

# 1. Fiber Network

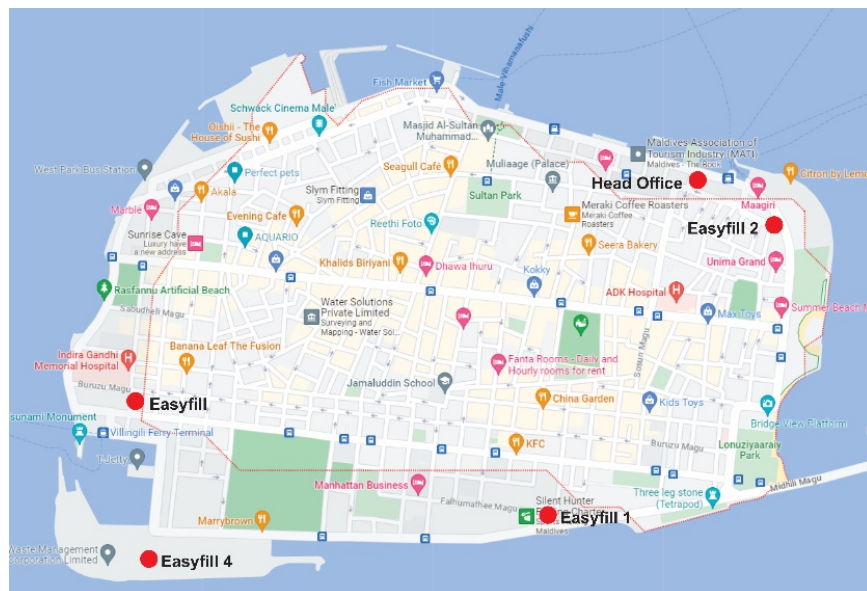
## Scope of Work

a. To design, implement, and maintain a fiber optic network infrastructure.

➤ Male Locations.

- Proper survey to be done before submitting the proposal.
- Supply Fiber cables, fiber patch cords and Equipment's.
- Fiber optic cable laying and equipment installation.
- Singlemode Air blown Microcable Fiber to be used.
- The installation method for the fiber must be air blown fiber.
- Minimum 4 Core terminated at each end with SC connector.
- The fiber network project shall include the implementation of redundancy cables.
- 4th Floor B (server room) should be terminated to Rack mount Fiber Patch Panel.
- All other Locations should be terminated using Wall mount Dustproof Fiber Optical Terminal Boxes.

From	To
Easy Fill2	FSM Building
Easy Fill1	FSM Building
Easy Fill	FSM Building
Easy Fill4	FSM Building



➤ Head Office Floors.

- Proper survey to be done before submitting the proposal.
- Supply Fiber cables, fiber patch cords and Equipment's.
- Fiber optic cable laying and equipment installation.
- Multimode fiber to be used between floors.
- Minimum 4 Core terminated at each end.
- Use PVC conduit as a duct and securely fasten the conduit using appropriate brackets, clips, or straps.
- 4th Floor B (server room) should be terminated to Rack mount ODF.
- All other Locations should be terminated using Wall mount Dustproof Fiber Optical Terminal Boxes.

<b>From</b>	<b>To</b>
7 <sup>th</sup> Floor A	4 <sup>th</sup> Floor B
7 <sup>th</sup> Floor B	4 <sup>th</sup> Floor B
6 <sup>th</sup> Floor B	4 <sup>th</sup> Floor B
5 <sup>th</sup> Floor A	4 <sup>th</sup> Floor B
5 <sup>th</sup> Floor B	4 <sup>th</sup> Floor B
4 <sup>th</sup> Floor A	4 <sup>th</sup> Floor B
2 <sup>nd</sup> Floor A	4 <sup>th</sup> Floor B

b. Termination and Testing.

- Terminate the fiber optic cables into connectors or patch panels.
- Fiber Testing and Inspection after the completion of the project must be done.
- Conduct comprehensive testing, such as OTDR (Optical Time Domain Reflectometer) testing, to verify cable integrity, attenuation, and signal quality.
  - Manufacturer's Testing  
Provide documentation of all factory tests performed by the manufacturer for all fiber optic cable, splicing material, cable terminations, and patch panels.
  - End to End Attenuation Testing  
Perform test on all fibers to ensure that no discontinuities greater than 0.2 decibel per 300 feet exist. Repair or replace cable sections exceeding allowable attenuation at no cost.
  - Splice Loss Testing  
Ensure that the splice loss for a SMF fusion splice does not exceed a maximum bidirectional average of 0.1 decibel per splice. Repair or replace splices that exceed allowable attenuation at no cost.

- Connector Loss Testing

- Connector Loss Testing
  - Ensure that the attenuation in the connector at each termination panel and its associated splice does not exceed 0.5 decibel. Repair or replace connectors exceeding allowable attenuation at no cost.

- Troubleshoot and rectify any issues or defects identified during testing.

- c. Documentation and Labeling.

- Create accurate documentation, including cable and equipment labeling, to facilitate future maintenance and troubleshooting.
- Each terminated fiber should be clearly labeled with relevant information.
- Record cable routes, fiber connections, and equipment configurations in network diagrams.
- Maintain an inventory of installed equipment and spare fibers for future reference.

- d. Maintenance Contract.

- An agreement for Fiber Network Maintenance needs to be established through a maintenance contract.
- The contract must outline the terms, responsibilities, and scope of the maintenance services to be provided.
- The contractor should provide free of charge maintenance for the first year.

- e. Training and Handover.

- Provide training to technical staff members.
- Conduct a thorough handover of the installed fiber optic network.
- Ensure all necessary documentation, including maintenance schedules and contact information, is provided.

## **Deliverables:**

The expected deliverables of the Fiber Network Project are as follows:

a. Network Design Plan. – with bid documents.

- Provide a detailed drawing of the overall structure and layout of the network, including the fiber route, redundancy fiber route, Fiber Termination Box, and Interconnections.
- Include detailed specifications for Fiber cable and the network equipment, such as brand, model and capabilities.
- Provide a comprehensive list of all network equipment required for the project, including quantities and specific configurations or features.

b. Project Timeline. – with bid documents.

- Provide a project timeline outlining the different stages and milestones of the network implementation project.
- Include start and end dates for each task or activity, dependencies between tasks, and key milestones.

c. Fiber Optic Cable Installation. – Upon project award

- The completion of fiber optic cable installation, including the laying, routing, and termination of the fiber cables throughout the designated areas or locations within the project scope.

d. Network Equipment Installation. – Upon project award

- The installation and integration of network equipment such as FTB, patch panels, and other devices necessary for the operation of the fiber network.

e. Fiber Testing and Inspection Documentation Report. – After Completing Project

- Provide a comprehensive documentation report detailing the fiber testing and inspection results after the completion of the project.
- The performance testing and validation of the fiber network to ensure proper signal transmission, low attenuation, minimal loss, and adherence to industry standards.
- Include information on the testing methods used.
- Document the procedures and tools used for inspecting fiber connectors and splices, along with any issues or defects found during inspection.
- Provide records of each tested pair, including fiber ID or label, location, and test results.

f. Documentation and As-Built Drawings. - After Completing Project

- Provide comprehensive documentation, including as-built drawings, updated network diagrams, and records of any changes or modifications made during the project implementation.

g. Maintenance and support plan. – with bid documents.

- Include a detailed maintenance and support plan outlining the services and activities to be provided after the project is completed.
- Specify the Service Level Agreements (SLAs) that define response times, resolution times, and availability guarantees for different types of incidents or service requests.
- Clearly define escalation procedures for handling critical issues or situations that require higher-level support or management involvement.
- Outline the regular maintenance tasks, which encompass scheduled inspections, updates, and preventive maintenance activities.

h. Training and Handover - After Completing Project

- Provide training sessions or materials to relevant personnel on the operation, maintenance, and troubleshooting of the fiber network to manage the network effectively.