Good afternoon.

As instructed by the Authority, LIME has redacted the confidential copy of the Authorities second round interrogatories to LIME. Attached please find the redacted public copy of those interrogatories. Note that all redacted information is identified in the attached copy by '##'.

Further, LIME proposes it will provide responses to each of the Authorities' second round interrogatories on or before Thursday, 31 July 2014.

Sincerely,
David

On 17 April 2014 12:48, Mark Connors <mark.connors@icta.ky> wrote:

To: CD2012-1 Distribution list

Please see the attached second round ICTA interrogatories to LIME and the second round ICTA interrogatories to Digicel.

....mark

Mark Connors

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1. In the 'Change Log' sheet of the file named '2013 05 06 CYM fixed – Conf.xls' (the "Fixed Module"), LIME has reported the changes it implemented to 15 January 2013 version of the Fixed Module. The Authority notes that not all the changes made by LIME between the two versions of the Fixed Module have been reported in the 'Change Log' sheet (for example, changes made in the 'MG Dimensions' sheet). The Authority reminds LIME that it is required to identify all the changes it made to each revised version of the Fixed Module. In a letter to the Authority dated 2 October 2012, LIME described the changes made in the revised Fixed Module submitted as file '2012 10 02 CYM fixed – Conf.xlsx', from the previous version of the model submitted by LIME as '2012 02 07 CYM Fixed – Conf.xlsx'. The Authority has therefore reviewed all the changes made starting from the revised version named '2012 10 02 CYM fixed – Conf.xlsx' and has noted that a number of changes have not been listed in 'Change Log' sheet of the subsequent versions of the Fixed Module.

    Accordingly, LIME is requested to provide a complete list of changes made to the version of the Fixed Module named '2012 02 07 CYM Fixed – Conf.xlsx', including all the changes to which LIME referred in its letter to the Authority dated 2 October 2012 and any other changes made to the module made throughout this proceeding.

2. In the 'Change Log' sheet of the Fixed Module, LIME has reported that some changes have been made in the 'Duct Dimensions' sheet of the Fixed Module, specifying that the rows referring to 20-48 bore size ducts as well as sub-ducts are no longer used and are therefore excluded from the Fixed Module.

    The Authority notes that the changes made in the 'Duct Dimensions' sheet of the Fixed Module (cells D7:D21) are significant, as illustrated below for comparison between the initial version ('2012 10 02 CYM Fixed – Conf.xls') and the latest version of the Fixed Module, and therefore require detailed explanation.

    ##

    In response to the first round interrogatory 48, LIME stated that it measured the length of duct in its network from two maps using the measuring tool in Adobe Acrobat, without giving any specific information on the reasons why the measures taken for various duct dimensions are so different between the two versions of the Fixed Module.

    With regard to the change in the value for average separation of jointing boxes in the 'Duct Dimensions' sheet (cell D21) of the Fixed Module (from

0.275km in the initial version to 1.9km in the latest version of the Fixed Module), LIME stated that the revised input value (cell H127 in the 'Cost Assumptions' sheet) is based on an estimate from LIME's outside plant team, without giving any explanation and justification for the use of the revised value.

LIME is requested to provide a detailed explanation and justification, along with supporting documentation, for the changes introduced in cells D7:D21 in the 'Duct Dimensions' sheet of the Fixed Module.

3.   The Authority notes that the average duration of call for '900-DIAL UP INTERNET USAGE' service in the 'Hypothetical Volumes' section (columns V:AD) in the 'Volume Input for TD' sheet of the Fixed Module, is ## minutes per call (cells Z5/X5; i.e. ##). However, for the purpose of fixed network cost modeling LIME has used the adjusted volume of minutes for '900-DIAL UP INTERNET USAGE' service in cell F5 (24,500 minutes), which resulted in a reduction of average call duration for this service to ## minutes per call.

LIME is requested to provide a detailed explanation and supporting documentation on the change it made for the volume of minutes for '900-DIAL UP INTERNET USAGE' service in cell F5 in the 'Volume Input for TD' sheet.

4.   The cost of 'Bad Debts' in row 72 in the 'Retail Costs' sheet of the Fixed Module is allocated to retail and wholesale services, i.e. to forty-eight (48) fixed and mobile services (cells M25:BH25), using revenue-based allocation. The data input related to the relevant revenue for each of the forty-eight (48) services is provided in columns C and E in the 'REVENUE MAPPING' sheet of the Appendix V-TD LRIC Input_10_06_30 Conf.xls'.

The Authority notes that the information provided in columns C and E in the 'REVENUE MAPPING' sheet are pasted values and LIME has not provided an explanation of how these values were calculated.

LIME is requested to provide a detailed explanation for the data provided in columns C and E in the 'REVENUE MAPPING' sheet of the Appendix V-TD LRIC Input_10_06_30 Conf.xls', in particular:

a.   Please explain to which period the revenues specified in columns C and E make reference.

b.   In relation to the '900-DOMESTIC TRANSIT' service, the Authority notes that the revenue attributed to this service appears to be

significantly high (CI$3,846,211) given the annual volumes provided in the 'Volume Input for TD' sheet (22,046,397 calls and 24,343,486 minutes).

Please provide an explanation whether the revenue attributed to the '900-DOMESTIC TRANSIT' service corresponds to the interconnection revenue (including any relevant discounts) billed by LIME to OLOs in accordance with 'Part 4. PSTN TRANSIT SERVICE' of LIME's Interconnection agreement and, if the revenue specified for this service is inaccurate, please amend the relevant input in the 'REVENUE MAPPING' sheet.

c.   It appears that the formulas used in cells H37:H48 are incorrect. For example, the formula that is used in cell H37 to calculate the relevant revenue for '900-MOBILE DATA' service ('=IF((SUMIF($D$65:$D$171,I37,$C$65:$C$171)+SUMIF($D$65:$D$199,I37,$E$65:$E$199))<0,0,(SUMIF($D$65:$D$171,I37,$C$65:$C$171)+SUMIF($D$65:$D$199,I37,$E$65:$E$199)))') excludes certain revenues from column C, as listed in the table below.

The Authority notes that the correct formula in cell H37 might be '=IF((SUMIF($D$65:$D$199,I37,$C$65:$C$199)+SUMIF($D$65:$D$199,I37,$E$65:$E$199))<0,0,(SUMIF($D$65:$D$199,I37,$C$65:$C$199)+SUMIF($D$65:$D$199,I37,$E$65:$E$199)))'.

##

Please provide an explanation as to why the above listed activities are excluded from the formulas used in cells H37:H48 in the 'REVENUE MAPPING' sheet and/or whether the formulas should be amended as noted above by the Authority.

d.   The Authority further notes that some activities have been excluded from the pool of forty-eight (48) services that are specified for the purpose of calculation carried out in the 'Retail Costs' sheet, as listed in the table below.

##

Please provide a detailed explanation why the above listed activities, with the corresponding revenues, have been excluded from the calculation carried out in the 'Retail Costs' sheet of the Fixed Module.

e.   The Authority notes that for ten (10) of the forty-eight (48) services specified in the 'Retail Costs' sheet, there is no revenue attributed in column H in the 'REVENUE MAPPING' sheet, albeit the demand volumes for these services have been provided in the 'Volume Input for TD' sheet of the Fixed Module, as listed in the table below.

##

Please provide a detailed explanation as to why there is no revenue in column H in the 'REVENUE MAPPING' sheet attributed to the services listed in the table above.

f.   The Authority further notes that for six (6) of the forty-eight (48) services specified in the 'Retail Costs' sheet, there is no revenue attributed in column H in the 'REVENUE MAPPING' sheet, albeit the demand volumes for these services have been provided in the 'Volume Input for TD' sheet of the file named '2012 02 21 CYM Mobile 3G – Conf.xls', as listed in the table below.

##

Please provide a detailed explanation as to why there is no revenue in column H in the 'REVENUE MAPPING' sheet attributed to the services listed in the table above.

g.   The Authority notes that LIME has not provided the demand volumes in the 'Volume Input for TD' sheet for two (2) the forty-eight (48) services specified in the 'Retail Costs' sheet, although the revenues have been attributed to these services in column H in the 'REVENUE MAPPING' sheet, as shown in the table below.

##

Please provide a detailed explanation as to why there are no demand volumes in the 'Volume Input for TD' sheet attributed to these two services.

5.   The cost item 'Direct Capex for Management System' (row 37) in the 'NGN Costs' sheet of the Fixed Module is calculated by allocating 'Management system cost' (cell C8) using specific input values in cells D36:L36. The Authority notes that the input values in cells D36:L36 are pasted values and LIME has not provided an explanation how these values are calculated. It appears that the correct allocation of 'Direct Capex for Management

System' should be done on the basis of the cost item 'Direct Capex' for 'Equipment' (row 35).

Please apply the following formula for calculating 'Direct Capex' for 'Management System' in cells D37:L37 in the 'NGN Costs' sheet of the Fixed Module, as for the following example in cell D37 '=$C$8*D35/SUM($D$35:$L$35)', or provide a detailed justification, along with supporting documentation, for the formula used in row 37 in the 'NGN Costs' sheet of the Fixed Module.

6. The cost item 'Management system cost' (cell C8) in the 'NGN Costs' sheet of the Fixed Module makes reference to cell D236 in the 'Cost Assumptions' sheet, i.e. cost item 'Spares' for 'Network Management'.

   Please provide a detailed justification for the formula currently used in cell C8 in the 'NGN Costs' sheet of the Fixed Module or amend the formula in order to make correct reference to the total "Network Management' costs identified in cell H236 in the 'Cost Assumption' sheet, so that the new formula in cell C8 is '='Cost Assumptions'!H236'.

7. In the 'International TX Costs' sheet of the Fixed Module, LIME has specified that 'Fibralink Capex - for Kingston - Panama - Miami ring', which is used for 'International Transmission', has a capacity of ## (cell C10).

   The 'Total cost CI$' of 'Fibralink Capex - for Kingston - Panama - Miami ring' is given in cell C7 after cost adjustments based on the calculation in cell E6 ('=(1-0.06)^3), which assumes that the equipment price ## should be corrected by the annual price trend based on LIME's benchmark value of -6%. The 'Cost per STM1' is then calculated in cell C11 as a function of these two values ('=C7/C10').

   The Authority notes that LIME has estimated in the Fixed Module that the total demand capacity for 'International Transmission' will be seven (7) STM1 (cell C16 in the 'International TX Costs' sheet), i.e. a significant reduction compared to the capacity estimated in the initial version of the Fixed Module (13 STM1 in '2012 12 02 CYM fixed – Conf.xls'), which is essentially due to the decrease in estimated demand volume for '900-INTERNATIONAL TRANSIT from OLO' service.

   LIME has then calculated the 'Total Cost' for 'International Transmission' in cell C18 as '=C16*C11'. The value obtained in C18 is ultimately used as the basis for calculation of 'GRC', 'Annualised Cost' and 'Opex' for the network component '400-International Tx'.

As a consequence of multiplying the 'Cost per STM1' (cell C11) by the estimated demand capacity (C16), the cost of 'International Transmission' (cell C18) is ## higher than the actual cost of 'Fibralink Capex - for Kingston - Panama - Miami ring'. Such difference between the actual cost of 'Fibralink Capex - for Kingston - Panama - Miami ring' and the estimated cost of 'International Transmission' is simply due to LIME's assumption that the capacity currently available on 'Fibralink Capex - for Kingston - Panama - Miami ring' would have to be increased from ## in order to accommodate the estimated total demand capacity for 'International Transmission', although this demand capacity is calculated on the basis of historical volumes for the period April 2011 to March 2012 with zero growth factor.

The Authority further notes that in a document in response to interrogatory 124 of the Authority's interrogatories of 19 August 2009 on the revised FLLRIC models, LIME submitted a file named 'Appendix XII(A) – Fibralink – confidential.xls', in which it provided the information on the value LIME has used in the Fixed Module for equipment purchase price ## and the total capacity available ## under 'Fibralink Budget'. In addition, on 4 September 2009 LIME submitted a file named 'Appendix XII – Cayman IRU Costs – CONFIDENTIAL.pdf' relating to 'Schedule 2 – Purchase Price and O&M Fee' for 'Cayman IRU Costs' (in reference to MAYA-1 consortia). This document makes reference to four (4) invoices showing the purchased capacity, as follows:

- Two (2) invoices for the 'Original Capacity', of which one for the amount of ## (dated ##) and the other one for the amount of ## (dated ##); and
- Two (2) invoices for the 'Additional Capacity', each for the amount of ## and dated ##.

Finally, the Authority notes that the Table 2 Submarine Cables of Annex 4 of the Licence to Cable & Wireless (Cayman Islands) Limited (the 'Table 2 Submarine Cables') specifies the following capacities on LIME's submarine cables:

- National submarine link on the cable system CJFS with landing points at Seven Mile Beach (near Marriot Hotel), Grand Cayman / Stake Bay, Cayman Brac - capacity ##;
- International submarine link on the cable system CJFS with landing point at Georgetown, Grand Cayman / Montego Bay, Jamaica / Kingston, Jamaica – capacity ##; and
- International submarine link on the cable system MAYA-1 with landing points at Half Moon Bay, Grand Cayman / Puerto

Cortex, Honduras / Puerto Limon, Costa Rica / Maria Chiquita, Panama / Tolu, Colombia / Hollywood, Florida – capacity ##.

It appears therefore that the total capacity available for 'International Transmission' on LIME's cable systems is ##.

Based on the above observations, LIME is requested to provide the following:

a. Given the information provided in the above mentioned file 'Appendix XII – Cayman IRU Costs – CONFIDENTIAL.pdf', provide an explanation and justification of how the equipment price in cell C6 in the 'International TX Costs' sheet ## has been calculated and in which year the equipment was purchased.

b. An explanation of why LIME has assumed that the available capacity on 'Fibralink Capex - for Kingston - Panama - Miami ring' is ## (cell C10 in the 'International TX Costs' sheet) while it appears that the total capacity available is either ## (according to the information provided in the above mentioned 'Appendix XII(A) – Fibralink – confidential.xls') or ## (according to the Table 2 Submarine Cables).

c. A detailed explanation and justification why the cost of 'International Transmission' (cell C18) should be allowed to increase by ## compared to the current cost of 'Fibralink Capex - for Kingston - Panama - Miami ring' (cell C7), given that the estimated demand volumes are based on the historical volumes for international outgoing calls in the period April 2011 to March 2012, ##.

d. A detailed explanation of why LIME has not included in cell C10 in the 'International TX Costs' sheet all of the capacity available for 'International Transmission' on its submarine cable systems, i.e. equivalent to ##, in accordance with the information provided in the Table 2 Submarine Cables.

8. In the 'International TX Costs' sheet of the Fixed Module, LIME estimates that the demand capacity for 'International Tx' will be 7 STM1 (cell C16). This demand in number of STM1 comes from an estimated number of 'STM1 tribs' (cell C129 in the 'TX Equipment Dimensions' sheet), which is based on LIME's calculation of 'Actual demand (minutes)' in cell C126 in the 'TX Equipment Dimensions' sheet, which in turn is based on 'Total International Minutes' of 48,383,754 (cell C125 in the 'TX Equipment Dimensions' sheet). The value in cell C125 is the sum of minutes calculated for the following three (3) services: in cell N25 (900-FIXED INTERNATIONAL OUTGOING), cell N33 (900-INTERNATIONAL PAYPHONE)

and cell N42 (900-INTERNATIONAL TRANSIT from OLO) in the 'Demand Calculations' sheet.

The Authority notes that 'Network Demand' in minutes for network element '400-International Tx' is 1,368,788,484 (cell C143 in the 'Demand Calculations' sheet). This volume of 'Network Demand' minutes is further used in calculation of 'Average cost per min/unit on a current cost basis' in cell F18 in the 'Fixed Network Costs' sheet, the value which is ultimately used as input for 'Average component cost' in cell C21 in the 'Fixed Service Costs' sheet. The value in cell C143 in the 'Demand Calculations' sheet is derived as the sum of 'Occupancy minutes (Network Demand) (mins)', after adjusting for relevant routing factors, for the following thirteen (13) services: in cell E10 (900-ADSL RETAIL), cell E13 (900-DIAL UP INTERNET USAGE), cell E14 (900-DIRECT CONNECT), cell E24 (900-FIXED INTERNATIONAL INCOMING), cell E25 (900-FIXED INTERNATIONAL OUTGOING), cell E29 (900-MPLS IP-PVN QoS RETAIL), cell E30 (900-MPLS IP-PVN QoS WHOLESALE), cell E31 (900-INTERNATIONAL LEASED CIRCUITS RETAIL), cell E32 (900-INTERNATIONAL LEASED CIRCUITS WHOLESALE), cell E33 (900-INTERNATIONAL PAYPHONE), cell E42 (900-INTERNATIONAL TRANSIT from OLO), cell E43 (900-INTERNATIONAL TRANSIT to OLO) and cell E45 (900-VOIP).

Accordingly, there exists an inconsistency in the Fixed Module between the approach applied to calculating relevant costs relating to the network component '400-International Tx', as calculated in cells C18:C21 in the 'International TX Costs' sheet on the basis of demand volumes for three (3) services, and the approach applied to calculating relevant volume of 'Network Demand' minutes relating to this network component, as calculated in cell C143 in the 'Demand Calculations' sheet on the basis of demand volumes for thirteen (13) services.

LIME is requested to provide a detailed explanation and justification for using two different approaches, as described above.

9. In the 'Calculations for National Submarine Link' section (cells A23:C39) in the 'International TX Costs' sheet of the Fixed Module, LIME has calculated 'STM1 Demand' for 'National Submarine' in cell C28 as a function of number of 'STM1 ADMs' given in cell J44 in the 'TX Equipment Dimensions' sheet, as follows '='TX Equipment Dimensions'!J44/2'. The 'Total Cost' for 'National Submarine' (cell C30) is calculated as a function of 'STM1 Demand' (cell C28) and 'National Submarine cost per STM1' (cell C26), which is based on 'Cost per STM1' (cell C11) of 'Fibralink Capex - for Kingston - Panama - Miami ring' and the proportion of the total length of 'Fibralink Capex - for Kingston - Panama - Miami ring' that is relevant to 'National Submarine'

(142.4 km over total length of 3,812 km). The value obtained in C30 is ultimately used as the basis for calculation of 'GRC', 'Annualised Cost' and 'Opex' for the network component '400-National Submarine Tx'.

The Authority notes that LIME has not provided any reference or explanation how the number of 'STM1 ADMs' in cell J44 in the 'TX Equipment Dimensions' sheet has been determined (LIME has used a paste value '2').

In response to the first round interrogatory 52, LIME has proposed that the formula for calculating 'STM1 Demand' for 'National Submarine' (cell C28) could be changed to '=G26/63', where cell G26 in the initial version of the Fixed Module refers to the 'Number of E1s' (192.69). It appears therefore that the approach proposed by LIME in response to that interrogatory would result in an increase in value in cell C28 from '1' to approximately '3', and therefore by the proportional increase in the 'Total Cost' for 'National Submarine' (cell C30).

The Authority further notes that the Table 2 Submarine Cables specifies the capacity available to LIME on the cable system CJFS with landing points at Seven Mile Beach (near Marriot Hotel), Grand Cayman / Stake Bay, Cayman Brac. That capacity is one ##.

LIME is requested to provide the following:

a.   An explanation of the relationship between two (2) STM1 ADMs reported in cell J44 in the 'TX Equipment Dimensions' sheet and the costs related to the network component '400-National Submarine Tx'.

b.   An explanation of why LIME has not included in the 'Calculations for National Submarine Link' section all of the capacity available for 'National Transmission' on its submarine cable systems, i.e. equivalent to ##, in accordance with the information provided in the Table 2 Submarine Cables, including the costs relevant to that capacity.

10.   In the 'Reval_Assets' sheet of the Fixed Module, the formulas in cells R2, X2, Y2 and Z2 appear to refer to incorrect cells in the 'Summary Expense Factors' sheet of the file 'Appendix III Fixed Assets Revaluation_20-09-09 Conf.xls' (the "Appendix III"). For example, cell Y2 in the 'Reval_Assets' sheet of the Fixed Module makes reference to the input value from cell Y2 in the 'Summary Expense Factors' sheet of the Appendix III, although it appears that the input value should in this case be from cell Z2.

LIME is requested to provide a detailed explanation on the reasons for using the existing formulas or to change the formulas in the cells R2, X2, Y2 and Z2 in the 'Reval_Assets' sheet of the Fixed Module, in order to make reference to what appear to be correct input values from the 'Summary Expense Factors' sheet in the Appendix III, as follows:

- R2='[Appendix III Fixed Assets Revaluation_20-09-09 Conf.xls]Summary Expense Factors'X$2
- X2='[Appendix III Fixed Assets Revaluation_20-09-09 Conf.xls]Summary Expense Factors'Y$2
- Y2='[Appendix III Fixed Assets Revaluation_20-09-09 Conf.xls]Summary Expense Factors'Z$2
- Z2='[Appendix III Fixed Assets Revaluation_20-09-09 Conf.xls]Summary Expense Factors'R$2

11. In the 'Assumption and Drivers' sheet of the Appendix III, columns AC:DW contain paste values. The Authority notes that these values are important inputs in the calculation of relevant costs of various network components.

   LIME is requested to provide a detailed explanation, along with supporting documentation, of how LIME has calculated all the values in columns AC:DW in the 'Assumption and Drivers' sheet of the Appendix III.

12. In response to the first round interrogatory 16, LIME has claimed that traffic originating from LIME's mobile network and routed across LIME's fixed network to an international carrier, is included in the '900-INTERNATIONAL TRANSIT from OLO' service in cells X34 (volume of calls) and Z34 (volume of minutes) in the 'Volume Input for TD' sheet of the Fixed module. LIME has provided the total volume of calls in cell X34 as 87,981 and the total volume of minutes in cell Z34 as 321,490, for the '900-INTERNATIONAL TRANSIT from OLO' service.

   However, the Authority notes that in its quarterly monitoring data ("QMD") reports submitted to the Authority, LIME provided the following volume of minutes (under the 'Part E: Mobile wireless' section) for the quarters 2Q 2011 to 1Q 2012:

- International retail minutes originated from residential postpaid telephone numbers: ##;
- International retail minutes originated from business postpaid telephone numbers: ##;
- International retail minutes originated from prepaid telephone numbers: ##; and

- International minutes originated from Inbound Roaming handsets: ##.

Therefore, according to QMD reports submitted by LIME, in the period 2011/12 (from April 2011 to March 2012) around ## minutes originated from LIME's mobile network and were routed across LIME's fixed network to an international carrier.

The Authority also notes that in the initial version of the Fixed Module (file named '2012 10 02 CYM fixed - Conf.xls'), LIME reported the total volume of calls in cell X34 as 22,658,610 and the total volume of minutes in cell Z34 as 47,447,018.

Accordingly, LIME is requested to adjust the volume of calls in cell X34 and volume of minutes in cell Z34 in the 'Volume Input for TD' sheet of the Fixed module, in order to include relevant demand volumes for calls and minutes originating on LIME's mobile network and routed across LIME's fixed network to an international carrier.

13. In its submission of 6 May 2013, LIME provided a revised set of cost inputs in the 'Duct Unit Costs' section in the 'Cost Assumptions' sheet of the Fixed Module in cells C25:C79 ('Equipment purchase price') and F25:F79 ('Installation labour'). In order to justify the revised cost inputs, LIME submitted the following confidential attachments:

- Attachment – response to ICTA interrog 19 (Anixter invoices1) CONFIDENTIAL.pdf
- Attachment – response to ICTA interrog 19 (Anixter invoices2) CONFIDENTIAL.pdf
- Attachment – response to ICTA interrog 19 (ABC Trenching contract) CONFIDENTIAL.doc

LIME is requested to respond to the following interrogatories:

a. The revised cost inputs relating to the 'Equipment purchase price' (cells C25:C27) for various types of ducts are all based on the same price multiplier of ## (expressed in US$ and further converted into CI$ in the same cell).

Please indicate where this price reference ## can be found in the above mentioned attachments submitted in support of LIME's response to first round interrogatory 19.

b. The revised cost inputs relating to the 'Equipment purchase price' (cells C29:C31, C41:C43, C53:C55, C65:C67 and C77:C79) for

various types of jointing boxes are all based on the same price multiplier of ## (expressed in CI$).

Please indicate where this price reference (2046) can be found in the above mentioned attachments submitted in support of LIME's response to the first round interrogatory 19.

c.   It appears that the revised cost inputs relating to the 'Installation labour' costs (cells F25:F79) for various types of ducts and jointing boxes, are based on the information contained in the document submitted by LIME as 'Attachment – response to ICTA interrog 19 (ABC Trenching contract) CONFIDENTIAL.doc'.

Please provide an explanation of why the installation labour cost for 'Jointing box – carriageway (asphalt)' in shared ducts with 3 or more bores is different from the installation labour cost in shared ducts with up to 2 bores (i.e. ## in cells F55, F67 and F79 compared to ## in cells F31 and F43).

14.   In its submission of 6 May 2013, LIME provided a revised set of cost inputs in the 'Access Network Assumptions' section in the 'Cost Assumptions' sheet of the Fixed Module in cells C93:C175 ('Equipment purchase price') and F93:F175 ('Installation labour'). In order to justify the revised cost inputs, LIME submitted the following confidential attachments:

- Attachment – response to ICTA interrog 19 (Anixter invoices1) CONFIDENTIAL.pdf
- Attachment – response to ICTA interrog 19 (Anixter invoices2) CONFIDENTIAL.pdf
- Attachment – response to ICTA interrog 25 (Peter Wight invoice) CONFIDENTIAL.pdf

LIME is requested to respond to the following interrogatories:

a.   The revised cost inputs relating to the 'Equipment purchase price' in cells C93:C116 are sourced from the invoices received by LIME from Anixter, which list the prices in US$. However, the calculation of relevant cost inputs in the 'Access Network Assumptions' section does not take into account the exchange rate CI$ to US$, which is specified in cell B7.

LIME is requested to add the exchange rate factor in the calculation of the 'Equipment purchase price' in cells C93:C116 or in the calculation of total costs for this cost group in cells H93:H116.

b.   The revised cost inputs relating to the 'Equipment purchase price' in cells C119:C123 are sourced from the webpage http://www.digikey.com/product-search/en/cables-wires-management/splice-enclosures-protection, where all the items are listed in US$ prices. In addition, it is difficult to know which items have been selected by LIME from that webpage to indicate the relevant 'Equipment purchase price' in cells C119:C123.

Please provide the exact reference to the items selected by LIME from the above mentioned webpage, which are used as benchmarks to specify the 'Equipment purchase price' in cells C119:C123, and add the exchange rate factor (cell B7) in the calculation of relevant costs expressed in CI$.

c.   LIME did not provide any explanation on the methodology used in calculation of the 'Installation labour' costs nor did it provide the source of the information used as input in cells F93:F135, such as in the following examples:

- F93=30*2*N93
- F95=29*30*N95
- F105=60*30*N105
- F119=11*50*N119

Please provide an explanation regarding the formulas used in calculation of the 'Installation labour' costs in cells F93:F135, including the source of information for labour cost inputs and the assumption on number of man-hours or other factors used in the formulas relevant to each specific item.

15. In its submission of 6 May 2013, LIME provided a revised set of cost inputs in the 'Transmission Direct Capex Assumptions' section in the 'Cost Assumptions' sheet of the Fixed Module in cells C189:C193 ('Equipment purchase price') and F189:F201 ('Installation labour'). In order to justify the revised cost inputs, LIME submitted the following confidential attachments:

- Attachment – response to ICTA interrog 19 (Anixter invoices1) CONFIDENTIAL.pdf

LIME is requested to respond to the following interrogatories:

a.   The revised cost inputs relating to the 'Equipment purchase price' in cells C189:C193 are sourced from the invoices received by LIME

from Anixter, which list the prices in US$. However, the calculation of relevant cost inputs in the 'Transmission Direct Capex Assumptions' does not take into account the exchange rate CI$ to US$, which is specified in cell B7.

LIME is requested to add the exchange rate factor in the calculation of the 'Equipment purchase price' in cells C189:C193.

b.   LIME has not provided any explanation, or source of information used, for calculation of the 'Installation labour' costs in cells F189:F201. In addition, there are inconsistencies between the formulas used in cells F189:F201 and the comments specified in cells I189:I201, for example:

- in cell I190, LIME specified that labour costs are $50 per man-hour, while the formula in cell F190 is '=66*30*N190';
- in cell I197, LIME specified that labour costs are $66 per man-hour, while the formula in cell F197 is '=0.5*50*N197'; and
- in cell I200, LIME specified that labour costs are $66 per man-hour, while the formula in cell F200 is '=1.5*50*N200'.

Please provide an explanation regarding the formulas used in calculation of the relevant 'Installation labour' costs in cells F189:F201, including the source of labour cost inputs and the assumption on number of man-hours or other factors used in the formulas relevant to each specific item.

16.   In its submission of 6 May 2013, LIME provided a revised set of cost inputs in the 'Transmission Equipment Direct Capex Assumptions' section in the 'Cost Assumptions' sheet of the Fixed Module in cells C213:C227 ('Equipment purchase price') and F213:F227 ('Installation labour'). In order to justify the revised cost inputs, LIME provided its response to the first round interrogatory 27, in which it claims it has submitted the following confidential attachments:

- Attachment – response to ICTA interrog 27 (trans equip 1) CONFIDENTIAL.pdf
- Attachment – response to ICTA interrog 27 (trans equip 2) CONFIDENTIAL.pdf

The Authority notes that LIME did not submit to the Authority the above mentioned pdf files, albeit it has submitted the following attachments in its 19 April 2013 submission:

- ▪ Attachment – response to ICTA interrog 27 (Desca 65XX) CONFIDENTIAL.pdf
- ▪ Attachment – response to ICTA interrog 27 (Desca 6130) CONFIDENTIAL.pdf

LIME is requested to respond to the following interrogatories:

a. LIME calculated the cost input for 'Digital Cross Connect' item in cell C227 as ##, where ## corresponds to the discounted price (at ## discount rate) for two units of 'Cross Connect' at ## per unit (before discount).

The Authority notes that the discounted price is based on a quote received by LIME for the purchase of equipment for two (2) host nodes (High Rock node and OTS node).

Since the discounted price is based on the quote for two host nodes, LIME is requested to amend the formula in cell C227 in the 'Cost Assumptions' sheet on the Fixed Module, to reflect the relevant cost input based on one (1) unit of 'Digital Cross Connect', as follows ##, or to provide a detailed rationale for the existing calculation.

b. LIME calculated the cost input for 'Port Cards for Transport Ring – STM-64' item in cell C216 as ##, where ## corresponds to the sum of discounted prices (at ## discount rate) for two units of 'Card – STM 64 Main Ring' at ## per unit (before discount) and two units of 'Card – XFP (plug-in modules for cards/ports) for Main Ring' at ## per unit (before discount).

Since it appears that the discounted prices are based on the quote for two host nodes, LIME is requested to amend the formula in cell C216 in the 'Cost Assumptions' sheet on the Fixed Module, to reflect the relevant cost input based on one unit 'Card – STM 64 Main Ring' and one unit of 'Card – XFP (plug-in modules for cards/ports) for Main Ring', as follows ## or to provide a detailed rationale for the existing calculation.

c. LIME calculated the cost input for 'Port Cards for Transport Ring – STM-16' item in cell C215 as ##, where ## corresponds to the sum of discounted prices (at ## discount rate) for ## value of two units of 'Card – STM-16 & STM-1' at ## per unit (before discount), and four units of 'SFP (plug-in modules) for STM16 Access Ring' at ## per unit (before discount).

Since it appears that the discounted prices are based on the quote for two host nodes, LIME is requested to amend the formula in cell C215 in the 'Cost Assumptions' sheet on the Fixed Module, to reflect the relevant cost input based on one unit of 'Card – STM-16' and two units of 'SFP (plug-in modules) for STM16 Access Ring', as follows ##, or to provide a detailed rationale for the existing calculation.

d. LIME calculated the cost input for 'Port Cards for Transport Ring – STM-1' item in cell C213 as ## where ## corresponds to the standard prices (before ## discount rate) for ## value of two units of 'Card – STM-16 & STM-1' at ## per unit (before discount), and four units of 'SFP for STM1 RLU Access' at ## per unit (before discount).

In accordance with the principles discussed above (final prices based on ## discount rate and network elements required for one host node only), LIME is requested to amend the formula in cell C213 in the 'Cost Assumptions' sheet on the Fixed Module, to reflect the relevant cost input based on the discounted prices for one unit of 'Card – STM-1' and two units of 'SFP for STM1 RLU Access', as follows ##, or to provide a detailed rationale for the existing calculation.

e. LIME calculated the costs for 'Installation labour' in cells F213:F227, as for the example in cell F213 '=(C213+D213+E213)*(SUM(D\$261:D\$274)/SUM(C\$261:D\$274))', where:

- cell C213 refers to cost based on 'Equipment purchase price';
- cell D213 refers to cost of 'Spares';
- cell E213 refers to cost of 'Import duty';
- cells C261:C274 refer to what LIME has specified as "Figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell C260); and
- cells D261:D274 refer to what LIME has specified as "IRM = installation related materials, figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell D260).

It appears that the costs of 'Spares' and 'Import duty' should be excluded from the formulas in cells F213:F227 as the descriptions given by LIME in cells C260 and D260 suggest that 'Spares' and 'Import duty' are not included in cells C261:D274.

Accordingly, LIME is requested to amend the formulas used in cells F213:F227 in the 'Cost Assumptions' sheet, to reflect more correct estimation of the 'Installation labour' costs, as for the example in cell F213 '=C213*(SUM(D$261:D$274)/SUM(C$261:D$274))', or to provide a detailed rationale for the existing calculation.

17. In its submission of 6 May 2013, LIME provided a revised set of cost inputs for 'Network Management' in the 'NGN Direct Capex Assumptions' section in the 'Cost Assumptions' sheet of the Fixed Module in cells C236 ('Equipment purchase price') and F236 ('Installation labour'). In order to justify the revised cost inputs, LIME submitted the following confidential attachment:

- Attachment – response to ICTA Interrog 33 (Nortel bill of materials) CONFIDENTIAL.xls

LIME calculated the 'Installation labour' costs in cell F236 as '=(C236+D236+E236)*(SUM(D$261:D$274)/SUM(C$261:D$274))', where:

- cell C236 refers to cost based on 'Equipment purchase price';
- cell D236 refers to cost of 'Spares';
- cell E236 refers to cost of 'Import duty';
- cells C261:C274 refer to what LIME has specified as "Figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cells C260); and
- cells D261:D274 refer to what LIME has specified as "IRM = installation related materials, figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell D260).

It appears that the costs of 'Spares' and 'Import duty' should be excluded from the formula in cell F236 as the descriptions given by LIME in cells C260 and D260 suggest that 'Spares' and 'Import duty' are not included in cells C261:D274.

Accordingly, LIME is requested to amend the formula to reflect more correct estimation of 'Installation labour' costs, as follows '=C236*(SUM(D$261:D$274)/SUM(C$261:D$274))', or to provide a detailed rationale for the existing calculation.

18. In the 'Cost assumptions' sheet of the Fixed Module, LIME calculated the 'Installation labour' costs for 'Voicemail platform' in cell F237 as '=(C237+D237+E237)*(SUM(D$261:D$274)/SUM(C$261:D$274))', where:

- cell C237 refers to cost based on 'Equipment purchase price';

- cell D237 refers to cost of 'Spares';

- cell E237 refers to cost of 'Import duty';

- cells C261:C274 refer to what LIME has specified as "Figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell C260); and

- cells D261:D274 refer to what LIME has specified as "IRM = installation related materials, figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell D260).

It appears that the costs of 'Spares' and 'Import duty' should be excluded from the formula in cell F237 as the descriptions given by LIME in cells C260 and D260 suggest that 'Spares' and 'Import duty' are not included in cells C261:D274.

Accordingly, LIME is requested to amend the formula to reflect more correct estimation of 'Installation labour' costs, as follows '=C237*(SUM(D$261:D$274)/SUM(C$261:D$274))', or to provide a detailed rationale for the existing calculation.

19. In its submission of 6 May 2013, LIME provided a revised set of cost inputs for the block 'MSE: Numbers from original contract' in the 'NGN Direct Capex Assumptions' section in the 'Cost Assumptions' sheet of the Fixed Module in cells C241:C248 ('Equipment purchase price') and F241:F248 ('Installation labour'). In order to justify the revised cost inputs, LIME submitted the following confidential attachment:

- Attachment – response to ICTA Interrog 33 (Nortel bill of materials) CONFIDENTIAL.xls

LIME calculated the 'Installation labour' costs in cells F241:F248 as '=(C241+D241+E241)*(SUM(D$261:D$274)/SUM(C$261:D$274))' (example from cell F241), where:

- cell C241 refers to cost based on 'Equipment purchase price';
- cell D241 refers to cost of 'Spares';
- cell E241 refers to cost of 'Import duty';
- cells C261:C274 refer to what LIME has specified as "Figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell C260); and

- cells D261:D274 refer to what LIME has specified as "IRM = installation related materials, figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell D260).

It appears that the costs of 'Spares' and 'Import duty' should be excluded from the formulas in cells F241:F248 as the descriptions given by LIME in cells C260 and D260 suggest that 'Spares' and 'Import duty' are not included in cells C261:D274.

Accordingly, LIME is requested to amend the formulas to reflect more correct estimation of 'Installation labour' costs, as for the example in cell F241 '=C241*(SUM(D$261:D$274)/SUM(C$261:D$274))', or to provide a detailed rationale for the existing calculation.

20. In the 'NGN Direct Capex Assumptions' section in the 'Cost Assumptions' sheet of the Fixed Module, LIME provided a revised set of cost inputs for 'Current MG Pricing' in cells C251:H257). In order to justify the revised cost inputs, LIME submitted the following confidential attachment:

- Attachment – response to ICTA interrog 50 (access node invoice) CONFIDENTIAL.xls

a. The 'Equipment purchase price' for 'Fixed Costs per 432-port Chassis (Power, Chassis, Uplink Card, etc.)' is given in cell C254 as '=14022*K254'.

Please provide a detailed explanation, along with supporting documentation, on how LIME calculated the value '14022' in cell C254.

b. LIME calculates the 'Equipment purchase price' in cells C253:C257 using the price inputs from the 'Attachment – response to ICTA interrog 50 (access node invoice) CONFIDENTIAL.xls', and by multiplying these values by the 'Cost adjustment for MG-related' values, specified in cells K253:K257.

The 'Cost adjustment for MG-related' values in cells K253:K257 are calculated on the basis of the reference year (cells J253:J257) relevant to the source of information for the price inputs used in the 'Equipment purchase price'.

The Authority notes that the invoice provided by LIME as 'Attachment – response to ICTA interrog 50 (access node invoice) CONFIDENTIAL.xls' is dated 27 September 2010, while the reference

year which is used as a basis to calculate the 'Cost adjustment for MG-related' values in cells K253:K257 is '2013'.

LIME is therefore requested to amend the values in cells J253:J257 to '2010'.

c.   LIME calculated the 'Installation labour' costs in cells F253:F257 as '=(C253+D253+E253)*(SUM(D$261:D$274)/SUM(C$261:D$274))' (example from cell F253), where:

   - cell C253 refers to cost based on 'Equipment purchase price';
   - cell D253 refers to cost of 'Spares';
   - cell E253 refers to cost of 'Import duty';
   - cells C261:C274 refer to what LIME has specified as "Figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell C260); and
   - cells D261:D274 refer to what LIME has specified as "IRM = installation related materials, figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell D260).

It appears that the costs of 'Spares' and 'Import duty' should be excluded from the formulas in cells F253:F257 as the descriptions given by LIME in cells C260 and D260 suggest that 'Spares' and 'Import duty' are not included in cells C261:D274.

LIME is requested to amend the formulas to reflect more correct estimation of 'Installation labour' costs, as for the example in cell F253 '=C253*(SUM(D$261:D$274)/SUM(C$261:D$274))', or to provide a detailed rationale for the existing calculation.

21.   In the 'MG Dimensions' sheet of the Fixed Module, LIME introduced a revised value ('432') in cell K2 for 'Max lines per Chassis' (in the previous versions of the Fixed Module, LIME referred to 'Max Lines per MG' in cell N2). In column J in the 'MG Dimensions' sheet, LIME has calculated the number of chassis ('# Chassis') required at each access node location, which is a function of the number of 'Subscribers modelled' (column I) that are connected to each access node and the 'Max lines per Chassis' specified in cell K2.

The Authority notes the following:

   - the values for '# Chassis' in column J range from zero (0) to fourteen (14) per access node location;

- there are fifty (50) access node locations;
- twenty two (22) out of fifty (50) access node locations require more than one (1) chassis, given that the 'Max lines per Chassis' is specified as 432; and
- the maximum number of lines per access node location is given in cell I53 ('5901')

The histogram below shows the distribution of density of lines per access node location, as modelled in column I in the 'MG Dimensions' sheet.
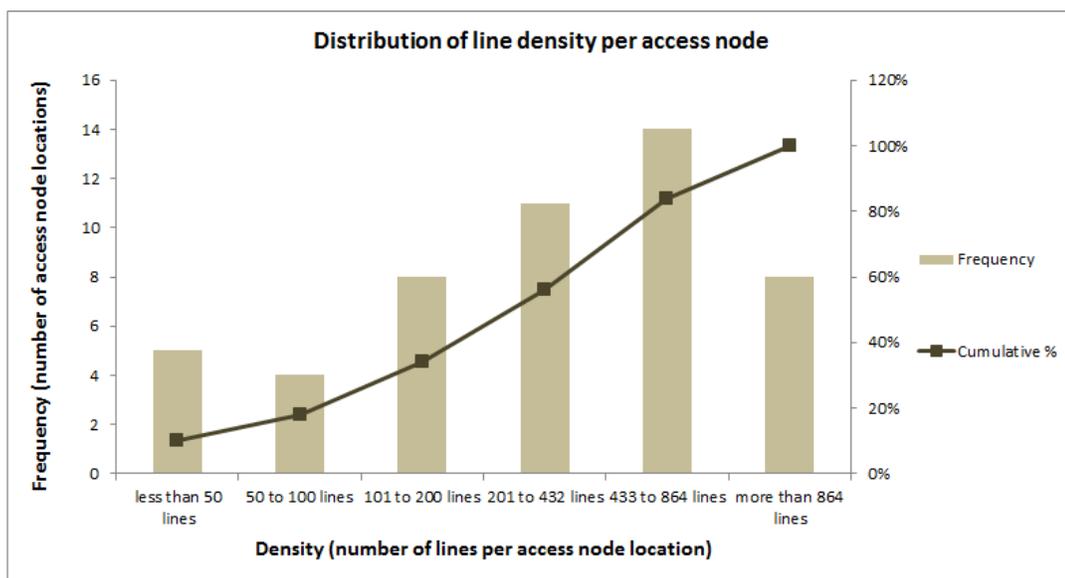
The Authority notes that in the invoice submitted by LIME as the 'Attachment – response to ICTA interrog 50 (access node invoice) CONFIDENTIAL.xls', LIME's supplier provided quotes for three different configurations for its' OPX Outside Plant Exchange Cabinet' populated with ## 'Combo Ports'. The quotes were provided with two different pricing options for each of the two LIME's access node locations identified as 'Spotts' and 'Bodden Town', proposing the following configurations:

- configuration of a product group named 'MALC Chassis & Accessories', including ##; or
- configuration of a product group named 'MXK Chassis and Cards', including ##.

Although LIME provided quotes for the configurations of up to ## lines per access node ('Combo Ports'), according to LIME's supplier (company named ##, who provided the quote submitted by LIME as the 'Attachment – response to ICTA interrog 50 (access node invoice) CONFIDENTIAL.xls') ##.

It appears therefore that the 'Max lines per Chassis' could be either ##.

The Authority notes that in cell C19 in the 'Technical Assumptions' sheet of the Fixed Module, LIME specified that the 'Max Lines per MG' should be 2,048. The Authority further notes that the value specified in cell C19 was used as reference in cell N2 in the 'MG Dimensions' sheet in previous versions of the Fixed Module, but it is now no longer used in the Fixed Module.

LIME is requested to provide the following:

a.   A detailed explanation of why LIME has changed its approach to cost modelling in the 'MG Dimensions' sheet by referring to '# Chassis' rather than '# of MGs'.

b.   An explanation of why the change in the modelling approach in the 'MG Dimensions' sheet has not been reported in the 'Change Log' sheet or if, as it appears, the information that has been changed is now effectively redundant information, why LIME has not removed that information from the Fixed Module, as directed by the Authority in 166(h) in ICT Decision 2011-3 dated 22 December 2011.

c.   A detailed explanation of why LIME has considered that 'Max Lines per Chassis' should be limited to four hundred thirty two (432), the value that is specified in cell K2 in the 'MG Dimensions' sheet and also referenced in other places in the Fixed Module (for example, in cell A254 in the 'Cost Assumptions' sheet or in cell F5 in the 'MG Calculations' sheet), rather than some higher value such as 960 or even 9216.

d.   In its submission of 6 May 2013, LIME introduced a revised set of data in column I in the 'MG Dimensions' sheet referring to 'Subscribers modelled'. The following formula is used in this column, as for the example given in cell I4 '=ROUNDDOWN(H4*SUM('Scenario Volumes'!$E$29:$E$30)/SUM($H$4:$H$53),0)'. The sum of values produced by this formula in column I (34115) is lower than the sum of values in cells E29 and E30 in the 'Scenario Volumes' sheet of the Fixed Module.

Accordingly, LIME is requested to amend this formula to obtain the sum of values in column I that is closer to the sum of values in cells E29 and E30 in the 'Scenario Volumes' sheet, as for the following example in cell I4 '=ROUND(H4*SUM('Scenario

Volumes'!$E$29:$E$30)/SUM($H$4:$H$53),0)', or to provide a detailed justification for the use of existing calculation.

e. The formula given in cells K4:K53, in which the values are expressed as '% Traffic' in each individual access node location, appears to be incorrect, as for the example in cell K4 '=I4/SUM($I$4:$I$108)'.

LIME is requested to amend the formula, as follows '=I4/SUM($I$4:$I$53)', or to provide a detailed justification for the use of existing calculation. However, it appears that the data in these cells are redundant information, and if that is the case, LIME should remove this information from the Fixed Module, in accordance with paragraph 166(h) of ICT Decision 2011-3 dated 22 December 2011.

f. The formula given in cell G61, in which LIME refers to access node locations in 'Sister islands', appears to make reference to some access node locations which are not located in 'Sister islands' (for example cell I45) while also excluding some other access node locations which are located in 'Sister islands' (for example cell I31).

LIME is requested to amend the formula in cell G61 in order to make reference to the relevant access node locations located in 'Sister islands', or to provide a detailed justification for the use of existing calculation in cell G61.

22. In the 'MG Calculations' sheet of the Fixed Module, LIME calculated the costs for 'MG' network components by separating 'MG' costs between 'Cabinet Costs' (column E), 'Chassis Costs' (column F) and 'Variable Costs' (column G).

The authority notes the following:

a. Cell G3 in the 'MG Calculations' sheet refers to the 'Number of MG'. This value should be equal to the number of access node locations, as listed in column A the 'MG Calculations' sheet, that are populated with at least one (1) line. However, LIME has used incorrect formula ('=COUNTIF($B$8:$B$55,"<>0")') to calculate the 'Number of MG'.

LIME is requested to amend the formula in cell G3 in the 'MG Calculations' sheet as follows '=COUNTIF($B$8:$B$57,"<>0")', or to provide a detailed justification for the use of existing calculation in cell G3.

b.   The 'Outdoor Cabinet Costs', specified in cell G4 in the 'MG Calculations' sheet, are ultimately used for calculation of 'Cabinet Costs' in column E in the 'MG Calculations' sheet. However, they are not used for any other purpose in the Fixed Module.

LIME is requested to provide an explanation as to why the 'Outdoor Cabinet Costs' are calculated in column E in the 'MG Calculations' sheet although that information is not used anywhere else in the Fixed Module.

c.   In the initial version of the Fixed Module, the costs related to the network component '400-RSU traffic sensitive' were distributed equally across all access node locations as a fixed cost of 27,638 per 'MG' (column E in the 'MG Calculations' sheet in '2012 12 02 CYM fixed – Conf.xls'), while in the 'MG Calculations' sheet of the latest version of the Fixed Module, LIME calculated the costs related to the network component '400-RSU traffic sensitive' as a function of estimated number of lines per access node (column C), the 'Max lines per Chassis' (specified as '432'), and the unit price of the cost group 'Chassis Costs' (cell G5). Based on the revised methodology, the costs related to the network component '400-RSU traffic sensitive' range from 16,072 (for example in cell F11) up to 257,145 (cell F57) per access node location.

The Authority notes that the methodology adopted by LIME for calculation of costs related to the network component '400-RSU traffic sensitive' assumes that, for any access node location where the number of lines per access node exceeds 432, the 'RSU traffic sensitive' costs are increased in increments based on the 'Chassis Costs' for additional 432 lines (for example, for access node location with three times 432 lines, the 'RSU traffic sensitive' costs will increase threefold). On the other hand, for any access node location where the number of lines connected to the access node is significantly smaller than 432, the 'RSU traffic sensitive' costs will remain at the same level.

As a consequence, based on the revised methodology, the quantity of network component '400-RSU traffic sensitive' that LIME has implicitly modelled in the 'MG Calculations' sheet is 113 ('=F105/G5'), while the quantity that was modelled in the initial version of the Fixed Module was 46 ('=E112/F4', in the 'MG Calculations' sheet of the file '2012 10 02 CYM fixed – Conf.xls').

LIME is requested to provide a detailed explanation and justification for the use of the revised methodology for calculation of costs related to the network component '400-RSU traffic sensitive', namely in relation to the underlying assumption that the quantity of network component '400-RSU traffic sensitive' should now be increased from 46 to 113.

23. In the 'Other Cost Assumptions' section in the 'Cost Assumptions' sheet of the Fixed Module (cells C291:H296), LIME provided a revised set of cost inputs for the cost group previously referring to 'DSLAM Equipment Unit Cost, Broadband Access Server, Core Ethernet Switch, Core Juniper Router, Other Servers & Software and Software' cost items specified in cells D283:D290 in the 'Cost Assumptions' sheet of the initial version of the Fixed Module ('2012 10 02 CYM fixed – Conf.xls').   In the latest version of the Fixed Module, LIME changed the cost items in this cost group. In order to justify the revised cost inputs, LIME submitted the following confidential attachment:

- Attachment – response to ICTA interrog 50 (access node invoice) CONFIDENTIAL.xls

LIME has provided the sources of information for each specific cost input given in cells C291:H296, as illustrated in the table below:

Item	Source
MG Port Cost attributed to ADSL	MSAN pricing appendix
Broadband Access Server	Benchmark (BIPT NGN, NGA model 2011, NPT fixed LRIC model 2010, Australia)
DNS	Benchmark (BIPT NGN, NGA model 2011, NPT fixed LRIC model 2010, Australia)
RADIUS	Benchmark (BIPT NGN, NGA model 2011, NPT fixed LRIC model 2010, Australia)
Core Ethernet Switches (Alcatel 7750 System Bundle)	Alcatel
Core Juniper Router (ERX 705)	Juniper

a. The revised cost inputs for 'Equipment purchase price' items listed in cells C292:C294 correspond to benchmarked prices, the sources of which LIME identified as 'BIPT NGN, NGA model 2011', 'NPT fixed LRIC model 2010'; and 'Australia'.   It appears that the selected benchmarks have been sourced from cost models produced in the period 2010-2011.

The Authority notes that cells J292:J294 refer to the reference years for the source of information, and they have all been given the same value '2013'.

Accordingly, LIME is requested to amend the values in cells J292:J294 in order to reflect the reference year of the benchmark prices selected by LIME, either 2010 or 2011, whichever is the

closest value to the average reference year of the three benchmarked cost models.

b.   The revised cost inputs for 'Equipment purchase price' item listed in cell C295 correspond to a benchmarked price, the source of which LIME identified as 'Alcatel'. In response to the first round interrogatory 34, LIME has provided the website link http://www.peppm.org/Products/alcatellucent/price.pdf (a PDF document showing the 'Pricelist Template Form'), from which LIME sourced the value ## used in cell C295.

The Authority notes the following:

▪ it has been unable to find/obtain the value ##, used in cell C295, from the above mentioned 'Pricelist Template Form' sourced by LIME;

▪ the above mentioned 'Pricelist Template Form' specifies that the prices are listed for a quantity of 1, and that a quote can be obtained for volume discounts; and

▪ the formula in cell C295 is ## where the value ## corresponds to 'network of ## Core Ethernet Switches (Alcatel 7750 System Bundle)'.

Accordingly, LIME is requested to clarify how it has obtained the value which is used as cost input in cell C295, and to clarify and justify why it is necessary to use ## Core Ethernet Switches (Alcatel 7750 System Bundle) items in its Fixed Module, and if such volume is justified, LIME is requested to amend the formula in cell C295 to reflect the relevant volume discount that could be negotiated by purchasing ## units, as specified in 'Pricelist Template Form' sourced by LIME.

c.   The revised cost inputs for 'Equipment purchase price' item listed in cell C296 correspond to a benchmarked price, the source of which LIME identified as 'Juniper'. In response to the first round interrogatory 34, LIME has provided the website link www.juniper.net from which LIME claimed it sourced publicly available information on 'Core Juniper Router (ERX 705)' cost item, and LIME submitted that it further discounted the list price by ## to reflect possible sales incentives. The Authority notes that the price information on 'Core Juniper Router (ERX 705)' on the website indicated by LIME appears to be available only through a quote, and so it is not publicly available information. In addition, the Authority

notes that LIME made reference to '2 units' (cell B296) in relation to 'Core Juniper Router (ERX 705)' cost item.

Accordingly, LIME is requested to provide further information on how it has obtained the value which is used as cost input in cell C296, and to clarify and justify why it is necessary to use two (2) units of 'Core Juniper Router (ERX 705)' in its Fixed Module, as specified in cell B296.

d.   LIME calculated the relevant cost inputs for 'Installation labour' costs in cells F291:F296, as for the example in cell F291 '=(C291+D291+E291)*(SUM(D\$261:D\$274)/SUM(C\$261:D\$274))', where:

- cell C291 refers to cost based on 'Equipment purchase price';
- cell D291 refers to cost of 'Spares';
- cell E291 refers to cost of 'Import duty';
- cells C261:C274 refer to what LIME has specified as "Figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell C260); and
- cells D261:D274 refer to what LIME has specified as "IRM = installation related materials, figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell D260).

It appears that the costs of 'Spares' and 'Import duty' should be excluded from the formula in cells F291:F296 as the descriptions given by LIME in cells C260 and D260 suggest that these cost items are not included in cells C261:D274.

Accordingly, LIME is requested to amend the formula to reflect more correct estimation of 'Installation labour' costs, as for the example in cell F291 '=C291*(SUM(D\$261:D\$274)/SUM(C\$261:D\$274))', or to provide a detailed rationale for the existing calculation.

24.   In response to the first round interrogatory 35, LIME provided the source of information for its cost input for 'Data Network Equipment (Cisco 3560)' in cell C299 in the 'Other Cost Assumptions' section in the 'Cost Assumptions' sheet of the Fixed Module, as follows http://www.router-switch.com/Price-cisco-switches-cisco-catalyst-3560_c22.

a.   The Authority notes that the formula used in cell C299 for 'Equipment Purchase Price' is ##, where the value ## appears to correspond to what LIME identified in its response to the first round

interrogatory 35 as 'discounted price for the Cisco 3560 switch'. The Authority notes that this value is a pasted value from cell C292 in the 'Cost Assumptions' sheet of the initial version of the Fixed Module ('2012 10 02 CYM fixed – Conf.xls'). Furthermore, the Authority notes that the highest unit price obtained from the website cited by LIME in its response to the first round interrogatory 35 is ## (discounted price for the model WS-C3560V2-48PS-SM, as viewed on 14 March 2014).

Accordingly, LIME is requested to clarify how it has obtained the value ## which is used as cost input in cell C299.

b.   In relation to the relevant cost inputs for 'Installation labour' (cell F299), LIME has applied the following formula '=(C299+D299+E299)*(SUM(D\$261:D\$274)/SUM(C\$261:D\$274))', where:

- cell C299 refers to cost based on 'Equipment purchase price';
- cell D299 refers to cost of 'Spares';
- cell E299 refers to cost of 'Import duty';
- cells C261:C274 refer to what LIME has specified as "Figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell C260); and
- cells D261:D274 refer to what LIME has specified as "IRM = installation related materials, figures from actual delivery invoices i.e. post discount and including shipping etc. USD" (cell D260).

It appears that the costs of 'Spares' and 'Import duty' should be excluded from the formula in cell F299 as the descriptions given by LIME in cells C260 and D260 suggest that these cost items are not included in cells C261:D274.

Accordingly, LIME is requested to amend the formula to reflect more correct estimation of 'Installation labour' costs, as follows '=C299*(SUM(D\$261:D\$274)/SUM(C\$261:D\$274))', or to provide a detailed rationale for the existing calculation.

25.   In the 'Other Cost Assumptions' section in the 'Cost Assumptions' sheet of the Fixed Module, the cost input for 'Interconnect billing platform (adjusted)' is given in cell E305 by the formula '=E303-E304', where:

- cell E303 refers to 'Interconnect billing platform (fixed to mobile and mobile to mobile)' at cost value of CI$ 500,000; and

- cell E304 refers to 'Variable capital cost for mobile-to-mobile billing' at cost value of CI$ 78,300.

In its first round interrogatory 36, the Authority requested from LIME to provide detailed documentation for the cost inputs provided in cells E303 and E304, for example an invoice or bill of materials for the cost input in cell E303, and supporting calculations and documentation for the cost input in cell E304. LIME responded that it would revise the Fixed Module by applying the same approach to costing the interconnection billing platform as LIME adopted in the mobile LRIC proceedings, unless instructed by the Authority otherwise.

The Authority notes that the cost input 'Variable capital cost for mobile-to-mobile billing' specified in cell E304 was used as the relevant cost input for the network component '400-3G: Interconnect Specific Costs' in the file 'LIME_2012 02 21 CYM Mobile 3G – Conf.xls' ("3G Mobile Module"). This cost input (## in cell E229 in the 'Cost Assumptions' sheet of the '3G Mobile Module') was computed as the sum of the following cost items:

- CS Labour Cost (2 CS @ 20 days);
- IT Labour Cost (1 IT @ 10 days + 1 IT @ 20 days);
- Switch Engineer Cost (1 Swt. Eng. @ 15 days);
- Intec Project Cost (40 days);
- Mediation - Additional Space (900Gb); and
- Project Management Costs (45 days).

The Authority further notes that the cost input 'Variable capital cost for mobile-to-mobile billing' specified in cell E304 was categorized in the '3G Mobile Module' as duration-sensitive cost since it was allocated to the network component '400-3G: Interconnect Specific Costs'.

Accordingly, LIME is requested to provide response to the following interrogatories:

a.   Please clarify whether LIME intends to use the cost items listed above as relevant inputs into calculation of costs specific to 'Interconnect Billing Platform' in the Fixed Module, and if not, please explain in detail the approach to calculating these costs that LIME has proposed in its response to the first round interrogatory 36; and

b.   Please provide an explanation as to why LIME has categorized the costs specific to 'Interconnect Billing Platform' as call-sensitive in the

Fixed Module (i.e. allocated to the network component '400-Interconnect billing platform') while such costs were categorized as duration-sensitive in the '3G Mobile Module'.

26. In the 'Other Cost Assumptions' section in the 'Cost Assumptions' sheet of the Fixed Module, the revised cost inputs for the cost group 'VOIP' is given in cells E315:E317, as for the example in cell E315 '=B315*$B$313' where:

- cell B315 (as well as cell B317) refers to the price quotation identified in the document submitted by LIME as 'Attachment – response to ICTA interrog 37 (Netspeak agreement) CONFIDENTIAL.pdf'; and
- cell B313 refers to 'Number Customers' which makes reference to cell G37 in the 'Volume Input for TD' sheet ('='Volume Input for TD'!G37').

The Authority notes that in cell G37 in the 'Volume Input for TD' sheet is given an estimated quantity of 2 Mbps equivalent lines ('Volume – 2M') for '900-VOIP' service (the value given is 150) rather than an estimated number of customers for this service. In addition, in cell H37 in the 'Volume Input for TD' sheet there is another value (662) which is given for what LIME identified as 'Volume - Other' (cell H1).

Please clarify whether or not the value in cell H37 in the 'Volume Input for TD' sheet represents an estimated number of VOIP customers.

If the answer is yes, please provide an explanation as to why LIME did not apply the formula '='Volume Input for TD'!H37' in cell B313 in the 'Cost Assumptions' sheet and, if necessary, amend the formulas in cells E315-E317.

If the answer is no, please provide a detailed explanation of the existing calculations in cells E315-E317.

27. In the 'Core Fibre Dimensions' sheet of the Fixed Module, LIME provided the length of core fibre network in meters for aerial and underground fibre cables, aggregated per type of cable (8, 12, 24 of 48 fibre strands). The total length of aerial fibre cables is given in cell B13 as 13,400 meters (13.4 km), while the total length of underground fibre cables if given in cell B20 as 109,387 meters (109.387 km). The total length of all core fibre cables in the Cayman Islands is then given in cell B22 as 122,787 meters (122.787 km).

In response to the first round interrogatory 45, LIME submitted the following confidential attachment:

- Attachment – response to ICTA Interrog 45 (core fibre network dimensions) CONFIDENTIAL.xlsx

The Authority notes that the total length of LIME's core fibre route is given in cell D18 of the 'Attachment – response to ICTA Interrog 45 (core fibre network dimensions) CONFIDENTIAL.xlsx' as ##, of which ## is aerial and ## is underground.

LIME is requested to provide an explanation and justification as to why the data related to core fibre route lengths in the 'Core Fibre Dimensions' sheet of the Fixed Module do not match the data provided in the 'Attachment – response to ICTA Interrog 45 (core fibre network dimensions) CONFIDENTIAL.xlsx'.

28. LIME has made some changes in the 'Access Ring Capacity' section in the 'TX Equipment Dimensions' sheet of the Fixed Module, namely in cells B40:D89 by linking the names of 'RLU Node' (column B) to 'Exch. Code' displayed in column D in the 'MG Dimensions' sheet, and by mapping each individual 'RLU Node' to the relevant 'Access Ring' (column D) using specific values in cells D40:D89 ('1', '2', '3' or 'remote').

The Authority notes that in cells I40:I44 in the 'TX Equipment Dimensions' sheet, LIME calculated '# of STM1 tribs' (number of STM1 tributary cards) by counting the values specified in cells D40:D89 ('1', '2', '3' or 'remote'), using the following formulas:

- '=2*COUNTIF($D$40:$D$89,"1")' for the value '1';
- '=2*COUNTIF($D$40:$D$89,"2")' for the value '2';
- '=2*COUNTIF($D$40:$D$89,"3")' for the value '3'; and
- '=COUNTIF($D$40:$D$89,"remote")' for the value 'remote'.

The total number of STM1 tributary cards (cell G59 in the 'TX Equipment Dimensions' sheet) is used as relevant quantity of tributary cards in cell C14 in the 'Transmission Equipment Costs' sheet. This quantity (cell C14) is then multiplied by the unit cost for 'Access Ring ADM + Port Cards per Access Node' specified in cell F39 in the 'Transmission Equipment Costs' sheet (as a reference to cell H219 in the 'Cost Assumptions' sheet), in order to calculate the total cost of 'Tributary Cards' for 'Host-Remote (Access Rings)' in cell G52 in the 'Transmission Equipment Costs' sheet.

Further, the Authority notes that in response to the first round interrogatory 27, LIME has provided an explanation for its calculation of the unit cost for 'Access Ring ADM + Port Cards per Access Node' (cell H219 in the 'Cost Assumptions' sheet) and submitted that 'Access Ring ADM + Port Cards per Access Node' "*need a minimum of two [cards] for redundancy purposes*".

Accordingly, as the unit cost for 'Access Ring ADM + Port Cards per Access Node' (cell H219 in the 'Cost Assumptions' sheet) is calculated for the configuration consisting of two (2) STM1 tributary cards, it appears that the formulas in cells I40:I42 the 'TX Equipment Dimensions' sheet need to be amended in order to avoid the double counting of the number of STM1 tributary cards for each 'RLU node', as follows:

- in cell I40 '=COUNTIF($D$40:$D$89,"1")';
- in cell I41 '=COUNTIF($D$40:$D$89,"2")'; and
- in cell I42 '=COUNTIF($D$40:$D$89,"3")'.

a. LIME is requested to amend the formulas in cells I40-I42 in the 'TX Equipment Dimensions' sheet or to provide an explanation as to why the current formulas do not need to be changed.

b. LIME is also requested to provide an explanation as to why the cells D37:D38 in the 'MG Dimensions' sheet are left blank, thus excluding two access node locations ('Bloosom's Village' and 'May's Bay') from the 'Access Ring Mapping' in cells D39:D89 in the 'TX Equipment Dimensions' sheet.

29. In response to the first round interrogatory 49, LIME submitted that the STM-n capacity reported in cells J40:K44 in the 'Tx Equipment Dimensions' sheet of the Fixed Module should be explicitly driven by demand from the access rings, international traffic and interconnection traffic, and it proposed to implement relevant changes in a revised version of the model.

Please provide the revised version of the model and supporting documentation to implement the relevant changes.

30. The Authority notes that the costs of 'Tributary Cards' in cells F52:I52 in the 'Transmission Equipment Costs' sheet have increased significantly compared to the previous version of the Fixed Module ('2012 10 02'), as illustrated in the table below.

##

The difference in costs of 'Tributary Cards' between the two versions of the Fixed Module is essentially due to the change in unit costs in cells F39:F40 (## compared to ## in the 'Fixed Module dated 2012 10 02') which make reference to cells C219:C220 in the 'Cost Assumptions' sheet of the Fixed Module.

In response to the first round interrogatory 27, LIME provided a detailed explanation and cost justification for three basic elements to the transmission systems in the model, i.e. 'Add-Drop Multiplexer' ("ADM"), Cross-Connect (not necessary for the access node transmission) and Service Cards (or as they appear in the model "Trib" Cards).

It appears that LIME has allocated the costs of 'ADM' to the costs of 'Trib' cards in cells C219:C220 in the 'Cost Assumptions' sheet of the Fixed Module, although in the initial version of the Fixed Module ('Fixed Module dated 2012 10 02' in the table above) LIME made reference only to 'Tributary Card, Access Ring' (cell C218 in the 'Cost Assumptions' sheet of the 'Fixed Module dated 2012 10 02') or 'Tributary Card, Transport Ring' (cell C219 in the 'Cost Assumptions' sheet of the 'Fixed Module dated 2012 10 02').

Based on the above observations, it appears that by adding 'ADM' costs to the costs of tributary cards in cells C219:C220 in the 'Cost Assumptions' sheet, LIME has incorrectly allocated the costs of 'ADM' to cells F52:I52 in the 'Transmission Equipment Costs' sheet of the Fixed Module.

Accordingly, LIME is requested to amend its approach to calculating the costs of 'Tributary Cards' in cells F52:I52 in the 'Transmission Equipment Costs' sheet of the Fixed Module or to provide an explanation as to why the current approach does not need to be changed.

31. In its first round interrogatory 54, the Authority noted and questioned the large share (approximately 60%) of access costs that jointing costs accounted for in the initial version of the Fixed Module. In response to this interrogatory, LIME has made some adjustments in the Fixed Module which resulted in a decreased share (approximately 14 %) of access costs related to the jointing cost data (cells C136 and C144 in the 'Access Costs' sheet).

The Authority notes that it is now another cost group 'DPs, Dropwire, NID' (cells C138 and C146 in the 'Access Costs' sheet) that accounts for the largest share of access costs (more than 65%).

LIME calculated the 'Direct Capex' for 'DPs, Dropwire, NID' (cell C138 in the 'Access Costs' sheet which makes reference to cell L129) as a function of

the number of fixed lines comprising of PSTN, ISDN, Payphone and Leased Circuits (cell J129 in the 'Access Costs' sheet which makes reference to cell E175 in the 'Access Calculations' sheet, which in turn makes reference to cell S142 in the 'Demand Calculations' sheet), and the average value of the cost group 'DPs, Dropwire, NID' (cell J129 in the 'Access Costs' sheet), which is essentially based on the following cost inputs:

- 'Total installation per pair' (cell G121 in the 'Access Costs' sheet), which is derived from cell H175 in the 'Cost Assumptions' sheet ('TERMINAL 76C 20 pair'), divided by the number of pairs (cell E121, specified as '20' pairs);

- 'Unit cost UG' (cell H127 in the 'Access Costs' sheet), which is sum of 'Total installation per pair' (cell G121), 'NID 6pr' (cell H102 in the 'Cost Assumptions' sheet) and 'Underground 6 pair dropwire' (cell H105 in the 'Cost Assumptions' sheet);

- 'Unit cost Aerial' (cell H128 in the 'Access Costs' sheet), which is sum of 'Total installation per pair' (cell G121), 'NID 6pr' (cell H102 in the 'Cost Assumptions' sheet) and 'Aerial 6' (cell H94 in the 'Cost Assumptions' sheet)

It appears that LIME's proposed approach to cost modelling of the cost group 'DPs, Dropwire, NID' in the 'Access Costs' sheet, which assumes the allocation of costs of six (6) pairs of 'NID' and 'Dropwire' ('Underground' or 'Aerial') to each individual fixed line, may not equate to an efficient cost modelling. For example, it is not clear why LIME did not model the cost group 'DPs, Dropwire, NID' as a function of two (2) or maximum (3) pairs of 'NID' and 'Dropwire' ('Underground' or 'Aerial'), rather than six (6).

In addition, the Authority notes that the 'Equipment purchase price' of the item 'Aerial 6' (cell C94 in the 'Cost Assumptions' sheet) is extrapolated value ('=C93*6') based on the value specified for the item 'Aerial 1' (cell C93 in the 'Cost Assumptions' sheet), which in turn appears to be based on a quote for three (3) pair aerial dropwire (item number 7 in the 'Attachment – response to ICTA interrog 19 (Anixter invoices1) CONFIDENTIAL.pdf'). It appears therefore that the extrapolated value in cell C94 would correspond to eighteen (18) pair dropwire rather than six (6).

Furthermore, the difference in the value of the 'Equipment purchase price' between 'Aerial 6 pair dropwire' (cell C94 in the 'Cost Assumptions' sheet) and 'Underground 6 pair dropwire' (cell C105 in the 'Cost Assumptions' sheet) is significant enough (8.7:1 in the Fixed Module compared to 1.2:1 in the initial version of the Fixed Module) to raise further doubts about the accuracy of cost modelling of the cost group 'DPs, Dropwire, NID', as proposed by LIME in the Fixed Module.

LIME is requested to provide a detailed explanation and justification, or to amend its entire approach, in relation to LIME's cost modelling of the cost group 'DPs, Dropwire, NID' in the Fixed Module.

32. In response to the first round interrogatory 56, LIME stated that the '*issue of the call and minute related drivers for the MSE elements has a long history*' and it referred the Authority to LIME's response to 'Interrogatory 3.2.1 of ICTA/Telcordia Round 2 Interrogatories, Part 5, dated 22 June 2007'.

The Authority notes that LIME's response to 'Interrogatory 3.2.1 of ICTA/Telcordia Round 2 Interrogatories, Part 5, dated 22 June 2007' clarified the rationale for using the ratio of 74% of call-sensitive to duration-sensitive capex for 'MSE' (specified in cell C5 in the 'NGN Costs' sheet), which was based on the investment costs of ## for call-sensitive components and ## for duration-sensitive components.

The following five (5) components were classified as "call-set up" (call-sensitive): Call Server Hardware, Call Server Software, IMS, Gateway Controller and Signalling.

The following two (2) components were classified as "call conveyance" (duration-sensitive): ATM Switch and Packet Voice Gateway, and Routing Switch.

The Authority notes the following examples of inconsistency between the approach to cost modelling of 'MSE' network components in the 'NGN Costs' sheet of the Fixed Module and LIME's response to 'Interrogatory 3.2.1 of ICTA/Telcordia Round 2 Interrogatories':

- In LIME's response to 'Interrogatory 3.2.1 of ICTA/Telcordia Round 2 Interrogatories', 100% of the costs related to 'Call Server Hardware' and 'Call Server Software' were allocated to 'call set up functionality' ('call-sensitive' costs), while in the 'NGN Costs' sheet 74% of these costs (cell E14 in the 'NGN Costs' sheet) are allocated to cell D35 in the 'NGN Costs' sheet (and ultimately to the network component '400-PSTN Host Switch - call sensitive') and 26% cell E35 in the 'NGN Costs' sheet (and ultimately to the network component '400-PSTN Host Switch - duration sensitive');

- In LIME's response to 'Interrogatory 3.2.1 of ICTA/Telcordia Round 2 Interrogatories', 100% of the costs related to 'IMS' were allocated to 'call set up' functionality ('call-sensitive' costs), while in the 'NGN Costs' sheet these costs (cell E20 in

the 'NGN Costs' sheet) are allocated entirely to cell E35 in the 'NGN Costs' sheet (and ultimately to the network component '400-PSTN Host Switch - duration sensitive');

- In LIME's response to 'Interrogatory 3.2.1 of ICTA/Telcordia Round 2 Interrogatories', 100% of the costs related to 'Gateway Controller' were allocated to 'call set up' functionality ('call-sensitive' costs), while in the 'NGN Costs' sheet these costs (cell E16 in the 'NGN Costs' sheet) are allocated entirely to cell E35 in the 'NGN Costs' sheet (and ultimately to the network component '400-PSTN Host Switch - duration sensitive'); and

- In LIME's response to 'Interrogatory 3.2.1 of ICTA/Telcordia Round 2 Interrogatories', 100% of the costs related to 'Signalling' were allocated to 'call set up' functionality ('call-sensitive' costs), while in the 'NGN Costs' sheet these costs (cell E21 in the 'NGN Costs' sheet) are allocated entirely to cell E35 in the 'NGN Costs' sheet (and ultimately to the network component '400-PSTN Host Switch - duration sensitive').

LIME is requested to provide a detailed explanation and justification for each specific component of 'MSE' (cells B13:E21 in the 'NGN Costs' sheet) as to why, and to what proportion, such component should be allocated to either cell D35 (and ultimately to the network component '400-PSTN Host Switch – call sensitive') or cell E35 (and ultimately to the network component '400-PSTN Host Switch – duration sensitive') in the 'NGN Costs' sheet of the Fixed Module'.

33. In a letter to the Authority dated 3 June 2013 ('Ref: Major Transmission failure in Jamaica Affecting Cayman OLO Signalling Links'), LIME stated, amongst other things, the following:

- ##

LIME is requested to provide a detailed explanation as to how the new arrangements for signaling facilities, described in LIME's letter dated 3 June 2013, have been treated in the Fixed Module. In particular, please explain the rationale for using the network component 'USP' in the Fixed Module (row 21 in the 'NGN Costs' sheet), noting that the STP functionality has been migrated from Cayman to Jamaica.

34. In its first round interrogatory 59, the Authority requested LIME to provide a detailed rationale for using the allocation key to split total manhole costs in the core network into one quarter Host-Host and three quarters RSU-Host related. LIME responded that "*this is a simplifying assumption that*

uses a proportion that roughly corresponds to the same split for core duct length" and so LIME "*propose to use the same approach used to split Duct Core between Host-Host and Host-Remote, i.e. the relative share of annual fibre transmission costs found in cells D21 and E21 in the 'Cost Summary & Mapping' sheet*".

The Authority notes that LIME's response did not provide a detailed rationale for using the allocation key to split total manhole costs in the core network into one quarter host-host and three quarters RSU-Host related, and it has rather pointed to a simplifying approach that LIME has used elsewhere in the 'Cost Summary & Mapping' sheet of the Fixed Module. The Authority further notes that the same allocation key to split specific core network related costs into one quarter host-host and three quarters RSU-Host related, is adopted by LIME for:

- 'Fibre Transmission' in cells D21:E22 in the 'Cost Summary & Mapping' sheet;
- 'Manholes-Core' in cells I27:J28 in the 'Cost Summary & Mapping' sheet; and
- 'Duct-Core' in cells F33:G34 in the 'Cost Summary & Mapping' sheet.

LIME is therefore requested to provide a detailed justification for using the allocation key to split the above listed core network related costs into one quarter Host-Host and three quarters RSU-Host related.

35. In its first round interrogatory 60, the Authority requested from LIME to reconcile the traffic volumes in cells X2:AB37 in the 'Volume Input for TD' sheet of the Fixed Module, with the Quarterly Monitoring Data ("QMD") reports and the LIME interconnection services invoices.

In response to this interrogatory, LIME revised the demand volumes for a number of services in columns X (calls) and Z (minutes) in the 'Volume Input for TD' sheet of the Fixed Module submitted on 6 May 2013, and it provided the following files in support of the reconciliation of these volumes with the QMD reports and the LIME interconnections services invoices:

- 'Attachment – response to ICTA Interrog 60c (Volumes to QMD reconcile) CONFIDENTIAL.xls'
- 'Attachment – response to ICTA Interrog 60e 60g 60i (interconnection minutes reconciliation)_CONFIDENTIAL.xlsx'.

The Authority notes the following:

a.   The 'Attachment – response to ICTA Interrog 60e 60g 60i (interconnection minutes reconciliation)_CONFIDENTIAL.xlsx' contains the records of invoiced minutes, which are not necessarily the total (final) invoiced minutes for the relevant period. For example, LIME issued an invoice to Digicel for its monthly interconnection traffic with LIME in March 2012, in which 'Mobile to LIME Fixed' service (cell P9 in the 'Digicel' sheet of the attachment) was billed for a significantly lower amount than in previous months (## compared to approximately ## in previous months). However, the Authority notes that in a subsequent invoice, LIME billed Digicel for additional amount of traffic for March 2012 by adding more than ## to that billing period (such corrections by LIME in invoicing the actual traffic for the relevant billing period have been produced a number of times in the past).

Accordingly, LIME is requested to use the total interconnection minutes (and number of calls) for a specific billing period, after taking into consideration any reconciliation or further adjustments made for the interconnection traffic invoiced in the relevant billing period, and to provide supporting documentation.

b.   For '900-DOMESTIC TRANSIT' services, it appears that LIME has incorrectly calculated the volume of minutes from QMD reports as a sum of 'Transit calls originated on OLO's network' (row 102) and 'Mobile network termination of calls originated on OLO's network' (row 101). Moreover, in its 'Attachment – response to ICTA Interrog 60c (Volumes to QMD reconcile) CONFIDENTIAL.xls', LIME acknowledged that "*the relevant minutes for the model are in the QMD report row 102 only, but must be combined with LIME mobile originated transit minutes of ## to arrive at total domestic transit minutes*".

Accordingly, LIME is requested to amend the demand volumes for this service as a sum of domestic transit of calls originated on OLOs network and domestic transit of calls originated on LIME mobile (and terminated on OLOs network).

c.   For '900-INTERNATIONAL TRANSIT to OLO' service, LIME has calculated the demand volume as a sum of 'Incoming Int'l to Other Fixed' and 'Incoming Int'l to Mobile. This volume is confirmed in cell Q20 in the 'TOTAL' sheet of the 'Attachment – response to ICTA Interrog 60e 60g 60i (interconnection minutes reconciliation)_CONFIDENTIAL.xlsx'.

The Authority understands the following:

- the traffic designated as 'Incoming Int'l to Other Fixed' relates to traffic that is originated as international calls, then routed through an OLO network (and transited through LIME Fixed network) and terminated on another OLO Fixed network; and
- the traffic designated as 'Incoming Int'l to Mobile' relates to traffic that is originated as international calls, then routed through OLOs network (and transited through LIME Fixed network) and terminated on LIME Mobile and Digicel Mobile networks.

Please confirm if the Authority's understanding of LIME's calculation of the demand volumes for this service is correct, and if so:

- please explain where in the 'Volume Input for TD' sheet LIME has included the demand volumes for international incoming calls that are routed through LIME fixed network and terminated on OLOs and LIME Mobile networks, and
- provide the breakdown of demand volumes for each type of international incoming calls (i.e. calls to LIME Mobile, calls to Digicel, calls to Logic, etc.).

d.   For '900-FIXED INTERNATIONAL INCOMING' service, the Authority understands that the demand volumes provided by LIME correspond to the traffic that is originated as international calls and terminated on LIME Fixed network, a part of which is transiting through OLOs network as 'Incoming Int'l to LIME Fixed' service and the rest is directly terminated by LIME.

Please confirm if the Authority's understanding of LIME's calculation of the demand volumes for this service is correct.

e.   For '900-PSTN TERMINATION' service, LIME responded in the 'Attachment – response to ICTA Interrog 60e 60g 60i (interconnection minutes reconciliation)_CONFIDENTIAL.xlsx' that "*the PSTN termination minutes volume reported in the model (cell Z32) is 16.2M. This amount includes both ## LIME originated traffic and ## OLO originated traffic*".

The Authority understands that '*## LIME originated traffic*' is in reference to the traffic that is originated on LIME Mobile network. Please confirm if this is correct.

f.   For '900-INTERNATIONAL TRANSIT from OLO' service, the Authority understands that the demand volumes provided by LIME correspond to the international outgoing calls that are originated on OLOs network and routed through LIME Fixed network to international destinations. It appears that traffic originating from LIME's mobile network and routed via LIME's fixed network to an international carrier is no longer included in the '900-INTENATIONAL TRANSIT from OLO' service.

Please explain where in the 'Volume Input for TD' sheet LIME has included the demand volumes for international outgoing calls that are originated on LIME Mobile network and routed through LIME Fixed network to international destinations. If such traffic has not been included in the 'Volume Input of TD' sheet, please provide a revised model which includes these demand volumes.

36.   In cells A1:K40 in the 'Demand Calculations' sheet of the 3G Mobile module, submitted as file named '2012 02 21 CYM Mobile 3G – Conf.xls', LIME calculated total outgoing and incoming interconnect traffic that is routed between LIME mobile network and LIME fixed network. This interconnect traffic consists of the following services '900-MOBILE DATA', '900-MOBILE INTERNATIONAL INCOMING', '900-MOBILE INTERNATIONAL OUTGOING', '900-MOBILE TO FIXED', '900-MOBILE TO OTHER MOBILE', '900-MOBILE TERMINATION', '900-MMS', '900-VIDEO CALLING', '900-MMS TERMINATION', '900-VIDEO CALL TERMINATION' and '900-INBOUND DATA ROAMING'.

Please explain where in the 'Volume Input for TD' sheet of the Fixed Module LIME has included the relevant demand volumes for each of the aforementioned services. If any such traffic has not been included in the 'Volume Input of TD' sheet of the Fixed Module, please provide a revised model which includes the demand volumes for all of the aforementioned services, or provide a detailed explanation, along with supporting documentation, as to why such traffic should not be included in the 'Volume Input of TD' sheet of the Fixed Module.

37.   In its first round interrogatory 2, the Authority requested from LIME to provide a detailed explanation of how the Fixed Module accounted for any increased traffic that might result from the introduction of Television Services on LIME Fixed network. In response to this interrogatory, LIME provided, amongst others, the following statements:

      ▪   "*As the IPTV service is provided via residential broadband lines we have modified the ADSL demand volumes in the*

> *revised version of the module. The peak traffic associated with the service will be a ## Mbps download flow. We assume that the entire base of current ADSL subscribers will eventually take the IPTV service*"; and

- "*Bandwidth requirements are derived as with the original subscriber numbers (see response to Interrogatory 60c file and "Attachment – response to ICTA Interrog 60c (broadband detail) CONFIDENTIAL.xlsx." The IPTV calculations are provided in cells AK77 to AR97.*"

In support of its calculation of the revised ADSL demand volumes, LIME submitted the following files:

- 'Attachment – response to ICTA Interrog 60c (Volumes to QMD reconcile) CONFIDENTIAL.xls'; and
- 'Attachment – response to ICTA Interrog 62c (broadband detail) CONFIDENTIAL.xlsx'.

For the sake of clarity, the Authority notes that the file named 'Attachment – response to ICTA Interrog 60c (broadband detail) CONFIDENTIAL.xlsx', which is quoted in LIME's response to the first round interrogatory 2, is not submitted for the record, however the Authority assumes that LIME intended to make reference to the file submitted as 'Attachment – response to ICTA Interrog 62c (broadband detail) CONFIDENTIAL.xlsx'.

In addition, the Authority understands that LIME's reference to IPTV calculations in cells AK77 to AR97 relates to the calculations made in cells AK77 to AR97 in the 'Monitoring Data' sheet of the 'Attachment – response to ICTA Interrog 60c (Volumes to QMD reconcile) CONFIDENTIAL.xls'.

The Authority notes that LIME has calculated the demand volumes (expressed in 'Volume – 2M') for '900-ADSL RETAIL' service on the basis of the number and distribution of ADSL retail subscribers before introduction of IPTV service (## subscribers, in cells AL80:AL96 in the 'Monitoring Data' sheet). In addition to this calculation, LIME has estimated the demand volumes on the basis of the number and distribution of ADSL retail subscribers by March 2016, after introduction of IPTV service (## subscribers, in cells AR80:AR96 in the 'Monitoring Data' sheet).

However, it appears that the assumption from LIME's statement that the "*peak traffic associated with the service will be a ## Mbps download flow*" is in reality disregarded, since the calculations of demand volumes for '900-ADSL RETAIL' service make no reference to the peak traffic volume of ## Mbps that is required for LIME's IPTV service.

Furthermore, the formulas used in cells AR89:AR96 appear to be applied incorrectly, where for example:

- for Business connections with maximum download throughput of ##Mbps (cell AR93), LIME has used the formula '=128/AR$78*AF93' while for Residential connections with maximum download throughput of ##Mbps (cell AR84), the formula is '=2000/$AR$78*AN84'; or

- for Business connections with maximum download throughput of ##Mbps (cell AR95), LIME has used the formula '=128/AR$78*AF95' while for Residential connections with maximum download throughput of ##Mbps (cell AR86), the formula is '=8000/$AR$78*AN86'.

a. Accordingly, please provide an adjusted model that reflects the traffic increase related to the TV service in the following manner. Calculate the traffic volume based on a forecasted number of IPTV subscribers who will be using ## Mbps bandwidth capacity for the duration of an average number of television service transmission hours (not necessarily viewing hours) assuming 6 hours per day per subscriber, and convert this traffic volume into equivalent annual voice minutes traffic, following this example conversion formula for ## IPTV subscribers: (## [Mbps bandwidth capacity] / 8 [## Megabytes in one second for ## Mbps bandwidth capacity] * 3600 [seconds in hour] * 6 [television service transmission hours per day] / 1024 [Megabytes in Gigabyte] * 365 [days in year] * ## [IPTV subscribers]) / (64,000 [64 kbps voice grade bandwidth] * 60 [seconds in minute] / 8 [bits in Byte] / 1024 [Bytes in Kilobyte] / 1024 [Kilobytes in Megabyte] / 1024 [Megabytes in Gigabyte]), which would appear in the following form '=(##/8*3600*6/1024*365*##)/(64000*60/8/1024/1024/1024)'.

b. If LIME does not agree with this approach to converting data traffic into equivalent voice minutes traffic outlined under a) above, please provide a detailed explanation along with any supporting documentation as to why such approach should not be implemented.

38. In response to the first round interrogatory 62a, LIME stated that retail and wholesale ADSL services are provided on a best-effort transmission speed basis while all the other data services are provided on a guaranteed transmission speed basis.

The Authority notes that the demand volumes for all the data services in the 'Volume Input for TD' sheet of the Fixed Module ('Volume - Minutes' in

column Z), and the corresponding occupancy minutes (network demand), have been calculated using the same conversion factor for capacity in annual minutes (20,000), thus implying that there is no difference in network capacity (network demand) provisioning between the services provided on a guaranteed transmission speed basis and those that are provided on a best-effort basis, which is contrary to the above mentioned LIME's response to the first round interrogatory 62a.

Noting the statement from LIME that ADSL services are provided on a best-effort transmission speed basis while all the other data services are provided on a guaranteed transmission speed basis, LIME is requested to provide a revised model that uses the following approach for converting data traffic into equivalent voice minutes traffic:

a.   For ADSL services ('900-ADSL RETAIL' and '900-ADSL WHOLESALE'), the average annual download and upload usage in GB (provided in the 'Avg usage' sheet of the file submitted by LIME as 'Attachment – response to ICTA Interrog 61 (broadband usage) CONFIDENTIAL.xlsx') for all active connections (provided in the 'Active connections' sheet of the file 'Attachment – response to ICTA Interrog 61 (broadband usage) CONFIDENTIAL.xlsx') should be converted into equivalent annual voice minutes traffic using the following conversion formula ([average monthly download per customer (in GB)] + [average monthly upload per customer (in GB)]) * ## [active subscribers specified in cell AN24 in the 'Active connections' sheet] * 12 [months in year] / (64,000 [64 kbps voice grade bandwidth] * 60 [seconds in minute] / 8 [bits in Byte] / 1024 [Bytes in Kilobyte] / 1024 [Kilobytes in Megabyte] / 1024 [Megabytes in Gigabyte]), which would appear in the following form '=[*average monthly download and upload per customer (in GB)*]*##*12/(64000*60/8/1024/1024/1024)'.

b.   For all other data services, except '900-DIAL UP INTERNET USAGE' service ('900-DIRECT CONNECT', '900-DOMESTIC LEASED CIRCUITS RETAIL', '900-DOMESTIC LEASED CIRCUITS WHOLESALE', '900-MPLS IP-VPN QoS RETAIL', '900-MPLS IP-VPN QoS WHOLESALE', '900-INTERNATIONAL LEASED CIRCUITS RETAIL' and '900-INTERNATIONAL LEASED CIRCUITS WHOLESALE'), the conversion of data traffic into equivalent annual voice minutes traffic should be based on the principle that all these services are provided on a guaranteed transmission speed basis, and thus, all the separate products should be deemed to use full capacity at any time of the day throughout the year.

For example, LIME has provided the customers/speed distribution data for '900- DOMESTIC LEASED CIRCUITS RETAIL' service in cells B18:O58 in the 'PLCs' sheet of the file submitted by LIME as 'Attachment – response to ICTA Interrog 62c (broadband detail) CONFIDENTIAL.xlsx'. The aggregate capacity sold to the '900-DOMESTIC LEASED CIRCUITS RETAIL' customers (obtained as the sum of products of the columns I and J for the appropriate rows in the 'PLCs' sheet) should be converted into equivalent annual voice minutes traffic using the following conversion formula ([aggregate capacity expressed in kbps] * 60 [seconds in minute] * 60 [minutes in hour] * 24 [hours in day] * 365 [days in year] / 8 [bits in Byte]) / 1024 [Kilobytes in Megabyte] / 1024 [Megabytes in Gigabyte] / (64,000 [64 kbps voice grade bandwidth] * 60 [seconds in minute] / 8 [bits in Byte] / 1024 [Bytes in Kilobyte] / 1024 [Kilobytes in Megabyte] / 1024 [Megabytes in Gigabyte]), which would appear in the following form '=([*aggregate capacity*]*60*60*24*365/8)/1024/ 1024/(64000*60/8/1024/1024/1024)'.

Similar calculations should be done for all guaranteed transmission speed data services.

c.   Please indicate for each guaranteed transmission service whether or not a customer can use the full contracted transmission speed in both directions at the same time. For example, if a customer subscribes to a 2048 kbps DPLC, is the customer able to send 2048 kbps and receive 2048 kbps at the same time?

d.   If the answer to c) above is that the customer can have full capacity in both directions at the same time, please adjust the formulas used in response to b) above to double the aggregate capacity.

e.   If LIME does not agree with this approach to converting data traffic into equivalent voice minutes traffic outlined under a) and b) above, please provide a detailed explanation along with any supporting documentation as to why such approach should not be implemented.

39.   In the 'FAC Values' sheet of the file named 'Appendix IV-FAC-TD Values 10_09_01_rev3 – Conf.xls', LIME has provided the values for 'INTER-Region Recharges IN (9004195) Carrier Service Billing' and 'INTER-Region Recharges IN (9004195) Carrier Sales & Operations' activities.

The Authority notes that the values for these two activities, specified in cells H872 and H873 in the 'FAC values' sheet, appear to be incorrectly used as inputs into cells B57 and B58 in the 'Expense Factor FAC Values' sheet of

the file 'Appendix IV-FAC-TD Values 10_09_01_rev3 – Conf.xls'. For example, the value in cell H873 in the 'FAC Values' sheet appears to be related to the 'INTER-Region Recharges IN (9004195) Carrier Sales & Operations' activity, however in the 'Expense Factor FAC Values' sheet this value is attributed to the 'INTER-Region Recharges IN (9004195) Carrier Service Billing' activity due to what appears to be an error in activity names used in cells J872 and J873 in the 'FAC Values' sheet.

LIME is requested to amend the activity names in cells J872 and J873 in the 'FAC Values' sheet in order to match them with the corresponding activity names specified in cells E872 and E873, or to provide an explanation and justification for the existing calculation in cells B57 and B58 in the 'Expense Factor FAC Values' sheet of the file 'Appendix IV-FAC-TD Values 10_09_01_rev3 – Conf.xls'.

40. In the 'overhead_exp' sheet of the Fixed Module, LIME has calculated operating expenses for each network component (columns G:CC) and each relevant activity group (cells A55:CC94). The sum of operating expenses for each activity group is given in cells F55:F94.

The Authority notes that for most activity groups the sum of operating expenses calculated in the 'overhead_exp' sheet (cells F55:F94) do not match operating expenses reported in column D in the 'FAC Input' sheet of the Fixed Module. This mismatch implies that operating expenses for most activity groups are either over or under recovered in the Fixed Module, as illustrated in the table below. For example, operating expenses related to the '100-C&W Group Management Fee' activity group have increased from 923,117 to 1,056,951, while operating expenses for the '100-Building Repairs' activity group have decreased from ## to ##.

<p align="center">##</p>

In accordance with the above observations, please provide a detailed explanation and justification for the difference in overhead expenses identified above.

41. In the 'Expense Factors' sheet of the Fixed Module, LIME has calculated the values for operating expenses for each network component (columns G:AT) and each relevant activity group (cells A30:A101). The sum of operating expenses for each activity group is given in cells F30:F101.

The Authority notes that, for each activity group, operating expenses calculated in the 'Expense Factors' sheet do not match operating expenses reported in column D in the 'FAC Input' sheet of the Fixed Module. This

mismatch implies that, for any individual activity group, operating expenses are either over or under recovered in the Fixed Module, as illustrated in the table below.

##

In accordance with the above observations, please provide a detailed explanation and justification for the difference in overhead expenses identified above.

42. The Authority notes that around 35% of the operating costs in the '400-Interconnect billing platform' network component (total of ## in cell B27 in the 'Fixed Network Costs' sheet of the Fixed Module) are related to nine (9) 'INTER-Region Recharges' activity groups (total of ## in cells X83:X87 in the 'overhead_exp' sheet and total of ## in cells X70:X73 in the 'Expense Factors' sheet), as illustrated in the table below.

##

LIME is requested to provide a detailed explanation, for each of the nine (9) activity groups that are reported in the table above, of why and to what extent such activity group is relevant to the '400-Interconnect billing platform' network component.

43. The Authority notes that around 34% of the operating costs in the '400-Interconnect Specific Costs' network component (total of ## in cell B21 in the 'Fixed Network Costs' sheet of the Fixed Module) are related to nine (9) 'INTER-Region Recharges' activity groups (total of ## in cells Y83:Y87 in the 'overhead_exp' sheet and total of ## in cells Y70:Y73 in the 'Expense Factors' sheet), as illustrated in the table below.

##

LIME is requested to provide a detailed explanation, for each of the nine (9) activity groups that are reported in the table above, of why and to what extent such activity group is relevant to the '400-Interconnect Specific Costs' network component.

44. After the Authority issued the Disclosure Determination on 13 December 2012, LIME submitted revised public (and confidential) versions of the Fixed Module on four different occasions. First three submissions (4 January 2013, 15 January 2013 and 28 March 2013) contained public versions of four Excel files, in which the public version of

the main Excel file was linked to public versions of the three supporting Excel files (Appendix III, Appendix IV and Appendix V).

The Authority notes that the subsequent, i.e. the most recent submission (6 May 2013) also contains public versions of four Excel files, however the public version of the main Excel file (file "2013 05 06 CYM fixed – Public.xls") is now linked to the confidential versions of the supporting Excel files (files "Appendix III Fixed Assets Revaluation_20-09-09 Conf.xls", "Appendix IV-FAC-TD Values 10_09_01_rev3 – Conf.xls" and "Appendix V-TD LRIC Input_10_06_30 Conf.xls") and not to the public versions that are included in the submission (files "Appendix III Fixed Assets Revaluation_20-09-09 Public.xls", "Appendix IV-FAC-TD Values 10_09_01_rev3 – Public.xls" and "Appendix V-TD LRIC Input_10_06_30 Public.xls").

Please provide a detailed explanation as to why in the public version of the Fixed Module submitted on 6 May 2013 the main file (file "2013 05 06 CYM fixed – Public.xls") is linked to the confidential versions of the supporting Excel files (files "Appendix III Fixed Assets Revaluation_20-09-09 Conf.xls", "Appendix IV-FAC-TD Values 10_09_01_rev3 – Conf.xls" and "Appendix V-TD LRIC Input_10_06_30 Conf.xls"). If this was incorrectly submitted, please provide the public version of the main Excel file with the corrected links to the public supporting Excel files.

45. In the 'Technical Assumptions' sheet of the Fixed Module, LIME has provided the 'Number of Core NGN Sites' (value '2' in cell C17) and the number of 'Main Exchanges Sites' (value '2' in cell C23), and it has referred to the information provided by LIME in file named '09_04_08 Appendix XVII – NGN Diagram - CONFIDENTIAL.doc'.

The Authority therefore understands that the two sites identified by LIME in cells C17 and C23 correspond to the 'One Technology Square (OTS)' and 'High Rock (HRK)' sites, as identified in the file named '09_04_08 Appendix XVII – NGN Diagram - CONFIDENTIAL.doc'.

Assuming that the Authority determines that a modern NGN network, designed with a bottom-up modeling approach, would require only one (1) main switching component to handle all the relevant communications in the Cayman Islands, LIME is requested to amend all the modeling assumptions in the Fixed Module, such as the number of sites specified in cells C17 and C23, and the relevant routing factors specified for the '400-PSTN Host Switch – call sensitive' (column E) and '400-PSTN Host Switch – duration sensitive' (column F) network components in the 'Routing Factors Input' sheet of the Fixed Module, in order to comply with the assumption that the

number of main switching components has been reduced from two (2) to one (1).

46. In response to the first round interrogatories, LIME submitted the file named 'CAY 2014_02_08 LIME Letter - Attachment - response to ICTA Interrogs 7-9 11 13 15 (network diagrams) PUBLIC.pdf' ("Routing Diagrams") in which LIME describes traffic routing paths, using high level network diagrams, for various services modelled by LIME in the Fixed Module.

The Authority notes that Slides 4 and 5 in the Routing Diagrams describe the traffic routing paths for 'Incoming International Call Termination to PSTN Service functionality' which appears to correspond to '900-FIXED INTERNATIONAL INCOMING' service.

a. Please clarify whether the Slides 4 and 5 refer to '900-FIXED INTERNATIONAL INCOMING' service, and if so, please confirm whether the four (4) elements (a, b, c and d) described in the diagram correspond to the following network components used by this service:

- '400-International Tx' network component, with routing factor 1.00 – represented by element (a) 'International Transmission';

- '400-PSTN Host Switch – call sensitive' and '400-PSTN Host Switch – duration sensitive' network components, with routing factors 1.79 and 1.78 respectively – represented by element (b) 'OTS' (Slide 4) or 'HRK' (Slide 5);

- '400-RSU-Host Tx' network component, with routing factor 1.00 – represented by element (c) 'Intra-Island Transmission'; and

- '400-RSU Traffic sensitive' network component, with routing factor 1.00 – represented by element (d) 'Access Node'.

b. Please explain where in these diagrams are presented the traffic routing paths for '400-Host-Host Tx' and '400-National submarine Tx' network components used by this service (i.e. routing factors of 0.79 and 0.01 respectively).

47. The Authority notes that Slide 7 in the Routing Diagrams describes the traffic routing path for 'Transit Part functionality under PSTN Terminating Access Service'. The Authority has been unable to determine which types of calls are illustrated by the diagram shown on Slide 7. In addition, while

the element (c) has been described as "Physical connection between switches in the form of multiple E1s on an SDH network using C7 common channel signaling", the name given for this element on the diagram is "Intra-Island Transmission" and not "Interconnection Link" (for comparison, see the description of the element (c) on Slide 6).

Please provide a detailed explanation for each of the elements illustrated by the diagram shown on Slide 7, including the exact matching between these elements and the network components used in the Fixed Module, together with the relevant routing factors for each element.

48. The Authority notes that Slide 8 in the Routing Diagrams describes the traffic routing path for 'Transit Part functionality under PLMN Terminating Access Service' which appears to correspond to '900-DOMESTIC TRANSIT' service for calls originating on OLO network and terminating on LIME or OLO mobile network.

   Please clarify whether the Slide 8 refers to '900-DOMESTIC TRANSIT' service for calls originating on OLO network and terminating on LIME or OLO mobile network, and if so, please confirm whether the three (3) elements (a, b and c) described in the diagram correspond to the following network components used by this service:

   - '400-Interconnect Specific Costs' and '400-Interconnect billing platform' network components, with routing factors 2.00 and 1.00 respectively – represented by element (a) 'Interconnection Link' (routing factor for '400-Interconnect Specific Costs' is 1.00 for this element);

   - '400-PSTN Host Switch – call sensitive' and '400-PSTN Host Switch – duration sensitive' network components, with routing factors 1.00 and 1.00 respectively – represented by element (b) 'OTS'; and

   - '400-Interconnect Specific Costs' network component, with routing factor 2.00 – represented by element (c) 'Interconnection Link' (routing factor is 1.00 for this element as for element (a) described above).

49. The Authority notes that Slide 9 in the Routing Diagrams refers to the traffic routing path for 'Transit Part functionality under Incoming International Call Termination to PSTN Service'. The Authority has been unable to determine which types of calls are illustrated by the diagram shown on Slide 9.

Please provide a detailed explanation for each of the elements illustrated by the diagram shown on Slide 9, including the exact matching between these elements and the network components used in the Fixed Module, together with the relevant routing factors for each element.

50. The Authority notes that Slide 10 in the Routing Diagrams refers to the traffic routing path for 'Transit Part functionality under Incoming International Call Termination to PLMN Service'. Since there are two (2) interconnection links shown in the diagram (elements a and c), it appears that the diagram illustrates the traffic routing path for incoming international calls to mobile subscribers, which transit through OLO network and are routed via LIME's OTS to LIME mobile or Digicel mobile networks.

Please confirm whether this interpretation of the diagram on Slide 10 is correct, and if so, please confirm whether the service described on Slide 10 is '900-DOMESTIC TRANSIT'. If the above interpretation of the diagram on Slide 10 is not correct, please provide a detailed explanation for each of the elements illustrated by the diagram shown on Slide 10, including the exact matching between these elements and the network components used in the Fixed Module, together with the relevant routing factors for each element.

51. The Authority notes that Slides 11 and 12 in the Routing Diagrams refer to the traffic routing paths for 'Call originating from Grand Cayman Access Node served by OTS NGN switch, and terminating to Grand Cayman radio base station' and 'Call originating from Grand Cayman Access Node served by OTS NGN switch, and terminating to Cayman Brac/Little Cayman radio base station' services respectively, which appear to correspond to '900-FIXED CALL TO C&W MOBILE' service.

Please clarify whether the Slides 11 and 12 refer to '900- FIXED CALL TO C&W MOBILE' service, and if so, please confirm whether the four (4) elements (a, b, c and d) described in the diagrams correspond to the following network components used by this service:

- '400-RSU Traffic sensitive' network component, with routing factor 1.00 – represented by element (a) 'Access Node';

- '400-RSU-Host Tx' network component, with routing factor 1.00 – represented by element (b) 'Intra-Island Transmission';

- '400-PSTN Host Switch – call sensitive' and '400-PSTN Host Switch – duration sensitive' network components, with routing factors 1.29 and 1.32 respectively – represented by element (c) 'OTS'; and

- '400-Interconnect Specific Costs' and '400-Interconnect billing platform' network components, with routing factors 1.00 and 1.00 respectively – represented by element (d) 'Interconnection Link'.

52. The Authority notes that Slides 13 and 15 in the Routing Diagrams refer to the traffic routing paths for 'Call originating from to Cayman Brac/Little Cayman Access Node served by BTN AXE switch, and terminating to Cayman Brac/Little Cayman radio base station' and 'Call originating from Cayman Brac/Little Cayman Access Node served by BTN AXE switch, and terminating to Grand Cayman radio base station' services respectively, which appear to correspond to '900-FIXED CALL TO C&W MOBILE' service.

    Please confirm whether the six (6) elements (a, b, c, d, e and f) described in the diagrams correspond to the following network components used by this service:

    - '400-RSU Traffic sensitive' network component, with routing factor 1.00 – represented by element (a) 'Access Node';

    - '400-RSU-Host Tx' and '400-National submarine Tx' network components, with routing factors 1.00 and 0.04 respectively – represented by element (b) 'Inter-Island (submarine) Trans.';

    - '400-PSTN Host Switch – call sensitive' and '400-PSTN Host Switch – duration sensitive' network components, with routing factors 1.29 and 1.32 respectively – represented by element (c) 'BTN AXE';

    - '400-Host to Host' network component, with routing factor 0.32 – represented by element (d) 'Intra-Island Trans.';

    - '400-PSTN Host Switch – call sensitive' and '400-PSTN Host Switch – duration sensitive' network components, with routing factors 1.29 and 1.32 respectively – represented by element (e) 'OTS'; and

    - '400-Interconnect Specific Costs' and '400-Interconnect billing platform' network components, with routing factors 1.00 and 1.00 respectively – represented by element (f) 'Interconnection Link'.

53. The Authority notes that Slides 17 and 19 in the Routing Diagrams refer to the traffic routing paths for 'Call originating from to Grand Cayman Access Node served by HRK NGN switch, and terminating to Grand Cayman radio base station' and 'Call originating from Grand Cayman Access Node served

by HRK NGN switch, and terminating to Cayman Brac/Little Cayman radio base station' services respectively, which appear to correspond to '900-FIXED CALL TO C&W MOBILE' service.

Please confirm whether the six (6) elements (a, b, c, d, e and f) described in the diagrams correspond to the following network components used by this service:

- '400-RSU Traffic sensitive' network component, with routing factor 1.00 – represented by element (a) 'Access Node';

- '400-RSU-Host Tx' network component, with routing factor 1.00– represented by element (b) 'Intra-Island Trans.';

- '400-PSTN Host Switch – call sensitive' and '400-PSTN Host Switch – duration sensitive' network components, with routing factors 1.29 and 1.32 respectively – represented by element (c) 'HRK';

- '400-Host to Host' network component, with routing factor 0.32 – represented by element (d) 'Intra-Island Trans.';

- '400-PSTN Host Switch – call sensitive' and '400-PSTN Host Switch – duration sensitive' network components, with routing factors 1.29 and 1.32 respectively – represented by element (e) 'OTS'; and

- '400-Interconnect Specific Costs' and '400-Interconnect billing platform' network components, with routing factors 1.00 and 1.00 respectively – represented by element (f) 'Interconnection Link'.

54. The Authority notes that Slide 21 in the Routing Diagrams refers to the traffic routing path for 'LIME mobile to OLO' service, which appears to correspond to '900-DOMESTIC TRANSIT' service.

Please clarify whether Slide 21 refers to '900-DOMESTIC TRANSIT' service for calls originating on LIME mobile network and terminating on OLO network, and if so, please confirm whether the three (3) elements (a, b, and c) described in the diagrams correspond to the following network components used by this service:

- '400-Interconnect Specific Costs' and '400-Interconnect billing platform' network components, with routing factors 2.00 and 1.00 respectively – represented by element (a) 'Interconnection Link'

(routing factor for '400-Interconnect Specific Costs' is 1.00 for this element);

- '400-PSTN Host Switch – call sensitive' and '400-PSTN Host Switch – duration sensitive' network components, with routing factors 1.00 and 1.00 respectively – represented by element (b) 'OTS'; and

- '400-Interconnect Specific Costs' network component, with routing factor 2.00 – represented by element (c) 'Interconnection Link' (routing factor is 1.00 for this element as for element (a) described above).

55. The Authority notes that Slide 22 in the Routing Diagrams refers to the traffic routing path for 'LIME mobile to International' service, which appears to correspond to '900-INTERNATIONAL TRANSIT from OLO' service.

Please clarify whether Slide 22 refers to '900- INTERNATIONAL TRANSIT from OLO' service for calls originating on LIME mobile network and routed to international destinations via LIME fixed network, and if so, please confirm whether the three (3) elements (a, b, and c) described in the diagrams correspond to the following network components used by this service:

- '400-Interconnect Specific Costs' and '400-Interconnect billing platform' network components, with routing factors 1.00 and 1.00 respectively – represented by element (a) 'Interconnection Link';

- '400-PSTN Host Switch – call sensitive' and '400-PSTN Host Switch – duration sensitive' network components, with routing factors 1.00 and 1.00 respectively – represented by element (b) 'OTS'; and

- '400-International Tx' network component, with routing factor 1.00 – represented by element (c) 'International Transmission'.

56. In response to the first round interrogatory 4b asking whether or not the LIME proposed FTR would apply only under the "PSTN Termination Part" rates for both the "PSTN Termination Access Service" and "Incoming International Call Termination to PSTN Service" categories of the interconnection agreement, LIME submitted that it expected the FTR would apply to all voice call termination services involving a fixed network irrespective of technology applied (e.g. fixed wireless).

a)   Specifically list each type of "voice call termination services involving a fixed network" other than those provided for under the "PSTN Termination Part" rates for both the "PSTN Termination Access Service" and "Incoming International Call Termination to PSTN Service" categories of the interconnection agreement to which LIME proposes the FTR will apply.

b)   Provide a detailed explanation, along with supporting documentation including a detailed call routing diagram, of each of the voice call termination services LIME referred to in its response to the first round interrogatory 4b.

c)   Identify whether or not, as suggested by LIME, such voice call termination services include calls terminating on a LIME fixed wireless network. If so, indicate how any such traffic is included in the Fixed Module.

57.   In response to first round interrogatory 61, LIME stated that the only available data on average monthly broadband usage per active connection are from January 2013. As LIME will now have had the opportunity to capture additional data, please provide that information for each month between February 2013 and March 2014.

58.   In cell C119 in the 'TX Equipment Dimensions' sheet of the Fixed Module LIME has calculated 'Busy hour erlangs' ("BHE") for 'Interconnection Capacity' using the following formula '=[Actual demand (minutes)] * [% traffic in busy hours] / [# of busy hours] / [Conversion factor for minutes to erlangs] * [# of 64kbps channels in a 2 Mbps link]'.

The Authority notes that LIME has applied the following formula for calculation of BHE for 'Interconnection Capacity' in the 3G Mobile Module, submitted as file named '2012 02 21 CYM Mobile 3G – Conf.xls', '=[Annual minutes for ic link sizing] / 12 / [No of busy days in month] * [% of daily CS traffic in BH] / 60'.

It appears therefore that the factor '# of 64kbps channels in a 2 Mbps link' (the value '30' specified in cell C7 in the 'Technical Assumptions' sheet of the Fixed Module) should be removed from the formula for calculation of BHE for 'Interconnection Capacity' in the Fixed Module.

Please either apply the following formula in cell C119 in the 'TX Equipment Dimensions' sheet of the Fixed Module '=[Actual demand (minutes)] * [% traffic in busy hours] / [# of busy hours] / [Conversion factor for minutes to

erlangs]' or provide a detailed explanation, along with supporting documentation, for the use of the existing calculation.

59. In cell C120 in the 'TX Equipment Dimensions' sheet of the Fixed Module LIME has calculated 'Transmission capacity needed' for 'Interconnection Capacity' using the following formula '=[BHE] / [Circuit Efficiency Factor]'.

In the 3G Mobile Module, submitted as file named '2012 02 21 CYM Mobile 3G – Conf.xls', LIME has applied the following formula for calculation of 'Transmission capacity needed' for 'Interconnection Capacity', '=[BHE] / [Capacity planning max load factor]'. The Authority notes that 'Capacity planning max load factor' used in the 3G Mobile Module is higher than the 'Circuit Efficiency Factor' used in the Fixed Module (80% and 66% respectively).

Please provide a detailed explanation, along with supporting documentation, for the use of 'Circuit Efficiency Factor', as specified in cell C21 in the 'Technical Assumptions' sheet of the Fixed Module (66%), rather than the 'Capacity planning max load factor', as specified in cell D42 in the 'Technical Assumptions' sheet of the 3G Mobile Module (80%), for the purpose of calculation of 'Transmission capacity needed' for 'Interconnection Capacity' in cell C120 in the 'TX Equipment Dimensions' sheet of the Fixed Module.