**# General Overview and Introduction:**

* The Cyber Security & Information Technology Directorate (CS&ITD) is planning to extend the existing fiber network in Amman to reach Zarqa region.
* Detailed technical requirements have been specified in the concerned section of this document, and the bidder must adhere at all requirements.
* The Bidder has the right to do the detailed site survey.

**# Scope of work of the bidder:**

* Fiber should be installed in existing track via (BRT) Bus Rapid Transit track between Amman and Zarqa.
* Existing track contain main 4 inch pipe, and subduct pipe 32 mm are required by this RFP to be installed inside main pipe.
* There is 27000 m of fiber cable will be installed in the existing tracks.
* All sketches for the project will be supplied at installation time.
* The company is not responsible for any construction work related to the track or manholes.

**# Delivery (completion time):**

The delivery of the project should be within 4 months, And the receipt will done one time at the end of the project.

**# Documentation:**

The bidder shall provide documentation containing the configuration, OTDR results, manholes coordinates, fiber's length, and as built drawing.

**# Technical Specification:**

All requirements shall meet the following requirements:

|  |  |  |
| --- | --- | --- |
| **item** | **Description** | **QTY** |
|  | Fiber optic cable: outdoor, Double jacket, SM, 144 core (per m) **\*** | **2000** |
|  | Fiber optic cable: outdoor, Double jacket, SM, 96 core (per m) **\*** | **25000** |
|  | Fiber joint box: capacity 144 cores, splicing 144 cores **\*\*** | **3** |
|  | Fiber joint box: capacity 96 cores, splicing 96 cores **\*\*** | **20** |
|  | Flexible PVC subduct pipe 32mm With accessories **(to be installed in existing 4 inch pipe, and fiber should be installed in subduct)** (per m) | **16000** |
|  | Abroad Training: CFOT ( Certified Fiber Optic Technician ) (Instructor-led training, 5 working day) | **4** |

**\* Detailed Fiber optic cable specification:**

1. Single mode, duct type, loose buffer, double sheath cable.
2. Shall be designed for applications inside ducts of 32mm diameter.
3. Optimized for use in both wave lengths windows of 1310 nm and 1550 nm.
4. shall meet the requirements stated in ITU-T Rec. G.652D
5. Each buffer tube shall contain 12 fibers which are color coded as shown below and the tubes shall have the same color coding:

|  |  |  |
| --- | --- | --- |
| ***Tube & Fiber Color Coding:*** | fiber-# 1 : Blue | fiber-# 7 : Red |
| fiber-# 2 : Orange | fiber-# 8 : Black |
| fiber-# 3 : Green | fiber-# 9 : Yellow |
| fiber-# 4 : Brown | fiber-# 10 : Violet (purple) |
| fiber-# 5 : Slate | fiber-# 11 : Pink (rose) |
| fiber-# 6 : White | fiber-# 12 : Turquoise (aqua) |

1. The cable shall contain one rip cord under each sheath for easy sheath removal.
2. **Tensile strength shall be provided by high tensile strength aramid yarn**.
3. The minimum bending radius of the cable shall be more than 5 times the outer diameter. After the test there shall be no change in fiber attenuation greater than the uncertainty of measurement.
4. *Optical Characteristic***:**

Mode field diameter (1310 nm): 9.2 µm ± 0.4 µm

Mode field diameter (1550 nm): 10.4 µm ± 0.8 µm

Cladding diameter: 125 µm ± 0.7 µm

Refractive index profile: step

Attenuation at 1310 nm: ≤ 0.35 dB/km

Attenuation at 1550 nm: ≤ 0.22 dB/km

1. Each buffer tube shall be filled with a non-hygroscopic, non-nutritive to fungus, electrically non-conductive, homogenous gel in order to prevent water penetration and migration. The gel shall be free from dirt and foreign matter. The gel shall be readily removable with conventional non-toxic solvents.
2. Cable should be tagged by (JAF 2024) along the cable.

# \*\* Detailed specification of optical cable splice enclosures

1. The closure shall be equipped with fiber cassettes and organizers that are easy to use and which provide full protection to the fibers and have space for identification of each fiber.
2. Entries for (4) cables.
3. The splice closure shall have as few parts as possible.
4. The splice closure shall be Made of plastic, Gasket seal, chemical-resistant material
5. **It shall have suitable design to splice a specific tube without affecting other tubes in cable.**
6. It shall be easy to re-enter the splice closure and close it again several times. Also the closure shall be capable of accepting additional cables without removal of the sheath retention or strength member clamping hardware on previously installed cables or disturbing existing splices.
7. For manhole installation it shall be possible to attach the splice closure to a manhole wall and all necessary materials for fixing should be included.

**# Terms and conditions**

1. Tender is one lot and indivisible.

2. Tender contains Supply, installation and integration of all items according to Directorate of information technology requirements in Amman and Zarqa.

3. Offer must include:

A. Technical proposal containing all detailed required specifications with specified Types and models.

B. Cross section for cable showing its construction and the required contents mentioned in specification.

C. Compliance sheet containing the requested and the offered specification referring to data sheets and the bidder is responsible for all data in this sheet (compliance sheet must include all the star (\*) noted specifications).

4. Abroad training:

A. shall Include (tickets, training fee, meals, transportation, full accommodation, visa … etc).

B. should be held at certified Training Center via fiber optic association or globally authorized company (such as FOA, City & Guilds, OTT,…).

5. Cable testing should be done under the supervision of (CS&ITD) Engineers, in the manner specified by them.

6. Leave at least 20m of cable in the manholes that are placed in circular shape in the manhole.

7. The bidder should adhere of all above specifications and conditions.