.
- A9 Provide a description of:
- A9.1 the processes **Chorus** uses to plan, deliver, maintain, and operate **Chorus' fibre assets**, including the assets associated with the proposed **base capex** and proposed **connection capex**; and
 - A9.2 **Chorus' fibre network(s)**, including a geographical representation, and connection numbers by region.
- A10 Provide a description of the external and internal drivers that materially impact or influence **Chorus' proposed base capex**, proposed **connection capex** and proposed **opex**. The explanation must, to the extent relevant, include:
- A10.1 how **Chorus'** business strategy is reflected in the proposed **base capex**, proposed **connection capex**, and proposed **opex**;
 - A10.2 how and where **Chorus'** asset management strategies are reflected in proposed **base capex**, proposed **connection capex** and proposed **opex**;
 - A10.3 where quality is a key driver for the proposed **expenditure**; and
 - A10.4 an explanation of material linkages and trade-offs between proposed **opex** and proposed **base capex**, proposed **connection capex**, quality or other outcomes.
- A11 Provide an explanation of where and how **Chorus** considers the proposed **base capex**, proposed **connection capex**, or proposed **opex** is likely to materially impact competitive dynamics or outcomes.
- A12 Provide a description of the legislative obligations that materially affect the proposed **base capex**, proposed **connection capex**, and proposed **opex**.
- A13 Provide an explanation of the trends and underlying causes or drivers for the trends in the **historical expenditure**, **PQP1 expenditure**, proposed **base capex**, proposed **connection capex** and proposed **opex**, including any material differences between historical expenditure and forecast expenditure.

- A14 Provide **Chorus' capital contributions** policy that applies to the proposed **base capex** and proposed **connection capex**.
- A15 Provide a list and description of **Chorus'** policies, strategies, other management frameworks, and risks assessments that materially influence the proposed **base capex**, proposed **connection capex** and proposed **opex**, including where relevant to each **expenditure sub-category**.
- A16 Provide an explanation of the basis for **Chorus'** forecast insurance (including self-insurance), including with reference to relevant company policies and external advice.

Proposal governance

- A17 Provide an explanation of the governance process used in developing the proposed **base capex**, proposed **connection capex** and proposed **opex**. The explanation must include:
- A17.1 a description of the approval process **Chorus** used for adopting the proposed **base capex** and proposed **connection capex**, including milestones that have been passed in respect of **Chorus'** internal governance and approval policies;
 - A17.2 the extent of reviews undertaken to ensure the quality and accuracy of the material incorporated within the proposals; and
 - A17.3 what internal or external challenge rounds were undertaken, the changes that resulted from such challenges, and which staff (by role) were involved in the challenge rounds.

Consultation

- A18 Provide a detailed explanation of:
- A18.1 the stakeholder consultation and engagement **Chorus** has undertaken on proposed **base capex**, proposed **connection capex**, and proposed **opex**, its effectiveness and its impact on proposed **base capex**, proposed **connection capex**, and proposed **opex**; and
 - A18.2 how and where any feedback received as a result of the consultation has been incorporated into, and what impact it has had on the proposed **base capex**, proposed **connection capex**, and proposed **opex**.

Deliverability and procurement

- A19 Provide an explanation of:

- A19.1 the strategy, approach, and plans for how **Chorus** expects to resource and deliver the proposed **base capex**, proposed **connection capex**, and proposed **opex**, including key assumptions regarding deliverability;
- A19.2 key risks associated with delivering the levels of proposed **base capex**, proposed **connection capex**, and proposed **opex** including for each risk:
 - A19.2.1 its potential impact on expenditure and outcomes, including quality;
 - A19.2.2 planned mitigations.
- A19.3 the procurement process for outsourced services, including an explanation of the extent to which the process will involve competitive bidding, and if not, why not; and
- A19.4 details of service level agreements and associated incentive arrangements in service company contracts, included but not limited to those that impact on PQ FFLAS quality outcomes.

Cost and efficiency

- A20 Provide an explanation and evidence demonstrating if, and how Chorus has, in relation to proposed **base capex**, proposed **connection capex**, and proposed **opex**:
 - A20.1 pursued, and is pursuing, process improvements that led or will lead to cost efficiencies and reduce **expenditure**;
 - A20.2 the impact that any process improvements that have or will led to trade-offs between proposed **base capex**, proposed **connection capex**, and or proposed **opex**;
 - A20.3 ensured and is seeking to ensure appropriate least whole-of-life cost and efficiency improvements;
 - A20.4 pursued and is pursuing cost reduction strategies for its **projects** and **programmes**; and
 - A20.5 ensured and is seeking to ensure that both internal and external suppliers of goods and services have incentives to perform well and to identify cost savings.
- A21 Provide a description and explanation of any efficiency assumptions that **Chorus** has applied in any of its proposed **base capex**, proposed **connection capex**, and proposed **opex**.

Links between expenditure proposals and financing

A22 Provide:

- A22.1 a summary of **Chorus'** strategies for dividends and debt management applicable to **PQP2**;
- A22.2 an explanation of how **Chorus'** strategies for dividends and debt management are consistent with the equivalent information available to **Chorus's** external stakeholders immediately prior to **Chorus** submitting its **base capex proposal, connections capex baseline proposal** and **opex proposal**;
- A22.3 an explanation of how **Chorus'** strategy for dividends and debt management are consistent with proposed **base capex**, proposed **connection capex**, and proposed **opex**; and
- A22.4 if **Chorus** makes assumptions in its responses to A22.1-A22.3 above that differ from its standard corporate modelling, describe those assumptions.

Base capex

General information

- A23 For each **base capex sub-category**, provide a list of the models **Chorus** used to determine the proposed **base capex** and a description of how **Chorus** has used those models.
- A24 If applicable, provide an explanation of the rationale for opting to include any **non-linear connection costs** in proposed **base capex** rather than proposed **connection capex**, including the value of such costs.

Base capex – non-priority sub-categories

- A25 For each **base capex sub-category** that is not a **priority base capex sub-category**, provide a high-level description of:
 - A25.1 key drivers, outputs and outcomes **Chorus** is targeting, including in relation to quality (where applicable);
 - A25.2 the expenditure forecasting approach used;
 - A25.3 key forecasting assumptions; and
 - A25.4 material risks.

Priority base capex sub-categories

- A26 For each **priority base capex sub-category**, provide a detailed explanation of:

- A26.1 the need for the proposed expenditure;
- A26.2 outputs and outcomes Chorus is targeting, including any material impact on quality;
- A26.3 processes relevant to planning and delivery, and the milestones that have been passed in respect of **Chorus'** internal governance and approval policies;
- A26.4 applicable asset lifecycle management objectives and strategies;
- A26.5 the forecast methodology and models used, why they are appropriate and the extent to which they incorporate a risk-based approach;
- A26.6 input data used, including information on data quality and vintage;
- A26.7 key assumptions, with supporting reasons and analysis of associated uncertainty (including in quantitative terms) and the impact of that uncertainty;
- A26.8 key risks, with impacts and planned mitigations;
- A26.9 sensitivity analysis used to test the proposed expenditure;
- A26.10 alternatives to the proposed expenditure that were considered;
- A26.11 economic analysis used to test the merits of the proposed expenditure;
- A26.12 the anticipated impact of the proposed expenditure on proposed **connection capex** and **opex**; and
- A26.13 any efficiency assumptions that **Chorus** has applied in the proposed **base capex**.

A27 Provide an explanation of how Chorus has taken a risk-based approach in developing the forecast in each proposed **base capex sub-category**.

A28 Provide a sample of business cases (where applicable) for **projects** or **programmes** within each **priority base capex sub-category**.

Connection capex

Specific information

A29 For each **connection type** or **connection sub-type** (as appropriate) provide an explanation of:

- A29.1 associated assets and cost components;
 - A29.2 why the **connection type** is an appropriate grouping of **connection sub-types**;
 - A29.3 any material impact of proposed expenditure on quality;
 - A29.4 the approach used to forecast volumes and unit costs, including for **non-linear connection costs**;
 - A29.5 governance processes relevant to planning and delivery;
 - A29.6 applicable asset lifecycle management objectives and strategies;
 - A29.7 the forecast methodologies and models used, why they are appropriate and the extent to which they incorporate a risk-based approach. The explanation of the models should include a list of the models used by **Chorus** to determine the proposed **connection capex**;
 - A29.8 input data used, including information on data quality and age;
 - A29.9 key assumptions, with supporting evidence and analysis of associated unit cost uncertainty in quantitative terms if applicable, including **capital contribution** assumptions;
 - A29.10 assumptions regarding **PQ FFLAS** pre-installations, and the impact of these assumptions on proposed **connection capex** and proposed **base capex**;
 - A29.11 key risks, with impacts and planned mitigations;
 - A29.12 sensitivity or impact analysis used to test the proposed expenditure;
 - A29.13 alternatives to the proposed expenditure that were considered;
 - A29.14 economic analysis used to test the merits of the proposed expenditure;
and
 - A29.15 the anticipated impact of the proposed expenditure on proposed **base capex** and **opex**.
- A30 For proposed **non-linear connection costs** (if any), provide an explanation of:
- A30.1 the proposed **non-linear connection cost function** and its derivation;
 - A30.2 how **Chorus** has ensured those costs are not also included in proposed **base capex** or other **connection capex**.

Other specific information (capex)

Individual capex

A31 Provide an overview of any **individual capex proposals** that **Chorus** is considering proposing prior to or during **PQP2**.

Capitalisation of costs

A32 Provide a summary of **Chorus'** approach for capitalising labour costs and any other costs **Chorus** capitalises.

A33 Provide a quantitative demonstration that **Chorus'** proposed **base capex**, **connection capex**, and **opex** do not (in aggregate) double-count capitalised costs.

Opex information

General information – opex

A34 Provide a list of the models **Chorus** used to determine the proposed **opex** and a description of how **Chorus** has used each of them when forecasting the proposed **opex** for each **opex sub-category**.

Information on Opex non-priority sub-categories

A35 For each **opex sub-category** that is not a **priority opex sub-category**, provide a high-level description of:

A35.1 key outputs and outcomes **Chorus** is targeting, including in relation to quality (if applicable);

A35.2 the expenditure forecasting approach used;

A35.3 key forecasting assumptions; and

A35.4 material risks associated with that **opex sub-category**.

Information on priority opex sub-categories

A36 For each **priority opex sub-category**, provide an explanation of:

A36.1 the need for the proposed expenditure;

A36.2 outputs and outcomes **Chorus** is targeting, including any material impact on quality;

A36.3 relevant governance processes, including milestones that have been passed in respect of **Chorus'** internal governance and approval policies ;

A36.4 the forecast methodology and models used, and why they are appropriate;

- A36.5 input data used, including information on data quality and vintage;
- A36.6 key assumptions, with supporting reasons and analysis of associated uncertainty (including in quantitative terms if applicable) and the impact of that uncertainty;
- A36.7 key risks, with impacts and planned mitigations;
- A36.8 sensitivity analysis used to test the proposed expenditure;
- A36.9 the anticipated impact of the proposed expenditure on the proposed **connection capex** and proposed **base capex**. The explanation should include:
 - A36.9.1 the detail of any quantitative or economic analysis undertaken to establish or influence the proposed **opex**;
 - A36.9.2 identification of any efficiency assumptions that **Chorus** has applied in the proposed **opex**; and
 - A36.9.3 any factors driving a material change in the proposed **opex** for each **opex sub-category** from the opex incurred in **PQP1**.

Cost escalators and foreign exchange assumptions

- A37 For any **cost escalator** used in the **base capex proposal**, **connection capex baseline proposal** or **opex proposal**, provide a description of:
 - A37.1 the **cost escalator** and the rationale for its use;
 - A37.2 the methodology used to forecast movement of the **cost escalator**, including the inputs and assumptions used; and
 - A37.3 the weighting given to the **cost escalator**, and how the weighting was determined.
- A38 Provide any consultant reports used in developing **cost escalator** forecasts.
- A39 For any foreign exchange rate adjustments used in the **base capex proposal**, **connection capex baseline proposal** or **opex proposal**, provide:
 - A39.1 historical and forecast (as applicable) foreign exchange rates, and the source of those rates; and
 - A39.2 forecast exposure to exchange rate movements for each currency for each **regulatory year** of **PQP2**, and an explanation of how those exposures were estimated.

Regulatory templates

- A40 Provide quantitative information regarding the **base capex proposal**, **connection capex baseline proposal**, and **opex proposal** in the **regulatory templates** that:
- A40.1 meets the minimum content and format requirements set out in Attachment C; and
 - A40.2 applies the **base capex sub-categories**, **connection capex types**, and **opex subcategories** in Attachment B.
- A41 Where **Chorus** considers information that must be provided in a **regulatory template** to be confidential, provide versions of the **regulatory template** both with and without the confidential information.

Cost allocation

General requirements for opex and capex cost allocation

- A42 Provide an overview (including a graphical illustration) of the process and key assumptions **Chorus** used for allocating costs that are **directly attributable** to **PQ FFLAS** and **opex** and asset values that are not **directly attributable** to **PQ FFLAS** in the proposed **base capex**, proposed **connection capex**, proposed **individual capex** (if any) and proposed **opex**.
- A43 Provide an explanation of what internal or external review has been undertaken as part of the allocation process (eg of key assumptions and models).
- A44 Provide the following for proposed **base capex**, proposed **connection capex**, and proposed **opex**:
- A44.1 the **allocator types**, **cost allocators**, **asset allocators** and **allocator values** **Chorus** used for each **PQP2 regulatory year**, including whether the **cost allocators** and **asset allocators** applied are based on a **causal relationship** or a **proxy cost allocator**;
 - A44.2 a summary of instances where the same **allocator types** have been applied:
 - A44.2.1 for similar expenditure types; and
 - A44.2.2 across time for a given expenditure type;
 - A44.3 a summary of instances where different **allocator types** have been applied:
 - A44.3.1 for similar expenditure types; and

- A44.3.2 across time for a given expenditure type;
- A44.4 an explanation of how:
- A44.4.1 any proposed **proxy cost allocators** or proposed **proxy allocators** that were not used to determine **PQP1** expenditure allowances, meet the 'objectively justifiable and demonstrably reasonable' test in the **IM Determination**; and
- A44.4.2 any **proxy cost allocators** or **proxy allocators** that were used to determine **PQP1** expenditure allowances but are being applied to expenditure differently than in **PQP1**, are objectively justifiable and demonstrably reasonable;
- A44.5 an explanation of how **Chorus** has determined that **proxy cost allocators** and **proxy asset allocators** that have not changed since **PQP1** continue to meet the 'objectively justifiable and demonstrably reasonable' test in the **IM Determination**;
- A44.6 In respect of **Chorus'** most recent review of its choice of **allocator types** for **cost allocators, proxy cost allocators, asset allocators** and **proxy asset allocators** as required by clause 2.1.3(1)(b) of the IM Determination:
- A44.6.1 the results of that review; and
- A44.6.2 an explanation of any changes that were made to its choice of **allocator types** for **cost allocators, proxy cost allocators, asset allocators** and **proxy asset allocators** that have been included in its **PQP2** expenditure proposals.
- A44.7 a description of any modifications or corrections made to **cost allocators, proxy cost allocators, asset allocators** and **proxy asset allocators** since the final **PQP1** determination;⁸ and
- A44.8 an explanation of the proposed cost allocation of the proposed **base capex** and proposed **opex** for each **base capex sub-category** and **opex sub-category**, including:
- A44.8.1 where forecast allocation values used to allocate expenditure to **PQ FFLAS** (for proposed **opex** and **base capex**), evidence that they are based on relevant and demonstrably reasonable assumptions, data, methods and judgements;

⁸ *Fibre Price-Quality Path Determination 2021 [2021] NZCC 27*

- A44.8.2 where **Chorus** provides **historical** allocated information, details of and justification for any cost and asset allocation assumptions **Chorus** made to allocate expenditure to **UFB FFLAS** (for proposed **opex** and **base capex**); and
- A44.8.3 where **allocator values** have changed materially since **PQP1**, an explanation for the changes.

Information required on cost allocation between PQ FFLAS and ID-only FFLAS

- A45 In relation to allocating forecast common costs between **PQ FFLAS** and **ID-only FFLAS** (where **Chorus** must apply the **PQ FFLAS scope**), provide:
- A45.1 an overview of the process and systems used, including any key assumptions, to develop forecast cost allocators consistent with the working assumption for “**PQ FFLAS scope**”; and
- A45.2 a summary of the forecast cost allocation outcome between **PQ FFLAS**, **ID-only FFLAS** and **services that are not regulated FFLAS** for the proposed **capex** and proposed **opex** for each **regulatory year** of **PQP2**.

Cross-expenditure type programme or project specific information

- A46 Provide:
- A46.1 for each **regulatory year** of **PQP2**, proposed **opex**, proposed **base capex**, proposed **connection capex** or revenue (i.e., where costs are taken to revenue) for:
- A46.1.1 **projects** or **programmes** aimed at increasing the number of **PQ FFLAS end-users**, including incentive programmes and discount programmes; and
- A46.1.2 **projects** or **programmes** aimed at retaining **PQ FFLAS end-users**, including incentive programmes, retention programmes and discount programmes;
- A46.2 in relation to **direct fibre access services**:
- A46.2.1 the actual or estimated number of **direct fibre access services** connections before 1 January 2025;
- A46.2.2 the forecast number of **direct fibre access services** connections for each **regulatory year** of **PQP2**;
- A46.2.3 proposed **base capex**, proposed **connection capex** or proposed **opex** related to **direct fibre access services**;

- A46.2.4 a justification for the level of expenditure proposed for **direct fibre access services**;
 - A46.2.5 when responding to paragraph A46.2.1, **Chorus** may determine an appropriate reference date to report on, where the reference date used must be consistent with the information provided in response to paragraph A46.2.2; and
 - A46.2.6 provide a list of **direct fibre access services** **Chorus** proposes to offer during **PQP2**, including a summary of each service;
 - A46.3 a description and value of all proposed **base capex**, proposed **connection capex**, and **opex** related to layer 1 PQ FFLAS;
 - A46.4 a justification for the level of expenditure proposed for layer 1 PQ FFLAS;
 - A46.5 the value of all forecast **capital contributions** in relation to each of the proposed **base capex sub-categories**;
 - A46.6 the value and description of any proposed **base capex**, proposed **connection capex** or proposed **opex** related to innovation (where **Chorus** is able to propose which expenditure it considers relates to innovation); and
 - A46.7 an overview of the **base capex** by each geographic breakdown proposed in the **regulatory templates**.
- A47 When responding to each of the requirements in paragraph A46 above, **Chorus** may make simplifying assumptions to provide a high-level estimate for each of the requirements. Where **Chorus** makes any such simplifying assumptions, **Chorus** must provide a summary of the key assumptions.
- A48 In relation to **Chorus'** proposed expenditure on marketing, provide:
- A48.1 an overview of how **Chorus'** different marketing initiatives are managed collectively, including whether trade-offs are considered and made between different marketing types such as retail and wholesale marketing and customer acquisition and retention payments; and
 - A48.2 a description of the economic analysis used to determine total marketing expenditure and its constituent parts.

Connections and Demand Forecasts

- A49 In relation to the forecast number of connections forecast in each year of **PQP2**, provide:

- A49.1 an explanation of the quantitative methodology and the data sets used, including specifically the methodology used to forecast:
- A49.1.1 the number of total net connections;
 - A49.1.2 the number of new connections;
 - A49.1.3 the number of new intact connections;
 - A49.1.4 the number of upgrades;
 - A49.1.5 the number of disconnections; and
 - A49.1.6 any ranges associated with the forecasts of new connections, new intact connections, upgrades and disconnections;
- A49.2 the assumptions that are relied upon or utilised in the forecasting of connections and upgrades.

A50 In relation to the forecast of demand for network capacity, provide a detailed description of the quantitative forecast methodology, data sets used and the assumptions relied upon or used in the forecasts.

Resilience Expenditure

- A51 In relation to **Chorus'** proposed expenditure on improving the resilience of Chorus' fibre network, provide:
- A51.1 an overview of the proposed expenditure;
 - A51.2 a description of the quantitative, economic or other analysis used to determine the proposed expenditure;
 - A51.3 the total resilience expenditure across all capex categories;
 - A51.4 the break of the capex expenditure by **base capex category** and **connection capex sub-type**;
 - A51.5 a description by **base capex category** and **connection capex sub-type** of the reason for the proposed expenditure, the risk or risks being managed or mitigated, alternatives considered, and whether the proposed expenditure will result is within the current network or equipment architecture standards; and
 - A51.6 any proposed **opex** that is proposed to improve the response time to high impact events.

Audit requirements

A52 Provide a report by an **auditor** that states whether:

A52.1 any historical financial information that forms part of the **opex information** has been:

A52.1.1 compiled, in all material respects, in accordance with the requirements of this notice;

A52.1.2 properly extracted from **Chorus'** financial records sourced from its financial systems; and

A52.1.3 audited in accordance with applicable auditing standards issued by the External Reporting Board in accordance with its functions under the Financial Reporting Act 2013 or any equivalent standards that replace these standards;

A52.2 any historical non-financial information that forms part of the **opex information** has been:

A52.2.1 compiled, in all material respects, in accordance with the requirements of this notice;

A52.2.2 properly compiled on the basis of the relevant underlying source information; and

A52.2.3 examined in accordance with applicable assurance standards;

A52.3 any forecast financial information that forms part of the **opex information** has been:

A52.3.1 compiled, in all material respects, in accordance with the requirements of this notice;

A52.3.2 properly compiled on the basis of disclosed assumptions and relevant underlying source information; and

A52.3.3 examined in accordance with applicable assurance standards; and

A52.4 any forecast non-financial information that forms part of the **opex information** has been:

A52.4.1 compiled in all material respects in accordance with the requirements of this notice;

- A52.4.2 properly compiled on the basis of the disclosed assumptions and the relevant underlying source information; and
- A52.4.3 examined in accordance with applicable assurance standards.

Attachment B Base capex and opex sub-categories and connection types

Base capex sub-category groups	Base capex sub-categories	Priority base capex subcategories
Extending the Network	Augmentation	✓
Extending the Network	New Property Developments	
Extending the Network	UFB Communal	
IT and Support	Business IT	✓
IT and Support	Corporate	
IT and Support	Network & Customer IT	✓
Installations	Complex Installations	
Installations	Standard Installations	✓
Network Capacity	Access	✓
Network Capacity	Aggregation	✓
Network Capacity	Transport	
Network Sustain and Enhance	Field Sustain	✓
Network Sustain and Enhance	Relocations	
Network Sustain and Enhance	Resilience	✓
Network Sustain and Enhance	Site Sustain	

Connection type	Connection sub-type
Group 1	UFB1 - SDU - Greenfields
Group 1	UFB2 - SDU - Greenfields
Group 1	UFB1 - SDU - SDU off MDU
Group 1	UFB2 - SDU - SDU off MDU
Group 2a	UFB1 - SDU - Aerial
Group 2a	UFB2 - SDU - Aerial
Group 2a	UFB1 - SDU - Haul/Conduit
Group 2a	UFB2 - SDU - Haul/Conduit
Group 2a	UFB1 - SDU - Surface Mount
Group 2a	UFB2 - SDU - Surface Mount
Group 2b	UFB1 - SDU - Civil
Group 2b	UFB2 - SDU - Civil

Group 3	UFB2 - MDU - Class 1 (2-5 DPs)
Group 3	UFB1 - MDU - Class 1 (2-5 DPs)
Group 3	UFB2 - ROW - Grade 1 (2-5 Buildings)
Group 3	UFB1 - ROW - Grade 1 (2-5 Buildings)
Group 3	UFB1 - Fibre Access
Group 4	UFB1 - ROW - Grade 2 (6-12 Buildings)
Group 4	UFB1 - MDU - Class 2 (6-12 DPs)
Group 4	UFB2 - MDU - Class 2 (6-12 DPs)
Group 4	UFB2 - ROW - Grade 2 (6-12 Buildings)
Group 4	UFB2 - MDU - Other
Group 4	UFB1 - MDU - Other
Group 5	UFB1 - ROW - Grade 3 (13-48 Buildings)
Group 5	UFB1 - MDU - Class 3 (13-48 DPs)
Group 5	UFB2 - MDU - Class 3 (13-48 DPs)
Group 5	UFB2 - ROW - Grade 3 (13-48 Buildings)
Group 6	UFB2 - MDU - Class 4 (48+ DPs)
Group 6	UFB1 - ROW - Grade 4 (49+ Buildings)
Group 6	UFB1 - MDU - Class 4 (48+ DPs)
Group 7	Hyperfibre installations
Group 8	Non-hyperfibre installations
Group 9	Complex installations
Group 10	Hyperfibre access (non-linear costs)

Opex sub-category groups	Opex sub-categories	Priority opex sub-categories
Customer	Customer operations	
Customer	Product, Sales & Marketing	✓
Network	Maintenance	✓
Network	Network Operations	
Network	Operating costs	
Support	Asset Management	✓
Support	Corporate	✓
Support	Technology	✓

Attachment C Minimum content for quantitative information (regulatory templates)

RT01 – Forecast and historic expenditure

- Links within RT01 are live-linked, rather than hard-coded. Links between other templates should be referenced so any hard coded numbers between templates can be traced.
- There are title, contents and overview sheets
- The form of the summary sheet
 - Covers years of RP1 (2022, 2023, 2024) and RP2, (2025, 2026, 2027, and 2028)
 - All amounts are FFLAS
 - Total capex, aggregate base capex, connections capex and opex
 - Rows for aggregate
 - constant price numbers (excluding and including IDC),
 - amount from CPI, RPE, FX and
 - nominal numbers
 - Value of commissioned asset for base capex and connections capex
- The form of the capex sheet
 - Covers calendar years 2016 to 2029 (see below for detail)
 - All amounts are FFLAS (either UFB FFLAS from 2016 to 2021 or PQ FFLAS from 2022 to 2029)
 - Total capex split in rows for expenditure categories and sub-categories
 - Total capex also split into 3 rows for base capex, connections capex and individual capex (where relevant)
 - Base capex split in rows for expenditure categories and sub-categories
 - Breakdown of connection capex into complex installations, standard installations and access capex
 - Breakdown of lease cash flows relating to leases in base capex
 - Columns for:
 - Capital expenditure excluding IDC at constant prices – 2023 to 2029
 - IDC rate
 - Capital expenditure including IDC at constant prices – 2023 to 2029
 - RPE and FX (from RT02) – 2023 to 2029
 - Capital expenditure in real prices – 2016 to 2029
 - CPI (from RT02) – 2016 to 2029
 - Capital expenditure at nominal prices – 2016 to 2029
 - WIP days
 - Commissioned value – 2023 to 2029

- **The form of the opex sheet**
 - Covers calendar years 2016 to 2029 (see below for detail)
 - All amounts are FFLAS (either UFB FFLAS from 2016 to 2021 or PQ FFLAS from 2022 to 2029)
 - Total opex split in rows for expenditure categories and sub-categories
 - Columns for:
 - Opex at constant prices – 2023 to 2029
 - RPE (from RT02) – 2023 to 2029
 - Opex at real prices – 2016 to 2029
 - CPI (from RT02) – 2016 to 2029
 - Opex at nominal prices – 2016 to 2029
- **Capex split into geographic breakdown**

RT02 – Cost escalation

- **Links within the sheets of RT02 are live-linked, rather than hard-coded. Links between other templates should be referenced so any hard coded numbers between templates can be traced.**
- **There are title, contents and overview sheets**
- **The form of the ‘Escalation calc – forecast’ sheet**
 - Covers calendar years 2022 to 2029
 - All amounts are FFLAS (PQ FFLAS)
 - Total capex split in rows for expenditure categories and sub-categories
 - Total capex also split into 3 rows for base capex, connections capex and individual capex (where relevant)
 - Breakdown of connection capex into complex installations, standard installations and access capex
 - Breakdown of lease cash flows relating to leases in base capex
 - Total opex split in rows for expenditure categories and sub-categories
 - Columns across 2022 to 2029 for:
 - Capital expenditure including IDC at constant prices (from RT01) and Opex at constant prices (from RT01)
 - RPE (calculated using an index from another sheet)
 - CPI (calculated using an index from another sheet)
 - FX (calculated on another sheet) – but only relevant for capex
 - Capital expenditure at nominal prices and Opex at nominal prices
- **The form of the ‘Real terms historic’ sheet**
 - Calendar years 2016 to 2021

- All amounts are FFLAS (UFB or PQ FFLAS)
- Total capex split in rows for expenditure categories and sub-categories
- Total capex also split into 3 rows for base capex, connections capex and individual capex (shown as n/a)
- Breakdown of connection capex into complex installations, standard installations and access capex
- Breakdown of lease cash flows relating to leases in base capex
- Total opex split in rows for expenditure categories and sub-categories
- Columns across 2016 to 2021 for:
 - Capital expenditure at nominal prices or Opex at nominal prices
 - CPI (calculated using an index from another sheet)
 - Capital expenditure at real prices or Opex at real prices
- The form of the 'Capex – RPE indices' sheet
 - Sets out real price changes by year for the relevant RPE activities – 2023 to 2029 (2022 being the base year)
 - Sets out percentage weightings of those RPE activities for each cost sub-category
 - Uses those percentage weightings to generate an RPE index number for each cost sub-category for each year 2023 to 2029
 - The index value in each case for 2022 (31 December 2022) is 1
- The form of the 'Opex – RPE indices' sheet
 - This is the same as the capex sheet, but for the opex sub-categories
- The form of the 'CPI forecast and index' sheet
 - Sets out a calculation of the regulatory CPI index value for 2016 to 2029
 - The index value for 2022 (31 December 2022) is 1
 - This uses the methodology specified in the RP1 Final Decision for calculating CPI
- The 'FX adjustments (up to decision)' sheet is only relevant to capex. It calculates any last-minute adjustment necessary to update to the FX rates forecast in the RP2 proposal.
- It should specify for each year the NZD value of capex subject to FX, the relevant currency and the relevant FX rates for each year.

RT03 – Cost allocations

- There are title, contents and overview sheets
- The form of the 'Capex (forecast)' sheet
 - Covers calendar years 2022 to 2029
 - Total capex split in rows for expenditure categories and sub-categories
 - Total capex split in rows by expenditure categories, expenditure sub-categories and allocation driver (e.g. UFB A-D lost, Shared with copper duct lost etc.)
 - Table showing the percentage allocated to FFLAS for each allocation driver by year (the asset allocator)
 - Columns across 2022 to 2029 for:
 - Unallocated capex (excl. IDC) at constant prices
 - Percentage allocated to FFLAS
 - FFLAS Capex (excl. IDC) at constant prices
 - Reference columns showing:
 - Allocator identifier (reference)
 - Allocator change from PQP1 allocator
- The form of the 'Capex (historic)' sheet
 - Covers calendar years 2016 to 2021
 - Total capex split in rows for expenditure categories and sub-categories
 - Total capex split in rows by expenditure categories, expenditure sub-categories and allocation driver (e.g. UFB A-D lost, Shared with copper duct lost etc.)
 - Table showing the percentage allocated to FFLAS for each allocation driver by year (the asset allocator)
 - Columns across 2016 to 2021 for:
 - Unallocated capex at nominal prices
 - Percentage allocated to FFLAS FFLAS Capex at nominal prices Reference column showing:
 - Allocator identifier (reference)
- The form of the 'Opex (forecast)' sheet
 - Covers calendar years 2022 to 2029
 - Opex split in rows for expenditure categories and sub-categories
 - Opex split in rows by expenditure categories, expenditure sub-categories and allocated service (e.g. FFLAS (fibre) directly attributed, Costs allocated using totex, etc.)
 - Table showing the percentage allocated to FFLAS for each allocated service by year (the cost allocator)
 - Reference columns showing:
 - Allocator identifier (reference)
 - Allocator change from PQP1 allocator

- **Columns across 2022 to 2029 for:**
 - **Unallocated Opex at constant prices**
 - **Percentage allocated to FFLAS**
 - **FFLAS Opex at constant prices**
- **The form of the 'Opex (historic)' sheet**
 - **Covers calendar years 2016 to 2021**
 - **Opex split in rows for expenditure categories and sub-categories**
 - **Opex split in rows by expenditure categories, expenditure sub-categories and allocated service (e.g. FFLAS (fibre) directly attributed, Costs allocated using totex etc.)**
 - **Table showing the percentage allocated to FFLAS for each allocated service by year (the cost allocator)**
 - **Columns across 2016 to 2021 for:**
 - **Unallocated opex at nominal prices**
 - **Percentage allocated to FFLAS**
 - **FFLAS opex at nominal prices**
 - **Reference column showing:**
 - **Allocator identifier (reference)**

RT04 – Connection capex

- **Links within RT04 are live-linked, rather than hard-coded. Links between other templates should be referenced so any hard coded numbers between templates can be traced.**
- **There are title, contents and overview sheets**
- **The form of the 'Breakdown' sheet**
 - **Covers calendar years 2016 to 2029**
 - **Breakdowns into the connection capex groups ("connection type" per the IM Determination), showing for each for each year of RP1:**
 - **The connection type name (e.g. 'Group 1', 'Group 2a')**
 - **Volume**
 - **Weighted average unit cost**
 - **Connections capex (volume x unit cost)**
 - **Connections capex above aggregated into complex installations (group 9), standard installations (groups 1 to 8) and access capex (group 10)**
 - **The breakdowns above in constant prices (2022 to 2029), real (2016 to 2029) and nominal (2016 to 2029)**
 - **The total nominal connections capex for each year**
- **The form of the 'Connections Capex adjustment' sheet**
 - **Covers the years of RP2 – 2025 to 2028**
 - **Forecast and actual volumes for each connection type**
 - **Forecast unit costs in nominal prices for each connection type**
 - **Those unit costs updated for actual volume in the case of non-linear costs, if relevant.**
 - **In each case the total cost to be split between variable connection costs and non-linear connection costs, if relevant**
 - **The difference between the total forecast capex and the total ex-post capex (using actual volumes)**
- **The form of the 'Constant real nominal prices' sheet**
 - **This sheet calculates the real and nominal unit costs for each connection type using cost escalation and other factors in RT01 and RT02**
- **The form of the 'Non-linear unit costs' sheet**
 - **Probably n/a and not included in the draft RT**