

**Section-09**  
**Documentation and Deliverables**  
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## Section-09

### Documentation and Deliverables

This section describes the documentation requirements and provides a list of deliverable that the Contractor shall provide to the Employer. Complete documentation necessary for the operation and maintenance of the communication system is required. All the documentation shall be provided in hard copy and also on PENDRIVES in full compliance with the specification. Conditions pertaining to Document Review and Approval Rights and Document Submission Scheduling are specified in this specification.

As detailed in subsequent sections the documentation shall include the following:

- (a) Detailed list of the deliverables
- (b) Description of the products
- (c) Technical particulars
- (d) Installation manuals
- (e) Maintenance manuals
- (f) Quality assurance manuals, Manufacturing Quality Plan (MQP) & Field Quality Plan (FQP)
- (g) Tests (type test, production, FAT, SAT) documentation

#### 9.1 System Functional Description Document

The document shall include an overview of the system configuration. This document shall be designed to serve as a complete introduction to the supplied system and to the more specific documents that are defined in technical specifications. The document shall be oriented to the Employer user's point of view and be subject to the Employer's review and approval. Users will include Employer's operating personnel communication support staff and maintenance personnel.

#### 9.2 System Documentation

A detailed documentation plan and document submission schedule shall be prepared and submitted for approval. The guidelines specified in table 9-1 and 9-2 shall be followed.

#### 9.3 Supplementary Documentation

If during the training courses or while performing maintenance on such equipment during the warranty period, the Employer determines that additional information is required to perform the maintenance function, the Contractor and/or its subcontractors shall provide the specific supplemental information necessary to

perform the maintenance function. This information shall be documented in a form suitable for incorporation into the appropriate maintenance document.

#### **9.4 Test Documentation**

The Contractor shall provide documentation for all factory and field tests. The test documentation shall include the following:

- (a) Test Procedure Document
- (b) Type test documents
- (c) Factory Acceptance Test Documents
- (d) Site Acceptance Test Documents

#### **9.5 Drawings**

All drawings submitted by the Contractor including those submitted at the time of bid shall be in sufficient detail to indicate the type, size, arrangement, dimensions, material description, Bill of Materials, weight of each component, break-up for packing and shipment, shipping arrangement required, the dimensions required for installation and any other information specifically requested in the Specifications.

Each drawing submitted by the Contractor shall be clearly marked with the Employer name, the unit designation, the specification title, the specification number and the name of the Project. All titles, notes, markings and writings on the drawing shall be in English. All the dimensions should be to the scale and in metric units. The drawing revision level/ issue no, issue date shall be marked on each drawing and the drawing shall carry issue history information and appropriate signatures (eg: originator, checker and approving authority).

#### **9.6 Drawing and Document Approval Procedure**

The drawings/documents submitted by the Contractor shall be reviewed by the Employer as far as practicable within stipulated duration and shall be modified by the Contractor if any modifications and/or corrections are required by the Employer in compliance with the Specifications. The Contractor shall incorporate such modifications and/or corrections and submit the final drawings for approval. Any delays arising out of failure by the Contractor to rectify the drawings in good time shall not alter the contract completion date.

The drawings/documents submitted for approval to the Employer shall be in triplicate. One print of such drawings shall be returned to the Contractor by the Employer marked with one of the categories as listed below:-

Category	Inference
Cat I	Approved/Released for implementation.
Cat II	Approved/Released for implementation subject to incorporation of comments. Revised drawing required.
Cat III	To be resubmitted for approval after incorporating comments.
Cat IV	For information and record.

The approval of the drawing/document conveyed vide above marked copy shall neither relieve the Contractor of its contractual obligations and its responsibilities towards weights, qualities, design details, assembly fits, performance particulars and conformity of supplies with the Indian Statutory Laws as may be applicable, nor shall it limit Employer's right under the contract.

Depending upon the category of approval the Contractor shall resubmit the drawings/documents for review by Employer after incorporating all corrections.

Further work by the Contractor shall be strictly in accordance with the Cat-I, Cat-II or Cat-IV approved drawings and no deviation shall be permitted without the written approval of the Employer.

All manufacturing and fabrication work in connection with the equipment/material prior to the approval of the drawings shall be at the Contractor's risk. The Contractor may make any changes in the design which are necessary to make the equipment/material conform to the provisions and intent of the Contract and such changes will again be subject to approval by the Employer. Approval of Contractor's drawing or work by the Employer shall not relieve the Contractor of any of his responsibilities and liabilities under the Contract.

## **9.7 Final Documentation**

Final documentation shall consist of the documents approved in Cat I and Cat IV listed in table 9-1. The documents will be used by the Employer personnel for operating and maintaining the equipment after acceptance.

Until acceptance of the equipment by the Employer, the Contractor shall be responsible for supplying documentation revisions or changes necessitated by inaccuracies, installation requirements, omissions determined by usage, and design or production alterations to the equipment. All changes shall be issued in the form of

replacements for the affected drawings, diagrams, charts, graphs, tables, lists, and pages in the various documentation such that all documentation describes the equipment "as delivered".

For all CAT-I & CAT-IV approved documents listed in table (except Type, FAT & SAT related), Three (3) sets of the final approved documentation shall be provided to the Employer in CD- ROM and two sets in hardcopy.

All final Contractor-supplied documentation shall be easily reproducible by the Employer.

<b>Table 9-1</b> <b>Documentation Plan for Communication System</b>				
<b>S. No</b>	<b>Document</b>	<b>Applicable Equipments / Item</b>	<b>Brief Description</b>	<b>Category of Approval</b>
1.	Documentation plan & schedule		This document shall contain the list of all documents to be submitted for approval and their submission/approval schedule.	IV
2.	Survey guidelines		As per Technical Specifications	I
3.	Data Requirement Sheets (DRS) and Guaranteed Technical Parameters & Drawings	For each and every item to be supplied including OPGW Cable, Optical Fiber, OPGW hardware & fittings, UGFO, Approach cable, Joint Box, FODP, D/I Mux, DACS, SDH equipment, NMS, DCPS & Battery, power and signal cables, earthing cables, patch cords etc	These document(s) shall describe all the technical parameters of the equipment being offered.	Cat-I(for DRS) & Cat-IV (for brochure)
4.	Sag Tension charts	For OPGW cable	Shall accompany the DRS document	I

5.	Mechanical drawings	As applicable	This document shall fully describe the equipment racks/ enclosures, MDF, peripherals and related hardware with particular reference to mechanical construction, materials and dimensions, appearance, mounting methods, earthing clearances required from walls/roof/other panels, cable entry details, dust and moisture ingress protection provisions etc.	I
6.	Equipment Manuals & Standard Documents	For all items	Complete set of all equipment manuals (Construction, Installation, Maintenance, Reference etc) for that product. A set of product brochures, photographs etc.	IV
7.	Previous type test reports	For all items for which type testing is envisaged.	Shall be complete in all respect including all test graphs, curves, calculations, photographs etc.	Acceptance letter by Employer
8.	Manufacturing Quality Plan	For all items to be supplied		I#
9.	Type test schedule	For all items for which type testing is required.	Shall indicate the start & finish data for each test & sequence of tests if applicable, test labs.	I

10.	Type test report	For all items for which type testing is required.		I
11.	Site survey reports	For each site	Link wise survey reports as per specifications,	*
12.	Link & Engineering Analysis	For each Fiber Optic link	Link budget calculations etc.	I
13.	Bill of Quantity	For each item and each line		I
14.	Numbering, Marking, labeling Document	As applicable.	Must include numbering, marking, labelling and naming conventions for channels, cables, connectors, subracks, cubicles etc	I
15.	Physical planning/site preparation manuals	As applicable.	Must contain data gathered during the site survey, including test results, if any. The document shall also contain floor plan, cable trenching/raceway drawings, station block diagrams, rack/cabinet elevation drawings, air-conditioning and power supply requirements, and power supply distribution and earthing system details.	*
16.	Channel Routing	Whole Network	E1 level Plan, subscriber voice and data channels plan for whole network.	I

17.	Synchronisation Plan	Whole Network	Locations of clocks, depiction of all interfaces, flow of synchronizing signal.	I
18.	Configuration Diagrams	Whole Network	Network configuration, Link wise and site wise equipment configuration, NMS configuration.	IV
19.	NMS Description Document	NMS	Functional description of Hardware, Description of all commonly used and major functions in detail, Reference, User, Maintenance Manuals, Interfaces and channel requirements and routing,	I (for NMS description document) and IV (for brochures)
20.	Factory acceptance test report	For all Factory acceptance tests		Acceptance letter by Employer
21.	Transportation & Handling Procedures	For all items	This document shall describe the procedures & precautions to be observed during overseas & inland transportation, equipment handling during transport, storage & pre-installation. It shall also include packing details and package labelling details.	IV
22.	Equipment Installation manual	For equipment types: Mux, D/I, DACS, SDH equipment, DCPS, Battery etc	The expected content of this document are presented in table below.	IV



23.	Site Drawings	Site wise complete documentation	This document must include, general details of equipments, cubicles, cables, connectors, MDFs, DDFs, network diagram, earthing connections, power supply connections and specific details i.e. site layout, floor plans, cubicle layout, subrack layout, channel routing, signal connections, cable routing, MDF	IV
24.	Field Quality Plan	One Document with multiple subdocuments if required	Field Quality Plan shall describe the quality control to be exercised during the field activities. This document can include the following information: (a.) The list of performance & safety checks applied to installation equipment, tools & tackles, checks, check on physical health & training records of installation crew etc. (b.) The list of Site Acceptance tests (including statement of acceptance criteria). The inclusion of list of site acceptance tests in FQP is analogous to the inclusion of list of FAT in the MQP. The formats for recording & reporting Site acceptance tests can also be reproduced	I#
25.	Approach Cable & FODP layout document-site wise	For each site	To describe the layout of approach cable at each site and the floor plan of the FODP.	I

26.	Training Manuals	System document	An advance copy of all training material.	IV
27.	Maintenance Philosophy & Procedures	System document	Shall cover breakdown maintenance procedures, preventive maintenance schedules and procedures	IV
28.	SAT reports	Per Link and per location		*

Note

\*: To be reviewed & approved by site. #: To be reviewed & approved by Q & I.

<b>Table 9-2(a)</b> <b>Expected Contents &amp; Structure of Equipment Installation Manual</b>		
1.	Installation procedure	<u>Description of activities of installation gangs:</u> Preparation & Setting up, Stringing, sagging, attaching hardware, attaching down lead clamps & cable routing on the tower, securing cable ends (for protection before work by jointing gang). Precautions for preventing damage etc shall be highlighted.
2.	Safety Instructions	<u>Instructions &amp; procedures related to ensuring installation crew safety:</u> personnel grounding & safety, installation equipment safety, Safety for power system & environment (viz preventing accidental tripping, precaution for railway crossings etc)
3.	Description of Installation Equipment	Sketches, drawings, photographs, safe working ratings of installation equipment, tools & tackles etc., handling instructions & precautions.

4.	Cable routing	Illustrations of the position of tower attachments clamps (down lead clamps), routing of FO cable on the tower, service loop(s), joint box position, various possible cable routing (Intra cabinet and inter cabinet, within the same room and located in different rooms/buildings etc.) methods.
5.	References	<p>References to other related documents covering the installation, jointing &amp; testing, such as</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> SAT administrative &amp; functional test plans &amp; test procedures</li> <li><input type="checkbox"/> Field Quality Plan &amp; Field Quality Audit</li> <li><input type="checkbox"/> Storage &amp; Handling Instructions</li> <li><input type="checkbox"/> Drawings, technical parameters, DRS etc</li> <li><input type="checkbox"/> Employer &amp; Statutory safety rules, safety manuals, standards, codes of practices etc.</li> </ul>

**Table 8-2b: Expected Contents & Structure of FO Cable Installation Manual for Overhead FO cable**

1.	Installation procedure	Description of activities of installation gangs: Preparation & Setting up, Stringing, sagging, attaching hardware, attaching down lead clamps & cable routing on the tower, securing cable ends (for protection before work by jointing gang). Precautions for preventing cable damage shall be highlighted.
2.	Safety Instructions	Instructions & procedures related to ensuring installation crew safety: personnel grounding & safety, installation equipment safety, Safety for power system & environment (viz preventing accidental tripping, precaution for railway crossings etc)
3.	Description of Installation Equipment	Sketches, drawings, photographs, safe working ratings of installation equipment, tools & tackles etc., handling instructions & precautions.
4.	Cable routing	Illustrations of the positions of tower attachment clamps (down lead clamps), routing of FO cable on the tower, service loop(s), joint box position.

5.	References	<p>References to other related documents covering the installation, jointing &amp; testing, such as</p> <ul style="list-style-type: none"><li>• SAT administrative &amp; functional test plans &amp; test procedures</li><li>• Jointing Procedures</li><li>• Field Quality Plan &amp; Field Quality Audit</li><li>• Storage &amp; Handling Instructions</li><li>• FO cable &amp; hardware drawings, technical parameters, DRS etc</li><li>• Employer &amp; Statutory safety rules, safety manuals, standards, codes of practices etc.</li></ul>
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