

Appendix 6

Eligibility Requirements

Lot 1 – Lot 5

Contents

1	Definitions.....	3
2	Introduction	4
3	Lot Eligibility Requirements	4
3.1	Lot 1 Dark Fibre	4
	Dark Fibre Specifications	4
	Dark Fibre Installation Requirements.....	5
	Dark Fibre Commissioning Tests	5
	Dark Fibre Handover Requirements	5
3.2	Lot 2 – Managed Wired Services.....	6
	Managed Wired Specifications	6
	Managed Wired Installation Requirements	8
	Managed Wired Commissioning Tests	9
	Managed Wired Handover Requirements.....	9
3.3	Lot 3 – Managed Wireless Services.....	10
	Managed Wireless Requirements.....	10
	Managed Wireless Specifications	10
	Managed Wireless Installation Requirements.....	11
	Managed Wireless Commissioning Tests	12
	Managed Wireless Handover Requirements.....	12
3.4	Lot 4 – Spectrum Services	13
	Spectrum Services Requirement	13
	Spectrum Services Specifications	13
	Spectrum Service Acceptance Details.....	13
	Spectrum Services Handover Requirements	14
	Spectrum Services Commissioning and Decommissioning.....	14
3.5	Lot 5 – Wavelength Services	15
	Wavelength Service Requirements.....	15
	Wavelength Services Specification	15
	Wavelength Services Handover Requirements	15
	Wavelength Service Commissioning and Decommissioning	16
4	Acceptance of Handover (All Lots)	16

1 Definitions

Term	Definition
PoPs	means points of presence which are located at key client sites, including universities, technical universities, institute of technologies, data centres and 3 rd party PoP locations nationwide.
DPS	means a Dynamic Purchasing System.
Mini-Competition	means any Call for Tender for services following the set-up of the DPS.
Interested Party	means the supplier/economic operator submitting an application to join the DPS.
Candidate	means the Interested Party that has been admitted into the DPS.
Tenderer	means the Candidate who is invited to competition and submits a tender.
Contractor	means the Tenderer who is awarded a Services Contract under the DPS.
Third-Party Infrastructure	means any fibre, ducting, chambers, sites belonging to any other party other than the party delivering the service.
Call for Tender	Means the mini competition published under the DPS on eTenders.
Response Time	means the time taken by the support personnel to assess each Incident once reported and to provide a Response to the Customer. The Response Time commences upon notification of the Incident to the Interested Party, either verbally or electronically, by the Customer or via any other method agreed with a Customer.
Resolution	means a solution to an Incident, supplied to and acceptable to the Customer to enable continuation of the Customer's business and its use of the Services. In providing a Resolution, the Customer acknowledges that an interim Resolution or fix may be required to enable the continuation of the Customer's business.
Resolution Time	means the time to be taken by the support personnel to provide a Resolution to the Incident. The Resolution Time commences upon notification of the Incident to the Interested Party either verbally or electronically by the Customer or via any other method agreed with the Customer.
The customer	Means Asiera

2 Introduction

Asiera has several Points of Presence (PoPs) located in key client sites, including universities, technical universities, institute of technologies, data centres and third-party PoP locations nationwide. Asiera may require during the lifetime of this DPS, dedicated dark fibre, managed wired, managed wireless, Spectrum or Wavelength services to facilitate the connectivity to Asiera's Network.

Asiera is looking for candidates to provide solutions on an inter-county and intra-county basis. Asiera may seek to procure dark fibre, managed wired, managed wireless, spectrum or wavelength services from Site A to Site B where Site A and Site B may be

- Any Asiera Client Site
- Any Asiera PoP location
- Any Asiera 3rd Party colocation.
- Any other site where Asiera may have networking equipment.

The majority of service requirements will be based in the Republic of Ireland however there may be some requirements for connectivity in Northern Ireland.

3 Lot Eligibility Requirements

Interested Participants must confirm in the Admission Qualification Questionnaire Part B that can meet each of the requirements below for each lot that are requesting admittance.

Interested parties must also provide documentation showing their solution capabilities.

Lot 1 Dark Fibre

Dark Fibre Specifications

Interested Parties must be capable of meeting the minimum specifications outlined below.

- Dark Fibre must conform to ITU G.652 or G.652.D fibre standards or better.
- No inline amplification is allowed.
- Dark fibre links must be presented on an SC/UPC or LC/UPC patch-panel at both Site- A and Site-B.
- The average splice attenuation on each section shall be confirmed to be $\leq 0.1\text{dB}$, where average splice attenuation on each section is calculated as follows:
 - $\sum \text{Splice losses} / \text{Number of Splice Joints in one (1) fibre}$
- The average attenuation of each mated connector pair on a section shall be confirmed to be $\leq 0.5\text{dB}$.
- The reflectance of the fibre at any point shall be confirmed to be $< -30\text{dB}$ and should be $< -40\text{dB}$.
- Average splice attenuation of every individual splice must be $< 0.15\text{dB}$, where average splice attenuation is calculated as follows:
 - $(\text{Splice Attenuation from A to B}) + (\text{Splice Attenuation from B to A})$
 - If the average splice attenuation remains outside of spec, then Asiera may either accept or cancel the order.

- Chromatic Dispersion (CD) at 1550nm shall be less than 18.5ps/nm.km.
- Cross Connects from the Interested Party meet me room to Asiera's PoP termination points to be ordered and provided by the Interested Party.
- Polarisation mode dispersion (PMD) shall be less than 0.5ps/ √Km and should be less than 0.20ps/ √

Dark Fibre Installation Requirements

Interested Parties must be capable of carrying out the following during installation:

- Provide a Project Schedule for the activities to install Dark Fibre solution.
- Carry out a site survey to plan the installation activity and ask approval from Asiera to start work. Please note site surveys cannot take place during the mini-competition phase. Once a lot is awarded, a site survey must be carried out.
- Take responsibility for all aspects of installation (including provision of all third-party links, road opening licences, wayleaves and data-centre cross-connects within their boundary of responsibility).
- Order any cross connects that are required to deliver the service to Asiera's datacentre PoPs.
- Installation may proceed during normal working hours at most locations. However, out-of-hours installation may be necessary at certain Site-A or Site-B locations and should be agreed in advance with Asiera.
- Provide a weekly update on progress. This must be provided via email. The weekly update should include:
 - Site Names
 - Circuit ID (If assigned)
 - Current Status of Implementation
 - Project Manager Name
 - Expected Delivery date.
 - Comments and explanations for any delays which may be encountered.

Dark Fibre Commissioning Tests

Interested Parties must be capable of carry out the following tests on the complete fibre path including any cross-connect required to deliver the service:

- Bidirectional OTDR test.
- ILM Test end to end with no loops.

Dark Fibre Handover Requirements

Interested parties must be capable of providing, upon commissioning, a handover document to include but not limited to the following:

- Confirmation of Labels on cables, equipment, connector panels, etc.
- Circuit ID detailing Site A and Site B termination points in Asiera PoPs/Client sites.
- Routing information on links.
- Drawing showing physical routing into/out of buildings.
- Drawing showing route between Site-A and Site-B.

- Photographs of fibre presentation pictures of ODF tray termination points and Labelling.
- .kmz file of final route to be provided with the handover documentation as a separate file.
- As part of the handover process, be it point to point fibre pair or fibre ring, the Interested Party will provide to the Customer the following information for both directions of each single strand of the fibre, at 1310nm and 1550nm:
 - Number of connectors in section
 - The attenuation in both directions [dB] in the section, i.e. ILM measurement.
 - The average splice attenuation on each section shall be confirmed to be $\leq 0.1\text{dB}$, where average splice attenuation on each section is calculated as follows:

$$\frac{\sum \text{Splice losses}}{\text{Number of Splice Joints in one (1) fibre}}$$
 - The average attenuation of each mated connector pair on a section shall be confirmed to be $\leq 0.5\text{dB}$
 - The reflectance of the fibre at any point shall be confirmed to be $< -30\text{dB}$ and should be $< -40\text{dB}$.
 - The street level geographical routing of the ducting used to carry the fibre pair must be provided including distances.
 - Average splice attenuation of every individual splice must be $< 0.15\text{dB}$, where average splice attenuation is calculated as follows:
(Splice Attenuation from A to B) + (Splice Attenuation from B to A))
 - If the average splice attenuation remains outside of spec, then Asiera may either accept or cancel the order.
 - Chromatic Dispersion (CD) at 1550nm shall be less than 18.5ps/nm.km
 - Polarisation mode dispersion (PMDq) shall be less than $0.5\text{ps}/\sqrt{\text{Km}}$ and should be less than $0.20\text{ps}/\sqrt{\text{Km}}$.
- A bidirectional OTDR trace must be provided for each section and each fibre length, in softcopy format.
- Soft copy of the ILM test Results.

Lot 2 – Managed Wired Services

Interested Parties must be capable of providing speeds of 100Mb to 100Gbps, however typically the requirements will be 1Gbps or 10Gbps.

Managed Wired Specifications

Interested Parties must be capable of meeting the minimum specifications outlined below.

- AC Dual Powered NTU required for Managed Wired Circuits.
- Circuit must be presented as Ethernet on SC, LC or RJ45 connectors at both ends. Asiera will specify the presentation type.
- Circuit must be un-contented end-to-end.
- The minimum MTU size required is 1560 bytes, however an MTU of 9192 bytes (or greater) is preferred.
- There must be no restrictions on use or number of VLANs.
- There must be no restrictions on use or number of MAC addresses.
- There must be no restrictions or filtering of Layer2 control protocols (e.g. CDP, VTP, STP,

LACP, UDLD, LLDP, PAGP, etc...).

- Interested Party must be able to manage the link, detect faults and sub-optimal performance at the transmission bearer level.
- Interested Party must manage and monitor the link end-to-end (i.e. between the agreed boundaries of management responsibility at each end) 24 hours per day, 7 days per week.
- Interested Parties must specify any space, power and other requirements for installing their equipment at any Asiera or client site.
- Any solutions based on 802.1ad (provider 802.1QinQ) must be identified as such and the ability to run Q-in-Q-in-Q with an undetermined number of VLANs (not pre-selected/mapped) must be confirmed.
- Interested Party should clearly describe any limitations on protocols that can be transmitted through the provided circuit.
- Interested Party must include information for each link about the end-to-end delay. Where this information is not yet available estimates must be given.

Figure 1 below details a standard use of managed wired services within the Asiera network.

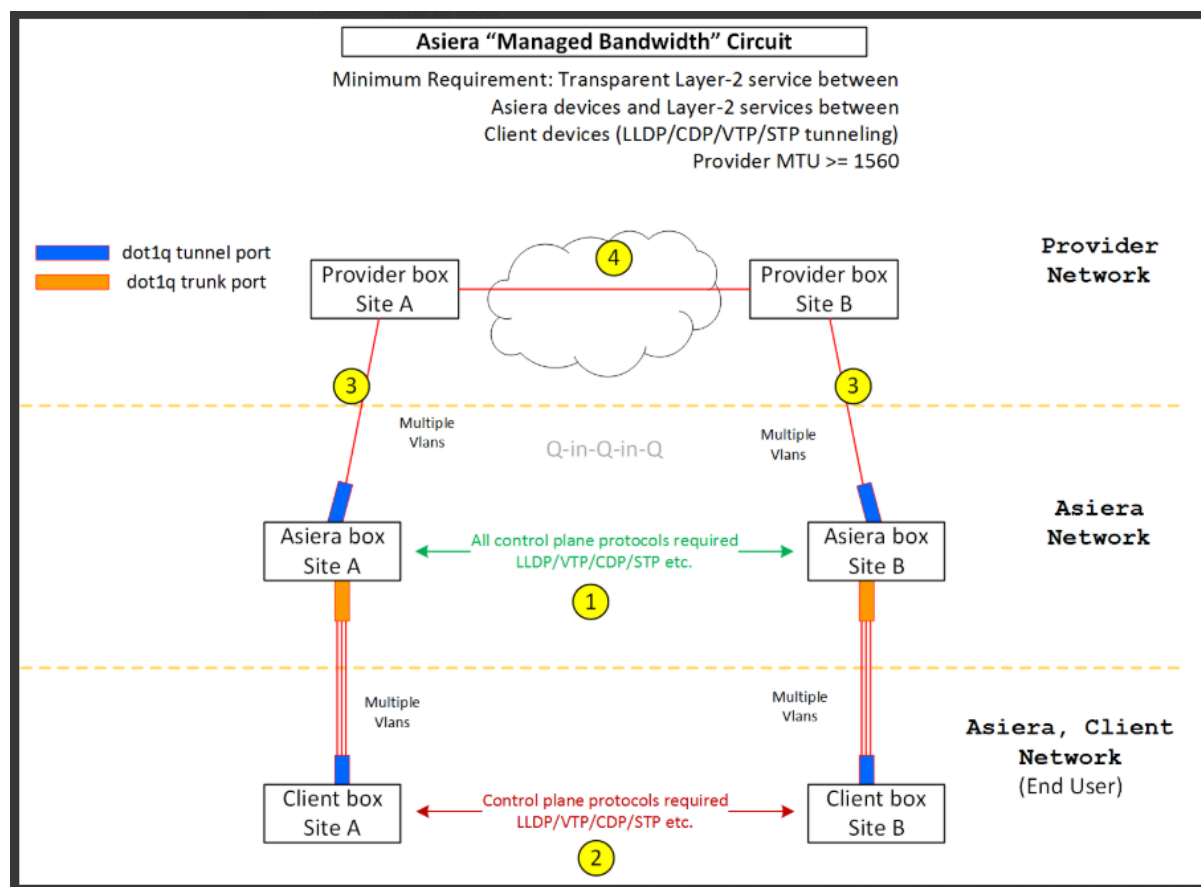


Figure 1 – Asiera Minimum Requirements Diagram

Managed Wired Installation Requirements

Interested Parties must be capable of carry out the following during Installation.

- Provide a Project Schedule for the activities to install Managed Wired solution.
- Carry out a site surveys to plan the installation activity and ask approval from Asiera to start work. Please note site surveys cannot take place during the mini-competition phase. Once a lot is awarded, a site survey must be carried out
- Take responsibility for all aspects of installation (including provision of all third-party links, road opening licences, wayleaves and data-centre cross-connects within their boundary of responsibility).
- Installation may proceed during normal working hours at most locations. However, out-of-hours installation may be necessary at certain Site-A or Site-B locations and should be agreed in advance with Asiera.
- Provide a weekly update on progress. This must be provided via email. The weekly update should include
 - Site Names
 - Circuit ID (If assigned)
 - Current Status of Implementation
 - Project Manager Name
 - Expected Delivery date.
 - Comments and explanations for any delays which may be encountered.

Managed Wired Commissioning Tests

Interested Parties must be capable of carry out the following tests on the complete path

- RFC2544 Test or Similar

Managed Wired Handover Requirements

Interested parties must be capable of providing, upon commissioning, a handover document to include but not limited to the following:

Upon commissioning a handover document must be provided and include but not limited to the following:

- Picture of any new active equipment on site must be provided along with photos of the labelled hardware.
- NTU's must be dual powered for redundancy purposes.
- Circuit ID detailing Site A and Site B termination points in Asiera PoPs/Client sites. Full Room details to be provided including Row and Rack number of any installed hardware.
- Drawing showing physical routing into/out of buildings
- Drawing showing route between Site-A and Site-B.
- Photographs of handover points (e.g. Pictures of active equipment installed by the contractor as part of the service delivery).
- Details of handover ports (LC, SC or Copper) on any active equipment used as part of the service delivery.
- Ports speed to be listed along with Auto Negotiation or Full Duplex configuration.
- Specification of optical Transceivers if fibre is used for handover ports. Details should include Manufacturer, Speed, Wavelength and Optical reach. For example, 1310nm Single mode (SM) Long Reach (LR)
- A final .kmz file must be provided to show the complete route of the Managed Wired Service end to end. Site A and Site B should be labelled clearly along with any other interconnects, or 3rd party sections along the route.
- Tests should include a 30-minute RFC2544 test providing results for:
 - Throughput
 - Latency
 - Frame Loss
 - Back-to-Back
 - Test results should be based on Frame Sizes of 64, 128, 256, 512, 1024, 1280, 1522(check) and 9192 bytes.
- If an RFC2544 test cannot be carried out, a similar test format should be provided.

Lot 3 – Managed Wireless Services

Note: The solution may only require wireless technology on one of the sites (A end) where the B end can use wired technology. Where this is the case, it will be specified at the tender stage.

Managed Wireless Requirements

Interested Parties must be capable of providing services that range from speeds of 100Mb up to 10Gbps however the typical bandwidth requirements would be 1Gbps.

Managed Wireless Specifications

Interested Parties must be capable of meeting the minimum specifications outlined below.

- Dual Powered NTU required for Managed Wireless Services.
- Circuit must be presented as Ethernet on SC, LC or RJ45 connectors at both ends
- Circuit must be un-contented end-to-end
- The minimum MTU size required is 1560 bytes, however an MTU of 9192 bytes (or greater) is preferred.
- There must be no restrictions on use or number of VLANs
- There must be no restrictions on use or number of MAC addresses
- There must be no restrictions or filtering of Layer2 control protocols (e.g. CDP, VTP, STP, LACP, UDLD, LLDP, PAGP, etc...)
- Interested Party must be able to manage the link, detect faults and sub-optimal performance at the transmission bearer level.
- Interested Party must manage and monitor the link end-to-end (i.e. between the agreed boundaries of management responsibility at each end) 24 hours per day, 7 days per week.
- Interested Parties must specify any space, power and other requirements for installing their equipment at any Asiera or client site.
- Any solutions based on 802.1ad (provider 802.1QinQ) must be identified as such and the ability to run Q-in-Q-in-Q with an undetermined number of vlans (not pre-selected/mapped) must be confirmed
- Interested Party should clearly describe any limitations on protocols that can be transmitted through the provided circuit
- Interested Party must include information for each link about the end-to-end delay. Where this information is not yet available estimates must be given.

Figure 2 below details a standard use of managed wireless solution within the Asiera network.

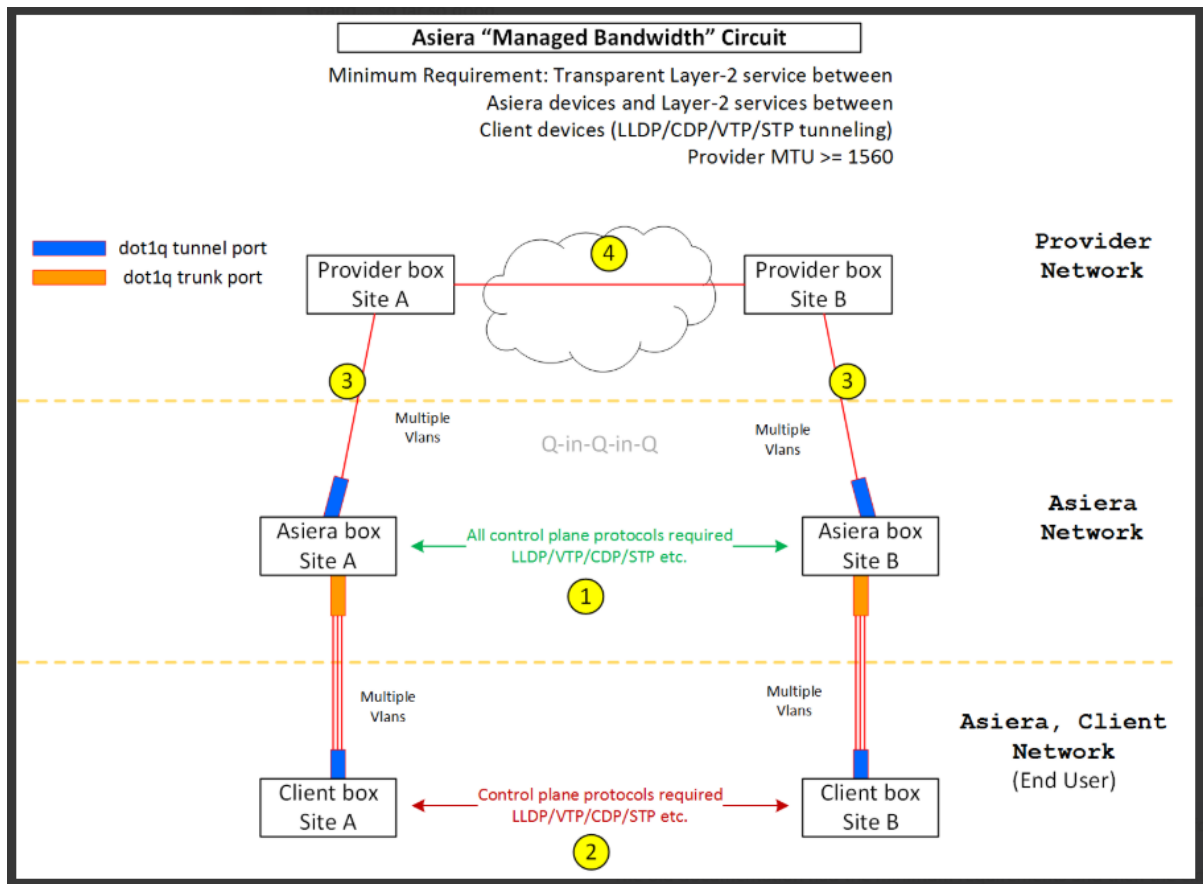


Figure 2 – Asiera Minimum Requirements Diagram

Managed Wireless Installation Requirements

Interested Parties must be capable of carry out the following during Installation.

- Provide a Project Schedule for the activities to install Managed Wireless solution.
- Carry out a site surveys to plan the installation activity and ask approval from Asiera to start work. Please note site surveys cannot take place during the mini-competition phase. Once a lot is awarded, a site survey must be carried out
- Take responsibility for all aspects of installation (including provision of all third-party links, road opening licences, wayleaves and data-centre cross-connects within their boundary of responsibility).
- Installation may proceed during normal working hours at most locations. However, out-of-hours installation may be necessary at certain Site-A or Site-B locations and should be agreed in advance with Asiera.
- Provide a weekly update on progress. This must be provided via email. The weekly update should include

- Site Names
- Circuit ID (If assigned)
- Current Status of Implementation
- Project Manager Name
- Expected Delivery date.
- Comments and explanations for any delays which may be encountered.

Managed Wireless Commissioning Tests

Interested Parties must be capable of carry out the following tests on the complete path.

- RFC2544 Test or Similar

Managed Wireless Handover Requirements

Interested parties must be capable of providing, upon commissioning, a handover document to include but not limited to the following:

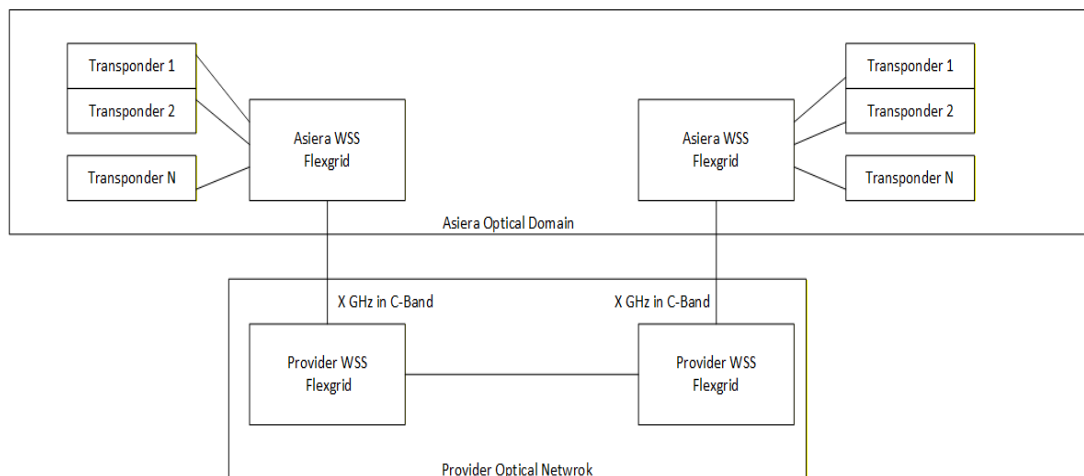
Upon handover of the Managed Wireless Service(s) the following information must be provided if requested:

- All Active Equipment on site, cables and connector panels must be clearly labelled.
- Picture of Active equipment on site must be provided along with photos of the labelled hardware.
- NTU's must be dual powered for redundancy purposes.
- Circuit ID detailing Site A and Site B termination points in Asiera PoPs/Client sites. Full Room details to be provided including Row and Rack number of any installed hardware.
- Drawing showing physical routing into/out of buildings.
- Drawing showing route between Site-A and Site-B.
- Photographs of handover points (e.g. Pictures of active equipment installed by the Interested Party as part of the service delivery).
- Details of handover ports (LC, SC or Copper) on any active equipment used as part of the service delivery.
- Specification of optical Transceivers if fibre is used for handover ports. Details should include Manufacturer, Speed, Wavelength and Optical reach. For example, 1310nm Single mode (SM) Long Reach (LR).
- A final .kmz file must be provided to show the complete route of the Managed Wired Service end to end. Site A and Site B should be labelled clearly along with any other interconnects, 3rd party sections along the route.
- Tests should include a 30-minute RFC2544 test providing results for:
 - Throughput
 - Latency
 - Frame Loss
 - Back-to-Back
 - Test results should be based on Frame Sizes of 64, 128, 256, 512, 1024, 1280, 1522(check) and 9192 bytes.
- If an RFC2544 test cannot be carried out, a similar test format should be provided.

Lot 4 – Spectrum Services

Spectrum Services Requirement

Interested Parties must be capable of providing spectrum services. Asiera may consider using dedicated spectrum services or wavelength services on an Interested Party's optical network as an alternative to dark fibre in certain scenarios. The Spectrum Service is typically provided using the Interested Party's flex-grid capable optical equipment. This allows the Interested Party to assign contiguous units of dedicated spectrum to Asiera typically in units of 12.5Ghz up to 400Ghz. Asiera may request up to 1.2Thz of spectrum on a dark fibre pair.



Spectrum Services Specifications

Interested Parties must be capable of meeting the minimum specifications outlined below.

- Minimum 100Ghz.
- Expandable to 400Ghz or higher subject to tender specification.
- Spectrum must be contiguous.
- Spectrum must be in the C-Band.
- Cross-connect from Interested Party WSS to the Asiera WSS to be provided by the Interested Party.
- No additional costs to incrementally make use of additional dedicated Spectral bandwidth/Channels.
- Coherent only neighbouring wavelengths. No on-off keying modulation should be deployed on the same fibre.

Spectrum Service Acceptance Details

- A detailed description of how the spectrum service should be accessed by Asiera.
- Overview of the equipment utilised for the multiplexing of Asiera signals (ROADM Add/Drop structure).
- Cross-connect details/last line fibre length, attenuation and termination details.
- Per wavelength power level Min/Max must be provided at the Interested Party's port.
- Aggregate power level Min/Max for the aggregate spectrum block provided.
- Expected OSNR and expect end of life OSNR for a 200Gbit/s 16QAM modulation with a 37.5Ghz carrier.

Spectrum Services Handover Requirements

Interested parties must be capable of providing, upon commissioning, a handover document to include but not limited to the following:

- Confirmation of Labels on cables, equipment, connector panels, etc.
- Circuit ID detailing Site A and Site B termination points in Asiera PoPs/Client sites.
- Routing information on links
- Drawing showing physical routing into/out of buildings
- Drawing showing route between Site-A and Site-B.
- Photographs of fibre presentation pictures of ODF tray termination points and Labelling.
- .kmz file of final route to be provided with the handover documentation as a separate file.

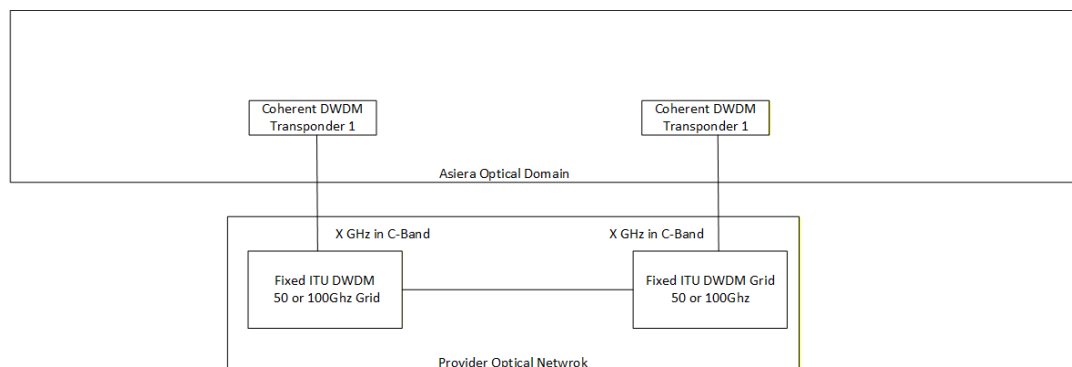
Spectrum Services Commissioning and Decommissioning

Interested parties must be capable of providing Asiera with technical assistance to onboard and offboard Asiera spectrum services should it be requested.

Lot 5 – Wavelength Services

Wavelength Service Requirements

Interested Parties must be capable of providing wavelength services. Where a Interested Party's equipment does not support flex-grid equipment, fixed grid equipment can also be used to provide optical wavelengths of 50 or 100Ghz.



Wavelength Services Specification

- 50Ghz or 100Ghz single channel from the ITU DWDM grid.
- Spectrum must be in the C-Band.
- Cross- connect from Interested Party WSS to the Asiera WSS to be provided by the Interested Party.
- Coherent only neighbouring wavelengths. No On-off keying modulation should be deployed on the same fibre.
- Wavelength Service Acceptance Details.
- A detailed description of how the spectrum service should be accessed by Asiera.
- Overview of the equipment utilized for the multiplexing of Asiera signals (ROADM Add/Drop structure).
- Cross-connect details/last line fibre length, attenuation and termination details.
- Per wavelength power level Min/Max must be provided at the Interested Party's port.
- Expected OSNR and expect end of life OSNR for a 200Gbit/s 16QAM modulation with a 37.5Ghz carrier.

Wavelength Services Handover Requirements

Interested parties must be capable of providing, upon commissioning, a handover document to include but not limited to the following:

- Confirmation of Labels on cables, equipment, connector panels, etc.
- Circuit ID detailing Site A and Site B termination points in Asiera PoPs/Client sites.
- Routing information on links.
- Drawing showing physical routing into/out of buildings.
- Drawing showing route between Site-A and Site-B.
- Photographs of fibre presentation pictures of ODF tray termination points and Labelling.
- .kmz file of final route to be provided with the handover documentation as a separate file.

Wavelength Service Commissioning and Decommissioning

During the lifetime of the agreement, interested parties must be capable of providing Asiera with technical assistance to onboard and offboard Asiera wavelength services should it be requested.

4 Acceptance of Handover (All Lots)

Interested Parties must agree to the following process for acceptance of handover:

- Following the handover of Lots 1- 5; Dark Fibre, Managed Wired, Managed Wireless, Spectrum, or Wavelength Services, an Asiera Network Engineer/s will be required to make a site visit to test and commission client services over the new solution.
- Asiera endeavour to carry this out no more than two weeks after the handover of the new solution/service by the Interested Party. Following acceptance of the new solution/service by Asiera, billing will commence.
- Should Asiera reject the handover, the provider must resolve any issues related to the service handover within:
 - 5 working days if an onsite visit is required to resolve the issue.
 - 1 working day if remote assistance is required for any configuration issues.
- Service Rejection can be related to but not limited to:
 - Incorrect Patching
 - Incorrect Port demarcation
 - Incorrect Media Type presentation (SM, MM, RJ45 Electrical)
 - Incorrect configuration.
 - Incorrect labelling.
 - unclean fibre patches preventing the turn up of active RAMAN hardware.