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By email: ben.oakley@comcom.govt.nz

14 May 2015

Dear Ben

COMMISSION'S FOLLOW UP QUESTIONS FOLLOWING FPP CONFERENCE – CONFIDENTIAL VERSION

1 We refer to your email of 24 April 2015 setting out a number of questions following the Commission's FPP conference on 14 – 17 April 2015.

2 In our letter of 12 May we provided our responses to all but one of the Commission's questions. Set out below is our response to the Commission's outstanding question regarding trenching costs.

Question 8: Provide TERA/Commission with details on the amount of trenching in Auckland used to derive the unit cost data

3 For the AK ESA (AT) the actual cost data was **[CI:** NZD /m**]**. This was a digging cost of **[CI:** NZD /m**]**, with the rest made up of traffic management, arborist, laterals and overheads. This average cost was based on a total of 16.5km of trench, across 36 projects in this ESA. However, the national rates used in Chorus' hybrid model are not skewed by the Auckland data for the reasons described below.

4 As described in Analysys Mason's cross-submission report to the Commission, trench costs per metre were calculated for each of the 778 ESAs in Chorus' network. Actual average costs per metre were derived for 132 ESAs (where there was enough project data). This includes the 7 ESAs in the Auckland/Wellington CBD areas. Values were then extrapolated for the remaining 646 ESAs using the 125 actual data points (i.e. the Auckland/Wellington CBD ESAs were excluded) via a statistical analysis. These 7 ESAs were excluded from the extrapolation to recognise that these costs were likely to be unique to these areas and, to avoid artificially high rates for other ESAs. This is the case for the trenching rates used in Analysys Mason's hybrid model, submitted to the Commission on 1 December 2014.

5 Analysys Mason's statistical estimation of average trenching costs at each ESA in Chorus' network were then blended on the basis of route metres in each ESA to derive average trenching costs by CSA (and then also nationally) in the hybrid model.

6 In Appendix 2, we set out a more detailed summary of the methodology Analysys Mason adopted to derive the ESA rates used in the hybrid model. This is consistent with the higher level summary included in our submissions on the draft determination.

7 We would be happy to provide the Commission with the underlying data to support the trenching rate used in the Analysys Mason hybrid model if useful

Confidentiality

8 We note that this letter contains confidential information. In order to provide our responses to the Commission as soon as possible we have not had time to carry out a detailed confidentiality review. We will identify the confidentiality status of the information contained in this letter and the reasons for our confidentiality requests as soon as we can.

9 Please feel free to contact me if you have any questions in relation to this letter.

Yours sincerely

Airihi Mahuika
Principal Counsel

Appendix 1 – Trenching rates

The following summarises the steps in the methodology Analysys Mason adopted to derive the trenching rates used in its hybrid model. Analysis Mason:

1 Investigated possible drivers that could influence the levels of trenching costs in different ESAs;

2 Quantified the drivers using the following available data sets:

- 2.1 Database of clutter (provided by Chorus – national database of 12 clutter types at a 25 m resolution) – focused on clutter types 8-12 and all other clutter types were considered as "other";
- 2.2 Database of the road network (from LINZ) – distinguished between level 2 roads and highways;
- 2.3 Database of rock types (from LRIS) – classified all rock types present as "urban", "soft", "hard" and "lava".

3 Overlaid the geographic dataset with trenching project data provided by Chorus;

4 Calculated for each FFP area, copper cabinet area and ESA the distribution of kilometres of road within them by clutter type, road type and rock type;

5 Calculated for each RBI route line segment in NetMap the kilometres of line segment by clutter type, road type (estimated by buffering the line segment with a 20m buffer) and by rock type;

6 Analysed the costs of a large number of trenching deployment projects undertaken by Chorus and aggregated the information for these projects by ESA - data was from UFB (years 3 and 4) and RBI build;

UFB:

- 6.1 trench related costs can be split out by trenching (digging), reinstatement, drilling/thrusting, traffic management, arborists, laterals;
- 6.2 number of metres of trenching, split by digging and drilling/thrusting;
- 6.3 for each FPP project Analysys Mason derived a blended per-metre cost of trenching which included overheads via a mark up of **[CI:]**%, **[CI:** NZD **]** per metre for other project costs, **[CI:** NZD **]** per metre for design costs;
- 6.4 only 1162 FPP projects had costs data and a shape;

RBI:

- 6.5 included trench related costs and excluded manhole, aerial, cable splicing and hauling, and connection to the exchange costs;

6.6 not all RBI projects have associated route metre information as not all require trenching;

6.7 overheads have been included as a **[CI:]**% mark up;

6.8 internal per project cost of **[CI:** NZD **]** included by calculating the average project cost per trench metre (**[CI:** NZD **]** per metre);

6.9 not all RBI projects have complete cost information because its only available when all payments have been made and work/documentation is complete;

6.10 matched 255 RBI projects with cabinet areas and 443 other RBI projects using NetMap routes;

7 Information for the projects collected was aggregated by ESA (376 ESAs in all, after small projects of less than 50m were excluded);

8 Analysys Mason excluded 7 ESAs in the business districts of Auckland and Wellington from analysis;

9 Trench metre and cost data plus the distributions of clutter/road/rock were gathered together;

10 Defined and calibrated a function relating to these drivers to the derived actual trenching costs in each ESA - statistical approach defined a function to estimate ESA trench costs based on the clutter/rock/road characteristics of the ESA;

11 Designed a set of rules as to when to use the average trenching costs based on Chorus data and when to apply the calibrated function:

11.1 7 ESAs in the Auckland/Wellington CBD excluded from the statistical analysis use per metre trenching costs from available projects;

11.2 of the 376 ESAs statistically analysed use actual per metre trenching costs from projects unless 2 or fewer projects (only 125 ESAs met these criteria);

11.3 remaining 646 ESAs use function with coefficients derived in Solver – inputs should be distributions by clutter type, road type and rock type derived for the road in the whole ESA;

12 Detailed trenching rate by ESA used to create a weighted average for each CSA;

13 Applied a trench width multiplier to account for increased costs of constructing wider trenches where they accommodate large numbers of duct the multiplier was calculated as a blended average across all trenches and applied to the unit costs. The blended-average multiplier is therefore applied to all trenched routes in the hybrid model i.e. copper distribution/feeder and fibre feeder.