

AIR TRAFFIC AND NAVIGATION SERVICES CO. LTD



REQUEST FOR PROPOSALS: RFP: ATNS/TS/RFP018/2024/25/Fibre Optic Replacement

APPOINTMENT OF A SERVICE PROVIDER FOR THE SUPPLY, DELIVERY, INSTALLATION, AND COMMISSIONING OF A 24 FIBRE OPTIC CABLE AT FALE, FABL, FAKM, FAUP AND FAGG. INCLUDING THE ESTABLISHMENT OF A NEW TRENCH AT FAUP AND FAGG.

VOLUME 2

FIBRE OPTIC CABLE REQUIREMENTS

NOVEMBER 2024

The information contained within this document is confidential to ATNS in all respects and it is hereby acknowledged that the information as provided shall only be used for the preparation of a response to this document. The information furnished will not be used for any other purpose than stated and that the information will not directly or indirectly, by agent, employee or representative be disclosed either in whole or in part, to any other third party without the express written consent by the Company or its representative.

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1 Response to this document

The Tenderer shall submit all responses, diagrams, project management documentation and drawings according to the GENERAL INFORMATION AND INSTRUCTIONS TO TENDERERS document and in the English language.

To assist Tenderers only, each paragraph or article has been appended throughout with the letters “(M)”, “(D)”, “(O)” or “(I)”, to indicate whether the requirement is **Mandatory**, **Desirable**, **Optional** or for **Information only**.

ALL RESPONSES TO THE REQUIREMENTS IN THIS DOCUMENT SHALL BE PROVIDED AS FOLLOWS:

TENDERERS SHALL RESPOND IN FULL TO EACH ITEM IN THE FORMAT PROVIDED AND REFERENCES TO DOCUMENTS AND RELEVANT INFORMATION SUPPORTING THE RESPONSES SHALL BE INDICATED IN THE SPACE PROVIDED. THIS INFORMATION WILL BE THE **ONLY RESPONSE USED FOR THE EVALUATION AND ASSESSMENT.**

Responses, provided in the space allowed, that are not clear or inadequate or the lack thereof shall be interpreted as **“Not Compliant”** even though the compliance column is declared as “Comply” and/or the Tenderer’s offer meets the requirement. Tenderers shall ensure that each response correctly addresses the requirement stated. Responses not addressing the requirement of the specific paragraph shall be interpreted as **“Not Compliant”**.

Tenderers shall declare compliance to each and every paragraph of this document in the column labelled “Compliance” as follows:

C: fully compliant = 2 points;
PC: partly compliant = 1 points;
NC: not compliant = 0 points.

For paragraphs marked “PC” or “NC”, Tenderer’s shall include a statement as to the nature of the variation and may additionally supply supporting information in the space provided to demonstrate how the proposal meets the needs of ATNS.

CHAPTER 1 – Fibre Optic Specifications

2 INTRODUCTION

2.1 Scope

The existing fiber optic network interconnects the ATNS facilities located in the airports in a ring configuration. The existing fibre optic cables are installed within ducts within sleeves with manholes at regular intervals.

The scope of the project is the supply, delivery and installation of the fibre optic cable forming a ring configuration at Durban (FALE), Bloemfontein (FABL), Kimberly (FAKM), Uppington (FAUP), and George (FAGG) airports.

- The installation at FALE, FABL, and FAKM will be done through the existing trenches, sleeves and ducts. The scope at these stations will further include:
 - rehabilitation of existing manholes, sleeves and route markers.
 - Pulling a new fibre optic cable
 - Decommissioning the existing fibre optic cable.

- The installation at FAUP and FAGG will include:
 - Trenching, padding, bedding, and backfilling and compacting the ground.
 - Installation of new sleeves and ducts
 - Pulling a new fibre optic cable

- Testing of the fibre optic network at the five stations.
- Commissioning the fibre optic cable at the five stations.

This specification sets the baseline requirements for a fibre optic cable and network to be used to connect the Communication Navigation and Surveillance (CNS) facilities to the equipment room within the airport.

The bidder shall base their proposal on the following surveyed information.

FALE

Figure 1 shows the FALE fibre route around the airport and the sites connected to the fibre network.



Figure 1. FALE Fibre Route

The fibre optic cable will be terminating at the following sites at King Shaka International Airport:

- Equipment room A and Equipment room B
- Radar site
- DVOR site
- SMR site

Figure 2 shows the FABL fibre route around the airport and the sites connected to the fibre network.

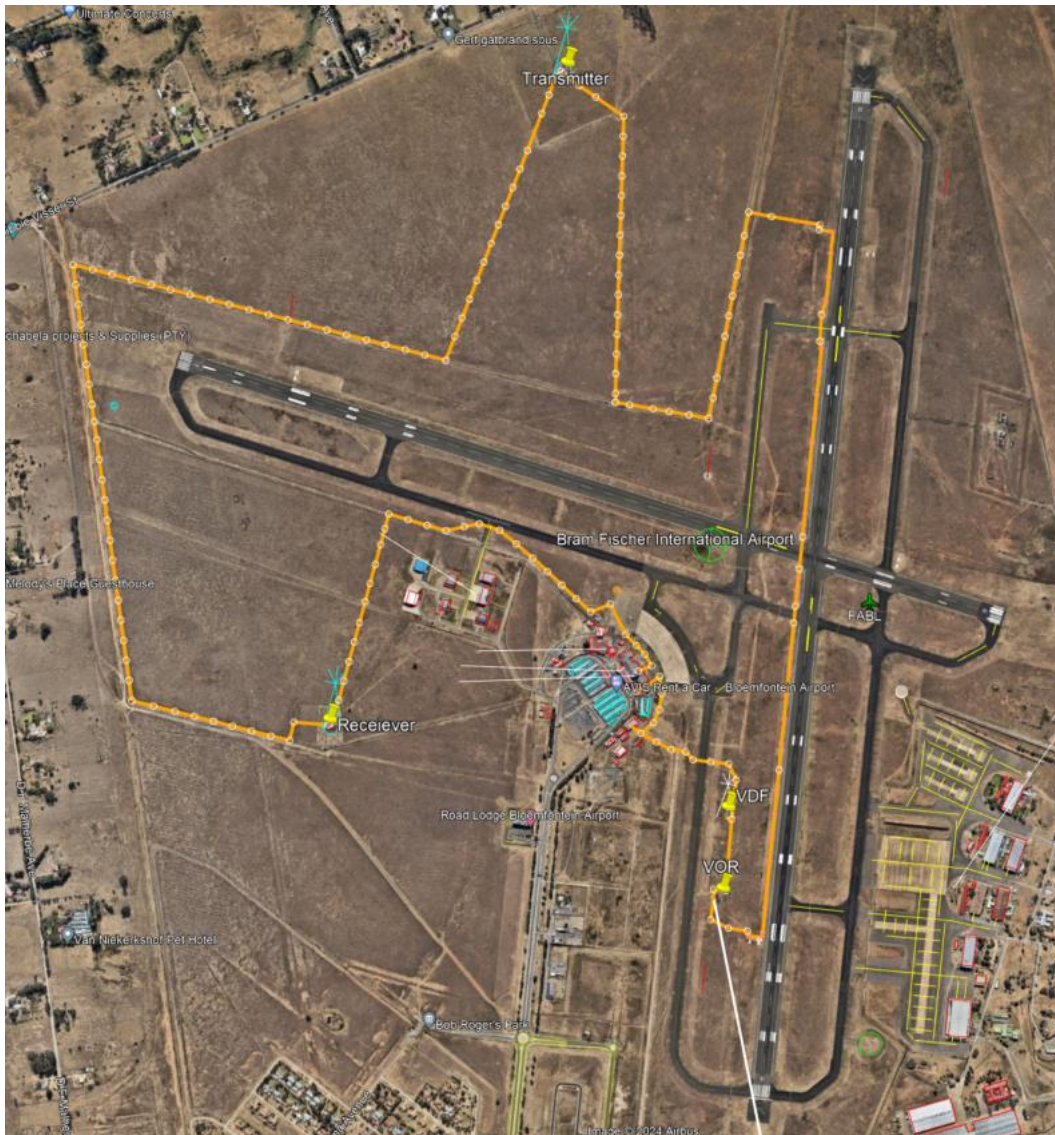


Figure 2: FABL Fibre Route

The fibre optic cable will be terminating at the following sites at Bloemfontein International Airport:

- Transmitter site
- Receiver site
- VOR site
- VDF site
- Equipment Room

Figure 3 shows the FAKM fibre route around the airport and the sites connected to the fibre network.



Figure 3: FAKM Fibre Route

The fibre optic cable will be terminating at the following sites at FAKM:

- Transmitter site (TX)
- VOR site
- VDF site
- Equipment Room (Receiver Site)

Figure 4 shows the FAUP fibre route around the airport and the sites connected to the fibre network. The blue lines highlight the areas that were plotted using Google Earth as they were not identifiable on-site. The pink route shows the new route to be trenched.



Figure 4: FAUP Fibre Route

The fibre optic cable will be terminating at the following sites at FAUP:

- Transmitter site (TX)
- VOR site
- VDF site
- Equipment Room

Figure 5 shows the FAGG fibre route around the airport and the sites connected to the fibre network. The pink route shows the new route to be trenched.



Figure 5: FAGG Fibre Route

The fibre optic cable will be terminating at the following sites at FAGG:

- Transmitter site
- Localiser 29 site
- Glidepath 29 site
- Localiser 11 site
- Glidepath 11 site
- Equipment Room

3 Cost Proposal

A. The Bidders shall include the following baseline cost information (D):

- Fiber Optic Cable cost per meter.
- Trenching, backfilling, and compacting cost per meter.
- Cable sleeves cost per meter.
- Cable ducts cost per meter.
- Manhole and installation per unit.
- Core drilling cost per meter (where required).
- Pulling of the cable per meter.

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

B. The Bidders shall include a cost per airport for: (D)

- Replacement of existing fibre optic cable with the associated cost for each component.
- Trenching of a new route (where required) with associated costs for each component.

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

4 General

4.1 Scope

- A. Bidders are required to supply and deliver a fiber optic cable that complies with the specifications below. Bidders shall provide a comprehensive description and design of the fibre network and plans on how the work will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

4.2 Permit Requirements

- A. The standard pre-conditions for complying with ACSA legislative and permit requirements are applicable. (I)
 - Permission applications will be required for all individuals who will be working at the airport.
 - Vehicles will require a permit to drive at the airport.
 - The drivers of the vehicles will require a driving permit/license.

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

4.3 Cable Management

- A. The fibre optic cable shall be pulled through the existing cable trays at the different termination sites. Where the existing cable tray is full, a new cable tray shall be provided to pull the new fibre cable. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

4.4 Auxiliary

- A. The project shall provide all the cables needed for the fibre optic network to be commissioned and deemed fully functional. (this excludes equipment after the termination points). (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

4.5 Operation Environmental Conditions

- A. The fibre optic cable shall be rated Ingress Protection 68 (IP68). Bidders shall include data sheets to indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- B. The fibre cable shall withstand and operate within the specifications under the environmental conditions as tabulated below as recommended on the ITU-T L.163 (11/2018). Bidders shall include data sheets to indicate compliance with the table below. (D)

Table 1:Fibre Optic Cable Environmental Conditions

Ambient Temperature	-40 °C to +70 °C
Temperature Variations	0 °C to 20 °C in 24-hour Period

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
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[INSERT FULL RESPONSE FOR EVALUATION HERE]
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

4.6 Lifespan

- A. The fibre cable and supporting infrastructure shall be designed to operate within specifications under the stated environmental conditions in Table 1 for a minimum period of 10 years. Bidders shall explain how this requirement will be met. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

5 TECHNICAL REQUIREMENTS

5.1 Fibre Optic Cable Specification

- A. The fibre optic cable supplied shall be a single-mode cable. Bidders shall include data sheets to indicate compliance with the below requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- B. The fibre optic cable supplied shall be a 24-core. Bidders shall include data sheets to indicate compliance with the below requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- C. The fibre optic cable shall comply with the 2016 ITU-T G652D standard. As a minimum, the cable shall meet the following:

Table 2: Fibre Optic Specifications

Requirement	Specification
Type	Heavy Duty Non-Metallic Loose Tube Duct Cable
Cable Construction	Polyethylene Outer Sheath Peripheral Strength Sheath – Aramid Yarn Dry Water-blocked Inner Cable Core Thixotropic Gel Filled Polybutylene Terephthalate Buffer Loose Tubes for individual fibre housing Glass Reinforced Plastic Centre Strength Member
Core diameter	9µm
Cladding diameter	125µm ± 0.7 µm
Minimum Bend Radius	110mm
Attenuation co-efficient @1310nm - Maximum	0.4dB/km
Attenuation co-efficient @1550nm - Maximum	0.30dB/km

Bidders shall include data sheets to indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

D. The fibre optic cable covering sheath shall be:

- High impact resistant.
- Flame retardant.
- Water resistant.
- Rodent resistant.

Bidders shall include data sheets to indicate compliance with the below requirement.

NB: The technical response to be inserted below shall address all 5 points listed above. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

5.2 Fibre Optic Cable Splicing Specification

A. The contractor shall keep the number of slices to a minimum to ensure minimal signal losses. Bidders shall explain how they will comply with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- B. The fusion method shall be used to splice the fibre cable. Bidders shall indicate how they will comply with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- C. The splicing machine used by the contractor shall show losses after splicing, so losses that are out of range can be identified and fixed early. Bidders shall provide the type of machinery that will be used for splicing and provide a datasheet indicating the machine can show losses after splicing. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- D. Bidders shall indicate the losses associated with the following. Bidders shall include data sheets to indicate compliance with this requirement. (D)

- The target losses associated with splicing shall be <0.05dB.

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- E. Bidders shall indicate the losses associated with the following (D). Bidders shall include data sheets to indicate compliance with the values below.

- The target insertion loss < 0.25dB.

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

- F. Bidders shall indicate the losses associated with the following (D). Bidders shall include data sheets to indicate compliance with the values below.
- The target Link Return loss > 60dB.

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- G. The fibre optic cable splices shall be covered by a protection layer to ensure that the fibre optic cable still meets the IP68 rating. Bidders shall include data sheets to indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- H. The protection layer shall not affect the attenuation of the splice or its functional properties of the fibre optic cable. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- I. Bidders shall follow the splicing test specification on ITU-T L.400/L.12. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

5.3 Fibre Optic Termination Panel and Optic Connectors.

- A. A 19-inch rack with 9U shall be provided for all sites to house the equipment. Bidders shall indicate compliance with this requirement and provide dimensions for the proposed rack. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- B. The equipment racks shall be wall-mounted at the termination sites unless stated otherwise. Bidders shall provide supporting information indicating how the racks will be wall-mounted. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- C. The fibre optic cable shall be terminated in each facility/site on a 19” patch panel(s), a patch panel that will accommodate 48 cores and a brush panel. Bidders shall indicate compliance to this requirement and provide dimensions for the proposed patch panels. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

D. A 1U Brush panel shall be installed directly beneath the 1U fibre optic termination patch panel per site. Bidders shall indicate compliance with this requirement and provide dimensions for the proposed brush panels. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

E. All terminated fibre spans must be clearly and accurately labelled following the guidelines in Section 7.5. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

F. A 1.5m slack fibre optic cable shall be provided at all manholes. The Contractor shall ensure that the slack is neatly coiled and secured in a manner that does not exceed the minimum bend of the pigtail. Bidders shall indicate their understanding of this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- G. A 1.5 meter fibre optic cable slack shall be provided at the equipment rack. The Contractor shall ensure that the slack is neatly coiled and secured in a manner that does not exceed the minimum bend of the pigtail. Bidders shall indicate their understanding of this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- H. The fibre optic termination/patch panel shall be installed with a fully loaded ST connector sliding front panel. Fibre splice tray assembly and unjacketed pigtails correctly spliced between the pigtail assembly and the fibre optic cable in accordance with the Fibre optic cable Termination/Patch Panel Manufacturer’s instructions. Bidders shall include data sheets for the proposed ST connectors. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- I. The cable entrance into the rear of the FO Termination/Patch Panel will be terminated with the correct cable glands as specified by the FO Termination/Patch Panel Manufacturer’s instructions. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- J. The terminating connectors shall all be factory-installed on patch cords or pigtails. No onsite installation of connectors shall be permitted. Bidders shall provide supporting documentation indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- K. Any unused ports on the panel shall be covered with the appropriate plugs. Bidders shall provide details of the plugs that will be used. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

6 INSTALLATION

6.1 Configuration

- A. The fibre cable shall be installed in a ring configuration and shall have two links (primary and secondary); one link shall be clockwise, and the other link anticlockwise. Figure 6 below gives an example. (I)

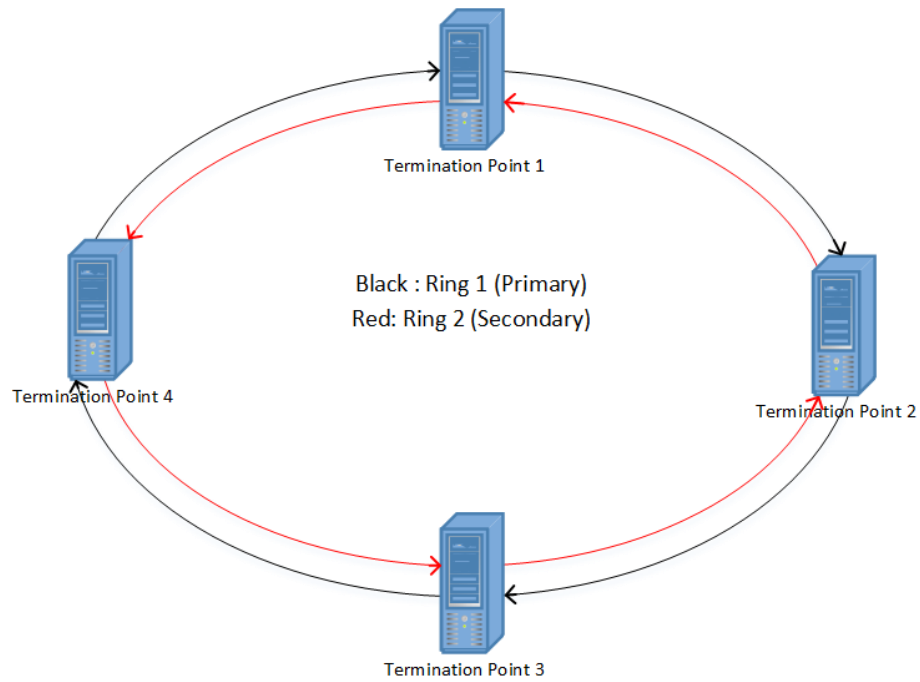


Figure 6: Generic Ring Configuration

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

6.2 General Installation Specifications

- A. A fibre optic cable of length 2 x 13 186,6 meters (excluding the termination slacks) shall be provided and installed at FALE, forming a ring configuration with primary and secondary links. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
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<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

B. A fibre optic cable of length 2 x 10 620,3 meters (excluding termination slacks) shall be provided and installed at FABL, forming a ring configuration with primary and secondary links. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

C. A fibre optic cable of length 2 x 6015,40 meters (excluding termination slacks) shall be provided and installed at FAKM, forming a ring configuration with main primary and secondary links. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

D. A fibre optic cable of length 2 x 7 357,9 meters (excluding termination slacks) shall be provided and installed at FAUP, forming a ring configuration with primary and secondary links. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- E. A fibre optic cable of length 2 x 7 149,5 meters (excluding termination slacks) shall be provided and installed at FAGG, forming a ring configuration with primary and secondary links. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- F. A 10m fibre optic cable slack shall be provided in every termination site to allow the cable to be pulled on either side. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- G. The Contractor shall tie slack fibre optic cable neatly. Bidders shall provide information on how this will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- H. The contractor must allow additional time to ensure that the existing communications and power cables are not damaged during the installation of the new cables. Where doubt about the existing cable route exists, the contractor must 'hand dig' the area in question. Bidders shall explain how this will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

6.3 Sleeves and Ducts

- A. The existing sleeves at FALE, FABL and FAKM shall be used to install the new fibre optic cable. Bidders shall indicate their understanding of this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- B. The existing sleeves at FALE, FABL, and FAKM shall be rehabilitated. Rehabilitating includes cleaning any blocked sleeves and ducts. Bidders shall indicate their understanding of this requirement and how the existing sleeves will be rehabilitated. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- C. New sleeves shall be provided and installed at FAUP and FAGG. Bidders shall explain their understanding of this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- D. The following section is specific to FAUP and FAGG. However, should sleeves be required at the other stations, these specifications shall also be used. (I)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

- E. The sleeves shall consist of 110mm PVC duct and hosting 4 x 50mm inner ducts. Bidders shall include data sheets to indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- F. Underground sleeves shall be used, no direct buried fibre optic cable will be accepted. Bidders shall explain how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- G. The sleeves shall be watertight and rodent resistant. Bidders shall provide supporting information on how this requirement will be complied with. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- H. Unused inner ducts shall be sealed with watertight stoppers/end-cups. Bidders shall provide details of the stoppers/end-cups that will be used. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
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<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- I. Any joints on the sleeves shall be well protected to ensure the standard of the sleeves is not impaired. Bidders are encouraged to minimise the joints. Bidders shall provide information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- J. A draw-wire shall be installed on the unused inner ducts for the next installation. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

7 Civil Works

7.1 Excavation (Trenching)

- A. The contractor shall scan the area to determine any cables that may be underneath the proposed trenching route before any trenching. A 1km route shall be covered at a time, and this activity will be conducted with an ATNS personnel present. After scanning, a report indicating the route and the location of all known and detected services shall be produced. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

- B. The existing trenches at FALE, FABL, and FAKM shall be used to install the new fibre optic cable. Bidders shall provide information indicating their understanding of this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- C. The existing route markers at FALE, FABL and FAKM shall be rehabilitated (where available). Bidders shall provide information indicating their understanding of this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- D. This section is specific to FAUP and FAGG. However, should trenching be required at the other stations, these specifications shall also be used (I).

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- E. New trenches shall be dug out at FAUP and FAGG, following the route provided in Figure 4 and Figure 5, respectively. Any variations to the proposed route shall be presented to ATNS for approval. Bidders shall provide information indicating their understanding of this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- F. 3 577,7 meters of new trench shall be dug out at FAUP. Bidders shall include the trenching process. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- G. 7 357,9 meters of new trench shall be dug out at FAGG. Bidders shall include the trenching process. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- H. The trenches connecting two points shall be a straight line as much as possible. Bidders shall provide information indicating how the work will carried out to meet this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- I. The Trench shall have a depth of 800mm, a width maximum of 400mm, and a minimum of 300mm. The trench width shall be maintained throughout the entire

trench route. Bidders shall provide information on how trenching will be carried out.

(D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- J. If rock formations prevent the excavation of the trench to a depth of 800mm, the sleeve will be installed to the greatest depth achievable, and the trench will be covered with a layer of concrete or similar material of at least 50mm. ATNS project manager shall provide approval for the deviation. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- K. Fibre optic cable route shall have markers installed next to every manhole. The markers shall have a 110mm diameter concrete extending at least 30mm above ground. Using concrete with 25MPa strength. Bidders shall provide supporting information indicating compliance to this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- L. All rules and regulations of the airport will be complied with. ICAO Doc 9137, Part 6, Section 3.2 recommendations on obstacles around the airfield shall be followed when trenching near the runway. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

M. Material (i.e., Manholes, Sleeves, Ducts, bedding soil) shall be delivered to the excavation site only when they are ready for use. Material that is not used shall be transported back to the site office at the end of the working day. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

7.2 Bedding, Padding and Backfill

Figure 7 shows the trench bedding, padding and backfill specifications (I).

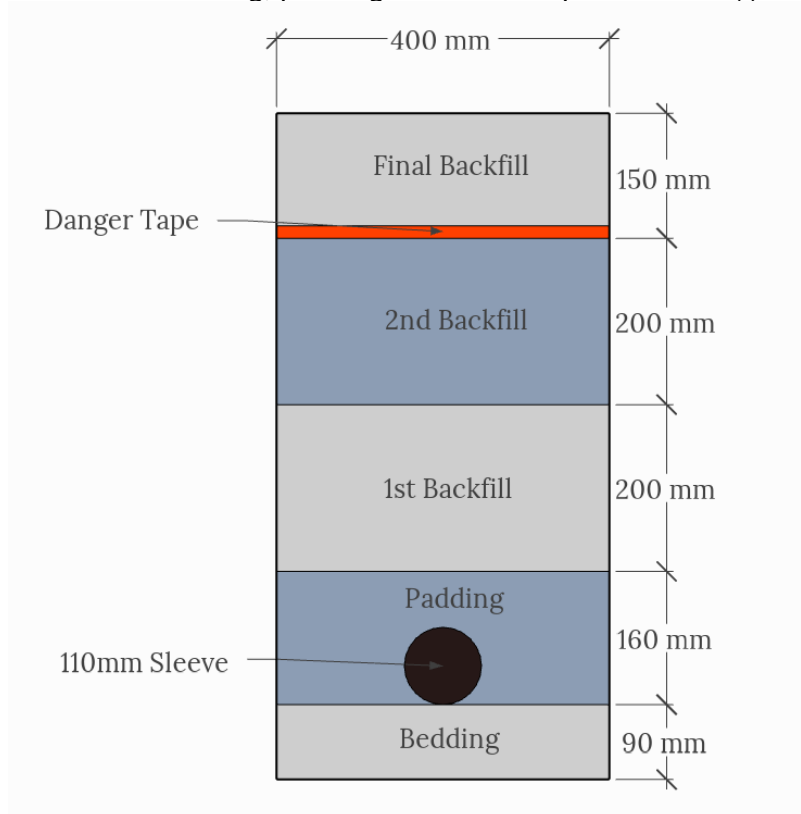


Figure 7: Trench profile.

- A. The trench shall have a bedding of 90mm in height and should be the backfilled with river sand or 6-13mm stone with the sleeve laid on top of this layer. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- B. The sleeve shall then be covered with river sand to a height of 160mm. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

- C. The next layer of backfill shall be of height 200mm consisting of soil with stones of a maximum size of 25mm in diameter. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- D. A danger/warning tape shall be laid on the middle of the trench from one manhole to the next manhole. The remaining 150mm of the trench shall be backfilled with in-situ material, stones no larger than 150mm in diameter and compacted. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- E. Compaction shall be done in such a way that sleeves are not disturbed, and joints are not impaired. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- F. All surfaces with tar road shall be refurbished to their previous state. Appendix A provides a list of these areas for each station. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

7.3 Directional bore drilling.

- A. Directional bore drilling shall be conducted in areas where trenching is impossible, such as taxiway and runway crossing. Areas that require directional bore drilling for each station are indicated in Appendix A. Bidders shall provide information on how this requirement will be carried out, including the details of the machine/mechanism that will be used. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- B. Directional bore drilling shall be used to drill underneath at a minimum depth of 1m, depending on existing services. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- C. Machine operators shall have a certificate of competency to operate their designated machinery and equipment. Bidders shall provide the certificate of competency to indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

7.4 Manholes

- A. The number of existing manholes is provided in Table 3. (I). The contractor is urged to verify all the existing manholes as part of the site survey. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- B. The existing manholes shall be rehabilitated. This includes removing mud, water and/or soil inside the manhole and labelling the manholes as described in Section 7.5. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- C. A manhole pit shall have a depth of 1500mm, width of 1500mm and length of 1500mm. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- D. The manhole shall be a modular airport manhole. Bidders shall include data sheets to indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

E. The modular manhole shall comprise a lid, cover slab, chamber, and base. Bidders shall include data sheets to indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

F. The manhole shall have at least one hole in the bottom center to drain water. Bidders shall provide information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

G. The manhole camber shall cater for at least 4 (four) 110mm sleeve entries. Bidders shall include data sheets to indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

H. The manholes shall be concrete. Bidders shall include data sheets to indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
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<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- I. The lid of the manhole shall be cast iron reinforced concrete. Bidders shall include data sheets to indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- J. An airport manhole of height 1150mm, diameter of 1000mm. Bidders shall include data sheets to indicate compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- K. The manhole pit shall be filled with 500mm of 19mm G5 aggregate bedding to allow water to drain out of the manhole so it does not fill with water. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- L. The rest of the pit can be filled with excavated material from the pit. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
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<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

M. The manholes shall be level. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

N. The manhole cover shall be 50mm above ground level. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

O. A manhole shall be on either side of a road/taxiway crossing, if it does not exist. Bidder shall provide information on how this requirement will be met (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

P. The connection between the sleeves and manholes shall be sealed inside the manhole and outside the manhole with a water-tight sealing agent such as a bituminous waterproofing sealant. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
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<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

Q. In a straight route, the manholes shall be installed at least 250m apart and a maximum of 300m apart. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

R. There shall be a manhole for turns and bends. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

S. There shall be a manhole for entering and exiting at each termination site (where there is going to be new trenches). This means two manholes are required for each termination site (in and out) for redundancy purposes. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

7.5 Labelling

A. The cable labelling material shall be resistant to the environmental conditions at the area of installation (such as moisture, heat, or ultraviolet light) and should have a design life equal to or greater than that of the labelled component. Bidders shall provide supporting information indicating compliance with this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- B. All fibre optic cables entering and exiting termination sites, manholes, cabinets, and patch panels shall be labelled. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- C. Labels shall be machine-typed, not handwritten. Bidders shall provide supporting information on the machine that will be used to print the labels. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- D. The underground fibre optic cable at the manholes shall have an ATNS label on it. Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

- E. The manholes shall be labelled using engraved aluminium plates. The plates shall be of 100mm x 60mm. Bidders shall indicate the plates that that will be used. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

F. The manhole labelling shall follow the below name convention:

ATNS – MH - XX

Where:

- MH: Manhole
- XX – Manhole number

e.g. ATNS – MH - 21

Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

G. Patch panel shall be labelled using the following name convention:

F1-F24 to XX, F25 – F48 to YY

Where:

- XX – next termination
- YY - next termination

Bidders shall provide information on how this requirement will be carried out. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		

8 SITE-SPECIFIC REQUIREMENTS

A. The specific requirements provided in the table below shall be met. Bidders shall take note of the below information. (D)

Table 3: Site Specific Requirements

	Fibre cable & Ducts	Sleeves	Existing Manholes	New Manholes	Trenching
FALE	2 x 13 187m	1 000m	126	4	1 000m
FABL	2 x 10 621m	1 000m	159 manholes & 33 Junction boxes	4	1 000m
FAUP	2 x 7 358m	3 578m	48	17	3578m
FAGG	2 x 7 358m	7 360m	22	32	7 358m
FAKM	2 x 6 016m	1 000m	90	4	1 000m

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

8.1 FAUP

A. New cable trays shall be provided at the Transmitter site. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

8.2 FAGG

- A. A 20A general circuit break and one plug point shall be provided for the 5 termination sites, excluding the Equipment room. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

9 FIBRE TESTING

9.1 Pre-installation Tests

- A. Attenuation tests shall be carried out on every fibre core of the cable while the cable is still on the drum to confirm that the fibre drums are in good condition after delivery and have been received by the Contractor/installer. The attenuation shall be within the specified requirements under Table 2. (D)

9.2 Post-installation Tests

- A. A point-to-point test shall be conducted during the implementation. Thereafter, a complete test of the fibre cable shall be conducted. Bidders shall provide information indicating how these tests will be conducted. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

- B. A bi-directional test shall be conducted for all the fibre cores installed. Bidders shall provide information indicating how these tests will be conducted. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		

[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]

C. Tests for attenuation, chromatic dispersion and polarization mode dispersion shall be conducted and meet the specifications specified in this document. Bidders shall provide information indicating how these tests will be conducted. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

D. The specific test procedure shall be documented, including details of the test equipment used. Bidders shall provide supporting information indicating compliance to this requirement. (D)

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
<i>[INSERT FULL RESPONSE FOR EVALUATION HERE]</i>		
<i>[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]</i>		

10 Appendix A

A. The specific requirements provided in the Table below show the different types of drilling that will be required. Bidders shall take note of the information below and provide the appropriate cost in the cost proposal. (I)

Station	Location	Distance	Type
FAGG	Taxiway Alpha 3	60 meters	Core Drilling
	Taxiway Alpha	40 meters	Core Drilling
	Taxiway General Aviation Area Hanger	50 meters	Core Drilling
	Taxiway Fire Station	40 meters	Core Drilling

	Taxiway Private Property	50 meters	Core Drilling
	Airfield Entrance Road	40 meters	Hand/TLB
FAUP	Runway 26	190 meters	Core Drilling

COMPLIANCE (C/PC/NC)	<i>Only responding C/PC/NC will not be accepted without proof.</i>	
[INSERT FULL RESPONSE FOR EVALUATION HERE]		
[INSERT REFERENCE TO ADDITIONAL INFORMATION HERE]		