



PUNJAB STATE TRANSMISSION CORPORATION LIMITED,

Regd Office: PSEB Head Office, The Mall, Patiala.147001.
Office of: SE/Communication, PSTCL, Quarter No. 20/21 (Type-IV),
Power Colony-2, Sarabha Nagar, Ferozpur Road, Ludhiana -141001.
Email: se-comm-ldh@pstcl.org, ase-comm-design@pstcl.org
Corporate Identity No. U40109PB2010SGC033814
Website : www.pstcl.org

TELEPHONES:	SE /Communication – 96461-18008, 96461-18025
E-MAIL ID	se-comm-ldh@pstcl.org , ase-comm-design@pstcl.org
E-TENDERING WEBSITE	https://eproc.punjab.gov.in/nicgep/app

SPECIFICATION NO: STQ – 8055

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System.

Due Dates & Time:

- | | |
|-------------------------------------------------------------|-----------------------------|
| I) Last date & time for downloading of tender specification | : 23.10.2023 upto 10:00 Hrs |
| II) Last date & time for receipt of tenders | : 23.10.2023 upto 12:00 Hrs |
| III) Date & time of opening of tenders | : 26.10.2023 at 12:00 Hrs |

**Dy. CE/Communication,
PSTCL, Ludhiana.**

NOTE:

1. Draft for EMD in favor of AO/CPC, PSTCL or PEMD certificate issued by AO/CPC. PSTCL may be furnished in separate envelopes up-to the last date/time of bid submission in the office of Dy. CE /Communication, PSTCL, Quarter No. 20/21 (Type-IV), Power Colony-2, Sarabha Nagar, Ferozpur Road, Ludhiana -141001, failing which bids of the firms will not be opened. It is to be noted that if bidder is submitting the EMD in the form of BG/DD, then the bidder has to opt for EMD exemption in the online portal of eproc and upload clear copy of BG/DD.
 2. Charges of all the above tests (i.e Stage tests, Routine Test, Type Test & Special Test) shall be deemed to have been included in the quoted prices. No separate charges shall be given for the tests. Offers of the firms who quote separate charges for these tests shall be rejected.
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3. Please note that the tenders against this tender enquiry are being invited through e-tendering mode. Submission of Manual tenders in any case shall not be accepted.
4. Prospective bidders are requested to get issued their digital signatures well in time for participation in the tender as no request for extension on this account will be entertained.
5. The details regarding e-tendering process may be seen on <https://eproc.punjab.gov.in/nicgep/app> or prospective bidders may contact M/s GePNIC at their toll free no. 0120-4001002, 4001005, 4200462 and 6277787. It may be noted that no hard copy of the specification will be issued by this office and the specification can only be downloaded from the above mentioned website. The prospective bidders are requested to get their digital signatures well in time for participation in the tender as no request for extension on this account will be entertained.
6. Those firms will not be considered where there is 25% or more default for 9 months or any quantity for more than 15 months in making supplies against earlier purchase orders placed on them.
7. **Only FIRM prices may be quoted. Bids with VARIABLE prices shall be rejected**
8. **Tender may be decided using Reverse Auction.**

INDEX**1. Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines of PSTCL System.**

- Volume I:** Section I Invitation For Bids (IFB)
- Section II Instruction To Bidders (ITB)
- Section III General Conditions of Contract (GCC)
- Section IV Sample Forms and Procedures (Forms)
- Volume II:** Specification for Indoor Fibre Optic Terminal Equipments along with its accessories
- Volume III:** Specification for OPGW, its cabling & associated hardware & fittings
- Volume IV:** Bid Form, Price Schedules and Technical Data Sheets

Volume-I
Bidding Documents
For
Supply, Erection, Testing and
Commissioning of OPGW along with its
Terminal Equipment on
132kV/220kV/400kV Transmission Lines&
sub-stations of PSTCL System

Volume-I consists of following Sections:-

Section-I: Invitation For Bids (IFB)

Section-II: Instruction To Bidders (ITB)

Section-III: General Conditions Of Contract

Section-IV: Sample Forms And Procedures (Forms)

SECTION-I
INVITATION FOR BIDS (IFB)
FOR
SUPPLY, ERECTION, TESTING AND COMMISSIONING OF OPGW ALONG WITH ITS TERMINAL EQUIPMENT ON 132KV/220KV/400KV TRANSMISSION LINES OF PSTCL SYSTEM
(SINGLE STAGE E-TENDER BIDDING)

SPECIFICATION NO. : STQ- 8055

1.0 PSTCL invites bids through e-tender mode from eligible bidders for the following package:

Description
SUPPLY, ERECTION, TESTING AND COMMISSIONING OF OPGW ALONG WITH ITS TERMINAL EQUIPMENT ON 132KV/220KV/400KV TRANSMISSION LINES OF PSTCL SYSTEM

This Invitation for Bids extended through media, website or written communication or by any other means, shall not be construed to mean that the prospective bidders to whom the Invitation for Bids has been extended and/or Bidding Documents have been issued is deemed to be an eligible bidder. The eligibility of the bidders shall be determined as per the provisions of Bidding Documents.

Note:

- a) Prospective bidders are requested to get their digital signatures well in time for participation in the tender as no request for extension on this account will be entertained.
 - b) The details regarding e-tendering process may be seen on www.eproc.punjab.gov.in. It may be noted that no hard copy of the specification will be issued by this office and the specification can only be downloaded from the above mentioned website.
 - c) Please see clause 5 regarding payment of tender document cost.
- 1.1 This Specification covers the following scope of works: The scope of work covered under this **package (Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System)** shall include following:
- a) Design, Engineering, Manufacture, Supply, Transportation, Erection, Testing, Commissioning and Civil Works (where ever required) for installation of OPGW its cabling along with its

associated hardware fittings like suspension assembly, tension assembly, vibrations dampers, joint box, FODP etc. and its splicing.

- b) Design, Engineering, Manufacture, Supply, Transportation, Erection, Testing, Commissioning and Civil Works (where ever required) for installation of Indoor Equipments of OPGW like SDH/PDH, Terminal Equipments and its cards & cables, Equipment Cabinets, approach cable and its connections with RTU/SCADA etc.

The above scope of work is indicative and the detailed scope of work is given in the Technical Specification (Volume-II& III) of the Bidding Documents.

- 1.2 The completion period for **Turnkey Package** shall be the period as specified in ITB Sub-Clause 24.1(c).
- 1.3 Bidding will be conducted as per the provisions of ITB and the contract shall be executed as per the provisions of the Contract. The respective rights of the Employer and the Bidder/Contractor shall be governed by the Bidding Documents/Contract signed between the Employer and the Contractor for the package.
- 2.0 The detailed Qualifying Requirements (QR) is given in the Bidding Document.
- 3.0 The complete Bidding Documents are available at PSTCL's website www.eproc.punjab.gov.in. Interested bidders can download the Bidding Documents and commence preparation of bids to gain time.
- 4.0 Interested eligible bidders may obtain further information from and inspect the Bidding Documents at the office of CE/TS PSTCL Patiala at the address given at para 8.0 below on all working days till the date and time of downloading of Bidding Documents is open as per para 5.0 below.
- 5.0 A complete set of Bidding Documents in English may be downloaded by interested Bidder or Bidder's authorised representative before 23.10.2023 upto 10.00 Hrs (IST).The cost of specification shall be zero and no fees is required to be deposited by the bidder.

Interested Bidders will be required to upload the Bidding Documents on the website www.eproc.punjab.gov.in. In addition to this, one hard copy of bidding documents (without price bid), which will be duly authenticated by the executive issuing the documents, shall be submitted in the office of Dy. CE/Comm., PSTCL, Qtr No. 20&21, Type -IV, Power Colony -2, Sarabha Nagar, Ludhiana-141001 on or before 23.10.2023 up to 11:00 Hrs.

- 6.0 A Single Stage Bidding Procedure will be adopted and will proceed as detailed in the Bidding Documents.

(a) The bid shall be uploaded on www.eproc.punjab.gov.in on or before 23.10.2023 upto 1200 Hrs. A hard copy of Bids, technical and commercial part only (without price bid) must be submitted in sealed envelopes to the address below on or before upto 23.10.2023 upto 1100

hrs. Late bids will be rejected. Techno Commercial Part shall be opened on 26.10.2023 at 1200 Hrs in the presence of the bidders' representatives who choose to attend in person at the address below at 1130 Hrs (IST). Price bid shall be opened in the presence of the bidders' representatives who choose to attend at the time and date at the address given in the intimation for opening of Price bid in accordance with Clause 25 of ITB.

(b) The bidders shall submit undertaking that the equipment offered by him is in line with the latest guidelines in respect of Make in india.

(c) All equipment, component, and parts imported for use in the power Supply System and Network shall be tested in the country to check for any kind of embeded malware/ trojans/ cyber threat and for adherence to Indian Standards.

(d) All such testings shall be done in certified laboratories that will be designated by the Ministry of Power (MoP).

(e) Any import of equipment/components/parts from "prior reference" countries as specified or by persons owned by controlled by, or subject to the jurisdiction or the directions of these " prior reference" countries will require prior permission of the Government of india.

(f). Where the equipment/components/parts are imported from "prior reference" countries, with special permission, the protocol for testing in certified and designated laboratories shall be approved by the Minstry of Power (MoP).

(e) Allow of foreign bidders shall not be effective.

All the bids must be accompanied by bid security (EMD) @ 2% of total tender cost ie Rs. 37,00,000/- (Rs. Thirty Seven Lacs Only) as per Clause 13 of ITB.

7.0 *PSTCL reserves the right to cancel/withdraw this invitation for bids without assigning any reason and shall bear no liability whatsoever consequent upon such a decision.*

8.0 All correspondence with regard to the above shall be to the following address. **(By Post/In Person)**

Dy.Chief Engineer/Communication,

Qtr No. 20 & 21, Type - IV, Power Colony -2, Sarabha Nagar

PSTCL, Ludhiana- 141001

Email Id:-se-comm-ldh@pstcl.org

Mob: 96461-18008/96461-18025

For more information, visit our site at <http://www.pstcl.org> or <http://eproc.punjab.gov.in/nicgep/app>

SECTION-II
INSTRUCTION TO BIDDERS (ITB)

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Preamble

This section (Section-II) of the Bidding Documents provides the information necessary for bidders to prepare responsive bids, in accordance with the requirements of the Employer. It also provides information on bid submission, opening and evaluation and on contract award. This Section (Section-II) contains provisions that are to be used unchanged unless Section-III, which consists of provisions that supplement, amend, or specify in detail, information or requirements included in Section-II and that are specific to each procurement, states otherwise. If there is a conflict between the provisions of Section-II & Section-III, the provisions of Section-III shall prevail.

However, provisions governing the performance of the Contractor, payments under the contract or matters affecting the risks, rights and obligations of the parties under the contract are not included in this section but instead under Section-III: General Conditions of Contract.

Further in all matters arising out of the provisions of this Section-II and the Section-III of the Bidding Documents, the laws of the Union of India shall be the governing laws and courts of Patiala only shall have exclusive jurisdiction.

However, standard prevailing terms and conditions as contained in Purchase Regulation-1981 erstwhile PSEB amended from time to time will remain into force.

A Introduction**1 Source of Funds**

The Owner which is:

Punjab State Transmission Corporation Ltd. ,

Shakti Sadan,

Patiala (Punjab) -147001,

Kind Attn.: Dy.CE/Communication

Email: se-comm-ldh@pstcl.org

Mobile No: 96461-18008,

intends to use domestic funding (Owner's Internal Resources/Domestic Borrowings/Bonds) for this Project.

All eligible payments under the contract for the package for which this Invitation for Bids is issued shall be made by the Employer which is:

Punjab State Transmission Corporation Ltd.,

Shakti Sadan, Patiala (Punjab) -147001,

Kind Attn.: Dy.Chief Engineer/Communication

Email: se-comm-ldh@pstcl.org

Telephone No: 96461-18008/96461-18025

2 Eligible Bidders

- 2.1 This Invitation for Bids, issued by the Employer is open to all firms including company(ies), Government owned Enterprises registered and incorporated in India as per Companies Act, 1956 amended time to time, barring firms/companies not registered and incorporated in India and those bidders with whom business is banned by the Employer.
- 2.2 Bidders should not be associated, or had been associated in the past, directly or indirectly, with a firm or any of its affiliates:
 - i) that has provided consulting services related to the facilities to the Employer during the preparatory stages of the Project of which the facilities form a part, or
 - ii) that has been hired (or is proposed to be hired) by the Employer as Project Manager for the contract.
- 2.3 The Bidder, directly or indirectly shall not be a dependent agency of the Employer.
- 2.4 Both the Principal Contractor/ Lead Partner and its sub-contractor(s) shall be PGCIL (Power Grid Corporation India Limited) approved vendors or may be Central/State Govt./Semi-Govt. Undertaking firm/Utility and/or those contractors/sub-contractors whose work appraisal already stands successfully conducted by PSTCL (or erstwhile PSEB).

3 Eligible Plant, Equipment, and Services

- 3.1 For the purposes of these Bidding Documents, the words “facilities,” “plant and equipment,” “installation services,” etc., shall be construed in accordance with the respective definitions given to them in the General Conditions of Contract.
- 3.2 All plant and equipment to be supplied and installed and services carried out under the contract shall have their origin in India barring those firms with whom business is banned by the Employer.

- 3.3 For purposes of this clause, “origin” means the place where the plant and equipment or component parts thereof are mined, grown, produced or manufactured. Plant and equipment are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.
- 3.4 The origin of the plant, equipment, and services is distinct from the nationality of the Bidder.

4 Cost of Bidding

The Bidder shall bear all costs associated with the preparation and submission of its bid including post-bid discussions, technical and other presentations etc., and the Employer will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

B The Bidding Documents

5 Content of Bidding Documents

- 5.1 The facilities required, bidding procedures, contract terms and technical requirements are prescribed in the Bidding Documents. The Bidding Documents comprise of the following and shall include amendments, if any, thereto:

- VOLUME-I: Conditions of Contract
- Section-I Invitations for Bids (IFB)
- Section-II Instructions to Bidders (ITB)
- Section-III General Conditions of Contract (GCC)
- Section-IV Sample Forms and Procedures (FP)
1. Bid Form & Price Schedule
 - 1.1 Bid Form
 - 1.2 Price Schedule
 2. Bid Security Form
 3. Form of Notification by the Employer to the Bank
 4. Form of ‘Notification of Award of Contract’

- 4(a) Form of 'Notification of Award of Contract' for Supply of Plant and equipment
- 4(b) Form of 'Notification of Award of Contract' for Installation of Plant and equipment
- 5. Form of Contract Agreement
 - 5.1 Appendix-1: Terms and Procedures of Payment
 - 5.2 Appendix-2: Price Adjustment
 - 5.3 Appendix-3: Insurance Requirements
 - 5.4 Appendix-4: Time Schedule
 - 5.5 Appendix-5: List of Approved Subcontractors
 - 5.6 Appendix-6: Scope of Works and Supply by the Employer
 - 5.7 Appendix-7: List of Document for Approval or Review
 - 5.8 Appendix-8(a): Guarantees, Liquidated Damages for Non-Performance
 - 5.9 Appendix-9: Contract Co-ordination Procedure
 - 5.10 Appendix-10: Break-up of Contract Price for On-Account Payment Purpose
 - 5.11 Integrity Pact
- 6. Performance Security Form
- 7. Form of Taking Over Certificate
- 8. Form of Indemnity Bond to be executed by the Contractor for the Equipment handed over in one lot by Employer for performance of its contract.
- 9. Form of Indemnity Bond to be executed by the Contractor for the Equipment handed over in installments by Employer for performance of its contract.
- 10. Form of Authorisation Letter
- 11. Form of Trust Receipt for Plant, Equipment and Materials received

12. Form of Extension of Bank Guarantee
13. Form of Power of Attorney for Joint Venture
14. Form of Joint Venture Agreement
15. Format for Evidence of Access to or Availability of Credit/
Facilities
16. Form of Operational Acceptance
17. Form of Safety Plan to be submitted by the Contractor
within sixty days of award of contract
18. Form of Joint Undertaking by the Collaborator /Parent
Company along with the Bidder / Manufacturer.
19. Form of Bank Guarantee for Contract Performance (to be
submitted by Collaborator).
20. Deleted

21. Form of Deed of Joint Undertaking to be executed by
the Bidder and the Promoter of the Group Company
(when the Group Company is yet to be incorporated
under Indian Companies Act) of the Bidder for
supply at least 25% of OPGW Cable manufactured in
the said facilities in *[stipulated in Clause 1.1.2 (A) (I) of
Qualification Requirement Annexure-A (ITB)/GCC Sub-
Clause 5.1.1]*

22. Form of Deed of Undertaking to be executed by the
Bidder *[where the Subsidiary Company / Joint
Venture Company is to be incorporated]* for supply
at least 25% of OPGW Cable manufactured in the
said facilities in India *[stipulated in Clause 1.1.2 (A) (I)
of Qualification Requirement Annexure-A (ITB)/GCC
Sub-Clause 5.1.1]*

23. Form of Bank Guarantee for Contract Performance [*as stipulated in GCC Sub-clause 5.1.2*]

(TO BE SUBMITTED BY INDIAN SUBSIDIARY COMPANY OF A QUALIFIED OPGW CABLE MANUFACTURER / OTHER PROMOTERS (IF ANY) HAVING 25% OR HIGHER EQUITY PARTICIPATION IN THE INDIAN SUBSIDIARY COMPANY)

24. Form of Bank Guarantee for Contract Performance [*as stipulated in GCC Sub-clause 5.1.2*]

(To be submitted by Joint Venture Company of a Qualified OPGW Cable Manufacturer / Other Promoter (Indian OPGW Cable Manufacturer) Having 51% or Higher Equity participation in the Joint Venture Company)

25. Form of Deed of Undertaking to be executed by the Bidder/Manufacturer for extended warranty of two (02) years over and above the warranty period specified for OPGW cable {*as per requirements of Clause 1.1.2 (A) (II) of Qualification Requirement Annexure-A (ITB)*}.

26. Form of Joint Deed of Undertaking to be executed by the Bidder/Manufacturer alongwith Parent Company (Principal) or Collaboratorfor technological support and for extended warranty obligations of additional two (2) years over and above the warranty period specified for OPGW {*as per requirements of para 1.1.2(A)(III) of Annexure-A (ITB)*}

28. Form of Joint Deed of Undertaking to be executed by the Bidder alongwith proposed Sub-Contractor for Installation of OPGW by the proposed Sub-contractor{as per requirements of para 1.1.2(B) of Annexure-A (ITB)}

29. Performance Security Form with Initial validity of 5 years.

(to be submitted by the contractor opting for submission of performance security with initial validity of 5 years in accordance with clause GCC 9.3.1.1)

VOLUME-II: Specification for Indoor Fibre Optic Terminal Equipments along with its accessories

VOLUME-III: Specification for OPGW, its cabling & associated hardware & fittings

VOLUME-IV: Bid Form, Price Schedules & Technical Data Sheets

5.2 The Bidder is expected to examine all instructions, forms, terms, specifications and other information in the Bidding Documents. Failure to furnish all information required by the Bidding Documents or submission of a bid not substantially responsive to the Bidding Documents in every respect will be at the Bidder's risk and may result in rejection of its bid.

5.3 Scope of Work is given in Volume-II & III of Bidding Documents.

6 Clarification of Bidding Documents; and Pre-Bid Meeting

6.1 A prospective Bidder requiring any clarification of the Bidding Documents may notify the Employer in writing or by mail or by fax at the Employer's mailing address. Similarly, if a Bidder feels that any important provision in the documents, such as those listed in ITB Sub-Clause 22.3.1, will be unacceptable, such an issue should be raised as above. The Employer will respond in writing to any request for clarification or modification of the Bidding Documents that it receives no later than Ten (10) days prior to the original deadline for submission of bids prescribed by the Employer. The Employer shall not be obliged to respond to any request for clarification received later than the above period. Further, the mere request for clarification from the Bidders shall not be a ground for seeking extension in the deadline for submission of bids. Written copies of the Employer's response

(including an explanation of the query but not identification of its source) will be uploaded on PSTCL website.

- 6.2 The Bidder is advised to visit and examine the site where the facilities are to be installed and its surroundings and obtain for itself on its own responsibility and cost all information that may be necessary for preparing the bid and entering into a contract for supply and installation of the facilities. The costs of visiting the site shall be at the Bidder's own expense.
- 6.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such inspection, but only upon the express condition that the Bidder, its personnel and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of the inspection.

7 Amendment of Bidding Documents

- 7.1 At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at its own initiative, or in response to a clarification requested by a prospective Bidder, amend the Bidding Documents.
- 7.2 The amendment will be uploaded on PSTCL's website for information of bidders. Bidders are required to immediately acknowledge any such amendment, and it will be assumed that the information contained therein will have been taken into account by the Bidder in its bid.
- 7.3 In order to afford reasonable time to the prospective Bidders to take the amendment into account in preparing their bid, the Employer may, at its discretion, extend the deadline for the submission of bids, in such cases; the Employer will upload on PSTCL's website the extended deadline. It is also informed that in case tender process is not completed due to any reason, no corrigendum will be published in newspaper. Details regarding corrigendum may be seen on official, PSTCL, website.

C Preparation of Bids

8 Language of Bid

The bid prepared by the Bidder and all correspondence and documents exchanged by the Bidder and the Employer related to the bid shall be written in the English language, provided that any printed literature furnished by the Bidder may be written in another language, as long as such literature is accompanied by English translation of its pertinent

passages, in which case, for purposes of interpretation of the bid, the English translation shall govern.

9 Documents Comprising the Bid

9.1 The bid shall be uploaded by the Bidder under “Single Stage” procedure of bidding. However, one hard copy of the bid (without price bid) shall be submitted as discussed IFB.

(a) Bid Form duly completed and signed by the Bidder, together with all Attachments, shall be scanned and uploaded (available in Volume-IV). All Attachments have been identified in ITB Sub-Clause 9.3 below.

(b) Technical Data Sheets (available in Volume-IV), if any, shall be duly completed, scanned and uploaded by the Bidder.

(c) Bid Form together with Price Schedules (available in Volume-IV), shall be duly completed, signed, scanned and uploaded by the Bidder.

Note: A hard copy of documents under para 9.1(a) and (b) shall also be submitted as discussed in IFB. In case of any discrepancy between the hard copy and in the uploaded documents, the uploaded documents will be considered as valid documents. No hard copy of documents under para 9.1(c) i.e. price bid is to be submitted .

9.2 Bidders shall note that, alternative bids are not permitted.

9.3 Each Bidder shall submit/upload with its Techno-Commercial Part the following attachments:

a) Attachment 1: Bid Security

A bid security in sealed separate envelope shall be furnished in accordance with ITB Clause 13 & ITB Clause 16. A scanned copy shall be uploaded.

b) Attachment 2: Power of Attorney

A power of attorney, duly notarized, indicating that the person(s) signing the bid has(ve) the authority to sign the bid and thus that the bid is binding upon the Bidder during full period of its validity, in accordance with ITB Clause 14. A scanned copy shall be uploaded.

c) Attachment 3: Bidder’s Eligibility and Qualifications

In the absence of prequalification, documentary evidence establishing that the Bidder is eligible to bid in accordance with ITB Clause 2 and is qualified to perform the contract in accordance with **Annexure–A (ITB)**, if its bid is accepted.

The documentary evidence of the Bidder's eligibility to bid shall establish to the Employer's satisfaction that the Bidder, at the time of submission of its bid, is eligible as defined in ITB Clause 2.

The documentary evidence of the Bidder's qualifications to perform the contract, if its bid is accepted, shall establish to the Employer's satisfaction that the Bidder has the financial, technical, production, procurement, shipping, installation and other capabilities necessary to perform the contract, and, in particular, meets the experience and other criteria outlined in the Qualification Requirement for the Bidders in **Annexure–A (ITB)** and shall also include:

The complete annual reports together with Audited statement of accounts of the company for last five years of its own (separate) immediately preceding the date of submission of bid.

[Note I. In the event the Bidder is not able to furnish the above information of its own (i.e., separate), being a subsidiary company and its accounts are being consolidated with its Group/ Holding/ Parent company, the Bidder should submit the audited balance sheet, income statement, other information pertaining to it only (not of its Group/Holding/Parent company) duly certified by any one of the authority [(i) Statutory Auditor of the Bidder/(ii) Company Secretary of the Bidder a (iii) A certified Public Accountant] certifying that such information/documents are based on the audited accounts as the case may be.

Note II. Similarly, if the Bidder happens to be a Group/Holding/ Parent company, the Bidder should submit the above documents/information of its own (i.e., exclusive of its subsidiaries) duly certified by any one of the authority mentioned in Note I above certifying that these information/documents are based on audited accounts, as the case may be.]

Unless otherwise mentioned, bids submitted by a joint venture of two or more firms as partners, if allowed as per stipulated Qualification Requirements in Annexure-A (ITB), shall comply with the following requirements:

- (i) The bid shall include all the information required for Attachment 3 as described above for each joint venture partner.
- (ii) The bid shall be signed so as to be legally binding on all partners.

- (iii) One of the partners responsible for performing a key component of the contract shall be designated as leader; this authorization shall be evidenced by submitting with the bid a power of attorney signed by legally authorized signatories as per Form-13 of Section-IV.
- (iv) The leader shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture, and the entire execution of the contract, including payment, shall be done exclusively with the leader, provided otherwise requested by the joint venture and agreed between the Employer and the leader.
- (v) All partners of the joint venture shall be liable jointly and severally for the execution of the contract in accordance with the contract terms.
- (vi) A copy of the agreement entered into by the joint venture partners shall be submitted with the bid as per Form-14 of Section-IV, including inter alia delineation of responsibilities and obligations of each partners appended thereto, notwithstanding the joint and several liability.
- (vii) The joint venture agreement should indicate precisely the responsibility of all members of JV in respect of planning, design, manufacturing, supply, installation, commissioning and training. All members of JV should have active participation in execution during the currency of the contract. This should not be varied/modified subsequently without prior approval of the Employer; and

In order for a joint venture to qualify, each of its partners or combination of partners must meet the minimum criteria listed in the Qualification Requirement for the Bidder in enclosed **Annexure-A (ITB)** for an individual Bidder for the component of the contract they are designated to perform. Failure to comply with this requirement will result in rejection of the joint venture bid.

A firm can be a partner in only one joint venture; bids submitted by joint ventures or consortia including the same firm as partner will be rejected.

In the case of a Bidder who offers to supply and/or install plant and equipment under the contract that the Bidder did not manufacture or otherwise produce and/or install, the Bidder shall (i) have the financial and other capabilities necessary to perform the contract; (ii) have been duly authorized by the manufacturer or producer of the related plant and equipment or component as per proforma in attachment 7 to supply and/or install that item in the Employer's country; and (iii) be responsible for ensuring that the manufacturer

or producer complies with the requirements of ITB Sub-Clause 3.2 and meets the minimum criteria listed for an individual Bidder for that item.

However, if the bidder resorts to unethical practices inter-alia including misrepresentation of facts, submission of false and/or forged details/documents/declaration as above, the bidder may be debarred from the participation in Employer's tenders for a period of 1 to 3 years, as considered appropriate and its Bid Security/Contract Performance Guarantee shall be forfeited besides taking other actions as deemed appropriate

Allow offoreign bidders shall not be effective.

Further, pursuant to Clause BDS (ITB 23.2), capacity, capability and experience of the Associate shall also be taken into account for the purpose of award of contract(s). Further, the bidder has the option to propose more than one Associate for executing the Second Contract (On-Shore Supply) and/or Third Contract (On-Shore Services Contract) so that in case of one of the proposed Associate not found acceptable by the Employer, the other proposed Associate can be considered by the Employer. However, such bidder can propose up to a maximum of only 3 (three) Associate(s) for executing the Second Contract (On-Shore Supply) and/or Third Contract (On-Shore Services Contract), indicating their order of preference for acceptance by the Employer. In case, no order of preference has been indicated then the order, in which the names of the proposed Associate(s) have been listed, shall be deemed to be the order of preference.

Bidders shall also submit forms if applicable, as per Annexure-A (ITB) with the bid (in Original)

(Uploading of Scanned Copies of documentary evidence in support of Bidder's qualification. In case of Joint Venture bid, submission of Hard Copy in 'Original' of the JV Agreement and POA for JV)(d) Attachment 4: Eligibility and Conformity of the Facilities

Documentary evidence established in accordance with ITB Clause 3 that the facilities offered by the Bidder in its bid are eligible and conform to the Bidding Documents.

The documentary evidence of the eligibility of the facilities shall consist of a statement on the country of origin of the plant and equipment offered, which shall be confirmed by a certificate of origin issued at the time of shipment.

The documentary evidence of the conformity of the facilities to the Bidding Documents may be in the form of literature, drawings and data, and shall furnish:

- (i) a detailed description of the essential technical and performance characteristics of the facilities;
 - (ii) a list giving full particulars, including available sources, of all spare parts, special tools, etc., necessary for the proper and continuing functioning of the facilities for a period of Fifteen (15) years following completion of facilities in accordance with provisions of contract; and
 - (iii) a commentary on the Employer's Technical Specifications and adequate evidence demonstrating the substantial responsiveness of the facilities to those specifications. Bidders shall note that standards for workmanship, materials and equipment designated by the Employer in the Bidding Documents are intended to be descriptive (establishing standards of quality and performance) only and not restrictive. The Bidder may substitute alternative standards, brand names and/or catalog numbers in its bid, provided that it demonstrates to the Employer's satisfaction that the substitutions are substantially equivalent or superior to the standards designated in the Technical Specifications.
 - (iv) All details regarding after sale service support offered.
 - (v) All details regarding proposed training for Employer's personnel.
 - (vi) Detailed answers to all the Questions in the Questionnaire, if prescribed in the Bidding Document.
 - (vii) Details establishing the responsiveness of the offer in accordance with Technical Specification, Volume-II.
- (e) Attachment 5: Subcontractors Proposed by the Bidder

The Bidder shall include in its bid details of all major items of supply or services that it proposes to purchase or sublet, and shall give details of the name and nationality of the proposed Subcontractor, including vendors, for each of those items. Bidders are free to list more than one Subcontractor against each item of the facilities. Their participation should be confirmed with a letter of intent between the parties, as needed, in Attachment 7. Quoted rates and prices will be deemed to apply to whichever Subcontractor is appointed, and no adjustment of the rates and prices will be permitted.

The Bidder shall be responsible for ensuring that any Subcontractor proposed complies with the requirements of ITB Clause 2, and that any plant, equipment or services to be provided by the Subcontractor comply with the requirements of ITB Clause 3 and Qualification Requirement for the Bidder, enclosed as **Annexure-A (ITB)** and Qualification Requirement for subcontractors or Sub-vendors given in Technical Specification, Volume-II & III.

The Employer reserves the right to delete any proposed Subcontractor from the list prior to award of contract, and after discussion between the Employer and the Contractor, the corresponding Appendix to the form of Contract Agreement shall be completed, listing the approved Subcontractors for each item concerned.

OR

The bidder shall submit an undertaking that subcontractor shall be got approved before signing of contract agreement.

(f) Attachment 6: Deviations

In order to facilitate evaluation of bids, deviations, if any, from the terms and conditions or Technical Specifications shall be listed in Attachment 6 to the bid. The Bidder is required to provide the cost of withdrawal for such deviations. However, the attention of the bidders is drawn to the provisions of ITB Sub-Clause 22.3 regarding the rejection of bids that are not substantially responsive to the requirements of the Bidding Documents.

Bidder's attention is also drawn to the provisions of ITB Sub-Clause 22.3.1.

(g) Attachment 7: Manufacturer's Authorisation Form

(h) Attachment 8: Work Completion Schedule.

(i) Attachment 9: Guarantee Declaration.

(j) Attachment 10: Information regarding ex-employees of Employer in Bidder's firm.

(k) Attachment 11: Technical data Sheet

(l) Attachment 12: Declaration regarding Social Accountability

(m) Attachment 13: Information for E-payment, PF details and declaration regarding Micro/Small & Medium Enterprises

(n) Attachment 14: Additional Information

- (i) Certificate from their Banker(s) (as per prescribed formats in Form 15, Section-IV: Sample Forms and Procedures) indicating various fund based/non fund based limits sanctioned to the Bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the date of bid opening. Wherever necessary the Employer may make queries with the Bidders' Bankers.
 - (ii) Detailed information on any litigation or arbitration arising out of contracts completed or under execution by it over the last five years. A consistent history of awards involving litigation against the Bidder or any partner of JV may result in rejection of Bid.
 - (iii) Any other information which the Bidder intends to furnish.
- (o) Attachment 15: Declaration for tax exemptions, reductions, allowances or benefits.
- (p) Attachment 16: Declaration
- Attachment-16A: Deleted
- Attachment-16B: Declaration regarding percentage of OPGW cable outsource/subcontract from Parent Company (Principal) or Collaborator by an Indian Bidder proposing to qualify through route specified at Clause No. 1.1.2(A)(III) of Annexure A (ITB).
- (q) Attachment 17: GTPs
- (r) Attachment 18: Price Bid Form.
- (s) Attachment 19: Deleted .
- (t) Attachment 20: Deleted.
- (u) Attachment-21: Declaration of Key Managerial Person jointly with Power of Attorney holder
- (v) Attachment-22: Unequivocal consent of the proposed Sub-Contractor(s)

Any other document(s), if applicable, as per Clause ITB 5.1. The scanned copy of all attachments/documents shall be uploaded.

10 Bid Form and Price Schedules

- 10.1 The Bidder shall complete and upload the Bid Form(s) and the appropriate Price Schedules furnished in the Bidding Documents as indicated therein, following the requirements of ITB Clauses 11 and 12.

11 Bid Prices

- 11.1 Unless otherwise specified in the Technical Specifications, bidders shall quote for the entire facilities on a “single responsibility” basis such that the total bid price covers all the Contractor’s obligations mentioned in or to be reasonably inferred from the Bidding Documents in respect of the design, manufacture, including procurement and subcontracting (if any), delivery, construction, installation and completion of the facilities including supply of mandatory spares (if any). This includes all requirements under the Contractor’s responsibilities for testing, pre-commissioning and commissioning of the facilities and, where so required by the Bidding Documents, the acquisition of all permits, approvals and licenses, etc.; the operation, maintenance and training services and such other items and services as may be specified in the Bidding Documents, all in accordance with the requirements of the General Conditions of Contract. Items against which no price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed to be covered by the prices for other items.

If a Bidder is proposing to qualify through route specified at *Clause No. as mentioned in ITB* of Qualification Requirement at Annexure A (ITB), he shall necessarily propose Indian Associate(s) for executing the Second Contract (On-Shore Supply) and Third Contract (On-Shore Services Contract), failing which such bid shall be treated as non-responsive.

If a Bidder/Manufacturer is proposing to supply more than 25% OPGW cable from its Subsidiary or Group Company or a JVC in India, the Indian Subsidiary or Group Company or a JVC should have established the manufacturing facilities and supplied OPGW cable for 66kV or above voltage line from said Indian works, pursuant to GCC Sub-Clause 5.1, failing which such bid shall be treated as non-responsive.

Indian Bidders, proposing to qualify through route specified at Clause No. 1.1.2(A)(III) of Qualification Requirement at Annexure A (ITB), are allowed to outsource/sub-contract maximum upto 33% of the OPGW Cable from the Parent Company (Principal) or Collaborator as off-the-shelf item.

- 11.2 Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the Bidding Documents. If a Bidder wishes to make a deviation, such deviation shall be listed in Attachment 6 of its bid. The Bidder is required to provide the cost of withdrawal for such deviations.
- 11.3 Bidders shall give a breakdown of the prices in the manner and detail called for in the Price Schedules. Where no Price Schedules are included in the Bidding Documents, Bidders shall present their prices in the following manner:

Separate numbered Schedules shall be used for each of the following elements. The total amount from each Schedule 1 to 5 shall be summarized in a grand summary of Price Proposal (Schedule 6) giving the total bid price(s) to be entered in the Bid Form.

Schedule 1 Plant and Equipment (including mandatory Spares) to be supplied including Type Test Charges

Schedule 2 Local Transportation, Insurance and other incidental services applicable for supply of Plant & Equipment

Schedule 3 Installation Services

Schedule 4 Charges for Training to be imparted

Schedule 5 Taxes and Duties not included in Schedule 1 to 4

Schedule 6 Grand Summary (Schedule Nos. 1 to 5)

Bidders shall note that the plant and equipment included in Schedule No. 1 above exclude materials used for civil, building and other construction works. All such materials shall be included and priced under Schedule No. 3, Installation Services.

- 11.3.1 The bid price for the items for which quantities have been estimated by the Employer shall be governed based on the unit price quoted by the bidder.
- 11.3.2 The bid price for (i) the items for which quantities have been indicated as lump-sum or lot or set and/or (ii) where the quantities are to be estimated by the Bidder shall remain constant unless there is change made in the Scope of Work by Employer. The quantities and unit prices (i) subsequently arrived while approving the Bill of Quantities (BOQ) /Billing breakup of lump-sum quantities/lot/Set and/or (ii) estimated by the bidder shall be for on account payment purpose only. In case additional quantities, over and above the quantities BOQ/billing breakup and /or estimated by the bidder, are required for successful completion of the scope of work as per Technical Specification,

the Bidder shall execute additional quantities of these items for which no additional payment shall be made over and above the lump-sum bid price. In case quantities of these items supplied at site are in excess of that required for successful completion of scope of work, such additional quantities shall be the property of the bidders and they shall be allowed to take back the same from the site for which no deduction from the lump-sum bid price shall be made. Further, in case actual requirement of quantities for successful completion of scope of work is less than the quantities identified in the approved BOQ /billing breakup and/or estimated by the bidder, the lump-sum bid price shall remain unchanged and no deduction shall be made from the lump-sum price due to such reduction of quantities.

HSN/SAC has not been indicated for lumpsum quantities/lot/Set as each of these consists of many items for which billing break up shall be furnished during contract execution. For the purpose of evaluation, the bidder has to indicate the rate of GST applicable on these items. As it is possible that the incidence of GST on each of these items may be different, provision has been made in the price schedules for quoting the bid price in different categories based on the incidence of GST. The bidder shall accordingly quote price in different tax categories. HSN /SAC for these items shall be furnished along with billing breakup prior to payment for these items. Employer's liability for reimbursement of GST shall be lower of the GST applicable at the rate as confirmed/deemed confirmed in the bid or actual GST paid/payable by the bidder for that item.

- 11.3.3 It shall be the responsibility of the bidders to pay all statutory taxes, duties and levies (including GST) and interest, if applicable on account of additional revised invoice issued for actual material supplied, to the concerned authorities for such return/supply of surplus material, which would otherwise have been, lawfully payable. The bidders shall submit an indemnity bond to keep Employer harmless from any liability, before release of such material to the bidder by Employer.
- 11.3.4 Set/Lot/Lump-sum shall be governed as per the requirement of the corresponding item description read in conjunction with relevant provisions of Technical Specifications.
- 11.4 In the schedules, Bidder shall give the required details and a breakdown of their price **considering and taking into account the Input Tax Credit (ITC) as may be available under the Goods and Services Tax (GST) Laws and Regulations**, in the schedules as follows:

- (a) The Employer shall be responsible and be liable for payment of **Customs duty (i.e. Basic Customs duty, Cess, GST etc.)** on CIF Indian Port of Entry component of the Goods to be supplied from abroad. However, the Employer, as an importer, shall furnish promptly necessary clarifications and documents as may be required to be furnished by the importer for the purpose of customs clearance.

The customs duty **(i.e. Basic Customs duty, Cess, GST etc.)** as applicable shall be indicated separately in Schedule 5.

- (b) Goods to be supplied from within India, shall be quoted on an EXW (ex-factory, ex-works, ex-warehouse or off-the-self, as applicable) basis and Type Test Charges for Type Test to be conducted in India (including the Type Test to be conducted abroad in case of an Indian Bidder), shall also be quoted in Schedule 1b.

EXW price shall be inclusive of all cost as well as duties and taxes (viz., customs duties & levies, duties, GST etc.) paid or payable on components, raw materials and any other items used for their consumption incorporated or to be incorporated in the Goods.

Further, in case of imported Equipment/items offered as 'Off the Shelf' or dispatched directly from the Indian Port of disembarkation, the price of such Equipment/items shall be inclusive of all cost as well as any **duties paid/payable in relation to import of such goods (viz., Customs duties, cess, GST & levies etc.) considering and taking into account the ITC as may be available under the applicable laws including GST.**

The price quoted in respect of all items in the above schedule shall be excluding GST applicable on transaction between the Employer and the Contractor.

- (c) Local/Inland transportation, In-transit insurance, **loading and unloading** of the Goods to be supplied shall be quoted separately in Schedule 2, **as composite supply of services, with local/inland transportation being**

the Principal Supply. It is the Employer's understanding that as per extant provisions, on the charges for supply of services related to Inland transportation, In-transit insurance, loading and unloading by the Bidder to the Employer, GST is not payable.

Further, charges for Custom clearance & port handling for CIF supply of Plant & Equipment from abroad, if any, shall also be quoted in Schedule 2. The Price quoted in respect of these services shall be excluding GST, if any, payable.

- (d) Installation Charges shall be quoted separately (Schedule 3) and shall include rates and prices for all labour, Contractor's equipment, temporary works, materials, consumables and all matters and things of whatsoever nature, provision of operations and maintenance manuals, etc. wherever identified in the Bidding Documents as necessary for the proper execution of all installation services except those priced in other Schedules. The price quoted in respect of all items in the above schedule shall be excluding GST. **The earth wire along with hardware fitting dismantled while erection of OPGW shall be returned to stores of PSTCL. If any shortage is observed during receipt of material, the adjustment will be made on the account of the contractor as per prevailing approved rated of stores and Disposal organisation of PSTCL.**

It is understood that a part of the import duty is reimbursed by GoI when the equipment imported into India is re-exported after use. However, it shall be the responsibility of the Bidder to ascertain the same from the relevant authorities and quote the Bid Price accordingly. The Employer shall not bear any liability on this account.

- (e) The Training Charges shall be furnished separately in Schedule-4a for the training to be imparted abroad.

The Training Charges shall be furnished separately Schedule 4b for the training to be imparted in India. In case of Indian Bidder, the Training Charges for training to be imparted abroad shall be furnished in Schedule-4b. The price quoted against training charges in Schedule 4b shall be excluding GST.

- (f) The break-up of Annual Maintenance Charges (AMC) for OPGW for 1 year (extendable or may be foreclosed) within defect liability period shall be furnished in Schedule 4c. Maintenance carried out as per appendix-D of technical specification of OPGW Volume-III.

The price indicated in respect of all items in Schedule 4c shall be excluding GST, if any, payable.

- (g) Deleted

- (h) **In case of Supply of goods and Services from within India, to facilitate the bidders, Employer has indicated an HSN/SAC code and rate of GST against each item in the Price Schedule except for lumpsum quantities/lot/Set as mentioned at ITB 11.3.2. It shall entirely be the responsibility of the bidder to check the HSN/SAC code and rate of GST given against each item. The bidder may either confirm the HSN/SAC and rate of GST or if the bidder opts to classify the item in question under a different HSN/SAC code or opts to indicate a different rate of GST, bidder may indicate the same in the columns provided. The bidders shall solely be responsible for HSN/SAC classification and the rate of GST for each item. Employer's liability for reimbursement of GST shall be lower of the GST applicable at the rate as confirmed/deemed confirmed in the bid or actual GST paid/payable by the bidder for that item.**

- (i) **Total Customs duty (i.e. Basic Custom Duty, cess, levies and GST) and GST on Supply of goods viz. Equipment/items and Services shall be indicated in Schedule -5.**

- (j) **The Input Tax Credit (ITC) available, if any, under the GST law as per the relevant Government policies wherever applicable shall be taken into account by the Bidder while quoting bid price.**

- (k) **The Bidder shall include In-transit insurance charges in its bid prices as per insurance requirement mentioned in Section - IV: General**

Conditions of Contract (GCC) and Appendix-3: Insurance Requirements to Form of Contract Agreement as contained in Section VI: Sample Forms and Procedures (FORMS) of the Bidding Documents. Bidder shall further note that the Employer shall not be liable to make any payment/ reimbursement to the Contractor whatsoever for insurance of Contractor's Plant and Machinery.

- (l) The bidder shall fill up only the marked cell (shaded in green color) in the work sheets of Schedule 1 to 5. Bidder shall not carry out any modification or changes in any other cell. Required calculations will be carried out automatically in the respective work sheets of Schedule-6 (Grand Summary).
- (m) Bidders may like to ascertain availability of exemptions, reductions, allowances or benefits in case of goods and services to be supplied to the Employer. They shall solely be responsible for obtaining such benefits, and in case of failure to receive such benefits for any reasons whatsoever, the Employer will not compensate the Bidder. The Bidder shall furnish along with their bid, a declaration to this effect in Attachment 15 as per the format enclosed in the Bidding Documents.

Further, if issuance of the necessary certificate for availing such exemptions, reductions, allowances or benefits is permitted and is required to be issued by the Employer in line with the relevant policies, rules and procedures of Govt. of India in vogue, the same shall be considered for issuance by the Employer, provided the Bidder explicitly indicates in their bid that they have quoted prices after considering the applicable concessional duty/exemption. However, the Bidder alone shall be responsible for obtaining any benefits there from as may be admissible under Govt. policies/procedures and in case of their failure to receive such benefits, partly or fully, for any reason whatsoever, the Employer will neither be responsible nor be liable to compensate the Contractor, and the Employer shall have no financial liability on this account.

Where the Bidder has quoted taking into account such benefits, he must give all information required for issuance of such certificate in terms of

the relevant notifications of the Govt. of India along with his bid in Attachment 15. In case bidder has not indicated such information or has indicated "to be furnished later on" in Attachment 15, the same shall be construed to mean that no benefit has been passed on by the bidder to the Employer, and the Employer shall not issue any certificate to the contractor for availing the same even if admissible.

n) Employer shall, deduct taxes at source as per the applicable laws/rules, if any, and issue Tax Deduction at Source (TDS) Certificate to the Contractor.

11.4.1 Discount(s)/rebate(s) offered by the bidder shall be indicated as a percentage of price component(s). Bidder shall also indicate in his bid, the price component(s) on which the discount is to be applied.

11.5 --DELETED--

12 Bid Currencies

12.1 Prices shall be quoted in Indian Rupees Only.

- (a) Plant and equipment be supplied from abroad quoted under Schedule 1 a.
- (b) Training Charges for training to be imparted abroad quoted under Schedule 4 a.
- (c) Deleted
- (d) Deleted

13 Bid Security (EMD)

13.1 The Bidder shall furnish, as part of its bid, a bid security (EMD) in the amount and currency of 37,00,000/- (Rs. Thirty Seven Lacs Only). The bid security (EMD) must be submitted in the form provided in the Bidding Documents.

13.2 The bid security (EMD) shall, at the bidder's option, be in the form of a crossed bank draft/pay orders/banks certified cheque or a bank guarantee in favour of Employer i.e AO/CPC, PSTCL, Patiala from a reputed commercial bank and located in India. The format of the bank guarantee shall be in accordance with the form of bid security included in the Bidding Documents. Bid security (EMD) shall remain valid for a period of thirty (30) days beyond the original bid validity period, and beyond any extension subsequently requested under ITB Sub-Clause 14.2.

- 13.3 Any bid not accompanied by a bid security (EMD) or un-acceptable bid security shall be rejected by the Employer as being nonresponsive, pursuant to ITB Sub-Clause 22.4. The bid security of a joint venture must be in the name of all the partners in the joint venture submitting the bid.
- 13.4 The bid securities (EMD) of unsuccessful bidders will be returned as promptly as possible, but not later than twenty-eight (28) days after the expiration of the bid validity period.
- 13.5 The successful Bidder shall be required to keep its bid security (EMD) valid for a sufficient period till the performance security(ies) pursuant to ITB Clause 35 are furnished to the satisfaction of the Employer. The bid security (EMD) of the successful Bidder will be returned when the 100% material /equipments as mentioned at Appendix-A of Volume-II and Appendix-B of Volume-III of tender specification has been successfully delivered physically at the respective sites of PSTCL where such equipment/material is to be installed by the contractor.
- 13.6 The bid security (EMD) may be forfeited
- (a) If the Bidder withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form; or
 - (b) In case the Bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid; or
 - (c) If a Bidder does not accept the corrections to arithmetical errors identified during preliminary evaluation of his bid pursuant to ITB Sub-Clause 27.2; or
 - (d) If, as per the requirement of Qualification Requirements the Bidder is required to submit a Deed of Joint Undertaking and he fails to submit the same, duly attested by Notary Public of the place(s) of the respective executant(s) or registered with the Indian Embassy/High Commission in that Country, within ten days from the date of intimation of post – bid discussion; or
 - (e) In the case of a successful Bidder, if the Bidder fails within the specified time limit
 - (i) To sign the Contract Agreement, in accordance with ITB Clause 34, or
 - (ii) To furnish the required performance security(ies), in accordance with ITB Clause 35 and/or to keep the bid security (EMD) valid as per the requirement of ITB Sub-Clause 13.5.
- 13.7 No interest shall be payable by the Employer on the above Bid Security (EMD).

14 Period of Validity of Bid

- 14.1 Bids shall remain valid for the period of 180 days after the date of opening of Techno - Commercial Part, prescribed by the Employer, pursuant to ITB Sub-Clause 20.1. A bid valid for a shorter period shall be rejected by the Employer as being non-responsive.
- 14.2 In exceptional circumstance, the Employer may solicit the Bidder's consent to an extension of the bid validity period. The request and responses thereto shall be made in writing or by cable. If a Bidder accepts to prolong the period of validity, the bid security (EMD) shall also be suitably extended. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request will not be required or permitted to modify its bid.

15 Format and Signing of Bid

- 15.1 The Bidder shall prepare an original bid and upload the bid on e-tendering website. Hard copy of the original bid will be submitted to this office. In the event of any discrepancy between them, the bid uploaded on the website shall govern.
- 15.2 The original bid, consisting of the documents listed in ITB Clause 9, shall be typed or written in indelible ink and shall be signed by the Bidder or a person or persons duly authorized to bind the Bidder to the contract. The latter authorization shall be indicated by written power of attorney accompanying the bid and submitted as Attachment 2 to the Bid under ITB Sub-Clause 9.3. All pages of the bid, except for un-amended printed literature, shall be initialed by the person or persons signing the bid and shall be serially numbered.
- 15.3 The bid shall contain no alterations, omissions or additions, unless such corrections are initiated by the person or persons signing the bid.
- 15.4 The Bidder shall furnish information as described in the last paragraph of the Bid Form on commissions or gratuities, if any, paid or to be paid to agents relating to this bid, and to contract execution if the Bidder is awarded the contract.

D Submission of Bids

16 Sealing and Marking of Bids

- 16.1 The Bidder shall seal the original bid in two separate envelopes, one containing Techno-Commercial Part(without Price Bid) containing the documents mentioned at ITB Clause 9 and second containing bid security documents (EMD). These envelopes shall then be sealed in an outer envelope. The techno-commercial part , Bid Security documents (EMD) shall be uploaded on the e-tendering website.

The hard copy of price bid is not to be submitted.

16.2 The envelope shall

(a) be addressed to the Employer at the address Dy.CE/Communication, PSTCL, Qtr No.20-21, Power Colony 2, Sarabha Nagar, Ludhiana, 141001

and

(b) bear the contract name, the Invitation for Bids title and number indicated, and the statement "Do Not Open Before [date]," to be completed with the time and date specified in the, pursuant to ITB Sub-Clause 20.1.

16.3 Bid Securities (EMD) in original shall be submitted in separate superscribed envelopes along with First Envelope.

All the inner envelopes shall also indicate the name and address of the Bidder so that the bid can be returned unopened in case it is declared "late."

16.4 If the outer envelope is not sealed and marked as required by ITB Sub-Clause 16.2 above, the Employer will assume no responsibility for the bid's misplacement or premature opening. If the outer envelope discloses the Bidder's identity, the Employer will not guarantee the anonymity of the bid submission, but this disclosure will not constitute grounds for bid rejection.

17 Deadline for Submission of Bids

17.1 Bids must be received by the Employer at the address specified under ITB Sub-Clause 16.2 no later than the time and date stated. In the event of the specified date for the submission of bids being declared a holiday for the Employer, the bids will be received up to the appointed time on the next working day. Bids once received by the Employer shall not be returned except otherwise provided in the Bidding Documents.

17.2 The Employer may, at its discretion, extend this deadline for submission of bids by amending the Bidding Documents in accordance with ITB Sub-Clause 7.3 for the reasons specified therein at any time prior to opening of bids by the Employer pursuant to ITB Clause 20, in which case all rights and obligations of Employer and bidders will thereafter be subject to the deadline as extended.

18 Late Bids

18.1 Any bid received by the Employer after the bid submission deadline prescribed by the Employer, pursuant to ITB Clause 17, will be rejected and returned unopened to the Bidder.

19 Modification and Withdrawal of Bids

- 19.1 The Bidder may modify or withdraw its bid after submission, provided that modification or written notice of withdrawal is received by the Employer prior to the deadline prescribed for bid submission.
- 19.2 The Bidder's modifications shall be prepared, sealed, marked and dispatched as follows:
- (a) The Bidders shall provide an original and two number of copies of any modifications to its bid, clearly identified as such, in two inner envelopes duly marked "Bid Modifications Envelope —Original" and "Bid Modifications Envelope —Copies." The inner envelopes shall be sealed in an outer envelope, which shall be duly marked "Bid Modifications."
 - (b) Other provisions concerning the marking and dispatch of bid modifications shall be in accordance with ITB Sub-Clauses 16.2, 16.3 and 16.4.
- 19.3 A Bidder wishing to withdraw its bid shall notify the Employer in writing prior to the deadline prescribed for bid submission. The notice of withdrawal shall
- (a) be addressed to the Employer at the address named , and
 - (b) bear the contract name, the IFB number, and the words "Bid Withdrawal Notice." Bid withdrawal notices received after the bid submission deadline will be ignored, and the submitted bid will be deemed to be a validly submitted bid.
- 19.4 No bid may be withdrawn in the interval between the bid submission deadline and the expiration of the bid validity period specified in ITB Clause 14. Withdrawal of a bid during this interval may result in the Bidder's forfeiture of its bid security, pursuant to ITB Sub-Clause 13.6.

E Online Bid Opening and Evaluation

20 Online Opening of Bid by Employer

- 20.1 The envelope containing Bid Security pursuant to clause 16.3 shall be opened first and Bid Security being in order as per clause 13, the Employer will open the online bid.i.e. Techno – Commercial Part in public, including withdrawals and modifications made pursuant to ITB Clause 19, in the presence of bidders' designated representatives who choose to attend, at the time, date, and location stipulated above. The bidders' representatives who are present shall sign a register evidencing their attendance. In the event of the specified date for the submission of bids being declared a holiday for the Employer, the bids will be received upto the appointed time on the next working day.

- 20.2 Envelopes marked "Withdrawal" shall be opened first and the name of the Bidder shall be read out. Bids for which an acceptable notice of withdrawal has been submitted pursuant to ITB Clause 19 shall be returned unopened.
- 20.3 For all other Bids, the bidders' names, deviation having cost of withdrawal, if any, the presence of bid security, and any such other details as the Employer may consider appropriate, will be announced by the Employer at the opening. Subsequently, all envelopes marked "Modification" shall be opened and the submissions therein read out in appropriate detail. No bid shall be rejected at bid opening except for late bids pursuant to ITB Clause 18. Such bids shall be returned to the Bidder unopened. However, opening of bid, whether or not accompanied with the bid security, shall not be construed to imply its acceptability which shall be examined in detail pursuant to the provisions contained in this Section-II.
- 20.4 The Employer shall prepare minutes of the bid opening in the form of Bid Opening Statement, including the information disclosed to those present in accordance with ITB Sub-Clause 20.3.
- 20.5 Bids not opened and read out at bid opening shall not be considered further for evaluation, irrespective of the circumstances and shall be returned to the Bidder unopened.

21 Clarification of Bids

- 21.1 During bid evaluation, the Employer may, at its discretion, ask the Bidder for a clarification of its bid. The request for clarification and the response shall be in writing, and no change in the price or substance of the bid shall be sought, offered or permitted.

22 Preliminary Examination of Techno-Commercial Bid:

- 22.1 The Employer will examine the bids to determine whether they are complete, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.
- 22.2 The Employer may waive any minor informality, nonconformity or irregularity in a bid that does not constitute a material deviation, whether or not identified by the Bidder in Attachment 6 to its bid, and that does not prejudice or affect the relative ranking of any Bidder as a result of the technical and commercial evaluation, pursuant to ITB Clause 24.
- 22.3 Prior to the detailed evaluation, the Employer will determine whether each bid is of acceptable quality, is complete and is substantially responsive to the Bidding Documents. Any deviations, conditionality or reservation introduced in

Attachment-6 and/or in the Bid Form, Technical Data Sheets and covering letter, or in any other part of the bid will be reviewed to conduct a determination of the substantial responsiveness of the bidder's bid. For purposes of this determination, a substantially responsive bid is one that conforms to all the terms, conditions and specifications of the Bidding Documents without material deviations, objections, conditionalities or reservations. A material deviation, objection, conditionality or reservation is one (i) that affects in any substantial way the scope, quality or performance of the contract; (ii) that limits in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the successful Bidder's obligations under the contract; or (iii) whose rectification would unfairly affect the competitive position of other bidders who are presenting substantially responsive bids.

22.3.1 Bids containing deviations from critical provisions relating to GCC Clauses 2.14 (Governing Law), 8 (Terms of Payment), 9.3 (Performance Security), 10 (Taxes and duties), 21.2 (Completion Time Guarantee), 22 (Defect Liability), 23 (Functional Guarantee), 25 (Patent Indemnity), 26 (Limitation of Liability), 38 (Settlement of Disputes), 39 (Arbitration) and Appendix 2 to the Form of Contract Agreement (Price Adjustment) will be considered as non-responsive.

22.3.2 Regarding deviations, conditionality or reservations introduced in the bid, which will be reviewed to conduct a determination of substantial responsiveness of the Bidder's bid as stated in ITB Sub-Clause 22.3, the order of precedence of these documents to address contradictions, if any, in the contents of the bid, shall be as follows:

- I. Covering Letter
- II. Bid Form
- III. Attachment-6 : Deviations
- IV. Technical Data Sheet
- V. Any other part of the bid

Contents of the document at Sr. No. I above will have overriding precedence over other documents (Sr. No. II to V above). Similarly, contents of document at Sr. No. II above will have overriding precedence over other documents (Sr. No. III to V above), and so on.

22.4 If a bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by the Bidder by correction of the nonconformity. The Employer's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

23 Qualification

- 23.1 The Employer will ascertain to its satisfaction whether Bidders determined having submitted substantially responsive bids are qualified, as per the Qualification Requirement specified in Annexure – A (ITB) to satisfactorily perform the contract. The Employer shall be the sole judge in this regard and the Employer's interpretation of the Qualification Requirement shall be final and binding.
- 23.2 The determination will take into account the Bidder's financial, technical capabilities including production capabilities, in particular the Bidder's contract work in hand, future commitments & current litigation and past performance. It will be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder in Attachment 3 to the bid, as well as such other information as the Employer deems necessary and appropriate. This shall, however, be subject to assessment that may be carried out, if required, by the Employer as per the provisions of Annexure -A (ITB). The employer shall be the sole judge in this regard.
- 23.3 The Employer may waive any minor informality, nonconformity or irregularity in a bid that does not constitute a material deviation, affecting the capability of the Bidder to perform the Contract.
- 23.4 An affirmative determination will be a prerequisite for the Employer to evaluate the Techno - Commercial Part and open the online Price bid of the Bidder. A negative determination will result in rejection of the Bidder's bid.

24 Evaluation of Techno - Commercial Part (First Envelope)

- 24.1 The Employer will carry out a detailed evaluation of the bids of the qualified bidders in order to determine whether the technical aspects are in accordance with the requirements set forth in the Bidding Documents. In order to reach such a determination, the Employer will examine the information supplied by the bidders, pursuant to ITB Clause 9, and other requirements in the Bidding Documents, taking into account the following factors:
- (a) overall completeness and compliance with the Technical Specifications and Drawings; deviations from the Technical Specifications as identified in Attachment 6 to the bid and those deviations not so identified; suitability of the facilities offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the bid. The bid that does not meet minimum acceptable standards of completeness, consistency and detail will be rejected for non-responsiveness.

- (b) Deleted.
- (c) Compliance with the time schedule called for in the corresponding Appendix to the Form of Contract Agreement and evidenced as needed in a milestone schedule provided in the bid;

Time schedule (program of performance)

The plant and equipment covered by this bidding shall have the 'Taking Over' by the Employer after successful Completion within the period as:

Description	Duration in months from date of Notification of Award (NOA).
Taking over by employer upon successful completion of Supply, Erection, Testing And Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines of PSTCL System	36 Months

However, the transmission lines (132kV/220kV/400KV) which will be offered to firm must be completed in a time period of 6 months. Extension only be provided if there is ROW or departmental own issues.

Bidders are required to base their prices on the time schedule given in Appendix 4 to the Form of Contract Agreement (Time Schedule) or, where no time schedule is given in Appendix 4, on the Completion date(s) given above. No credit will be given to earlier completion. Bids offering completion beyond the specified period are liable to be rejected.

- (d) Type, quantity and long-term availability of mandatory and recommended spare parts and maintenance services
- (e) Any other relevant technical factors that the Employer deems necessary or prudent to take into consideration.
- (f) Any deviations to the commercial and contractual provisions stipulated in the Bidding Documents.
- (g) Details furnished by the bidder in response to the requirements specified in Volume-II & III of the Bidding Documents.

(h) The acceptability of the vendors and subcontractors proposed in Attachment 5 to be used by the Bidder will be evaluated. Should a vendor or subcontractor, for the items other than those covered under Annexure-A (ITB), be determined to be unacceptable, the bid will not be rejected, but the Bidder will be required to substitute an acceptable vendor or subcontractor without any change to the bid price.

24.2 Where alternative technical solutions have been permitted and offered in Attachment 7 to the bid, the Employer will make a similar evaluation of the alternatives, which will be treated in the technical and commercial evaluations as if they were base bids. Where alternatives are not permitted, but have in any event been offered, they shall be ignored.

25 Opening of Price Bid by Employer

25.1 The online Price Part of only those Bidders shall be opened who are determined as having submitted substantially responsive bids and are ascertained to be qualified to satisfactorily perform the Contract, pursuant to ITB Clause 23 and 24. Such Bidders shall be intimated about the date and time for opening of online Price Part of the Bids by the Employer. A negative determination of the bids pursuant to ITB Clause 23 and 24, shall be notified by the Employer to such Bidders.

25.2 The Employer will open online Price Part at the specified time and date in the presence of bidders' designated representatives who choose to attend, at the time, date, and location stipulated in the intimation for opening of online Price part. The bidders' representatives who are present shall sign a register evidencing their attendance.

25.3 The bidders' names, the Bid Prices, including any alternative Bid Price or any discounts, and any such other details as the Employer may consider appropriate, will be announced by the Employer at the opening. The prices and details as may be read out during the bid opening and recorded in the Bid Opening Statement would not be construed to determine the relative ranking amongst the Bidders, or the successful Bidder, and would not confer any right or claim whatsoever on any Bidder. The successful Bidder (also referred to as the L1 Bidder) shall be determined as per the provisions of this Section-II and considered for award of contract as provided in ITB Clause 31.

25.4 The Employer shall prepare minutes of the bid opening, including the information disclosed to those present in accordance with ITB Sub-Clause 25.3.

25.5 Bids not opened and read out at bid opening shall not be considered further for evaluation, irrespective of the circumstances.

26 Conversion to Single Currency

26.1 This shall not be applicable as domestic firms are required to quote the prices in Indian Rupees only.

27 Evaluation of (Price Part)

27.1 The Employer will examine the Price Parts to determine whether they are complete, whether any computational errors have been made, whether the documents have been properly signed, and whether the bids are generally in order.

The Price Part containing any deviations and omissions from the contractual and commercial conditions and the Technical Specifications which have not been identified in the Techno-Commercial Bid are liable to be rejected.

27.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity, or between subtotals and the total price, the unit or subtotal price shall prevail, and the total price shall be corrected. However, in case of items quoted without indicating any quantity or the items for which the quantities are to be estimated by the Bidder, the total price quoted against such items shall prevail. If there is a discrepancy between words and figures, the amount in words will prevail.

If there is a discrepancy between the quantity specified by the Employer and the quantity indicated by the bidder in any price schedules, the quantity specified by the Employer shall prevail and shall be corrected accordingly.

The prices of all such item(s) against which the Bidder has not quoted rates/amount (viz., items left blank or against which '-' is indicated) in the Price Schedules will be deemed to have been included in other item(s).

If the discount(s)/rebate(s) offered by the Bidder is a percentage discount and the price component(s) on which the said discount is not indicated in the bid, the same shall be considered on the total bid price [i.e. proportionately on each price component], in the event of award. However, if lump-sum discount is offered, the same shall be considered in full on the Ex-works price component (by proportionately reducing Ex-works price of individual items), in case of award. Further, Conditional discounts/rebates, if any, offered by the bidder shall not be taken into consideration for evaluation. It shall, however, be considered in case of award.

In respect of taxes, duties and other levies indicated by the Bidder in the Bid, which are reimbursable in line with the provisions of the Bidding Documents, the applicable rate and amount thereof shall be ascertained by the Employer based on which, if required, necessary rectification and arithmetical correction shall be carried out by the Employer. If the bidder has left the cells for confirmation of HSN/SAC code and/or corresponding rate of GST "blank", the HSN/SAC code and/or corresponding rate indicated by the Employer shall be deemed to be the one confirmed by the Bidder. The GST rate and amount so ascertained by the Employer for the said HSN/SAC code shall prevail.

The rate of GST for the purpose of evaluation shall be the rate of GST as confirmed/deemed confirmed by the bidder for each item in the bid/schedules.

If there is difference in HSN/SAC classification and corresponding rate of GST of an item as confirmed/deemed confirmed by the bidder in its bid and HSN/SAC and corresponding rate of GST as interpreted under any interpretation/ judgment/ Notification/ Circular issued under the GST law before or after the award of contract, GST reimbursable to the bidder/Contractor shall be lower of the GST applicable at the rate as confirmed/deemed confirmed in the bid or actual GST paid/payable by the bidder for that item.

The subtotal, total price or the total bid price to be identified in Bid Form for this purpose, irrespective of the discrepancy between the amount for the same indicated in words or figures shall be rectified in line with the procedure explained above. If the Bidder does not accept the correction of errors, its bid will be rejected and the amount of Bid Security forfeited.

The Bidder should ensure that the prices furnished in various price schedules are consistent with each other. In case of any inconsistency in the prices furnished in the specified price schedules to be identified in Bid Form for this purpose, the Employer shall be entitled to consider the highest price for the purpose of evaluation and for the purpose of award of the Contract use the lowest of the prices in these schedules.

27.3 The comparison shall be on the total price in Price Schedule No.6 Grand Summary (Total of Schedule Nos. 1 to 5).

The comparison shall also include the applicable taxes, duties and other levies, which are reimbursable in line with the provisions of the Bidding Documents.

The Employer's comparison will also include the costs resulting from application of the evaluation procedures described in ITB Sub-Clause 27.4 & 27.5.

27.4 The Employer's evaluation of a bid will take into account, in addition to the bid prices indicated in Price Schedule Nos. 1 through 5, the following costs and factors that will be added to each Bidder's bid price in the evaluation using pricing information available to the Employer, in the manner and to the extent indicated in ITB Sub-Clause 27.5 and in the Technical Specifications:

(a) the cost of all quantifiable deviations and omissions from the contractual and commercial conditions and the Technical Specifications as identified in the evaluation of Techno-Commercial Bid, and other deviations and omissions not so identified;

(b) the performance of the equipment offered;

Bidder shall confirm the guaranteed performance or efficiency of the Equipments, in response to the Technical Specifications. Equipment offered shall have a minimum performance specified in the Technical Specifications to be considered responsive. Bids offering plant and equipment with performance less than specified may be rejected.

(c) the extra cost of work, services, facilities, etc., required to be provided by the Employer or third parties;

The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the contract, shall not be taken into account in bid evaluation.

27.5 Pursuant to ITB Sub-Clause 27.4, the following evaluation methods will be followed:

(a) Contractual and commercial deviations

The evaluation shall be based on the evaluated cost of fulfilling the contract in compliance with all commercial, contractual and technical obligations under this Bidding Documents. In arriving at the evaluated cost, towards deviations whether material or minor identified in the evaluation of Techno-Commercial Bid, the cost of withdrawal indicated by the bidder in Attachment-6 of the Techno-Commercial Bid will be used. If such a price is not given, except for material deviation the Employer will make its own assessment of the cost of such a deviation for the purpose of ensuring fair comparison of bids.

In those cases, where the bidder has taken a material deviation but has not indicated the cost of withdrawal, the bid shall be treated as non-responsive and shall not be considered further.

(b) Work, services, facilities, etc., to be provided by the Employer

Where bids include the undertaking of work or the provision of services or facilities by the Employer in excess of the provisions allowed for in the Bidding Documents, the Employer shall assess the costs of such additional work, services and/or facilities during the duration of the contract. Such costs shall be added to the bid price for evaluation.

(c) Performance Guarantees of the Equipments

For the purpose of evaluation, no adjustment to the bid price towards performance guarantees of equipments is applicable.

27.6 Any adjustments in price that result from the above procedures shall be added, for purposes of comparative evaluation only, to arrive at an "Evaluated Bid Price." Bid prices quoted by bidders and rectified as per ITB Sub Clause 27.2 shall remain unaltered.

28. Reverse Auction:-

The following procedure and terms & conditions shall be applicable for Reverse Auction :-

- All the Bidders shall be assigned a unique user name and password by e-tendering agency of PSTCL. Bidders are advised to change the password after the receipt of initial password from PSTCL to ensure confidentiality. All bids made from Login IDs assigned to bidders shall be deemed to have been made by bidders/bidders' company/ bidders' authorized representatives.
- Bidders shall be required to submit their acceptance to the stipulated terms and conditions before participating in the R.A.
- Online Reverse Auction shall be conducted by PSTCL on pre-specified date and time for duration of 1 Hour. The bidders may quote the bids from their own offices /place of their choice. Internet connectivity is to be ensured by bidders themselves.
- All bidders are required to submit their price bid along with submission of Techno-commercial bid as per schedule. Only those bidders who submit their original bids within the scheduled time and who are considered technically and commercially eligible, shall be eligible to participate in RA process.

- The 'Opening Price' i.e. start price for RA shall be decided by PSTCL. Bid Decrement shall be **0.1%** of L-1 Bid Price obtained against a particular tender enquiry upon the opening of Price Bid of tender.
- The maximum limit for reducing prices during reverse auction process shall be 40% of received L-1 FOR destination rate in original price bid.
- Bidders shall be able to view the following on their screen along with the necessary fields during Online Reverse Auction:-
 - a) Start Price
 - b) Decrement Value
 - c) Current Bid value of the Bidder (Total Bid Price)
 - d) Best bid in the Auction (Current L1 price)
- Bidder may become 'L1 Bidder' by offering a price equal to or lower than the Next Valid Bid (i.e current L-1 price minus decrement) and this shall continue as an iterative process.
- **Auction Extension Time** :If a valid bid is placed within 5 minutes of End Time of the RA, then Reverse Auction duration shall get automatically extended for another 5 minutes from the existing end time. It may be noted that the auto extension will take place if a valid Bid comes in those last five minutes. If a bid does not get accepted as the lowest Bid, the auto-extension will not take place even if the bid might have come in last five minutes. The above process shall continue till no valid bid is received in last 5 minutes which shall mark the completion of reverse auction. The bidders are advised not to wait till the last moment to enter their bid so as to avoid complications related to internet connectivity, network problems, system crash down, Power failure etc. No request for extension in time period of RA due to any of the above reasons shall be entertained by PSTCL.
- If no bid is received within the specified time duration of the online RA, then PSTCL shall reserve the rights to scrap the online RA process and proceed with the L-1 Bid Price received through e-tendering for further processing.
- After completion of online Reverse Auction, the Closing Price (CP) shall be considered as L1 rate for further processing including negotiations (if required). Based on the final price quoted by bidders, the successful bidders shall be required to submit summary of Final Price in prescribed format (Summary of Final Price-Reverse auction, Uploaded

by PSTCL in Excel Sheet) within 2 hours of conclusion of the RA. In case of Turnkey projects, bidders shall be given 24 hours after completion of Reverse auction to submit the revised price breakup. The bidders shall uniformly reduce the pricing for all the items proportionately in total amount of each item while filling summary of final price. In case a bidder fails to submit the above Summary, then it may lead to cancellation of bid and call for action against the bidder which may include forfeiture of EMD/PEMD and suspension of business dealings etc.

- PSTCL shall reserve the rights to cancel/reschedule the RA process/ tender at any time, with due intimation to all concerned, without assigning any reason.
- Other terms and conditions shall be as per bidder's Techno-Commercial offers and as per PSTCL's bidding documents and other up to date correspondence (if any).

29 Purchase/Domestic Preference

29.1 No purchase preference is presently applicable for the Plant and Equipment to be supplied under the Contract

29.2 No margin of domestic preference will be allowed in evaluation and comparison of bids.

30 Contacting the Employer

30.1 After the public opening of bids, information relating to the examination, clarification, and evaluation of bids and recommendations concerning awards shall not be disclosed to Bidders or other persons not officially concerned with this process until the publication of contract award. From the time of bid opening to the time of contract award, if any Bidder wishes to contact the Employer on any matter related to its bid, it should do so in writing.

30.2 Any effort by a Bidder to influence the Employer in the Employer's bid evaluation, bid comparison or contract award decisions may result in rejection of the Bidder's bid. The Employer shall be the sole judge in this regard.

31 Award of Contract

Award Criteria

31.1 Subject to ITB Clause 32, the Employer will award the contract to the successful Bidder (also referred to as the L1 Bidder) whose bid has been determined to be substantially responsive and to be the lowest evaluated bid, further provided that the Bidder is determined to be qualified, as per the Qualification

Requirement specified in Annexure-A (ITB) to perform the contract satisfactorily.

- 31.2 The Employer may request the Bidder to withdraw any of the deviations listed in the winning bid.

At the time of Award of Contract, if so desired by the Employer, the bidder shall withdraw the deviations listed in Attachment 6 to the First Envelope at the cost of withdrawal stated by him in the bid. In case the bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid, his bid will be rejected and his bid security forfeited.

Bidder would be required to comply with all other requirements of the Bidding Documents except for those deviations which are accepted by the Employer.

- 31.3 The Employer reserves the right to vary the quantity of any of the spares and/or delete any items of spares altogether at the time of Award of Contract.

- 31.4 The mode of contracting with the successful bidder will be as per stipulation outlined in GCC Sub-Clause 2.1 and briefly indicated below:

- 31.4.1 The award shall be made as follows:

- (i) First Contract: For Ex-Works supply of all equipments and materials and Type Tests to be conducted and its copies to be submitted along with Bidding Documents.
- (ii) Second Contract: For providing all services i.e. port handling and custom clearance of imported goods and loading, inland transportation for delivery at site, insurance, unloading, storage, handling at site, installation, Testing and Commissioning including performance testing in respect of all the equipments supplied under the "First Contract", Training to be imparted (whether in India or abroad) and any other services specified in the Contract Documents.

Both contracts will contain a cross fall breach clause specifying that breach of one will constitute breach of the other.

- 31.4.2 Deleted

- 31.4.3 It is the Employers understanding that as per extant provisions, Indian Income Tax is not payable on sale of goods, if the Contract is on Principal-to-Principal basis and the title of goods passes to the Employer outside India as in the proposed First Contract (in case of Foreign Bidder). The Bidders are, however, advised to check the position from their own sources.

- 31.4.4 Compliance of applicable laws of the land in India inter-alia including Taxation laws, FEMA and RBI guidelines etc shall be a necessary condition for release of payments to the Foreign Bidder/Contractor.

32 Employer's Right to Accept any Bid and to Reject any or all Bids

- 32.1 The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to award of contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Employer's action.

33 Notification of Award

- 33.1 Prior to the expiration of the period of bid validity, the Employer will notify the successful Bidder in writing, that its bid has been accepted. The notification of award will constitute the formation of the contract.
- 33.2 The Employer shall publish the results on its website, identifying the bid and Specification numbers and the following information: (i) name of each Bidder who submitted a Bid; (ii) bid prices as read out at bid opening; (iii) name and evaluated prices of each Bid that was evaluated; (iv) name of bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded.
- 33.3 Upon the successful Bidder's furnishing of the performance security pursuant to ITB Clause 35, the Employer will promptly discharge the bid securities, pursuant to ITB Sub-Clause 13.4 & 13.5.

34 Signing the Contract Agreement

- 34.1 At the same time as the Employer notifies the successful Bidder that its bid has been accepted, the Employer in consultation with the Bidder will prepare the Contract Agreement provided in the Bidding Documents, incorporating all agreements between the parties.
- 34.2 The Contract Agreement shall be prepared within twenty-eight (28) days of the Notification of Award and the successful Bidder and the Employer shall sign and date the Contract Agreement immediately thereafter.

35 Performance Security/Guarantee of supply/commissioning portion only

- 35.1 Successful Bidder shall furnish the performance security for 5% (Five percent) of the total supply portion only of project within twenty-eight (28) days after receipt of the Notification of Award. In case the successful bidder is submitted by a Joint

Venture, within 28 days, Lead partner shall submit 5% of total supply portion of the project as security while other partner(s) shall deposit 5% of its own scope of supply separately either in cash/DD or in shape of BG meeting with the Qualification Criteria which is in line with **Annexure A (ITB)** and in the form provided in Section IV: Sample Forms and Procedures of the Bidding Documents and as per Clause no. 4 of Joint Deed of Undertaking mentioned at Sl. No. 19 of Section – V : Sample Forms and Procedures.

35.2 Failure of the successful Bidder to comply with the requirements of ITB Clause 34 or Clause 35 shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security, in which event the Employer may make the award to the next lowest evaluated Bidder or call for new bids.

36 Fraud and Corruption

It is the Employer's policy that requires the Bidders, suppliers and contractors and their subcontractors under the contracts to observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the Employer:

(a) defines, for the purpose of this provision, the terms set forth below as follows:

- (i) "corrupt practice" is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
- (ii) "fraudulent practice" is any act or omission, including a misrepresentation, that knowingly or recklessly misleads or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
- (iii) "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
- (iv) "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
- (v) "obstructive practice" is
 - (aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Employer's investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its

knowledge of matters relevant to the investigation or from pursuing the investigation;

or

(bb) acts intended to materially impede the exercise of the Employer's inspection and audit rights.

- (b) will reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for the contract in question;
- (c) will sanction a firm or individual, including declaring ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for, or in executing, a contract; and
- (d) will have the right to require that the provision be included in Bidding Documents and in contracts, requiring Bidders, suppliers, and contractors and their sub-contractors to permit the Employer to inspect their accounts and records and other documents relating to bid submission and contract performance and to have them audited by auditors appointed by the Employer.

37 Negligence and Default:

In case of negligence on the part of supplier/contractor to execute the order/contract with due diligence and expedition and to comply with any reasonable orders given in writing by the Purchaser in connection with the Purchase Order/Contract or any contravention in the provisions of the Purchase order/contract, the Purchaser may give 21 days notice in writing to the supplier/contractor to make good the failure or neglect or contravention and if the supplier/contractor fails to comply with the notice within time considered to be reasonable by the purchaser, he will suspend/terminate business dealings with the supplier/contractor for a specific period apart from claiming reasonable compensation/damage, forfeiture of security etc. The action taken under this clause will be notified to all the purchasing agencies & other State Transmission Corporations/Utilities.

38 Force Majeure:

During the pendency of the contract/purchase order, if the performance in whole/part by either party or any obligation there under, is prevented/delayed by causes arising out of any war, hostility, civil commotion, acts of the public enemy, sabotage, fire, floods, explosions, epidemics or non-availability of Government controlled raw-material under order/Instructions of Central/State Government regulations, strikes, lockouts, embargo,

acts of Civil /Military authorities or any other cases beyond their reasonable control , neither of the two parties shall be made liable for loss or damages due to delay or failure to perform the contract during the currency of Force Majeure conditions, provided that the happening is notified in writing (with documentary proof) within 30 days from the date of the occurrence.

The supplies shall be resumed under the contract as soon as practicable after the happening (event) ceases to exist.

39 Intimation to Accounts Officer (CPC) and Consignee:

The supplier will have to intimate the probable date of dispatch followed by telegraphic/email advance intimation regarding the actual date of R.R. to Accounts Officer/Centralized payment Cell, Punjab State Transmission Corporation Ltd., Patiala, to enable him to arrange payment failing which demurrage/wharfage etc. will be to supplier's account. A copy of such intimation should be sent to the consignees and **Dy. CE/Commn., PSTCL, QtrNo. 20-21, Power Colony 2, Sarabha Nagar, Ludhiana** also for reference immediately.

Mandatory Spares will be dispatched to the consignee i.e AEE, P&M Store, 220kV Sub-Station, Umedpur, Dhelon Road, Sahnewal, Distt Ludhiana - 141 020. However material may be dispatched Site Store, PSTCL, Old SabjiMandi, 66 KV Sub-Station, G.T. Road, Ludhiana.

40 Goods & Service Tax (GST):

PSTCL is registered centrally in the state under **GSTIN 03AAFCP4714J1ZK**.

In case supply is made beyond contractual delivery period, no increase in the GST, if so prevailing at the time of supply, would be allowed unless suitable extension in delivery period is granted and the payment of GST, is specially agreed to by the purchaser:-

Any statutory variation in taxes and duties will be to PSTCL's account against documentary proof within contractual delivery period.

- i) GST as applicable, will be paid as per prevailing provisions of GST Act, & Laws against submission of documentary proof at rate (s) prevailing during the contracted delivery period on the basis of actual. The following certificates shall have to be furnished along with invoice-cum-gate pass duly signed by the authorized agent/signatory. The first invoice should accompany the specimen signatures of the authorized duly attested by the Managing Director of the factory with a copy of orders regarding his appointment as authorized signatory.

Certified that the transaction on which the GST is claimed has been/shall be included in the return submitted/to be submitted to the GST Authorities and the amount

claimed from the Punjab State Transmission Corporation Limited, has been/shall be paid to the GST Authorities.

Certified that the goods on which GST has been charged have not been exempted under GST Act or rule made there-under and the GST charged on these goods is not more than what is payable under the provisions of the relevant act.

Certified that we shall indemnify the Punjab State Transmission Corporation Limited, in case, it is found, at a later stage, that wrong or incorrect payment had been received on account of GST, the same will be refunded.

Certified that we are registered dealer under the GST Act & our RegistrationNo.is _____.

- ii) In case the GST is applicable and is required to be paid extra as referred to Para (i) above, the tendered should clearly indicate HSN code of item along with present rate (in percentage) applicable to their company.
- iii) The maximum rate (in percentage) up-to which the GST may become leviable/payable under the prevailing Rules & Regulations applicable to their company, should also be clearly indicated in their tender.
- iv) In case the GST is applicable/payable, necessary certificate of GST claimed/GST Gate pass duly authenticated by the authorized representative of GST Authorities, shall however, be furnished by the supplier along with each consignment. The supplier should, thereof, clearly indicate in their tender that whether such GST Gate Passes/Certificate shall be furnished by them or not.

NOTE: The firm indicating NIL or concessional rate of GST in their tenders (if any) will have to absorb the GST up to full rate applicable at the time of tendering.

- v) FURTHER any loss due to non-availability of ITC or levy of penalty/interest payable by PSTCL on account of non-filing of return or non-compliance or any miss-statement given under the provisions of GST Act by the firms shall be recoverable from them.
- vi) FURTHER firms will also give following undertaking, if applicable

“We will pass on benefits accrued (if any) due to reduction in rate of tax on any supply of goods or services or from input tax credit to the PSTCL. However, if at a later stage, it is found that such accrued benefit has not been passed on to PSTCL: We (Our Firm) shall be liable to compensate PSTCL with the requisite amount along with interest @ 12% per annum up to date, in addition to the provisions laid down in

the Goods and Services Tax (GST). Further, PSTCL shall be free to take action as per Negligence and Default clause of PO i.e. Suspension of Business Dealing etc.”

- vii) All clauses regarding ED, CST, VAT etc. mentioned in the specification/PO may be considered as not applicable as GST has subsumed these taxes w.e.f. 01.07.2017.**

41 Insurance

- i) The rates are required to be quoted on FOR destination basis and it is the responsibility of the supplier to deliver the goods in sound condition FOR destination and for that purpose the supplier may at his option insure the material against all risks at his own cost during transit for full delivered value of the material upto destination. All works in connection with making and settling of claims, if any, with Railway Authorities and or Insurance Company shall be carried out by the Contractor for which no extra payment shall be made by the PSTCL. However, necessary assistance required in connection with making and settling of such claims, if any, shall be provided by the consignees.
- ii) All damages and/or shortages during transit as covered by the insurance shall be made good immediately on receipt of such information from the consignees without waiting for settlement of claim. However, in case of apparent damages and/or shortages, the consignee shall obtain the loss/damage certificate from the Road Transport/Railway authority and send the same to the Contractors within a period of thirty days from the date of receipt of material. The Supplier/Contractors shall submit a certificate with each bill to the effect that the material has been duly insured.
- iii) The consignees shall report losses and damages to the firm within 30 days of arrival of the equipment at the site. It will, however, be supplier's responsibility to prefer timely claims on the insurance underwriters and to arrange replacement thereof to the consignees.
- iv) The suppliers shall be wholly responsible for the loss, shortages, and damages etc. during transit. Such shortages and damages etc. will have to be replaced/repared by supplier/ contractor free of cost immediately without waiting for maturing of the Supplier's/Contractor's claims with the Road Transport/Railway Authorities.
- v) In case replacement/repair of defective material is not carried out within six months of intimation of damages, supplier shall have to pay interest at the rate of 12% per annum on the advance payments made by the Punjab State Transmission Corporation Ltd. from the date of its payment upto the date of the re-commissioning of the equipment after replacement/repair or to the date the default is made good.

- vi) In case replacement/repair of short/defective material is not made good within one month from the date of receipt of intimation from the consignee in this regard, the purchaser shall have to the option to get short/damaged material fabricated from some other source and in that case, the recovery at double the cost provided in the P.O./ Specification shall be made from supplier.

42 Inspection and Test

The PSTCL shall inspect, examine and test equipment/material through its officials and/or through an outside agency nominated by PSTCL at the manufacturer's/supplier's work, during or after the manufacture of goods prior to despatch, on receipt of a clear notice of minimum two weeks in advance, to be reckoned from the date of receipt by purchaser. The supplier/contractor shall provide all facilities as may be required to carry out the tests in accordance with approved standards, free of cost. If the purchaser or the nominee representative desires to have one or all the tests to be got done through independent lab or test house, the charges of such lab/test house shall be borne by the supplier.

In case the inspection is waived off by the PSTCL, the supplier shall be required to submit test certificates in triplicate for approval. No material shall be dispatched without inspection and/or approval of test certificates unless so directed. Any material consumed during testing/ inspection shall be to supplier's account.

Random testing of material on receipt in the stores irrespective of the fact whether or not it was inspected before dispatch shall be carried out by PSTCL and in case of any failure the entire lot shall be rejected at the risk and loss of supplier. The supplier/contractor shall be required to furnish to the purchaser office/consignees wherever necessary the following documents alongwith the consignment:-

- | | |
|-------------------------------------------|----------|
| i) Printed pamphlets catalog | 2 copies |
| ii) Instruction book | 2 copies |
| iii) Drawings | 2 copies |
| iv) Any other relevant information (to be | 2 copies |

incorporated at the time of placing the P.O.)

In case the goods have not been inspected/tested at the manufactures works by a representative of the PSTCL, the supplier/contractor shall furnish the following certificates alongwith consignment for facility of the consignee.

- a) Type test certificate
- b) Routine test certificate (if applicable)

43 Civil Suit/Jurisdiction:

All legal proceedings in connection with this purchase order/contract shall be subject to the territorial Jurisdiction of the local civil courts at Ludhiana only.

44 Arbitration:

- a) If at any time, any question, dispute or difference, whatsoever, shall arise between the purchaser/PSTCL and the contractor/supplier, upon or in relation to or in connection with the P.O. /contract, either party may forthwith give to other, notice in writing of the existence of such question dispute or difference and the same shall be referred for sole arbitration of a nominee of the purchaser/PSTCL who shall give a reasoned/speaking award. The award of the sole arbitrator shall be final and binding on the parties under the provision of the Indian Arbitration and Conciliation Act, 1996 and of the rules there-under. Any statutory amendment, modification or re-enactment thereof for the time-being in force, shall be deemed to apply to and be incorporated in contract/P.O. It will not be objectionable if the sole arbitrator is an officer of the PSTCL and he has expressed his views on all or any of the matters in question of dispute or difference.
- b) Upon every or any such reference, the cost of and incidental to the reference and award respectively, shall be the discretion of the Sole Arbitrator so appointed who may determine the amount thereof or direct the same to be taxed as between solicitor and client or as between party and party and shall direct by whom and to whom and in what manner the same is to be borne and paid.
- c) The work under the contract shall, if reasonably possible, continue during the arbitration proceeding and no payments due or payable by the purchaser/ PSTCL shall be withheld on account of such proceedings.

45 Constitution Experience and Financial Standing

The bidders should invariably supply the following information with the tenders on relevant Annexure:

- a) Constitution and composition of the firms
 - i) If a Joint Stock company, copy of its Memorandum and articles of Association and other particular.
 - ii) If a partnership, a copy of the partnership deed, particulars of partners.
 - iii) If a proprietary concern, the standing of the proprietor and if registered with the Register of Companies/Firms, their registration No.
- b) Experience & standing in the market.

- c) Particulars of purchase order/contracts executed with the PSTCL & other Board's/government departments.
- d) Financial position;
 - i) Balance sheet for the last three years, including Trading, Manufacturing, profit and Loss Account.
 - ii) Bank references.

46 Information Regarding List of Bankers the Purchaser Deals with

1. The Railway Receipt/Goods Receipt and invoices etc. should be sent to the authorities to be specified in the Purchase Order.
2. Any demurrage occurring as a result of sending Railway goods Receipt through a Bank other than the one with which the accounts of the Purchaser are operated will be to the account of the Supplier/Contractor.
3. No goods will be accepted by the consignees unless accompanied by challan or invoices.
4. The Punjab State Transmission Corporation Ltd. deals with the State Bank of Patiala, The Mall, Patiala.

The G.R./R.R. and invoice should, therefore, be sent to Accounts Officer, Centralized Payment Cell, PSTCL, Patiala through any of these banks at Patiala. Any demurrage occurring as a result of sending RR/GR through a bank other than one with which the accounts of the PSTCL are operated will be to the account of the supplier.

47 Cancellation

The purchaser reserves the right to cancel the purchase order as a whole or in part at any time or in the event of default on the part of the supplier prior to the receipt of information regarding taking in hand of the manufacture of material against the Purchase order/despatch of material to the consignee.

48 Fake Inspection Call

If the firm does not get the material inspected when the inspecting officer visits their works after receipt of inspection call on one pretext or the other or the material fails during inspection, it will have to bear TA/DA for the journey performed by such an inspecting officer which shall be Rs.15,000/- (outside Punjab) & Rs.5000/- (within Punjab) per visit of each officer. Besides the recovery against each fake call, a letter of warning shall be issued and it shall be counted towards firm's performance for all intents and purposes.

QUALIFICATION OF THE BIDDER :-

The qualification of the bidders for the proposed Turnkey Package are proposed as under:

Qualification of bidder will be based on meeting the minimum pass/fail criteria specified below regarding the Bidder's Technical Experience and Financial Position as demonstrated by the Bidder's responses in the corresponding Bid Schedules. Subcontractors' technical experience and financial resources shall not be taken into account in determining the Bidder's compliance with the qualifying criteria. The bid can be submitted by an individual firm who can be a Manufacturer of Equipment or EPC Contractor or any contracting company with required technical experience and financials as detailed in Point no. 2. below.

PSTCL may assess the capacity and capability of the bidder, to ascertain that the bidder can successfully execute the scope of work covered under the package within stipulated completion period.

This assessment shall inter-alia include

- (i) Document verification;
- (ii) Bidders work/manufacturing facilities visit,
- (iii) Details of works executed , works in hand ,and that anticipated in future
- (iv) Details of financial resources;
- (v) Details of quality systems in place ;
- (vi) *Past experience and performance ;*
- (vii) *Customer feedback ;*
- (viii) *Banker's feedback etc.*

PSTCL reserves the right to waive minor deviations if they do not materially affect the capability of the Bidder to perform the contract.

Qualifying Criteria:-**1.0 QUALIFICATION OF THE BIDDERS**

Qualification of bidder will be based on meeting the minimum pass/fail criteria specified below regarding the Bidder's technical experience and financial position as demonstrated by the Bidder's responses in the corresponding Bid Schedules. Technical experience and financial resources of any proposed subcontractor shall not be taken into

account in determining the Bidder's compliance with the qualifying criteria except for the requirement stipulated herein below at 1.1.1 (B) and 1.1.2 (B). The bid can be submitted by an individual firm or a Joint Venture of two or more firms (Specific requirements for Joint Ventures are given under Para 1.3 below).

The Owner may assess the capacity and capability of the bidder, to successfully execute the scope of work covered under the package within stipulated completion period. This assessment shall inter-alia include (i) document verification; (ii) bidder's work/manufacturing facilities visit; (iii) manufacturing capacity, details of works executed, works in hand, anticipated in future & the balance capacity available for the present scope of work; (iv) details of plant and machinery, manufacturing and testing facilities, manpower and financial resources; (v) details of quality systems in place; (vi) past experience and performance; (vii) customer feedback; (viii) banker's feedback etc.

PSTCL reserves the right to waive minor deviations if they do not materially affect the capability of the Bidder to perform the contract.

1.1 TECHNICAL EXPERIENCE

1.1.1 Route 1: Installation Agency

- (A) The Bidder should have supplied, installed, tested and commissioned at least 200 Kms of OPGW and live line installation of 100 Km of OPGW, on 66 kV or above transmission line(s) as a prime contractor* in the last seven (07) years, which must have been in satisfactory operation# for at least one (1) year as on the date of bid opening

Note* : In case of works executed under a contract that had been awarded on a Joint Venture, the experience of individual Joint Venture partner shall be considered limited to the scope of that partner under the said contract.

Note#Satisfactory operation means certificate issued by the employer certifying the operation without any adverse remarks.

AND

- (B) The Bidder shall offer OPGW from a manufacturer meeting the criteria stipulated at 1.1.2 (A) below:
(C)

1.1.2 Route 2: Manufacturer of OPGW

A (I) The Bidder should be a manufacturer who has been manufacturing OPGW for the last three (3) years and at least 100 Kms of OPGW manufactured by the bidder should have been in satisfactory operation on 66kV or above transmission line(s) for at least two (02) years as on date of bid opening.

OR

(II) The Bidder should be a manufacturer who must have established manufacturing and routine test facility for OPGW in India and at least 100Km of OPGW manufactured by the bidder should have been installed on 66 kV or above Transmission line(s) as on the date of bid opening. Further, the bidder shall submit, along with its bid, a legally enforceable undertaking for extended warranty of two (2) years over and above the warranty period specified for OPGW cable.

OR

(III) The bidder should be a manufacturer who must have established manufacturing and routine test facility for OPGW in India based on technological support of a parent company (principal) or collaborator and has commenced manufacturing. The parent company (principal) or collaborator should meet the criteria of clause 1.1.2 (A) (I) above and bidder furnishes along with its bid a legally enforceable joint deed of undertaking along with the collaborator / principal for extended warranty obligations of additional two (2) years over and above the warranty period specified for the OPGW and a confirmation letter from the parent company or the collaborator to furnish performance guarantee for an amount of 10% of the cost of OPGW cable.

AND

(B) The bidder as a prime contractor* or as a sub-contractor should have installed at least 50 Kms of OPGW in live-line condition on 66 kV or above transmission line(s) as on date of bid opening.

OR

The bidder proposes to engage a sub-contractor who should have installed at least 50 Kms of OPGW in live-line condition on 66 kV or above transmission line(s), as on date of bid opening. The bidder shall submit, along with its bid, a legally enforceable joint deed of undertaking along with the sub-contractor confirming that the installation of OPGW for the Package shall be done by the proposed sub-contractor.

Note* : In case of works executed under a contract that had been awarded on a Joint Venture, the experience of individual Joint Venture partner shall be considered limited to the scope of that partner under the said contract.

In case bidder is a holding company, the technical experience referred to in clause 1.1.1

& 1.1.2 above shall be of that holding company only (i.e. excluding its subsidiary / group companies). In case bidder is a subsidiary of a holding company, the technical experience referred to in clause 1.1.1& 1.1.2 above shall be of that subsidiary company only (i.e. excluding its holding company).

1.2 FINANCIAL POSITION

For the purpose of this particular bid, bidders shall meet the following minimum criteria :

1.2.1 For Route 1

- (a) Net Worth* for last 3 financial years should be positive.
- (b) Minimum Average* Annual Turnover# (MAAT) for best three financial years out of last five financial years of the bidder should not be less than Rs. 33.05 crore.
- (c) Bidder shall have liquid assets (L.A.) or/and evidence or access to or availability of credit facilities of not less than the amount Rs. 5.5 crore.

Note:-

- (i) * In case bidder has established manufacturing facility in India and is yet to complete three financial years, the Net Worth and average of the turnover as per financial statement for completed financial years shall be considered for the purpose of compliance to the specified Net Worth and MAAT requirements.
- (ii)# Annual turnover as incorporated in the profit & loss account excluding non-recurring income e.g. sale of fixed assets etc.

Note: For converting Net worth, MAAT, LA, etc. in case of foreign bidders, rate of currency w.r.t. Indian currency as on the date of opening of tender enquiry.

1.2.2 For Route 2

- (a) The bidder, who is the manufacturer of OPGW and meets the technical experience criteria of clause 1.1.2 A(I) or A(II) above shall be required to meet the financial position criteria given at clause 1.2.1 above.

OR

- (b) The bidder, who is an indigenous manufacturer of OPGW and meets the technical experience criteria of clause 1.1.2 A(III) above shall be required to meet the following minimum criteria:

The bidder shall be required to have a minimum subscribed and paid up share capital of Rs 30 Crs (Rs. 300 Million) as on date of bid opening.

In case bidder is a holding company, Financial Position Criteria referred to in clause 1.2.1 and 1.2.2 above shall be that of holding company only (i.e. excluding its subsidiary / group companies). In case bidder is a subsidiary of a holding company, Financial Position Criteria referred to in clause 1.2.1 and 1.2.2 above shall be that of subsidiary company only (i.e. excluding its holding company).

1.3 JOINT VENTURES BIDS

In case a bid is submitted by a Joint Venture (JV) of two or more firms as partners, joint venture must comply with the following minimum criteria stipulated either in clause 1.3 (A) or 1.3 (B) :

1.3 (A) JV-1 (Lead Partner through Route 1):

- (a) All the partners of JV should meet individually the Financial Position criteria given at clause 1.2.1 (a) above.
- (b) The lead Partner should meet the Technical Experience criteria given at clause 1.1.1(A) above and not less than 40 % of the Financial Position criteria given in clause 1.2 (b) & (c) above.
- (c) Each of the other partner(s) should meet Technical Experience (at least 25% individually and 100% collectively) criteria given at clause 1.1.2 A(I) or A(II) above and not less than 25% of Financial Position criteria given at clause 1.2.1(b) & (c) above.

1.3 (B) JV-2 (Lead Partner through Route 2) :

- (a) All the partners of JV should meet individually the Financial Position criteria given at clause 1.2 (a) above.
- (b) The lead Partner should meet the Technical Experience criteria given at 1.1.2 A(I) or A(II) above and not less than 40 % of the Financial Position criteria given in clause 1.2.1 (b) & (c) above.
- (c) Each of the other partner(s) should meet Technical Experience (at least 25% individually and 100% collectively) criteria given at clause 1.1.1 (A) above and not

less than 25 % of Financial Position criteria given at clause 1.2.1 (b) & (c) above.

- (d) The JV1 should collectively meet the criteria of Clause 1.1.1 (A) & 1.1.2 A(I) or A(II) and JV2 should collectively meet clause 1.1.2 A(I) or A(II) and 1.1.1 (A) for which purpose the relevant figures of Technical Experience and Financial Position criteria (referred to in clause 1.2 (b) & (c) above) for each of the Partner(s) shall be added together to arrive at the Joint Venture's total capacity.

1.4 The bidder shall submit documentary evidence in support of the qualifying requirement stipulated as above.

1.5 (i) The SDH equipment shall be offered from a manufacturer(s)

- (a) who has been manufacturing SDH equipment for the last three (3) years and at least five (05) nos of SDH Equipments manufactured by such manufacturer (s) shall been in satisfactory operation in one or more projects in 110 KV or higher voltage power substation for at least two (02) years as on the date of opening of tender enquiry.

OR

- (b) who has established production line in India for manufacturing of SDH equipment based on technological support of a parent company (principal) or collaborator or subsidiary and has been manufacturing SDH equipment for last three (03) years and at least five (05) SDH equipments manufactured by such manufacturer are in operation for at least two (02) years as on the date of opening of tender enquiry provided that
- 1) the parent company (principal) or collaborator or subsidiary meets the Power Utility experience requirement mentioned in clause (a) above.
 - 2) the bidder furnishes following documents from the proposed SDH equipment manufacturer along with the bid:
 - (I) a legally enforceable joint deed of undertaking along with the collaborator/principal/subsidiary to guarantee quality, timely supply, performance and extended warranty obligations of additional two (2) years over and above the warranty period as specified for the SDH equipment under the package as per the format specified in the bidding documents; and
 - (II) a valid collaboration agreement for technology transfer/license to manufacture, test and supply SDH equipment in India.
- (ii) The Primary/Drop-Insert Multiplexers shall be offered from a manufacturer who has been manufacturing Primary/Drop-Insert Multiplexer for the last three (3) years and at least five (5) Primary/Drop-Insert Multiplexers manufactured by such manufacturer shall have been in satisfactory operation in one or more projects for at least two (2) years as on the date of opening of tender enquiry. In addition, at least

two (2) Primary/Drop-Insert Multiplexers manufactured by such manufacturer shall be in operation in 110 kV or higher voltage Power substations as on the date of opening of tender enquiry.

- (iii) The installation of communication equipment shall be done by a firm who has previous experience of installation, testing and commissioning of at least 20 nodes of Fibre Optic Transmission System based on SDH technology and at least 5 no. of these nodes must be in satisfactory operation for at least two (2) years as on the date of opening of tender enquiry.

Satisfactory Operation means certificate issued by employer certifying the operation without any adverse remarks.

SECTION – III

GENERAL CONDITIONS OF CONTRACT (GCC)

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Preamble

This Section (Section –III) of the Bidding Documents [named as General Conditions of Contract (GCC)] provides all the rights and obligations of the parties under the Contract. This Section contains provisions that are to be used unchanged.

A. Definitions and Interpretation

1. Definitions

- 1.1 The following words and expressions shall have the meanings hereby assigned to them:
- (a) “Arbitrator” means the person or persons appointed by agreement between the Employer and the Contractor to make a decision on or to settle any dispute or difference between the Employer and the Contractor referred to him or her by the parties pursuant to GCC Sub-Clause 39.1 (Arbitration) hereof.
 - (b) “Associate” means a party who has been conjoined by the Contractor to independently execute a pre-selected part of facilities of the contract and grant him the associated contractual rights and obligations, without diluting the overall responsibility of the contractor in respect of the Facilities under the contract.
 - (c) “Collaborator” or “Parent Company” means the firms/corporations who has provided technological support to the manufacturer for establishing production line for the specific Equipment.
 - (d) “Commissioning” means operation of the Facilities or any part thereof, if any, as per GCC Sub-Clause 1.1(e) by the Contractor as specified in the Technical Specifications, which operation is to be carried out by the Contractor as provided in GCC Sub-Clause 20.1.3 (Commissioning), for the purpose of Trial – Operation (GCC Sub-Clause 20.1.4).
 - (e) “Completion” means that the Facilities have been completed operationally and structurally and put in a tight and clean condition and that all works in respect of pre-commissioning of the Facilities has been completed (wherever required, as per Technical Specifications) and Commissioning followed by Trial – Operation has been completed, as provided in GCC Sub-Clause 20.1 (Completion of Facilities) hereof.
 - (f) “Contract” means the Contract Agreement entered into between the Employer and the Contractor together with the Contract Documents referred to therein.
 - (g) “Contract Documents” means the documents listed in Clause 1.1 of Article 1 (Contract Documents) of the Form of Contract Agreement (including any amendments thereto).

- (h) “Contract Price” means the sum specified in Clause 2.1 of Article 2 (Contract Price) of the Contract Agreement, subject to such additions or deductions there from, as may be made pursuant to the Contract. For the purpose of Liquidated Damages and Contract Performance Guarantee, the “Contract Price” means the sum specified in Clause 2.1 of Article 2 (Contract Price) of the Contract Agreement.
- (i) “Contractor” means the firms whose bid to perform the Contract has been accepted by the Employer and is named in the Contract Agreement, and includes the legal successors or permitted assigns of the Contractor.
- (j) “Contractor’s Equipment” means all plant, facilities, equipment, machinery, tools, apparatus, appliances or things of every kind required in or for installation, completion and maintenance of Facilities that are to be provided by the Contractor, but does not include Plant and Equipment, or other things intended to form or forming part of the Facilities.
- (k) “Contractor’s Representative” means any person nominated by the Contractor and approved by the Employer in the manner provided in GCC Sub-Clause 13.2 (Contractor’s Representative and Construction Manager) hereof to perform the duties delegated by the Contractor.
- (l) “Day” means calendar day of the Gregorian Calendar.
- (m) “Defect Liability Period” means the period of validity of the warranties given by the Contractor commencing at Completion of the Facilities or a part thereof, if any, as per GCC Sub-Clause 1.1(e), during which the Contractor is responsible for defects with respect to the Facilities (or the relevant part thereof) as provided in GCC Clause 22 (Defect Liability) hereof.
- (n) “Effective Date” means the date of Notification of Award from which the Time for Completion shall be determined.
- (o) “Employer” means Punjab State Transmission Corporation Limited, Shakti Sadan Patiala.
- Kind attention: Dy.Chief Engineer/Communication, PSTCL
- (p) “Facilities” means the Plant and Equipment to be supplied and installed, as well as all the Installation Services to be carried out by the Contractor under the Contract.
- (q) “GCC” means the General Conditions of Contract hereof.
- (r) “Guarantee Test(s)” means the test(s) specified in the Technical Specifications to be carried out to ascertain whether the Facilities or a specified part thereof is able to attain the Functional Guarantees specified in the Technical Specifications in

accordance with the provisions of GCC Sub-Clause 20.2.1 (Guarantee Test) hereof during/after successful Commissioning followed by Trial - Operation.

- (s) "Installation Services" means all those services ancillary to the supply of the Plant and Equipment for the Facilities, to be provided by the Contractor under the Contract; e.g., transportation and provision of marine or other similar insurance, inspection, expediting, site preparation works (including the provision and use of Contractor's Equipment and the supply of all construction materials required), installation, testing, pre-commissioning, commissioning, operations, maintenance, the provision of operations and maintenance manuals, training, etc.
- (t) "Month" means calendar month of the Gregorian Calendar.
- (u) "Notification of Award" means the official notice issued by the Employer notifying the Contractor that his bid has been accepted.
- (v) "Operational Acceptance" means the acceptance by the Employer of the Facilities (or any part of the Facilities where the Contract provides for acceptance of the Facilities in parts), which certifies the Contractor's fulfillment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of GCC Sub-Clause 20.2.2 (Operational Acceptance) hereof after successful Commissioning followed by Trial - Operation.
- (w) "Owner" is Punjab State Transmission Corporation Limited, Shakti Sadan Patiala.

Kind attention: Dy.Chief Engineer/Communication, PSTCL

Mob: 96461-18008
- (x) "Plant and Equipment" means permanent plant, equipment, machinery, apparatus, articles and things of all kinds to be provided and incorporated in the Facilities by the Contractor under the Contract (including the spare parts to be supplied by the Contractor under GCC Sub-Clause 3.3 hereof), but does not include Contractor's Equipment.
- (y) "Pre-commissioning" means the testing, checking and other requirements specified in the Technical Specifications that are to be carried out by the Contractor in preparation for Commissioning as provided in GCC Sub-Clause 20.1.2 (Pre-Commissioning) hereof.
- (z) "Project Manager" means the person appointed by the Employer in the manner provided in GCC Sub-Clause 13.1 hereof to perform the duties delegated by the Employer.

- (aa) "Site" means the land and other places upon which the Facilities are to be installed, and such other land or places as may be specified in the Contract as forming part of the Site.
- (bb) "Subcontractor"/"vendor"/"subvendor" means firms/corporations/government entities to whom execution of any part of the Facilities, including preparation of any design or supply of any Plant and Equipment, is sub-contracted directly or indirectly by the Contractor with the consent of the Employer in writing, and includes its legal successors or permitted assigns.
- (cc) "Taking Over" means the Employer's written acceptance of the Facilities under the Contract, after successful Trial – Operation for the specified period in accordance with the Contract, as provided in GCC Sub-Clause 20.1.5.
- (dd) "Time for Completion" shall be as under:

Description	Duration in months from date of Notification of Award (NOA)
Taking over by employer upon successful completion of Supply, Erection, Testing And Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines of Pstcl System	36 months

However, the transmission lines (132kV/220kV/400KV) which will be offered to firm must be completed in a time period of 6 months. Extension only be provided if there is ROW or departmental own issues.

2.1 Contract

GCC 2.1.1

For Indian Bidder:

- (i) First Contract (**Supply of Goods**): For Ex-works supply of all equipment and materials including mandatory spares and Type Tests to be conducted (whether in India or abroad)
- (ii) Second Contract (**Supply of Services**): For providing all services i.e. inland transportation for delivery at site, **In-transit** insurance, unloading, handling at site, installation, Testing and Commissioning including performance testing in respect of all the equipments supplied under the "First Contract", Training to be imparted (whether

in India or abroad) and any other services specified in the Contract Documents. Annual Maintenance during Defect Liability period shall be part of Second Contract.

GCC 2.1.2 The award of two separate Contracts shall not in any way dilute the responsibility of the Contractor for the successful completion of the facilities as per Specification and a breach in one Contract shall automatically be construed as a breach of the other Contract(s) which will confer a right on the Employer to terminate the other Contract(s) also at the risk and the cost of the Contractor.

GCC 2.1.3 Deleted

GCC 2.1.4 It is further expressly understood and agreed that in case the option is not exercised by the Bidder or the Associate fails to enter into the Second Contract with the Employer or if the Employer in its judgment does not find acceptance of the proposed Associate as its contractor, then the bidder shall be obliged to enter into and execute both the contracts with the Employer and both the Contracts shall contain the aforesaid cross fall breach clause.

GCC 2.1.5 The Contract will be signed in two originals and the Contractor shall be provided with one signed original and the rest will be retained by the Employer.

GCC 2.1.6 The Contractor shall provide free of cost to the Employer all the engineering data, drawing and descriptive materials submitted with the bid, in at least two (2) copies to form a part of the Contract immediately after signing of contract.

2.2 Contract Documents

All documents forming part of the Contract (and all parts thereof) are intended to be correlative, complementary and mutually explanatory, subject to Article 1.2 (Order of Precedence) of the Contract Agreement. The Contract shall be read as a whole.

2.3 Language

The ruling language of the Contract and the language for communications shall be English.

2.4 Singular and Plural

The singular shall include the plural and the plural the singular, except where the context otherwise requires.

2.5 Headings

The headings and marginal notes in the General Conditions of Contract are included for ease of reference, and shall neither constitute a part of the Contract nor affect its interpretation.

2.6 Entire Agreement

Subject to GCC Sub-Clause 12.4 hereof, the Contract constitutes the entire agreement between the Employer and Contractor with respect to the subject matter of Contract and supersedes all communications, negotiations and agreements (whether written or oral) of parties with respect thereto made prior to the date of Contract.

2.7 Amendment

No amendment or other variation of the Contract shall be effective unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each party hereto.

2.8 Independent Contractor

The Contractor shall be an independent contractor performing the Contract. The Contract does not create any agency, partnership, joint venture or other joint relationship between the parties hereto.

Subject to the provisions of the Contract, the Contractor shall be solely responsible for the manner in which the Contract is performed. All employees, representatives or Subcontractors engaged by the Contractor in connection with the performance of the Contract shall be under the complete control of the Contractor and shall not be deemed to be employees of the Employer, and nothing contained in the Contract or in any subcontract awarded by the Contractor shall be construed to create any contractual relationship between any such employees, representatives or Subcontractors and the Employer.

2.9 Joint Venture

If the Contractor is a joint venture of two or more firms, all such firms shall be jointly and severally bound to the Employer for the fulfillment of the provisions of the Contract and shall designate one of such firms to act as a leader with authority to bind the joint venture. The composition or the constitution of the joint venture shall not be altered without the prior written consent of the Employer.

2.10 Non-Waiver

2.10.1 Subject to GCC Sub-Clause 2.10.2 below, no relaxation, forbearance, delay or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect or restrict the rights of that party under the Contract, nor

shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

- 2.10.2 Any waiver of a party's rights, powers or remedies under the Contract must be in writing, must be dated and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

2.11 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

2.12 Country of Origin

"Origin" means the place where the materials, equipment and other supplies for the Facilities are mined, grown, produced or manufactured, and from which the services are provided. Plant and equipment are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

2.13 Notices

- 2.13.1 Unless otherwise stated in the Contract, all notices to be given under the Contract shall be in writing, and shall be sent by personal delivery, special courier, telegraph, facsimile or Electronic Data Interchange (EDI) to the address of the relevant party set out in the Contract Agreement, with the following provisions:
- (a) Any notice sent by telegraph, facsimile or EDI shall be confirmed within two (2) days after dispatch by notice sent by special courier, except as otherwise specified in the Contract.
 - (b) Any notice sent by special courier shall be deemed (in the absence of evidence of earlier receipt) to have been delivered ten (10) days after dispatch. In proving the fact of dispatch, it shall be sufficient to show that the envelope containing such notice was properly addressed, stamped and conveyed to the postal authorities or courier service for transmission by special courier. Provided further that whenever the postal authorities or courier service provide a proof of delivery, the same shall also be applicable for presenting the fact of dispatch.
 - (c) Any notice delivered personally or sent by telegraph, facsimile or EDI shall be deemed to have been delivered on date of its dispatch.

(d) Either party may change its postal, facsimile or EDI address or addressee for receipt of such notices by ten (10) days' notice to the other party in writing.

2.13.2 Notices shall be deemed to include any approvals, consents, instructions, orders and certificates to be given under the Contract.

2.14 Governing Law & its Jurisdiction

The Contract shall be governed by and interpreted in accordance with laws of Union of India and the Courts of Patiala shall have exclusive jurisdiction in all matters arising under this Contract.

B. Subject Matter of Contract

3. Scope of Facilities

- 3.1 Unless otherwise expressly limited in the Technical Specifications, the Contractor's obligation shall include the provision of all Plant and Equipment and the performance of all Installation Services required for the design, the manufacture (including procurement, quality assurance, construction, installation, associated civil works, Pre-commissioning and delivery) of the Plant and Equipment and the installation, completion, commissioning and performance testing of the facilities in accordance with the plans, procedures, specifications, drawings, codes and any other documents as specified in the Technical specifications. Such specifications include, but are not limited to, the provision of supervision and engineering services; the supply of labour, materials, equipment, spare parts (as specified in GCC Sub-Clause 3.3 below) and accessories; Contractor's Equipment; construction utilities and supplies; temporary materials, structures and facilities; transportation (including without limitation, custom clearance, **port handling & custom clearance; transportation (including without limitation, all clearances and handling etc.);** storage and training except for those supplies, works and services that will be provided or performed by the Employer, as set forth in Appendix-6 (Scope of Works and Supply by the Employer) to the Contract Agreement.
- 3.2 The Contractor shall, unless specifically excluded in the Contract, perform all such work and/or supply all such items and materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Completion of the Facilities as if such work and/or items and materials were expressly mentioned in the Contract.
- 3.3 The supply of Mandatory Spare Parts, if any, shall be included in the Contract. Beside the aforesaid Mandatory Spares parts, the Contractor shall ensure the availability of spare parts required for the operation and maintenance of the Facilities to the Employer for a minimum period of 15 years from Completion of the Facilities. The Contractor shall carry sufficient inventories to ensure an ex-stock supply of consumable spares for the plant and equipment. If so desired by the

Employer, the Contractor shall submit the specifications, price and the terms and conditions relating to the supply thereof for such spares identified by the Employer with validity period of 6 months within 30 days of receipt of request from Employer for its consideration and placement of order.

- 3.4 The Contractor shall guarantee that in the event of termination of production of spare parts by the Contractor or his Sub-Contractor:
- (i) The Contractor shall send advance notification to the Employer of the pending termination, with 5 (Five) years time to permit the Employer to procure needed requirements, and
 - (ii) Following such termination, the Contractor shall furnish at no cost to the Employer the blueprints, drawings and specification of the spare parts, if requested.
- 3.5 In case the Contractor fails to supply the spares parts in accordance with the terms stipulated above, the Employer shall sanction the Contractor declaring them ineligible for a stated period of time for future projects.

4. Time for Commencement and Completion

- 4.1 The Contractor shall commence work on the Facilities from the Effective Date of Contract and without prejudice to GCC Sub-Clause 21.2 hereof, the Contractor shall thereafter proceed with the Facilities in accordance with the time schedule specified in the corresponding Appendix – 4 (Time Schedule) to the Contract Agreement.
- 4.2 The Contractor shall attain Completion of the Facilities (or of a part where a separate time for Completion of such part is specified in the Contract) within the time stated under Time for Completion or within such extended time to which the Contractor shall be entitled under GCC Clause 34 hereof.

5. Contractor's Responsibilities

- 5.1 The Contractor shall design, manufacture (including associated purchases and/or subcontracting), install and complete the Facilities with due care and diligence in accordance with the Contract.

GCC 5.1.1 (a) Deleted

GCC 5.1.1(b) Deleted

GCC 5.1.2 Deleted

GCC 5.1.3 Deleted

- 5.2 The Contractor confirms that it has entered into this Contract on the basis of a proper examination of the data relating to the Facilities (including any data as to boring tests) provided by the Employer, and on the basis of information that the Contractor could have obtained from a visual inspection of the Site (if access thereto was available) and of other data readily available to it relating to the Facilities as of the date twenty-eight (28) days prior to bid submission. The Contractor acknowledges that any failure to acquaint itself with all such data and information shall not relieve its responsibility for properly estimating the difficulty or cost of successfully performing the Facilities.
- 5.3 The Contractor shall acquire in its name all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the Site is located that are necessary for the performance of the Contract, including, without limitation, visas for the Contractor's and Subcontractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals and/or licenses that are not the responsibility of the Employer under GCC Sub-Clause 6.3 hereof and that are necessary for the performance of the Contract.

Wherever required, the Contractor has to open Project office/site/Liaison office/Bank Account in India complying with all applicable laws and regulations viz. Income Tax, FEMA, RBI, Government of India etc., for effecting remittances in INR.

- 5.4 The Contractor shall comply with all laws in force in India. The laws will include all local, state, national or other laws that affect the performance of the Contract and bind upon the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the Subcontractors and their personnel, but without prejudice to GCC Sub-Clause 6.1 hereof.
- 5.5 Any Plant, Material and Services that will be incorporated in or be required for the Facilities and other supplies shall have their origin as specified under GCC Sub-Clause 2.12 (Country of Origin).
- 5.6 The Contractor shall permit the Employer to inspect the Contractor's accounts and records relating to the performance of the Contractor.
- 5.7 The Contractor shall engage local Contractors/as sub agencies to the main EPC Contractor for atleast 30% of Services/erection works.

6. Employer's Responsibilities

- 6.1 The Employer shall ensure the accuracy of all information and/or data to be supplied by the Employer as described in the corresponding Appendix - 6 (Scope

of Works and Supply by the Employer) to the Contract, except when otherwise expressly stated in the Contract.

- 6.2 The Employer shall be responsible for acquiring and providing legal and physical possession of the Site and access thereto, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way, as specified in the corresponding Appendix – 6 (Scope of Works and Supply by the Employer) to the Contract Agreement. The Employer shall give full possession of and accord all rights of access thereto on or before the date(s) specified in that Appendix.
- 6.3 The Employer shall acquire and pay for all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the Site is located which such authorities or undertakings require the Employer to obtain them in the Employer's name, are necessary for the execution of the Contract (they include those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract), including those specified in Appendix 6 (Scope of Works and Supply by the Employer) to the Contract Agreement.
- 6.4 If requested by the Contractor, the Employer shall use its best endeavours to assist the Contractor in obtaining in a timely and expeditious manner all permits, approvals and/or licenses necessary for the execution of the Contract from all local, state or national government authorities or public service undertakings that such authorities or undertakings require the Contractor or Subcontractors or the personnel of the Contractor or Subcontractors, as the case may be, to obtain.
- 6.5 Unless otherwise specified in the Contract or agreed upon by the Employer and the Contractor, the Employer shall provide sufficient, properly qualified operating and maintenance personnel; shall supply and make available all raw materials, utilities, lubricants, chemicals, catalysts, other materials and facilities; and shall perform all work and services of whatsoever nature, to enable the Contractor to properly carry out Commissioning, all in accordance with the provisions of Appendix 6 (Scope of Works and Supply by the Employer) to the Contract Agreement at or before the time specified in the program furnished by the Contractor under GCC Sub-Clause 14.2 (Program of Performance) hereof and in the manner thereupon specified or as otherwise agreed upon by the Employer and the Contractor.
- 6.6 The Employer shall be responsible for the continued operation of the Facilities after Taking Over, in accordance with GCC Sub-Clause 20.1.5.
- 6.7 All costs and expenses involved in the performance of the obligations under this GCC Clause 6 shall be the responsibility of the Employer.

C. Payment

7. Contract Price

- 7.1 The Contract Price shall be as specified in Article 2 (Contract Price and Terms of Payment) of the Form of Contract Agreement.
- 7.2 The Contract Price shall be subject to adjustment in accordance with the provisions of Appendix 2 (Price Adjustment) to the Contract Agreement. The Contract Price shall be increased or reduced on account of variation in quantity in accordance with Clause 33 of GCC.
- 7.3 Subject to GCC Sub-Clauses 5.2 and 6.1 hereof, the Contractor shall be deemed to have satisfied itself as to the correctness and sufficiency of the Contract Price, which shall, except as otherwise provided for in the Contract, cover all its obligations under the Contract.

8. Terms of Payment

- 8.1 The Contract Price shall be paid as specified in the corresponding Appendix - 1 (Terms and Procedures of Payment) to the Contract Agreement. The procedures to be followed in making application for and processing payments shall be those outlined in the same Appendix.
- 8.2 All payments under the Contract shall be made in Indian Rupees.

9. Securities

9.1 Issuance of Securities

The Contractor shall provide the securities specified below in favour of the Employer at the times, and in the amount, manner and form specified below.

9.2 Performance Security

- 9.2.1 The Principal Contractor/Lead Partner and other partner(s) separately shall, within twenty-eight (28) days of the notification of award, provide a performance security separately for the due performance of the Contract in the amount equivalent to Five percent (5%) of the Contract Price as per the following:
- i) Performance Security in the amount equivalent to Five percent (5%) of the Ex-works Price of complete package with a validity upto ninety (90) days beyond the Defect Liability Period for said equipment [refer GCC Sub Clause 22.2(i)].
 - ii) Performance Security in the amount equivalent to five percent (5%) of the balance Contract Price for all equipment/materials other than those

specified in (i) above, with a validity upto ninety (90) days beyond the Defect Liability Period, applicable for said equipment [refer GCC Sub Clause 22.2(ii)].

The performance security (ies) shall be extended by the Contractor time to time till ninety (90) days beyond the actual Defect Liability Period, as may be required under the Contract.

Apart from the Contractor's performance security, the Contractor shall be required to arrange additional performance securities, if any, within twenty-eight (28) days of the notification of award in favour of the Employer in the form acceptable to the Employer.

The Contractor shall arrange additional Performance Security(ies), if applicable, as per Clause no. 4 of Joint Deed of Undertaking mentioned at Sl. No. 19 of Section – IV : Sample Forms and Procedures. The said security(ies) shall be required to be extended time to time till ninety (90) days beyond the actual Defect Liability Period, as may be required under the Contract.

- 9.2.1.1 Notwithstanding above, in case of the performance security (ies) for which the validity as per GCC Clause 9.2.1 is required to be more than 5 years, the Contractor may choose to submit the performance security with initial validity of 5 years. In such cases, the Contractor shall, however be required to extend the validity till ninety (90) days beyond the actual Defect Liability Period, as may be required under the Contract at any time, but no later than 6 months, prior to expiry of the performance security failing which the said performance security shall be forfeited by the Employer.
- 9.2.1.2 If the Contractor delays submission of the performance security(ies) vis-à-vis the period specified in Clause GCC 9.2.1, then without prejudice to any other rights or remedies available with the Employer, following shall also be applicable:
- a) The Defect Liability Period pursuant to Clause GCC 22 for the Facilities or any relevant part thereof covered under the said performance security shall stand extended and the Contractor shall accordingly extend the validity of the Contract Performance Security to be furnished as per Clause GCC 9.2.1 by the period of delay as per Clause GCC 9.2.1.2 (c), over and above the period required as per the Contract.
 - b) Alternatively, if the Contractor fails to extend the validity of the performance security pursuant to Clause GCC 9.2.1.1 (b), an amount @prevailing SBI Card Rate applicable for Inland Bank Guarantee +2% per annum on the performance security amount corresponding to the Facilities or any relevant part thereof covered under the said performance security, for the period of

delay as per Clause GCC 9.2.1.2 (c) shall be paid by the Contractor to the Employer. The Employer may, without prejudice to any other method of recovery, deduct the amount worked out as above from any monies due or to become due to the Contractor under the Contract.

- c) The period of delay for the above purpose shall be the time elapsed between the due date for submission of performance security as per the Contract and the date of performance security.
- d) In case the Contractor fails to submit the performance security within 90 days of the Notification of Award, the Employer, without prejudice to any other rights or remedies it may possess under the Contract, may forfeit the bid security and/or may terminate the Contract forthwith pursuant to GCC Clause 36.

9.2.1.3 The above extension of Defect Liability Period or deduction shall not relieve the Contractor from any of his obligations and liabilities under the Contract.

9.2.1.4 The Employer shall be sole judge in above regard.

9.2.1.5 Apart from the performance security (ies) to be furnished as per Clause GCC 9.2.1 above, additional performance securities, as specified in the Bidding Documents, shall be arranged and furnished by the Contractor at any time after the Notification of Award. The submission of these performance securities to the Employer shall, however, be one of the conditions precedent for release of payment (other than Initial/Mobilisation advance) due against such equipment/ works for which the said performance security is required to be submitted.

9.2.2 The performance security shall be in the Form of unconditional Bank Guarantee attached hereto in the Section V - Sample Forms and Procedures.

9.2.3 Reduction in the security pro rata to the Contract Price of any part of the Facilities is not admissible. However, if the Defects Liability Period has been extended on any part of the Facilities pursuant to GCC Sub-Clause 22.8 hereof, the Contractor shall issue an additional security in an amount proportionate to the Contract Price of that part. The security shall be returned to the Contractor immediately after its expiration, provided, however, that if the Contractor pursuant to GCC Sub-Clause 22, is liable for an extended warranty obligation, the performance security shall be reduced to ten percent (10%) of the value of the component covered by the extended warranty.

9.2.4 In case of award of the contract to a Joint Venture, the Bank Guarantees for performance security and the Bank Guarantee for advance payment shall be submitted in the name of all the partner(s) of the Joint Venture

GCC 9.3.1

The Contractor shall, within twenty-eight (28) days of the notification of award, provide a performance security for the due performance of the Contract in the amount equivalent to **Five (5%) of the Contract Price** (including Maintenance charges during Defect Liability Period), with a validity upto ninety (90) days beyond the Defect liability Period. The same shall be extended by the Contractor from time to time till ninety (90) days beyond the actual **Defect Liability Period**, as may be required under the Contract.

Apart from Performance Security(ies) as mentioned above, the successful bidder is required to furnish additional performance security(ies), if applicable, as per Forms at Sl. No. 22 & 23 and /or Clause no. 3 of Joint Deed of Undertaking mentioned at Sl. No. 25 of Section – VI: Sample Forms and Procedures., within twenty eight (28) days of the notification of award in favour of the Employer in the form acceptable to the Employer. The said security(ies) shall be required to be extended from time to time till ninety (90) days beyond the actual Defect Liability Period, as may be required under the Contract.

Further, Contractor shall within 28 days, after Defect Liability Period, provide Contract Performance Guarantee in the amount equivalent to **Two Percent (2%) of the Total Contract Price** to cover the contractor's obligations under Maintenance Period as per the provisions in the Technical Specification, Vol-II, with a validity upto ninety (90) days beyond the AMC Period, as per Form - 29 of Section – VI: Sample Forms and Procedures.

The Contractor shall also arrange additional Performance Security(ies), if applicable, as per Joint Deed of Undertaking mentioned at Sl. No. 19 to 21 of Section – VI : Sample Forms and Procedures. The said security(ies) shall be required to be extended time to time till ninety (90) days beyond the actual Defect Liability Period, as may be required under the Contract. The above additional Performance Securities shall be submitted before release of first dispatch payment.

The said security(ies) shall be required to be extended from time to time till ninety (90) days beyond completion period of Annual Maintenance Contract as may be required under the Contract.

- 9.3.1.1 Notwithstanding above, in case of the performance security(ies) for which the validity as per GCC Clause 9.3.1 is required to be more than 5 years, the Contractor may choose to submit the performance security with initial validity of 5 years. In such cases, the Contractor shall, however be required to extend the validity till ninety (90) days beyond the actual Defect Liability Period, as may be required under the Contract at any time, but no later than 6 months, prior to expiry of the performance security failing which the said performance security shall be forfeited by the Employer.

9.3.1.2 If the Contractor delays submission of the performance security(ies) vis-à-vis the period specified in Clause GCC 9.3.1, then without prejudice to any other rights or remedies available with the Employer, following shall also be applicable:

- a) The Defect Liability Period pursuant to Clause GCC 22 for the Facilities or any relevant part thereof covered under the said performance security shall stand extended and the Contractor shall accordingly extend the validity of the Contract Performance Security to be furnished as per Clause GCC 9.3.1 by the period of delay as per Clause GCC 9.3.1.2 (c), over and above the period required as per the Contract.
- b) Alternatively, if the Contractor fails to extend the validity of the performance security pursuant to Clause GCC 9.3.1.2 (a), an [amount @prevailing SBI Card Rate applicable for Inland Bank Guarantee +2%](#) per annum on the performance security amount corresponding to the Facilities or any relevant part thereof covered under the said performance security, for the period of delay as per Clause GCC 9.3.1.2 (c) shall be paid by the Contractor to the Employer. The Employer may, without prejudice to any other method of recovery, deduct the amount worked out as above from any monies due or to become due to the Contractor under the Contract.
- c) The period of delay for the above purpose shall be the time elapsed between the due date for submission of performance security as per the Contract and the date of performance security.
- d) In case the Contractor fails to submit the performance security within 90 days of the Notification of Award, the Employer, without prejudice to any other rights or remedies it may possess under the Contract, may forfeit the bid security and/or may terminate the Contract forthwith pursuant to GCC Clause 36.

9.3.1.3 The above extension of Defect Liability Period or deduction shall not relieve the Contractor from any of his obligations and liabilities under the Contract.

9.3.1.4 The Employer shall be sole judge in above regard.

9.3.1.5 Apart from the performance security (ies) to be furnished as per Clause GCC above, additional performance securities, as specified in the Bidding Documents, shall be arranged and furnished by the Contractor at any time after the Notification of Award. The submission of these performance securities to the Employer shall, However, be one of

the conditions precedent for release of payment (other than Initial/Mobilisation advance) due against such equipment/ works for which the said performance security is required to be submitted.

9.3.1.6 The submission of Performance security(ies) for contractor's obligations under Maintenance Period shall be a condition precedent for release of performance securities for the due performance of the contract. The securities towards contractor's obligations under the maintenance period shall be returned to the contractor immediately after its expiration.

9.4 Issuing Banks

The Bank Guarantee for Performance Security are to be provided by the Contractor, which should be issued either:

- (a) By a Public Sector Bank located in India, or
- (b) a scheduled Indian Bank having paid up capital (net of any accumulated losses) of Rs. 1,000 Million or above (the latest annual report of the Bank should support compliance of capital adequacy ratio requirement), or
- (c) Deleted

9.5 Indemnity

9.5.1 For the equipment/material to be provided by the Contractor, it will be the responsibility of the Contractor to take delivery, unload and store the materials at Site and execute an Indemnity Bond and obtain authorisation letter from Employer as per proforma enclosed at Section V (Sample Forms and Procedures), in favour of the Employer against loss, damage and any risks involved for the full value of the materials. This Indemnity Bond shall be furnished by the Contractor before commencement of the supplies and shall be valid till the scheduled date of Taking Over of the equipment by the Employer.

9.5.2 In case of divisible Contracts, where the Employer hands over his equipment to the Contractor for executing the Contract, then the Contractor shall, at the time of taking delivery of the equipment through Bill of Lading or other dispatch documents, furnish trust Receipt for Plant, Equipment and Materials and also execute an Indemnity Bond in favour of the Employer in the form acceptable to the Employer for keeping the equipment in safe custody and to utilize the same exclusively for the purpose of the said Contract. Samples of proforma for the Trust receipt and Indemnity Bond are enclosed under Section IV (Sample Forms and Procedures). The Employer shall also issue a separate Authorization Letter to the Contractor to enable him to take physical delivery of plant, equipment and materials from the Employer as per proforma enclosed under Section IV (Sample Forms and Procedures).

10. Taxes and Duties

10.1 The Contractor shall be entirely responsible for payment of all taxes, duties, license fees and other such levies legally payable/incurred until delivery of the contracted supplies to the Employer.

If it is statutory requirement to make deductions towards such taxes and duties or any other applicable taxes and duties, the same shall be made by the Employer and a certificate for the same shall be issued to the Contractor.

10.2 The Contractor shall be solely responsible for the taxes that may be levied on the Contractor's persons or on earnings of any of his employees and shall hold the Employer indemnified and harmless against any claims that may be made against the Employer. The Employer does not take any responsibility whatsoever regarding taxes under Indian Income Tax Act, for the Contractor or his personnel. If it is obligatory under the provisions of the Indian Income Tax Act, deduction of Income Tax at source shall be made by the Employer.

10.3 For CIF Contract:

In case of Supply of Goods and Services from abroad, taxes and duties shall be as follows:

(i) any Indian Customs duties (**Basic customs duty, Cess, GST etc.**) or levies including the Stamp Duty and Import License Fee levied by the Government of India or any State Government in India on the equipment and materials, covered in the Contract to be imported into India against Employer's Import License and which will become the property of the Employer under the Contract, shall be to the Employer's account and shall be paid directly by the Employer to Government of India or concerned authorities. In the event a Contractor is required by law to pay such levies in India, the same shall be reimbursed by the Employer to the Contractor in Indian Rupees, upon presentation of satisfactory documentary evidence for having made such payments. The Contractor shall submit a comprehensive list of all the goods to be imported into India under the Contract to enable the Employer to obtain the Import License endorsement of Project Imports for availing concessional rate of customs and import duties. Any additional liabilities of custom and import duties or penalty thereon, due to discrepancy in the said list of goods or any other lapse of the Contractor shall be to the account of the Contractor.

The Contractor shall arrange to get equipment assessed under "Project Rate" or "merit rate" of custom duty whichever is less as permitted under relevant notification for the type of Project.

(ii) GST, if any, on marine freight, payable separately by the Employer on reverse charge basis, due to engagement of foreign shipping line by the Contractor shall be paid by the Employer.

For local Supplies:

In respect of **supply of goods from within India** to the Employer by the Contractor, the EXW price is inclusive of all cost as well as duties and tax (viz., custom duties, levies, **GST** etc.) paid or payable on components, raw materials and any other items used for their consumption incorporated or to be incorporated in the Plant & Equipment.

Further, the EXW price of imported Equipments/items offered as 'Off the Shelf' or dispatched directly from the Indian Port of disembarkation are inclusive of all cost **as well as any duties paid/payable in relation to import of such goods (viz., Customs duties, Cess, GST & levies etc.)** and no separate claim on this behalf will be entertained by the Employer. If any tax exemptions, reductions, allowances or privileges may be available to the Contractor in the Country where the site is located and the Contractor has declared the same in its bid, the Employer shall use its best endeavors to enable the Contractor to benefit from such tax savings to the maximum allowable extent.

The Input Tax Credit (ITC) available, if any, under GST as per the relevant Government laws wherever applicable has been taken into account by the Contractor.

Ex-works price for supply of Goods viz Equipment/Items by the Contractor is excluding GST, if any, payable. The GST will be reimbursable (along with subsequent variation if any), by the Employer on the supplies made by the Contractor but limited to the tax liability on the transaction between the Employer and the Contractor.

Type test charges, if applicable, are excluding GST, if any, payable. Type test shall be considered an incidental expense incurred prior to the supply of goods viz. Equipment/items and would be added to the value of goods viz. Equipment/items for GST purposes and GST for Type Test shall be reimbursed at the rate applicable for such Equipment/items.

10.4 The price for supply of services viz. Port handling and customs clearance in case of CIF supply, Installation and training are excluding GST, if any, payable. The GST will be reimbursable (along with subsequent variation, if any), by the Employer on the supply of services made by the Contractor but limited to the tax liability on the transaction between the Employer and the Contractor.

10.5 Further the price for supply of services viz. Installation are excluding GST, if any, payable. The GST will be reimbursable (along with subsequent variation if any), by the Employer on the supplies made by the Contractor but limited to the tax liability on the transaction between the Employer and the Contractor.

GST, if payable, on services related to Inland transportation, Intransit insurance, loading and unloading shall be to the Bidder's account and Employer shall not reimburse any GST on this account.

10.6 Employer would not bear any liability on account of any other taxes duties, levies applicable locally.

10.7 Employer shall, deduct taxes at source as per the applicable laws/rules, if any, and issue Tax Deduction at Source (TDS) Certificate to the Contractor.

10.8 Reimbursement of GST by the Employer shall be at the rate applicable on the HSN/SAC of the goods/ services supplied by the Contractor to the Employer. The reimbursement of GST, except GST on Advance payment, shall be against Invoice/Debit Note containing particulars specified under the GST Act and related Rules, Notifications, etc as notified by the Government in this regard. In the event that the Contractor fails to provide the invoice in the form and manner prescribed under the GST Act and Rules, the Employer shall not be liable to make any payment against such invoice. Reimbursement of GST against Advance payment (applicable for Supply of Services) shall be against proforma invoice. Further, the Contractor shall, within 7 days from the date of receipt of Advance, furnish an Advance Receipt Voucher to the Employer, as prescribed under the GST Law.

In case of supply from within India, if there is difference in HSN/SAC classification and corresponding rate of GST of an item as confirmed/deemed confirmed by the bidder in its bid and HSN/SAC and corresponding rate of GST as interpreted under any interpretation/ judgment/ Notification/ Circular issued under the GST law before or after the award of contract, GST reimbursable to the bidder/Contractor shall be lower of the GST applicable at the rate as confirmed/deemed confirmed in the bid or actual GST paid/payable by the bidder for that item.

10.9 The Contractor shall comply with all tax laws in force in India. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, interest, damages, claims, fines, penalties and expenses of whatever nature arising or resulting from the violation of such tax laws by the Contractor or its personnel, including the Subcontractors and their personnel.

10.10 Owner's GSTIN number in each state/UT is published on the Owner's company website www.eproc.punjab.gov.in. While raising invoice/proforma invoice for Supply of Goods from within India , Contactor shall bill to and ship to the address of the Owner in the State/UT where the Goods or part thereof is to be Supplied and mention GSTIN of Owner in of the same state/UT. In case of Supply of Services from within India, the

Contractor shall invoice the Owner using the GSTIN of Owner in the state/UT in which the service or part thereof is to be rendered.

10.11 Notwithstanding anything above or elsewhere in the Contract, in the event that the input tax credit of the GST charged by the Contractor is denied by the tax authorities to the Employer for reasons associated with non-compliance/ incorrect compliance by the Contractor, the Employer shall be entitled to recover such amount from the Contractor by way of adjustment from any of the subsequent invoices submitted by the Contractor to the Employer. In addition to the amount of GST, the Employer shall also be entitled to recover interest and penalty, in case any interest and/or penalty are imposed by the tax authorities on the Employer for incorrect/wrong availment of Input Tax Credit. The Employer shall determine whether the denial of credit is linked to the non-compliance/ incorrect compliance of the Contractor and the said determination shall be binding on the Contractor.

10.12 For the purpose of the Contract, it is agreed that the Contract Price specified in Article 2(Contract Price and Terms of Payment) of the Contract Agreement is based on the taxes, duties, levies and charges prevailing at the date seven (07) days prior to the last date of bid submission (hereinafter called "Tax" in this GCC Sub-clause 10.7). If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation **except for classification related purpose** or application of any Tax occurs in the course of the performance of the Contract, which was or will be assessed on the Contractor in connection with performance of the Contract, an equitable adjustment of the Contract price shall be made to fully take into account any such change by addition to the Contract price or deduction therefrom, as the case may be, in accordance with GCC Clause 31 (Changes in Laws and Regulations) hereof. **These adjustments shall be applicable for all transactions between the Employer and the Contractor for supply of goods and services under the Contract but shall not be applicable on procurement of raw materials, intermediary components etc. by the Contractor and on account of variation in taxes, duties & levies applicable locally.**

In respect of raw materials, intermediary components etc and the taxes, duties & levies applicable locally, neither the Employer nor the Contractor shall be entitled to any claim arising due to increase or decrease in the rate of Tax, introduction of a new Tax or abolition of an existing Tax in the course of the performance of the Contract.

D. Intellectual Property

11. Copy Right

11.1 The copyright in all drawings, documents and other materials containing data and information furnished to the Employer by the Contractor herein shall remain vested in the Contractor or, if they are furnished to the Employer directly or through the

Contractor by any third party, including supplies of materials, the copyright in such materials shall remain vested in such third party.

The Employer shall however be free to reproduce all drawings, documents and other material furnished to the Employer for the purpose of the Contract including, if required, for operation and maintenance.

- 11.2 The copyright in all drawings, documents and other materials containing data and information furnished to the Contractor by the Employer herein shall remain vested in the Employer.

12. Confidential Information

- 12.1 The Employer and the Contractor shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party any documents, data or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following termination of the Contract. Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this GCC Clause 12.
- 12.2 The Employer shall not use such documents, data and other information received from the Contractor for any purpose other than the operation and maintenance of the Facilities. Similarly, the Contractor shall not use such documents, data and other information received from the Employer for any purpose other than the design, procurement of Plant and Equipment, construction or such other work and services as are required for the performance of the Contract.
- 12.3 The obligation of a party under GCC Sub-Clauses 12.1 and 12.2 above, however, shall not apply to that information which
- (a) now or hereafter enters the public domain through no fault of that party
 - (b) can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party hereto
 - (c) otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality.
- 12.4 The above provisions of this GCC Clause 12 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Facilities or any part thereof.

12.5 The provisions of this GCC Clause 12 shall survive termination, for whatever reason, of the Contract.

E. Execution of the Facilities

13. Representatives

13.1 If the Project Manager is not named in the Contract, then within fourteen (14) days of the Effective Date, the Employer shall appoint and notify the Contractor in writing of the name of the Project Manager. The Employer may from time to time appoint some other person as the project Manager in place of the person previously so appointed, and shall give a notice of the name of such other person to the Contractor without delay. The Employer shall take all reasonable care to see that no such appointment is made at such a time or in such a manner as to impede the progress of work on the Facilities. The Project Manager shall represent and act for the Employer at all times during the currency of the Contract. All notices, instructions, orders, certificates, approvals and all other communications under the Contract shall be given by the Project Manager, except as herein otherwise provided.

All notices, instructions, information and other communications given by the Contractor to the Employer under the Contract shall be given to the Project Manager, except as herein otherwise provided.

13.2 Contractor's Representative & Construction Manager

13.2.1 If the Contractor's Representative is not named in the Contract, then within fourteen (14) days of the Effective Date, the Contractor shall appoint the Contractor's Representative and shall request the Employer in writing to approve the person so appointed. If the Employer makes no objection to the appointment within fourteen (14) days, the Contractor's Representative shall be deemed to have been approved. If the Employer objects to the appointment within fourteen (14) days giving the reason therefore, then the Contractor shall appoint a replacement within fourteen (14) days of such objection, and the foregoing provisions of this GCC Sub-Clause 13.2.1 shall apply thereto.

13.2.2 The Contractor's Representative shall represent and act for the Contractor at all times during the currency of the Contract and shall give to the Project Manager all the Contractor's notices, instructions, information and all other communications under the Contract. All notices, instructions, information and all other communications given by the Employer or the Project Manager to the Contractor under the Contract shall be given to the Contractor's Representative or, in its absence, its deputy, except as herein otherwise provided. The Contractor shall not revoke the appointment of the Contractor's Representative without the Employer's prior written consent,

which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor's Representative, pursuant to the procedure set out in GCC Sub-Clause 13.2.1.

- 13.2.3 The Contractor's Representative may, subject to the approval of the Employer (which shall not be unreasonably withheld), at any time delegate to any person any of the powers, functions and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Contractor's Representative, and shall specify the powers, functions and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until a copy thereof has been delivered to the Employer and the Project Manager. Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this GCC Sub-Clause 13.2.3 shall be deemed to be an act or exercise by the Contractor's Representative.
- 13.2.3.1 Notwithstanding anything stated in GCC Sub-Clause 13.1 and 13.2.1 above, for the purpose of execution of Contract, the Employer and the Contractor shall finalize and agree to a Contract Co-ordination Procedure and all the communication under the Contract shall be in accordance with such Contract Coordination Procedure.
- 13.2.4 From the commencement of installation of the Facilities at the Site until Operational Acceptance, the Contractor's Representative shall appoint a suitable person as the construction manager, (hereinafter referred to as "the Construction Manager"). The Construction Manager shall supervise all work done at the Site by the Contractor and shall be present at the Site through-out normal working hours except when on leave, sick or absent for reasons connected with the proper performance of the Contract. Whenever the Construction Manager is absent from the Site, a suitable person shall be appointed to act as his or her deputy.
- 13.2.5 The Employer may by notice to the Contractor object to any representative or person employed by the Contractor in the execution of the Contract who, in the reasonable opinion of the Employer, may behave inappropriately, may be incompetent or negligent, or may commit a serious breach of the Site regulations provided under GCC Sub-Clause 18.3. The Employer shall provide evidence of the same, whereupon the Contractor shall remove such person from the Facilities.
- 13.2.6 If any representative or person employed by the Contractor is removed in accordance with GCC Sub-Clause 13.2.5, the Contractor shall, where required, promptly appoint a replacement.

14. Work Program

14.1 Contractor's Organization

The Contractor shall supply to the Employer and the Project Manager a chart showing the proposed organization to be established by the Contractor for carrying out work on the Facilities. The chart shall include the identities of the key personnel together with the curricula vitae of such key personnel to be employed within twenty-one (21) days of the Effective Date. The Contractor shall promptly inform the Employer and the Project Manager in writing of any revision or alteration of such an organization chart.

14.2 Program of Performance

Within twenty-eight (28) days after the date of Notification of Award, the Contractor shall prepare and submit to the Project Manager a detailed program of performance of the Contract (L2 Network) in the form of the Critical Path Method (CPM), the PERT network, or other internationally used programs and showing the sequence in which it proposes to design, manufacture, transport, assemble, install and pre-commissioning the Facilities, as well as the date by which the Contractor reasonably requires that the Employer shall have fulfilled its obligations under the Contract so as to enable the Contractor to execute the Contract in accordance with the program and to achieve Completion, Commissioning and Acceptance of the Facilities in accordance with the Contract. The program so submitted by the Contractor shall accord with the Time Schedule included in Appendix-4 (Time Schedule) to the Contract Agreement and any other dates and periods specified in the Contract. The Contractor shall update and revise the program as and when appropriate or when required by the Project Manager, but without modification in the Times for Completion under GCC Sub-Clause 4.2 and any extension granted in accordance with GCC Clause 34, and shall submit all such revisions to the Project Manager.

14.3 Progress Report

The Contractor shall monitor progress of all the activities specified in the program referred to in GCC Sub-Clause 14.2 above, and supply a progress report to the Project Manager every month.

The progress report shall be in a form acceptable to the Project Manager and shall indicate: (a) percentage completion achieved compared with the planned percentage completion for each activity; and (b) where any activity is behind the program, giving comments and likely consequences and stating the corrective action being taken.

14.4 Progress of Performance

If at any time the Contractor's actual progress falls behind the program referred to in GCC Sub-Clause 14.2, or it becomes apparent that it will so fall behind, the

Contractor shall, at the request of the Employer or the Project Manager, prepare and submit to the Project Manager a revised program, taking into account the prevailing circumstances, and shall notify the Project Manager of the steps being taken to expedite progress so as to attain Completion of the Facilities within the Time for Completion under GCC Sub-Clause 4.2, any extension thereof entitled under GCC Sub-Clause 34.1, or any extended period as may otherwise be agreed upon between the Employer and the Contractor.

14.5 Work Procedures

The Contract shall be executed in accordance with the Contract Documents and the procedures given in the section on Sample Forms and Procedures of the Contract Documents.

The Contractor may execute the Contract in accordance with its own standard project execution plans and procedures to the extent that they do not conflict with the provisions contained in the Contract.

15. Subcontracting

- 15.1 The corresponding Appendix (List of Approved Subcontractors) to the Contract Agreement specifies major items of supply or services and a list of approved Subcontractors against each item, including vendors. Insofar as no Subcontractors are listed against any such item, the Contractor shall prepare a list of Subcontractors for such item for inclusion in such list. The Contractor may from time to time propose any addition to or deletion from any such list. The Contractor shall submit any such list or any modification thereto to the Employer for its approval in sufficient time so as not to impede the progress of work on the Facilities. Such approval by the Employer for any of the Subcontractors shall not relieve the Contractor from any of its obligations, duties or responsibilities under the Contract. **Principal Contractor/ Lead Partner and its sub-contractor(s) shall be PGCIL approved vendor or may be Central/State Govt./Semi-Govt. Undertaking firm/Utility and/or those contractors/sub-contractors whose work appraisal already stands successfully conducted by PSTCL (or erstwhile PSEB). Contractor shall choose those sub-contractors/sub-vendors which also fulfill aforementioned term and certificate in this regard must be submitted by both contractor and sub-contractors/sub-vendors, duly certified by the concerned organizations.**
- 15.2 The Contractor shall select and employ its Subcontractors for such major items from those listed in the lists referred to in GCC Sub-Clause 15.1.
- 15.3 For items or parts of the Facilities not specified in the corresponding Appendix (List of Approved Subcontractors) to the Contract Agreement for supply of Goods Tax, the Contractor may employ such Subcontractors as it may select, at its discretion.

- 15.4 Notwithstanding anything stated above the purchaser reserves the right to assess bidders capability and capacity to perform the contract should circumstances warrant such an assessment in the overall interest of the Purchaser.

16. Design and Engineering

16.1 Specifications and Drawings

- 16.1.1 The Contractor shall execute the basic and detailed design and the engineering work in compliance with the provisions of the Contract, or where not so specified, in accordance with good engineering practice.

The Contractor shall be responsible for any discrepancies, errors or omissions in the specifications, drawings and other technical documents that it has prepared, whether such specifications, drawings and other documents have been approved by the Project Manager or not, provided that such discrepancies, errors or omissions are not because of inaccurate information furnished in writing to the Contractor by or on behalf of the Employer.

- 16.1.2 The Contractor shall be entitled to disclaim responsibility for any design, data, drawing, specification or other document, or any modification thereof provided or designated by or on behalf of the Employer, by giving a notice of such disclaimer to the Project Manager.

16.2 Codes and Standards

Wherever references are made in the Contract to codes and standards in accordance with which the Contract shall be executed, the edition or the revised version of such codes and standards current at the date twenty-eight (28) days prior to date of bid submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied after approval by the Employer and shall be treated in accordance with GCC Clause 33.

16.3 Approval/Review of Technical Documents by Project Manager

- 16.3.1 The Contractor shall prepare (or cause its Subcontractors to prepare) and furnish to the Project Manager the documents listed in Appendix-7 (List of Documents for Approval or Review) to the Contract Agreement for its approval or review as specified and as in accordance with the requirements of GCC Sub-Clause 14.2 (Program of Performance).

Any part of the Facilities covered by or related to the documents to be approved by the Project Manager shall be executed only after the Project Manager's approval thereof. GCC Sub-Clauses 16.3.2 through 16.3.7 shall apply to those documents requiring the Project Manager's approval, but not to those furnished to the Project Manager for its review only.

- 16.3.2 Within twenty one (21) days after receipt by the Project Manager of any document requiring the Project Manager's approval in accordance with GCC Sub-Clause 16.3.1, the Project Manager shall either return one copy thereof to the Contractor with its approval endorsed thereon or shall notify the Contractor in writing of its disapproval thereof and the reasons therefor and the modifications that the Project Manager proposes.
- 16.3.3 The Project Manager shall not disapprove any document, except on the grounds that the document does not comply with some specified provision of the Contract or that it is contrary to good engineering practice.
- 16.3.4 If the Project Manager disapproves the document, the Contractor shall modify the document and resubmit it for the Project Manager's approval in accordance with GCC Sub-Clause 16.3.2. If the Project Manager approves the document subject to modification(s), the Contractor shall make the required modification(s), and upon resubmission with the required modifications the document shall be deemed to have been approved.
- The procedure for submission of the documents by the Contractor and their approval by the Project Manager shall be discussed and finalized with the Contractor.
- 16.3.5 If any dispute or difference occurs between the Employer and the Contractor in connection with or arising out of the disapproval by the Project Manager of any document and/or any modification(s) thereto that cannot be settled between the parties within a reasonable period, then such dispute or difference may be referred to an Arbitrator for determination in accordance with GCC Sub-Clause 39 hereof. If such dispute or difference is referred to an Arbitrator, the Project Manager shall give instructions as to whether and if so, how, performance of the Contract is to proceed. The Contractor shall proceed with the Contract in accordance with the Project Manager's instructions, provided that if the Arbitrator upholds the Contractor's view on the dispute and if the Employer has not given notice under GCC Sub-Clause 39 hereof, then the Contractor shall be reimbursed by the Employer for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions as the Arbitrator shall decide, and the Time for Completion shall be extended accordingly.
- 16.3.6 The Project Manager's approval, with or without modification of the document furnished by the Contractor, shall not relieve the Contractor of any responsibility or liability imposed upon it by any provisions of the Contract except to the extent that any subsequent failure results from modifications required by the Project Manager.

- 16.3.7 The Contractor shall not depart from any approved document unless the Contractor has first submitted to the Project Manager an amended document and obtained the Project Manager's approval thereof, pursuant to the provisions of this GCC Sub-Clause 16.3. If the Project Manager requests any change in any already approved document and/or in any document based thereon, the provisions of GCC Clause 33 shall apply to such request.

17. Plant and Equipment

- 17.1 Subject to GCC Sub-Clause 10.2, the Contractor shall manufacture or procure and transport all the Plant and Equipment in an expeditious and orderly manner to the Site.
- 17.2 Employer-Supplied Plant, Equipment, and Materials. If the corresponding Appendix – 6 (Scope of Works and Supply by the Employer) to the Contract Agreement provides that the Employer shall furnish any specific items of machinery, equipment or materials to the Contractor, the following provisions shall apply:
- 17.2.1 The Employer shall, at its own risk and expense, transport each item to the place on or near the Site as agreed upon by the parties and make such item available to the Contractor at the time specified in the program furnished by the Contractor, pursuant to GCC Sub-Clause 14.2, unless otherwise mutually agreed.
- 17.2.2 The equipment & materials to be furnished by the Employer shall be supplied to the Contractor at the depots established by the Contractor or the Employer. The Lorry Receipts for the materials will be handed over to the Contractor by the representative of the Employer as and when the same are received. The Contractor shall be responsible for taking delivery of these materials from the railways/road transporter, unloading them from the transporter, carting them to different stores built by him for the purpose, the unloading and cartage being at the cost of the Contractor. All wharfage and demurrage charges (including taxes applicable, if any) incurred due to delay in taking delivery will be to the Contractor's account, except those due to reasons beyond his control in which case the Contractor shall immediately intimate the Engineer for settling the claims. The Contractor shall be responsible for proper handling and storage of these materials from the time of receipt up to the time of Taking Over of the Facilities by the Employer.
- 17.2.3 Yards and store provided by the Contractor for stacking and storage of materials shall be open for inspection by the Employer as and when required. The cost of handling and storage shall be to the Contractor's account.
- 17.2.4 Upon receipt of such item, the Contractor shall inspect the same visually and notify the Project Manager of any detected shortage, defect or default. For

the material being arranged by the Employer and supplied to the Contractor for erection, are received short, broken or damaged, an entry shall be made in the delivery register of the railway authorities/road transporter as far as possible and a report of the same giving full details of shortage and damages along with a copy of report entered in the delivery register of the road transporter/railways shall be submitted by the Contractor to the Project Manager and Employer's consignee immediately. The Employer shall immediately remedy any shortage, defect or default, or the Contractor shall, if practicable and possible, at the request of the Employer, remedy such shortage, defect or default at the Employer's cost and expense. After inspection, such item shall fall under the care, custody and control of the Contractor. The provision of this GCC Sub-Clause 17.2.4 shall apply to any item supplied to remedy any such shortage or default or to substitute for any defective item, or shall apply to defective items that have been repaired.

- 17.2.5 The foregoing responsibilities of the Contractor and its obligations of care, custody and control shall not relieve the Employer of liability for any undetected shortage, defect or default, nor place the Contractor under any liability for any such shortage, defect or default whether under GCC Clause 22 or under any other provision of Contract.

17.3 Transportation

- 17.3.1 The Contractor shall at its own risk and expense transport all the Plant and Equipment and the Contractor's Equipment to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances.
- 17.3.2 Unless otherwise provided in the Contract, the Contractor shall be entitled to select any safe mode of transport operated by any person to carry the Plant and Equipment and the Contractor's Equipment.
- 17.3.3 Upon dispatch of each shipment of the Plant and Equipment and the Contractor's Equipment, the Contractor shall notify the Employer by telex, facsimile or Electronic Data Interchange (EDI) of the description of the Plant and Equipment and of the Contractor's Equipment, the point and means of dispatch, and the estimated time and point of arrival in the country where the Site is located, if applicable, and at the Site. The Contractor shall furnish the Employer with relevant shipping documents to be agreed upon between the parties.
- 17.3.4 The Contractor shall be responsible for obtaining, if necessary, approvals from the authorities for transportation of the Plant and Equipment and the Contractor's Equipment to the Site. The Employer shall use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining such approvals, if requested by the Contractor. The Contractor

shall indemnify and hold harmless the Employer from and against any claim for damage to roads, bridges or any other traffic facilities that may be caused by the transport of the Plant and Equipment and the Contractor's Equipment to the Site.

17.4 Delivery and Documents

17.4.1 Delivery Documents

Upon shipment, the Contractor shall notify the Employer with full details of the dispatch and shall furnish the documents as specified in the corresponding Appendix - 1 (Terms and Procedures of Payment) to the Contract Agreement

17.4.2 Packing

17.4.2.1 The Contractor shall provide such packing of the Goods as it is required to prevent their damage or deterioration during transit to their final destination as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods final destination and the absence of heavy handling facilities at all points in transit.

17.4.2.2 The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract and, subject to any subsequent instruction ordered by the Employer consistent with the requirements of the Contract.

18. Installation

18.1 Setting Out/Supervision/Labor

18.1.1 Bench Mark: The Contractor shall be responsible for the true and proper setting-out of the Facilities in relation to bench marks, reference marks and lines provided to it in writing by or on behalf of the Employer.

If, at any time during the progress of installation of the Facilities, any error shall appear in the position, level or alignment of the Facilities, the Contractor shall forthwith notify the Project Manager of such error and, at its own expense, immediately rectify such error to the reasonable satisfaction of the Project Manager. If such error is based on incorrect data provided in writing by or on behalf of the Employer, the expense of rectifying the same shall be borne by the Employer.

18.1.2 Contractor's Supervision: The Contractor shall give or provide all necessary superintendence during the installation of the Facilities, and the Construction Manager or its deputy shall be constantly on the Site to provide full-time superintendence of the installation. The Contractor shall provide and employ only technical personnel who are skilled and experienced in their respective callings and supervisory staff who are competent to adequately supervise the work at hand.

18.1.3 Labour:

- (a) The Contractor shall provide and employ on the Site in the installation of the Facilities such skilled, semi-skilled and unskilled labor as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged to use local labor that has the necessary skills.
- (b) Unless otherwise provided in the Contract, the Contractor at its own expense shall be responsible for the recruitment, transportation, accommodation and catering of all labor, local or expatriate, required for the execution of the Contract and for all payments in connection therewith.
- (c) The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, riotous or disorderly conduct or behavior by or amongst its employees and the labor of its Subcontractors.
- (d) The Contractor shall, in all dealings with its labor and the labor of its Subcontractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious or other customs and all local laws and regulations pertaining to the employment of labor.

18.2 Contractor's Equipment

- 18.2.1 All Contractor's Equipment brought by the Contractor onto the Site shall be deemed to be intended to be used exclusively for the execution of the Contract. The Contractor shall not remove the same from the Site without the Project Manager's consent that such Contractor's Equipment is no longer required for the execution of the Contract.
- 18.2.2 Unless otherwise specified in the Contract, upon completion of the Facilities, the Contractor shall remove from the Site all Equipment brought by the Contractor onto the Site and any surplus materials remaining thereon.
- 18.2.3 The Employer will, if requested, use its best endeavors to assist the Contractor in obtaining any local, state or national government permission required by the Contractor for the export of the Contractor's Equipment

imported by the Contractor for use in the execution of the Contract that is no longer required for the execution of the Contract.

18.3 Site Regulations and Safety

The Employer and the Contractor shall establish Site regulations setting out the rules to be observed in the execution of the Contract at the Site and shall comply therewith. The Contractor shall prepare and submit to the Employer, with a copy to the Project Manager, proposed Site regulations for the Employer's approval, which approval shall not be unreasonably withheld.

Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the Facilities, gate control, sanitation, medical care, and fire prevention.

18.3.1 Compliance with Labour Regulations

18.3.1.1 During continuance of the contract, the Contractor and his sub-contractors shall abide at all times by all applicable existing labour enactments and rules made there under, regulations notifications and byelaws of the State or Central Government or local authority and any other labour law (including rules), regulations bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. The employees of the Contractor and the Sub-contractor in no case shall be treated as the employees of the Employer at any point of time.

18.3.1.2 The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules made there under, regulations or notifications including amendments.

18.3.1.3 If the Employer is caused to pay under any law as principal employer such amounts as may be necessary to cause or observe, or for non observance of the provisions stipulated in the notifications/ byelaws/Acts/ Rules/regulations including amendments, if any, on the part of the Contractor, the Employer shall have the right to deduct any money due to the Contractor under this contract or any other contract with the employer including his amount of performance security for adjusting the aforesaid payment. The Employer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

Notwithstanding the above, the Contractor shall furnish to the Employer the details/documents evidencing the Contractor's compliance to the laws applicable to establishments engaged in building and other construction

works, as may be sought by the Employer. In particular the Contractor shall submit quarterly certificate regarding compliance in respect of provisions of Employees' Provident Fund and Misc. Provisions Act 1952 to the Employer.

18.3.1.4 Salient features of some major laws applicable to establishments engaged in building and other construction works:

- (a) Workmen Compensation Act 1923: The Act provides for compensation in case of injury by accident arising out of and during the course of employment.
- (b) Payment of Gratuity Act 1972: Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years service or more or on death at the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.
- (c) Employee P.F. and Miscellaneous Provision Act 1952: The Act provides for monthly contribution by the employer plus workers @10% or 8.33%. The benefits under the Act are:
 - (i) Pension or family pension on retirement or death, as the case may be.
 - (ii) Deposit linked insurance on death in harness of the worker.
 - (iii) Payment of P.F. accumulation on retirement/death etc.
- (d) Maternity Benefit Act 1951: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.
- (e) Contract Labour (Regulation & Abolition) Act 1970: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by law. The Principal Employer is required to take Certification of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more labour contract labour.
- (f) Minimum Wages Act 1948: The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provision of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employments.
- (g) Payment of Wages Act 1936: It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

- (h) Equal Remuneration Act 1979: The Act provides for payment of equal wages for work of equal nature to Male and Female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.
- (i) Payment of Bonus Act 1965: The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs. 3500/- per month or less. The bonus is to be paid to employees getting Rs. 2500/- per month or above upto Rs. 3500/- per month shall be worked out by taking wages as Rs. 2500/- per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.
- (j) Industrial Dispute Act 1947: the Act lays down the machinery the procedure for resolution of Industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.
- (k) Industrial Employment (Standing Orders) Act 1946: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.
- (l) Trade Unions Act 1926: The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.
- (m) Child Labour (Prohibition & Regulation) Act 1986: The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.
- (n) Inter-State Migrant workmen's (Regulation of Employment & Conditions of Service Act 1979: The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain

facilities such as housing, medical aid, traveling expenses from home upto the establishment and back, etc.

- (o) The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996 : All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as Canteens, First-Aid facilities, Ambulance, Housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the government.
- (p) Factories Act 1948: The Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

18.3.2 Protection of Environment

The Contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as consequence of his methods of operation.

During continuance of the Contract, the Contractor and his Sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made there under, regulations, notifications and bye-laws of the State or Central Government, or local authorities and any other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local authority.

Salient features of some of the major laws that are applicable are given below:

The Water (Prevention and Control of Pollution) Act, 1974, This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly)

as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.

The Air (Prevention and Control of Pollution) Act, 1981, This provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence in the atmosphere of any 'air pollutant', which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

The Environment (Protection) Act, 1986, This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. 'Environment' includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property.

The Public Liability Insurance Act, 1991, This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under Environment (Protection) Act, 1986, and exceeding such quantity as may be specified by notification by the Central Government.

18.3.3 Safety Precautions

18.3.3.1 The Contractor shall observe all applicable regulations regarding safety on the Site.

Unless otherwise agreed, the Contractor shall, from the commencement of work on Site until Taking Over, provide:

- a) fencing, lighting, guarding and watching of the Works, and
- b) temporary roadways, footways, guards and fences which may be necessary for the accommodation and protection of Employer / his representatives and occupiers of adjacent property, the public and others.

18.3.3.2 The Contractor shall ensure proper safety of all the workmen, materials, plant and equipment belonging to him or to Employer or to others, working at the Site. The Contractor shall also be responsible for provision of all safety notices and safety equipment required both by the relevant legislations and the Project Manager, as he may deem necessary.

18.3.3.3 The Contractor will notify well in advance to the Project Manager of his intention to bring to the Site any container filled with liquid or gaseous fuel or explosive or petroleum substance or such chemicals which may involve hazards. The Project Manager shall have the right to prescribe the conditions, under which such container is to be stored, handled and used during the performance of the works and the Contractor shall strictly adhere to and comply with such instructions. The Project Manager shall have the right at his sole discretion to inspect any such container or such construction plant/equipment for which material in the container is required to be used and if in his opinion, its use is not safe, he may forbid its use. No claim due to such prohibition shall be entertained by the Employer and the Employer shall not entertain any claim of the Contractor towards additional safety provisions/conditions to be provided for/constructed as per the Project Manager's instructions.

Further, any such decision of the Project Manager shall not, in any way, absolve the Contractor of his responsibilities and in case, use of such a container or entry thereof into the Site area is forbidden by the Project Manager, the Contractor shall use alternative methods with the approval of the Project Manager without any cost implication to the Employer or extension of work schedule.

18.3.3.4 Where it is necessary to provide and/or store petroleum products or petroleum mixtures and explosives, the Contractor shall be responsible for carrying-out such provision and/or storage in accordance with the rules and regulations laid down in Petroleum Act 1934, Explosives Act, 1948 and Petroleum and Carbide of Calcium Manual published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the Project Manager. In case, any approvals are necessary from the Chief Inspector (Explosives) or any statutory authorities, the Contractor shall be responsible for obtaining the same.

18.3.3.5 All equipment used in construction and erection by Contractor shall meet Indian/International Standards and where such standards do not exist, the Contractor shall ensure these to be absolutely safe. All equipment shall be strictly operated and maintained by the Contractor in accordance with manufacturer's Operation Manual and safety instructions and as per Guidelines/rules of Employer in this regard.

18.3.3.6 Periodical examinations and all tests for all lifting/hoisting equipment & tackles shall be carried-out in accordance with the relevant provisions of Factories Act 1948, Indian Electricity Act 1910 and associated Laws/Rules in force from time to time. A register of such examinations and tests shall be properly maintained by the Contractor and will be promptly produced as and when desired by the Project Manager or by the person authorised by him.

- 18.3.3.7 The Contractor shall be fully responsible for the safe storage of his and his Sub-Contractor's radioactive sources in accordance with BARC/DAE Rules and other applicable provisions. All precautionary measures stipulated by BARC/DAE in connection with use, storage and handling of such material will be taken by the Contractor.
- 18.3.3.8 The Contractor shall provide suitable safety equipment of prescribed standard to all employees and workmen according to the need, as may be directed by the Project Manager who will also have right to examine these safety equipment to determine their suitability, reliability, acceptability and adaptability.
- 18.3.3.9 Where explosives are to be used, the same shall be used under the direct control and supervision of an expert, experienced, qualified and competent person strictly in accordance with the Code of Practice/Rules framed under Indian Explosives Act pertaining to handling, storage and use of explosives.
- 18.3.3.10 The Contractor shall provide safe working conditions to all workmen and employees at the Site including safe means of access, railings, stairs, ladders, scaffoldings etc. The scaffoldings shall be erected under the control and supervision of an experienced and competent person. For erection, good and standard quality of material only shall be used by the Contractor.
- 18.3.3.11 The Contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to the Employer or other Contractors under any circumstances, whatsoever, unless expressly permitted in writing by Employer to handle such fuses, wiring or electrical equipment
- 18.3.3.12 Before the Contractor connects any electrical appliances to any plug or socket belonging to the other Contractor or Employer, he shall:
- a. Satisfy the Project Manager that the appliance is in good working condition;
 - b. Inform the Project Manager of the maximum current rating, voltage and phases of the appliances;
 - c. Obtain permission of the Project Manager detailing the sockets to which the appliances may be connected.
- 18.3.3.13 The Project Manager will not grant permission to connect until he is satisfied that;
- a. The appliance is in good condition and is fitted with suitable plug;
 - b. The appliance is fitted with a suitable cable having two earth conductors, one of which shall be an earthed metal sheath surrounding the cores.

- 18.3.3.14 No electric cable in use by the Contractor/Employer will be disturbed without prior permission. No weight of any description will be imposed on any cable and no ladder or similar equipment will rest against or attached to it.
- 18.3.3.15 No repair work shall be carried out on any live equipment. The equipment must be declared safe by the Project Manager and a permit to work shall be issued by the Project Manager before any repair work is carried out by the Contractor. While working on electric lines/equipment, whether live or dead, suitable type and sufficient quantity of tools will have to be provided by the Contractor to electricians/workmen/officers.
- 18.3.3.16 The Contractors shall employ necessary number of qualified, full time electricians/electrical supervisors to maintain his temporary electrical installation.
- 18.3.3.17 The Contractor employing more than 250 workmen whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as safety officer to supervise safety aspects of the equipment and workmen, who will coordinate with the Project Safety Officer. In case of work being carried out through Sub-Contractors, the Sub-Contractor's workmen/employees will also be considered as the Contractor's employees/workmen for the above purpose.
- The name and address of such Safety Officers of the Contractor will be promptly informed in writing to Project Manager with a copy to Safety Officer-In charge before he starts work or immediately after any change of the incumbent is made during currency of the Contract.
- 18.3.3.18 In case any accident occurs during the construction/ erection or other associated activities undertaken by the Contractor thereby causing any minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be the responsibility of the Contractor to promptly inform the same to the Project Manager in prescribed form and also to all the authorities envisaged under the applicable laws.
- 18.3.3.19 The Project Manager shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipment. In such cases, the Contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove shortcomings promptly. The Contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of work to the Project Manager within 3 days of such stoppage of work and decision of the Project Manager in this respect shall be conclusive and binding on the Contractor.
- 18.3.3.20 The Contractor shall not be entitled for any damages/compensation for stoppage of work due to safety reasons as provided in GCC Sub-Clause 18.3.3.19 above and the period of such stoppage of work will not be taken as an extension of time for completion of work and will not be the ground for waiver of levy of liquidated damages.

18.3.3.21 It is mandatory for the Contractor to observe during the execution of the works, requirements of Safety Rules which would generally include but not limited to following:

Safety Rules

- a) Each employee shall be provided with initial indoctrination regarding safety by the Contractor, so as to enable him to conduct his work in a safe manner.
- b) No employee shall be given a new assignment of work unfamiliar to him without proper introduction as to the hazards incident thereto, both to himself and his fellow employees.
- c) Under no circumstances shall an employee hurry or take unnecessary chance when working under hazardous conditions.
- d) Employees must not leave naked fires unattended. Smoking shall not be permitted around fire prone areas and adequate fire fighting equipment shall be provided at crucial location.
- e) Employees under the influence of any intoxicating beverage, even to the slightest degree shall not be permitted to remain at work.
- f) There shall be a suitable arrangement at every work site for rendering prompt and sufficient first aid to the injured.
- g) The staircases and passageways shall be adequately lighted.
- h) The employees when working around moving machinery, must not be permitted to wear loose garments. Safety shoes are recommended when working in shops or places where materials or tools are likely to fall. Only experienced workers shall be permitted to go behind guard rails or to clean around energized or moving equipment.
- i) The employees must use the standard protection equipment intended for each job. Each piece of equipment shall be inspected before and after it is used.
- j) Requirements of ventilation in underwater working to licensed and experienced divers, use of gum boots for working in slushy or in inundated conditions are essential requirements to be fulfilled.
- k) In case of rock excavation, blasting shall invariably be done through licensed blasters and other precautions during blasting and storage/transport of charge material shall be observed strictly.

18.3.3.22

The Contractor shall follow and comply with all Employer Safety Rules, relevant provisions of applicable laws pertaining to the safety of workmen, employees, plant and equipment as may be prescribed from time to time without any demur, protest or contest or reservations. In case of any

discrepancy between statutory requirement and Employer Safety Rules referred above, the latter shall be binding on the Contractor unless the statutory provisions are more stringent.

18.3.3.23

If the Contractor fails in providing safe working environment as per Employer Safety Rules or continues the work even after being instructed to stop work by the Project Manager as provided in GCC Sub-Clause 18.3.3.19 above, the Contractor shall promptly pay to Employer, on demand by the Employer, compensation at the rate of Rs. 5,000/- per day of part thereof till the instructions are complied with and so certified by the Project Manager. However, in case of accident taking place causing injury to any individual, the provisions contained in GCC Sub-Clause 18.3.3.24 shall also apply in addition to compensation mentioned in this Clause.

18.3.3.24

If the Contractor does not take adequate safety precautions and/or fails to comply with the Safety Rules as prescribed by the Employer or under the applicable law for the safety of the equipment and plant or for the safety of personnel or the Contractor does not prevent hazardous conditions which cause injury to his own employees or employees of other Contractors or Employer's employees or any other person who are at Site or adjacent thereto, then the Contractor shall be responsible for payment of a sum as indicated below to be deposited with the Employer, which will be passed on by the Employer to such person or next to kith and kin of the deceased:

a.	Fatal injury or accident causing death	Rs. 1,000,000/- per person
b.	Major injuries or accident causing 25% or more permanent disablement	Rs. 100,000/- per person

Permanent disablement shall have same meaning as indicated in Workmen's Compensation Act. The amount to be deposited with Employer and passed on to the person mentioned above shall be in addition to the compensation payable under the relevant provisions of the Workmen's Compensation Act and rules framed there under or any other applicable laws as applicable from time to time. In case the Contractor does not deposit the above mentioned amount with Employer, such amount shall be recovered by Employer from any monies due or becoming due to the Contractor under the contract or any other on-going contract.

18.3.3.25 If the Contractor observes all the Safety Rules and Codes, Statutory Laws and Rules during the currency of Contract awarded by the Employer and no accident occurs then Employer may consider the performance of the Contractor and award suitable 'ACCIDENT FREE SAFETY MERITORIOUS AWARD' as per scheme as may be announced separately from time to time.

18.3.3.26 The Contractor shall also submit 'Safety Plan' as per pro-forma specified in Section – Sample Forms and Procedures of the Bidding Documents along with all the requisite documents

mentioned therein and as per check-list contained therein to the Engineer In-Charge for its approval within 60 days of award of Contract.

Further, one of the conditions for release of first progressive payment / subsequent payment towards Services Contract shall be submission of 'Safety Plan' along with all requisite documents and approval of the same by the Engineer In-Charge.

18.4 Opportunities for Other Contractors

18.4.1 The Contractor shall, upon written request from the Employer or the Project Manager, give all reasonable opportunities for carrying out the work to any other contractors employed by the Employer on or near the Site.

18.4.2 If the Contractor, upon written request from the Employer or the Project Manager, makes available to other contractors any roads or ways the maintenance for which the Contractor is responsible, permits the use by such other contractors of the Contractor's Equipment, or provides any other service of whatsoever nature for such other contractors, the Employer shall fully compensate the Contractor for any loss or damage caused or occasioned by such other contractors in respect of any such use or service, and shall pay to the Contractor reasonable remuneration for the use of such equipment or the provision of such services.

18.4.3 The Contractor shall also so arrange to perform its work as to minimize, to the extent possible, interference with the work of other contractors. The Project Manager shall determine the resolution of any difference or conflict that may arise between the Contractor and other contractors and the workers of the Employer in regard to their work.

18.4.4 The Contractor shall notify the Project Manager promptly of any defects in the other contractors' work that come to its notice, and that could affect the Contractor's work. The Project Manager shall determine the corrective measures, if any, required to rectify the situation after inspection of the Facilities. Decisions made by the Project Manager shall be binding on the Contractor.

18.5 **Emergency Work**

If, by reason of an emergency arising in connection with and during the execution of the Contract, any protective or remedial work is necessary as a matter of urgency to prevent damage to the Facilities, the Contractor shall immediately carry out such work.

If the Contractor is unable or unwilling to do such work immediately, the Employer may do or cause such work to be done as the Employer may determine is necessary in order to prevent damage to the Facilities. In such event the Employer shall, as soon as practicable after the occurrence of any such emergency, notify the Contractor in writing of such emergency, the work done and the reasons therefor. If the work done or caused to be done by the Employer is work that the Contractor was liable to do at its own expense under the Contract, the reasonable costs incurred by the Employer in connection

therewith shall be paid by the Contractor to the Employer. In case such work is not in the scope of the Contractor, the cost of such remedial work shall be borne by the Employer.

18.6 Site Clearance

18.6.1 Site Clearance in Course of Performance: In the course of carrying out the Contract, the Contractor shall keep the Site reasonably free from all unnecessary obstruction, store or remove any surplus materials, clear away any wreckage, rubbish or temporary works from the Site, and remove any Contractor's Equipment no longer required for execution of the Contract.

18.6.2 Clearance of Site after Completion: After Completion of all parts of the Facilities, the Contractor shall clear away and remove all wreckage, rubbish and debris of any kind from the Site, and shall leave the Site and Facilities clean and safe.

18.7 Watching and Lighting

The Contractor shall provide and maintain at its own expense all lighting, fencing, and watching when and where necessary for the proper execution and the protection of the Facilities, or for the safety of the owners and occupiers of adjacent property and for the safety of the public.

18.8 Work at Night and on Holidays

18.8.1 Unless otherwise provided in the Contract, no work shall be carried out during the night and on public holidays of the country where the Site is located without prior written consent of the Employer, except where work is necessary or required to ensure safety of the Facilities or for the protection of life, or to prevent loss or damage to property, when the Contractor shall immediately advise the Project Manager, provided that provisions of this GCC Sub-Clause 18.8.1 shall not apply to any work which is customarily carried out by rotary or double-shifts.

18.8.2 Notwithstanding GCC Sub-Clauses 18.8.1 or 18.1.3, if and when the Contractor considers it necessary to carry out work at night or on public holidays so as to meet the Time for Completion and requests the Employer's consent thereto, the Employer shall not unreasonably withhold such consent.

19. Test and Inspection

19.1 The Contractor shall at its own expense carry out at the place of manufacture and/or on the Site all such tests and/or inspections of the Plant and Equipment and any part of the Facilities as are specified in the Contract.

19.2 The Employer and the Project Manager or their designated representatives shall be entitled to attend the aforesaid test and/or inspection, provided that the Employer shall bear all costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.

19.3 Whenever the Contractor is ready to carry out any such test and/or inspection, the Contractor shall give four weeks advance notice of such test and/or inspection and of the place

and time thereof to the Project Manager. The Contractor shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Employer and the Project Manager (or their designated representatives) to attend the test and/or inspection.

19.4 The Contractor shall provide the Project Manager with a certified report of the results of any such test and/or inspection.

If the Employer or Project Manager (or their designated representatives) fails to attend the test and/or inspection, or if it is agreed between the parties that such persons shall not do so, then the Contractor may proceed with the test and/or inspection in the absence of such persons, and may provide the Project Manager with a certified report of the results thereof.

19.5 The Project Manager may require the Contractor to carry out any test and/or inspection not required by the Contract, provided that the Contractor's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of work on the Facilities and/or the Contractor's performance of its other obligations under the Contract, due allowance will be made in respect of the Time for Completion and the other obligations so affected.

19.6 If any Plant and Equipment or any part of the Facilities fails to pass any test and/or inspection, the Contractor shall either rectify or replace such Plant and Equipment or part of the Facilities and shall repeat the test and/or inspection upon giving a notice under GCC Sub-Clause 19.3.

19.7 If any dispute or difference of opinion shall arise between the parties in connection with or arising out of the test and/or inspection of the Plant and Equipment or part of the Facilities that cannot be settled between the parties within a reasonable period of time, it may be referred to an Arbitrator for determination in accordance with GCC Sub-Clause 39.

19.8 The Contractor shall afford the Employer and the Project Manager, at the Employer's expense, access at any reasonable time to any place where the Plant and Equipment are being manufactured or the Facilities are being installed, in order to inspect the progress and the manner of manufacture or installation, provided that the Project Manager shall give the Contractor a reasonable prior notice.

19.9 The Contractor agrees that neither the execution of a test and/or inspection of Plant and Equipment or any part of the Facilities, nor the attendance by the Employer or the Project Manager, nor the issue of any test certificate pursuant to GCC Sub-Clause 19.4, shall release the Contractor from any other responsibilities under the Contract.

19.10 No part of the Facilities or foundations shall be covered up on the Site without the Contractor carrying out any test and/or inspection required under the Contract. The Contractor shall give a reasonable notice to the Project Manager whenever any such part of the Facilities or foundations are ready or about to be ready for test and/or inspection; such test and/or inspection and notice thereof shall be subject to the requirements of the Contract.

19.11 The Contractor shall uncover any part of the Facilities or foundations, or shall make openings in or through the same as the Project Manager may from time to time require at the Site, and shall reinstate and make good such part or parts.

If any parts of the Facilities or foundations have been covered up at the Site after compliance with the requirement of GCC Sub-Clause 19.10 and are found to be executed in accordance with the Contract, the expenses of uncovering, making openings in or through, reinstating, and making good the same shall be borne by the Employer, and the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been delayed or impeded in the performance of any of its obligations under the Contract.

19.12 Fake Inspection Calls/Failure of Material:

All such firms who after giving inspection call do not get the material inspected when the inspection officer visits their works on one pretext or the other or if the material fails during inspection, will have to bear TA/DA for the journey performed by such an Inspecting Officers, which shall be Rs. 15000/- (Outside Punjab), Rs. 5000 (Within Punjab) per visit of each officer. Besides this recovery against each such fake call, a letter of warning shall be issued and it shall be counted towards firm's performance for all intents and purposes. These charges shall be Rs. 15000/- and Rs. 5,000/- per visit of each officer respectively in case the material fails during inspection.

20. Completion of the Facilities and Operational Acceptance

20.1 Completion of the Facilities

20.1.1 Physical Completion

20.1.1.1 As soon as the Facilities or any part thereof has, in the opinion of the Contractor, been completed operationally and structurally and put in a tight and clean condition as specified in the Technical Specifications, excluding minor items not materially affecting the operation or safety of the Facilities, the Contractor shall so notify the Employer in writing.

20.1.2 Pre-Commissioning

20.1.2.1 Within seven (7) days after receipt of the notice from the Contractor under GCC Sub-Clause 20.1.1.1, the Project Manager shall deploy the operating and maintenance personnel and other material if so specified in the corresponding Appendix – 6 (Scope of Works and Supply by the Employer) to the Contract Agreement for Pre-commissioning of the Facilities or any part thereof.

20.1.2.2 As soon as reasonably practicable after the operating and maintenance personnel have been deployed by the Employer and other materials have been provided by the Employer in accordance with GCC Sub-Clause 20.1.2.1, the Contractor shall commence Pre-commissioning of the Facilities or the relevant part thereof, in presence of the

Employer's representatives, as per procedures detailed in Technical Specifications in preparation for Commissioning.

20.1.2.3As soon as all works in respect of Pre-commissioning are successfully completed and, in the opinion of the Contractor, the Facilities or any part thereof is ready for Commissioning, the Contractor shall notify the Project Manager in writing.

20.1.2.4The Project Manager shall, within fourteen (14) days after receipt of the Contractor's notice under GCC Sub-Clause 20.1.2.3, notify the Contractor in writing of any defects and/or deficiencies.

20.1.2.5If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in GCC Sub-Clause 20.1.2.2. If in the opinion of the Contractor, the Facilities or any part thereof is now ready for Commissioning, the Contractor shall again notify the Project Manager in writing. If further defects and/or deficiencies are not notified by the Project Manager and if the Project Manager is satisfied that the Pre-commissioning of Facilities or that part thereof have been successfully completed, the Project Manager shall, within seven (7) days after receipt of the Contractor's such notice, advise the Contractor to proceed with the Commissioning of the Facilities or part thereof.

20.1.2.6If the Project Manager fails to inform the Contractor of any defects and/or deficiencies within fourteen (14) days after receipt of the Contractor's notice under GCC Sub-Clause 20.1.2.4 or within seven (7) days after receipt of the Contractor's notice on completion of repeat procedure under GCC Sub-Clause 20.1.2.5, then the Pre-commissioning of the Facilities or that part thereof shall be considered to have been successfully completed as of the date of the Contractor's notice.

20.1.2.7As soon as possible after Pre-commissioning, the Contractor shall complete all outstanding minor items so that the Facilities are fully in accordance with the requirements of the Contract, failing which the Employer will undertake such completion and deduct the costs thereof from any monies owing to the Contractor.

20.1.2.8In the event that the Contractor is unable to proceed with the Pre-commissioning of the Facilities pursuant to Sub-Clause 20.1.2 for reasons attributable to the Employer either on account of non-availability of other facilities under the responsibilities of other contractor(s), or for reasons beyond the Employer's control, the following provisions shall apply:

When the Contractor is notified by the Project Manager that he will be unable to proceed with the activities and obligations pursuant to above GCC Sub-Clause 20.1.2.8, the Contractor shall be entitled to the following:

- a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to GCC Sub-Clause 21.2.

- b) payments due to the Contractor in accordance with the provisions specified in Appendix I (Terms and Procedures of Payment) to the Contract Agreement, which would have not been payable in normal circumstances due to non-completion of the said activities and obligations, shall be released to the Contractor against submission of a security in the form of a bank guarantee of equivalent amount acceptable to the Employer, and which shall become null and void when the Contractor will have complied with its obligations regarding these payments, subject to the provisions of GCC Sub-Clause 21.2.9 below.

20.1.2.9 In the event that the period of suspension under GCC Sub-Clause 20.1.2.8 actually exceeds one hundred eighty (180) days, the following provisions shall apply:

- a) The Contractor shall be entitled to the following:
 - i) the expenses payable by the Contractor to the Bankers toward the extension of above security and extension of other securities under the Contract, of which validity need to be extended, shall be reimbursed to the Contractor by the Employer against documentary evidence.
 - ii) the additional charges toward the care of the Facilities pursuant to GCC Sub-Clause 28.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in GCC Sub-Clause 20.1.2.10 below. The provisions of GCC Sub-Clause 29.2 shall apply to the Facilities during the same period.
- b) The Employer and the Contractor shall mutually agree to any additional compensation payable to the Contractor

20.1.2.10 As and when, after the period of suspension under GCC Sub-Clause 20.1.2.8, the Contractor is notified by the Project Manager that the Facilities are ready for Pre-commissioning, the Contractor shall proceed without delay in performing all activities and obligations under the Contract.

20.1.3 Commissioning

20.1.3.1 Commissioning of the Facilities or any part thereof shall be commenced by the Contractor immediately after being advised by the Project Manager, pursuant to GCC Sub-Clause 20.1.2.5 or immediately after the Pre-commissioning is considered to be completed under GCC Sub-Clause 20.1.2.6.

20.1.3.1.1 Commissioning of the Facilities or any part thereof shall be completed by the Contractor as per procedures detailed in Technical Specifications.

20.1.3.2 The Employer shall, to the extent specified in Appendix – 6 (Scope of works and supply by the Employer), deploy the operating and maintenance personnel and supply all raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other materials required for commissioning.

20.1.3.3 In the event that the Contractor is unable to proceed with the Commissioning of the Facilities pursuant to Sub-Clause 20.1.3 for reasons attributable to the Employer either on account of non-availability of other facilities under the responsibilities of other contractor(s), or for reasons beyond the Employer's control, the provisions of GCC Sub-Clause 20.1.2.8 to 20.1.2.9 shall apply.

20.1.3.4 As and when, after the period of suspension under GCC Sub-Clause 20.1.2.8, the Contractor is notified by the Project Manager that the Facilities are ready for Commissioning, the Contractor shall proceed without delay in performing all activities and obligations under the Contract.

20.1.4 Trial - Operation

20.1.4.1 Trial–Operation of the Facilities or any part thereof shall be commenced by the Contractor immediately after the Commissioning is completed pursuant to GCC Sub-Clause 20.1.3.1.1.

20.1.4.2 Trial – Operation of the Facilities or any part thereof shall be completed by the Contractor for the period specified in Technical Specification (or for a continuous period of 24 hours where such period is not specified in Technical Specification) and as per procedures detailed in Technical Specifications.

20.1.4.3 At any time after the events set out in GCC Sub-Clause 20.1.4.2 have occurred, the Contractor may give a notice to the Project Manager requesting the issue of an Taking Over Certificate in the form provided in the Bidding Documents or in another form acceptable to the Employer in respect of the Facilities or the part thereof specified in such notice as of the date of such notice.

20.1.4.4 The Project Manager shall within twenty-one (21) days after receipt of the Contractor's notice, issue an Taking Over Certificate.

20.1.5 Taking Over

20.1.5.1 Upon successful Trial – Operation of the Facilities or any part thereof, pursuant to GCC Sub-Clause 20.1.4, the Project Manager shall issue to the Contractor a Taking Over Certificate as a proof of the acceptance of the Facilities or any part thereof. Such certificate shall not relieve the Contractor of any of his obligations which otherwise survive, by the terms and conditions of Contract after issue of such certificate.

20.1.5.2 If within twenty one (21) days after receipt of the Contractor's notice, the Project Manager fails to issue the Taking Over Certificate or fails to inform the Contractor in writing of the justifiable reasons why the Project Manager has not issued the Taking Over Certificate, the Facilities or the relevant part thereof shall be deemed to have been Taken Over as at the date of the Contractor's said notice.

20.1.5.3 Upon Taking Over of the Facilities or any part thereof, the Employer shall be responsible for the care and custody of the Facilities or the relevant part thereof, together with the risk of loss or damage thereto, and shall thereafter take over the Facilities or the relevant part thereof.

20.2 Operational Acceptance

20.2.1 Deleted

20.2.2 Operational Acceptance

20.2.2.1 Operational Acceptance shall occur in respect of the Facilities or any part thereof as mentioned below:

- (I) In case no Functional Guarantees are applicable, Operational Acceptance shall occur when the Facilities or part thereof have been successfully Commissioned and Trial – Operation for the specified period have been successfully completed.
- (II) In case Functional Guarantees are applicable, Operational Acceptance shall occur when the Functional Guarantees are met or the Contractor has paid liquidated damages specified in GCC Sub-Clause 23.3 hereof; or

20.2.2.2 At any time after any of the events set out in GCC Sub-Clause 20.2.2.1 have occurred, the Contractor may give a notice to the Project Manager requesting the issue of an Operational Acceptance Certificate in the form provided in the Bidding Documents or in another form acceptable to the Employer in respect of the Facilities or the part thereof specified in such notice as of the date of such notice.

20.2.2.3 The Project Manager shall within twenty-one (21) days after receipt of the Contractor's notice, issue an Operational Acceptance Certificate.

20.2.2.4 Upon Operational Acceptance, pursuant to GCC Sub-Clause 20.2.2.2, the Project Manager shall issue to the Contractor a Operational Acceptance Certificate as a proof of the final acceptance of the Plant and Equipment. Such certificate shall not relieve the Contractor of any of his obligations which otherwise survive, by the terms and conditions of Contract after issue of such certificate.

20.2.2.5 If within twenty one (21) days after receipt of the Contractor's notice, the Project Manager fails to issue the Operational Acceptance Certificate or fails to inform the Contractor in writing of the justifiable reasons why the Project Manager has not issued the Operational Acceptance Certificate, the Facilities or the relevant part thereof shall be deemed to have been accepted as at the date of the Contractor's said notice.

20.3 Partial Acceptance

20.3.1 If the Contract specifies that Commissioning shall be carried out in respect of parts of the Facilities, the provisions relating to Commissioning including the Trial – Operation and Guarantee Test shall apply to each such part of the Facilities individually, and the Operational Acceptance Certificate shall be issued accordingly for each such part of the Facilities.

F. Guarantees and Liabilities

21. Completion Time Guarantee

21.1 The Contractor guarantees that it shall attain Completion of the Facilities (or a part for which a separate time for completion is specified) within the Time for Completion specified in the GCC Sub-Clause 4.2, or within such extended time to which the Contractor shall be entitled under GCC Clause 34 hereof.

21.2 If the Contractor fails to comply with the Time for Completion in accordance with Clause GCC 21 for the whole of the facilities, (or a part for which a separate time for completion is agreed) then the Contractor shall pay to the Employer a sum equivalent to half percent (0.5%) of the Contract Price plus GST payable thereon as liquidated damages for such default and not as a penalty, without prejudice to the Employer's other remedies under the Contract, for each week or part thereof which shall elapse between the relevant Time for Completion and the date stated in Taking Over Certificate of the whole of the Works (or a part for which a separate time for completion is agreed) subject to the limit of five percent (5%) of Contract Price plus GST payable thereon. The Employer may, without prejudice to any other method of recovery, deduct the amount of such damages from any monies due or to become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations and liabilities under the Contract.

21.3 No bonus will be given for earlier Completion of the Facilities or part thereof.

22. Defect Liability Period/Warranty

22.1 The Contractor warrants that the Facilities or any part thereof shall be free from defects in the design, engineering, materials and workmanship of the Plant and Equipment supplied and of the work executed.

22.2 The Defect Liability Period shall be as under:

- (i) Sixty (60) months for OPGW and its allied accessories including hardware sets, joint box, approach cable and FODP from the date of Taking Over/Commissioning of Facilities (or any part thereof).

Additional 2 years warrantee requirements indicated in Clause 1.1.2(A)(II)/(III) of Annexure-A (ITB), as applicable.

- (ii) Twelve (12) months for Indoor Equipments (FOTE) and its allied accessories/cards including DCPS from the date of Taking Over/Commissioning of Facilities (or any part thereof). Thereafter supplier/bidder shall provide Preventive Maintenance (AMC) for next six (6) years of Indoor Equipment and its allied accessories/cards and DCPS without claiming any other maintenance/service/man-power charges and its to-&-fro charges, while carrying out Preventive Maintenance or attending or rectifying faults in such FOTE equipments.

If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the Plant and Equipment supplied or of the work executed by the Contractor, the Contractor shall promptly, in consultation and agreement with the Employer regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good (as the Contractor shall, at its discretion, determine) such defect as well as any damage to the Facilities caused by such defect. The Contractor shall not be responsible for the repair, replacement or making good of any defect or of any damage to the Facilities arising out of or resulting from any of the following causes:

- (a) Improper operation or maintenance of the Facilities by the Employer
- (b) Operation of the Facilities outside specifications provided in the Contract
- (c) Normal wear and tear.

22.3 The Contractor's obligations under this GCC Clause 22 shall not apply to

- (a) Any materials that are supplied by the Employer under GCC Sub- Clause 17.2, are normally consumed in operation, or have a normal life shorter than the Defect Liability Period stated herein
- (b) Any designs, specifications or other data designed, supplied or specified by or on behalf of the Employer or any matters for which the Contractor has disclaimed responsibility herein
- (c) Any other materials supplied or any other work executed by or on behalf of the Employer, except for the work executed by the Employer under GCC Sub-Clause 22.7.

- 22.4 The Employer shall give the Contractor a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. The Employer shall afford all reasonable opportunity for the Contractor to inspect any such defect.
- 22.5 The Employer shall afford the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its obligations under this GCC Clause 22. The Contractor may, with the consent of the Employer, remove from the Site any Plant and Equipment or any part of the Facilities that are defective if the nature of the defect, and/or any damage to the Facilities caused by the defect, is such that repairs cannot be expeditiously carried out at the Site.
- 22.6 If the repair, replacement or making good is of such a character that it may affect the efficiency of the Facilities or any part thereof, the Employer may give to the Contractor a notice requiring that tests of the defective part of the Facilities shall be made by the Contractor immediately upon completion of such remedial work, whereupon the Contractor shall carry out such tests.
- If such part fails the tests, the Contractor shall carry out further repair, replacement or making good (as the case may be) until that part of the Facilities passes such tests.
- 22.7 If the Contractor fails to commence the work necessary to remedy such defect or any damage to the Facilities caused by such defect within a reasonable time (which shall in no event be considered to be less than fifteen (15) days), the Employer may, following notice to the Contractor, proceed to do such work, and the reasonable costs incurred by the Employer in connection therewith shall be paid to the Employer by the Contractor or may be deducted by the Employer from any monies due the Contractor or claimed under the Performance Security.
- 22.8 If the Facilities or any part thereof cannot be used by reason of such defect and/or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Employer because of any of the aforesaid reasons.

Upon correction of the defects in the Facilities or any part thereof by repair/replacement, such repair/replacement shall have the Defect Liability Period extended by a period mentioned in GCC Sub-Clause 22.2 from the time of such replacement/repair of the facilities or any part thereof. However, upon correction of the defects in the OPGW and its allied accessories as mentioned in GCC Sub-Clause 22.2.1 by repair/replacement, such repair/replacement shall have the Defect Liability Period extended by a period of 2 years from the time of such repair/replacement of the said equipment to rectify the defect, or upto the expiry of period mentioned in GCC Sub-Clause 22.2, whichever is later. However, upon correction of the defects in case of FOTE equipments as specified in GCC Sub-

Clause 22.2 (ii), such repair/replacement shall have the Defect Liability Period extended by a period of one (1) year from the time of such repair/replacement of the said equipment to rectify the defect, or upto the expiry of period mentioned in GCC Sub-Clause 22.2, whichever is later.

22.8.1 --DELETED--

22.9 Except as provided in GCC Clauses 22 and 29, the Contractor shall be under no liability whatsoever and howsoever arising, and whether under the Contract or at law, in respect of defects in the Facilities or any part thereof, the Plant and Equipment, design or engineering or work executed that appear after Defect Liability Period except for the liability towards obligations that may survive in terms of the Contract after Defect Liability Period, except where such defects are the result of the gross negligence, fraud, criminal or willful action of the Contractor.

23. Deleted.

24. Equipment Performance Guarantees:-

24.1 Deleted.

24.2 If the guarantees specified in Appendix – 8 (Guarantees, Liquidated Damages for Non – Performance) to the Contract Agreement are not established, then the Employer shall, at the Employer’s discretion either

- (a) Reject the equipment, or
- (b) Accept the equipment after assessing liquidated damages in accordance with the provision detailed under against the Contractor and such amounts shall be deducted from the Contract Price or otherwise recovered from the Contractor:-

LD for Non-Performance of the Equipment

Deleted

24.3 Deleted.

24.4 Whenever the Employer exercises its option to accept the equipment after levy of liquidated damages, the payment of liquidated damages under GCC Sub-Clause 24.2, up to the limitation of liability specified as under, shall completely satisfy the Contractor’s guarantees under GCC Sub-Clause 24.2, and the Contractor shall have no further liability whatsoever to the Employer in respect thereof.

25. Patent Indemnity

25.1 The Contractor shall, subject to the Employer’s compliance with GCC Sub-Clause 25.2, indemnify and hold harmless the Employer and its employees and officers

from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Employer may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract by reason of: (a) the installation of the Facilities by the Contractor or the use of the Facilities in the country where the Site is located; and (b) the sale of the products produced by the Facilities in any country.

Such indemnity shall not cover any use of the Facilities or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, any infringement resulting from the use of the Facilities or any part thereof, or any products produced thereby in association or combination with any other equipment, plant or materials not supplied by the Contractor, pursuant to the Contract Agreement.

- 25.2 If any proceedings are brought or any claim is made against the Employer arising out of the matters referred to in GCC Sub-Clause 25.1, the Employer shall promptly give the Contractor a notice thereof, and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the twenty-eight (28) day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.

The Employer shall, at the Contractor's request, afford all available assistance to the Contractor in conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.

- 25.3 The Employer shall indemnify and hold harmless the Contractor and its employees, officers and Subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Contractor may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided or designed by or on behalf of the Employer.

26. Limitation of Liability

- 26.1 Except in cases of gross negligence or willful misconduct,

- (a) The Contractor and the Employer shall not be liable to the other party for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Contractor to pay liquidated damages to the Employer and
- (b) The aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.

G. Risk Distribution

27. Transfer of Ownership

- 27.1 Ownership of the Plant and Equipment (including spare parts) to be imported into India shall be transferred to the Employer upon loading on to the mode of transport to be used to convey the Plant and Equipment from the country of origin to that country and upon endorsement of the dispatch documents in favour of the Employer.
- 27.2 Ownership of the Plant and Equipment (including spare parts) procured in India, shall be transferred to the Employer upon loading on to the mode of transport to be used to carry the Plant and Equipment from the works to the site and upon endorsement of the dispatch documents in favour of the Employer.
- 27.3 Ownership of the Contractor's Equipment used by the Contractor and its Subcontractors in connection with the Contract shall remain with the Contractor or its Subcontractors.
- 27.4 Ownership of any Plant and Equipment in excess of the requirements for the Facilities shall revert to the Contractor upon Completion of the Facilities or at such earlier time when the Employer and the Contractor agree that the Plant and Equipment in question are no longer required for the Facilities provided quantity of any Plant and Equipment specifically stipulated in the Contract shall be the property of the Employer whether or not incorporated in the Facilities.
- 27.5 Notwithstanding the transfer of ownership of the Plant and Equipment, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor pursuant to GCC Clause 28 (Care of Facilities) hereof until Completion of the Facilities and Taking Over pursuant to GCC Clause 20 or the part thereof, if any, as per GCC Sub-Clause 1.1(e) in which such Plant and Equipment are incorporated.

28. Care of Facilities

28.1 The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of Taking Over Certificate pursuant to GCC Clause 20 or, where the Contract provides for Completion of the Facilities in parts, until the date of Completion of the relevant part, and shall make good at its own cost any loss or damage that may occur to the Facilities or the relevant part thereof from any cause whatsoever during such period. The Contractor shall also be responsible for any loss or damage to the Facilities caused by the Contractor or its Subcontractors in the course of any work carried out, pursuant to GCC Clause 22. Notwithstanding the foregoing, the Contractor shall not be liable for any loss or damage to the Facilities or that part thereof caused by any use or occupation by the Employer or any third party (other than a Subcontractor) authorized by the Employer of any part of the Facilities.

29. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification

29.1 The Contractor shall indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, in respect of the death or injury of any person or loss of or damage to any property (other than the Facilities whether accepted or not), arising in connection with the supply and installation of the Facilities and by reason of the negligence of the Contractor or its Subcontractors, or their employees, officers or agents, except any injury, death or property damage caused by the negligence of the Employer, its contractors, employees, officers or agents.

29.2 If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under GCC Sub-Clause 29.1, the Employer shall promptly give the Contractor a notice thereof and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the twenty-eight (28) day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.

The Employer shall, at the Contractor's request, afford all available assistance to the Contractor in conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.

29.3 Notwithstanding anything in this Contract to the contrary, it is agreed that neither the Contractor nor the Employer shall be liable to the other party for loss of

production, loss of profit, loss of use or any other indirect or consequential damages.

30. Insurance

30.1 To the extent specified in the corresponding Appendix-3 (Insurance Requirements) to the Contract Agreement, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified in the said Appendix. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, who should not unreasonably withhold such approval.

(a) Marine Cargo Policy/Transit Insurance Policy:

(I)(i) Marine Cargo policy for imported equipment

The Contractor shall take the Marine Cargo Policy for Plant and Equipment including Mandatory Spares to be supplied from abroad wherein export/import including inland transit is involved for the movement of the Plant and Equipment including mandatory Spares. The policy shall cover movement of Plant and Equipment including mandatory Spares from the manufacturer's works to the project's warehouse at final destination site. The policy shall cover all risk for loss or damage that may occur during transit of Plant and Equipment from the Contractor/sub-Contractor's works or stores until arrival at project's warehouse/ store at final destination. Institute Cargo Clause (ICC) 'A' along with war & Strike Riots & Civil Commotion (SRCC) cover shall be taken.

(I) (ii) Transit Insurance Policy for indigenous equipment Similarly, Transit Insurance Policy shall be taken wherein only inland transit is involved for the movement of Plant and Equipment including mandatory Spares supplied from within India. The policy shall cover movement of Plant and Equipment including mandatory Spares from the manufacturer's works to the project's warehouse at final destination site. Inland Transit Clause (ITC) 'A' along with war & Strike Riots & Civil Commotion (SRCC) extension cover shall be taken.

(II) If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.

(III) The Contractor shall take the policy in the joint names of Employer and the Contractor. The policy shall indicate the Employer as the beneficiary. However, if the Contractor is having an open policy for its line of business, it should obtain an endorsement of the open cover policy from the insurance company indicating that the dispatches against this Contract are duly covered under its open policy and include the name of the Employer as jointly Insured in the endorsements to the open policy.

(b) Erection All Risk Policy/Contractor All Risk Policy:

- (I) The policy should cover all physical loss or damage to the facility at site during storage, erection and commissioning covering all the perils as provided in the policy as a basic cover and the add on covers as mentioned at Sl. No. (III) below.
- (II) The Contractor shall take the policy in the joint name of Employer and the Contractor. All these policies shall indicate Employer as the beneficiary. The policy shall be kept valid till the date of the Operational Acceptance of the project and the period of the coverage shall be determined with the approval of the Employer.

If the work is completed earlier than the period of policy considered, the Contractor shall obtain the refund as per provisions of the policy and pass on the benefit to Employer. In case no refund is payable by the insurance company then the certificate to that effect shall be submitted to Employer at the completion of the project.

(III) The following add-on covers shall also be taken by the Contractor:

- i) Earthquake
- ii) Terrorism
- iii) Escalation cost (approximately @10% of sum insured on annual basis)
- iv) Extended Maintenance cover for Defect Liability Period
- v) Design Defect
- vi) Other add-on covers viz., 50-50 clause, 72 hours clause, loss minimization clause, waiver of subrogation clause (for projects of more than 100 crores, cover for offsite storage/fabrication (over 100 crores).

(IV) Third Party Liability cover with cross Liability within Geographical limits of India as on ADD-on cover to the basic EAR cover:

The third party liability add-on cover shall cover bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or

damage to property (including the Employer's property and any parts of the Facilities which have been accepted by the Employer) occurring in connection with supply and installation of the Facilities.

- (V) As per para 30.8 below, the cost of insurance premium is to be reimbursed to the Contractor for Owner Supplied Materials(OSM) for which the insurer is to be finalized by the Contractor as detailed therein. Alternatively, the Contractor may take a single policy covering the entire cost of the project including the cost of OSM. For this purpose, the Contractor shall submit documentary evidence for the premium paid for the entire project to the Employer and Employer shall reimburse to the Contractor the proportion of premium equal to value of OSM to total sum insured.
- (VI) If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.

(c) Automobile Liability Insurance

The Contractor shall ensure that all the vehicles deployed by the Contractor or its Subcontractors (whether or not owned by them) in connection with the supply and installation of the Facilities in the project are duly insured as per RTA act. Further the Contractor or its Subcontractors may also take comprehensive policy(own damage plus third party liability) of each individual vehicles deployed in the project on their own discretion in their own name to protect their own interest.

(d) Workmen Compensation Policy:

- (I) Workmen Compensation Policy shall be taken by the Contractor in accordance with the statutory requirement applicable in India. The Contractor shall ensure that all the workmen employed by the Contractor or its Subcontractors for the project are adequately covered under the policy.
- (II) The policy may either be project specific covering all men of the Contractor and its Subcontractors. The policy shall be kept valid till the date of Operational Acceptance of the project.

Alternatively, if the Contractor has an existing 'Workmen Compensation Policy' for all its employees including that of the Subcontractor(s), the

Contractor must include the interest of the Employer for this specific Project in its existing 'Workmen Compensation Policy'.

(III) Without relieving the Contractor of its obligations and responsibilities under this Contract, before commencing work the Contractor shall insure against liability for death of or injury to persons employed by the Contractor including liability by statute and at common law. The insurance cover shall be maintained until all work including remedial work is completed including the Defect Liability Period. The insurance shall be extended to indemnify the Principal for the Principal's statutory liability to persons employed by the Contractor.

The Contractor shall also ensure that each of its Subcontractors shall effect and maintain insurance on the same basis as the 'Workmen Compensation Policy' effected by the Contractor.

(e) Contractor's Plant and Machinery (CPM) Insurance

The Employer (including without limitation any consultant, servant, agent or employee of the Employer) shall not in any circumstances be liable to the Contractor for any loss of or damage to any of the Contractor's Equipment or for any losses, liabilities, costs, claims, actions or demands which the Contractor may incur or which may be made against it as a result of or in connection with any such loss or damage.

- 30.2 The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 30.1, except for the Third Party Liability, Workmen Compensation Policy Insurances, and the Contractor's Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 30.1 except for the Cargo Insurance During Transport, Workmen Compensation Policy Insurances. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.
- 30.3 The Contractor shall, in accordance with the provisions of the corresponding Appendix – 3 (Insurance Requirements) to the Contract Agreement, deliver to the Employer certificates of insurance (or copies of the insurance policies) as evidence that the required policies are in full force and effect. The certificates shall provide that no less than twenty-one (21) days' notice shall be given to the Employer by insurers prior to cancellation or material modification of a policy.
- 30.4 The Contractor shall ensure that, where applicable, its Subcontractor(s) shall take out and maintain in effect adequate insurance policies for their personnel and vehicles and for work executed by them under the Contract, unless such Subcontractors are covered by the policies taken out by the Contractor.

- 30.5 The Employer shall at its expense take out and maintain in effect during the performance of the Contract those insurances specified in the corresponding Appendix – 3 (Insurance Requirements) to the Contract Agreement, in the sums and with the deductibles and other conditions specified in the said Appendix. The Contractor and the Contractor's Subcontractors shall be named as co-insureds under all such policies. All insurers' rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies. The Employer shall deliver to the Contractor satisfactory evidence that the required insurances are in full force and effect. The policies shall provide that not less than twenty-one (21) days' notice shall be given to the Contractor by all insurers prior to any cancellation or material modification of the policies. If so requested by the Contractor, the Employer shall provide copies of the policies taken out by the Employer under this GCC Sub-Clause 30.5.
- 30.6 If the Contractor fails to take out and/or maintain in effect the insurances referred to in GCC Sub-Clause 30.1, the Employer may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Contractor under the Contract any premium that the Employer shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Contractor. If the Employer fails to take out and/or maintain in effect the insurances referred to in GCC 30.5, the Contractor may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Employer under the Contract any premium that the Contractor shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Employer.
- 30.7 Unless otherwise provided in the Contract, the Contractor shall prepare and conduct all and any claims made under the policies effected by it pursuant to this GCC Clause 30, and the monies payable by any insurers under all the insurance except Third Party Liability Insurance and Workmen Compensation Policy, shall be paid to the joint account of the Employer and the Contractor as mutually agreed and such amounts paid shall be apportioned between the Employer and the Contractor in accordance with the respective responsibilities under the Contract. The Employer shall give to the Contractor all such reasonable assistance as may be required by the Contractor. With respect to insurance claims in which the Employer's interest is involved, the Contractor shall not give any release or make any compromise with the insurer without the prior written consent of the Employer. With respect to insurance claims in which the Contractor's interest is involved, the Employer shall not give any release or make any compromise with the insurer without the prior written consent of the Contractor.
- 30.8 Further all equipment and materials being supplied by Employer for the erection (as per Technical Specification) shall be kept insured by the Contractor against any loss, damage, pilferage, theft, fire, etc. from the point of unloading up to the time of taking over by Employer including handling, transportation, storage, erection,

testing and commissioning etc. The premium paid to the Insurance company by the Contractor for such insurance shall be reimbursed by Employer to the Contractor. The Contractor shall obtain competitive quotation for such insurance and shall take prior approval from Employer before taking the insurance. The insurable value of the equipment being supplied by Employer shall be intimated to the Contractor for arranging the insurance.

- 30.9 It will be the responsibility of the Contractor to lodge, pursue and settle all claims with the insurance company in case of any damage, loss, theft, pilferage or fire during execution of Contract and Employer shall be kept informed about it. The Contractor shall replace the lost/damaged materials promptly irrespective of the settlement of the claims by the underwriters and ensure that the work progress is as per agreed schedules. The losses, if any, in such replacement will have to be borne by the Contractor.

31. Change in Laws and Regulations

- 31.1 If, after the date seven (07) days prior to the date of Bid Opening, any law, regulation, ordinance, order or by-law having the force of law is enacted, promulgated, abrogated or changed in India (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the costs and expenses of the Contractor and/or the Time for Completion, the Contract Price shall be correspondingly increased or decreased, and/or the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract. However, these adjustments shall be applicable for all the transactions between the Employer and the Contractor for supply of goods and services under the Contract but shall not be applicable on procurement of raw materials, intermediary components etc. by the Contractor for which the Employer shall be the sole judge. Notwithstanding the foregoing, such additional or reduced costs shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with the Appendix-2 to the Contract Agreement.

32. Force Majeure

- 32.1 "Force Majeure" shall mean any event beyond the reasonable control of the Employer or of the Contractor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected, and shall include, without limitation, the following:
- (a) war, hostilities or warlike operations (whether war be declared or not), invasion, act of foreign enemy and civil war,
 - (b) rebellion, revolution, insurrection, mutiny, usurpation of government, conspiracy, riot and civil commotion,

(c) earthquake, landslide, volcanic activity, flood or cyclone, or other inclement weather condition, nuclear and pressure waves or other natural or physical disaster,

- 32.2 Neither party shall be considered to be in default or in breach of his obligations under the Contract to the extent that performance of such obligation is prevented by any circumstances of Force majeure, which arises after date of Notification of Award.
- 32.3 If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event.
- 32.4 The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The Time for Completion shall be extended in accordance with GCC Clause 34.

H. Change in Contract Elements

33. Change in the Facilities

33.1 Introducing a Change

- 33.1.1 Subject to GCC Sub-Clauses 33.2.5 and 33.2.7, the Employer shall have the right to propose, and subsequently require, that the Project Manager order the Contractor from time to time during the performance of the Contract to make any change, modification, addition or deletion to, in or from the Facilities (hereinafter called "Change"), provided that such Change falls within the general scope of the Facilities and does not constitute unrelated work and that it is technically practicable, taking into account both the state of advancement of the Facilities and the technical compatibility of the Change envisaged with the nature of the Facilities as specified in the Contract.
- 33.1.2 The Contractor may from time to time during its performance of the Contract propose to the Employer (with a copy to the Project Manager) any Change that the Contractor considers necessary or desirable to improve the quality, efficiency or safety of the Facilities. The Employer may at its discretion approve or reject any Change proposed by the Contractor, provided that the Employer shall approve any Change proposed by the Contractor to ensure the safety of the Facilities.
- 33.1.3 Changes made necessary because of any default of the Contractor in the performance of its obligations under the Contract shall be not be deemed to

be a Change, and such change shall not result in any adjustment of the Contract Price or the Time for Completion.

- 33.1.4 The procedure on how to proceed with and execute Changes is specified in GCC Sub-Clauses 33.2 and 33.3.

33.2 Changes Originating from Employer

- 33.2.1 The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices included in the Contract. If such rates and prices are inequitable, the parties thereto shall agree on specific rates for the valuation of the Change.
- 33.2.2 The Contract Price for (i) the items for which quantities have been indicated as lump-sum or lot or set and/or (ii) where the quantities are to be estimated by the Contractor shall remain constant unless there is change made in the Scope of Work by Employer. The quantities and unit prices (i) subsequently arrived while approving the Bill of Quantities (BOQ)/Billing breakup of lump-sum quantities/lot/Set and/or (ii) estimated by the Contractor shall be for on account payment purpose only. In case additional quantities, over and above the quantities in BOQ/billing breakup and /or estimated by the Contractor, are required for successful completion of the scope of work as per Technical Specification, the Contractor shall execute additional quantities of these items for which no additional payment shall be made over and above the lump-sum Contract Price. In case quantities of these items supplied at site are in excess of that required for successful completion of scope of work, such additional quantities shall be the property of the Contractor and they shall be allowed to take back the same from the site for which no deduction from the lump-sum Contract Price shall be made. Further, in case actual requirement of quantities for successful completion of scope of work is less than the quantities identified in the approved BOQ /billing breakup and/or estimated by the Contractor, the lump-sum contract price shall remain unchanged and no deduction shall be made from the lump-sum price due to such reduction of quantities.

It shall be the responsibility of the Contractor to pay all statutory taxes, duties and levies to the concerned authorities for such surplus material which would otherwise have been, lawfully payable in case of non-deemed export contracts. The Contractor shall submit an indemnity bond to keep Employer harmless from any liability, before release of such material to the Contractor by Employer.

Set/Lot/Lump-sum shall be governed as per the requirement of the corresponding item description read in conjunction with relevant provisions of Technical Specifications and the Billing breakup referred to above shall be

issued by the Employer based on Contractor's request, if and as may be required during the currency of the Contract.

HSN/SAC has not been indicated in the Contract for lumpsum quantities/lot/Set as each of these consists of many items for which billing break up shall be furnished during contract execution. GST shall be reimbursed on these items based on HSN /SAC for these items furnished along with billing breakup. However, the reimbursement shall be limited to the amount derived based on the rate indicated in the contract or actual, whichever is less.

- 33.2.3 If before or during the preparation of the Change Proposal it becomes apparent that the aggregate effect of compliance therewith and with all other Change Orders that have already become binding upon the Contractor under this GCC Clause 33 would be to increase or decrease the Contract Price as originally set forth in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement by more than the percentage specified, the Employer and the Contractor shall mutually agree on specific rates for valuation of the Change beyond the specified percentage.

Percentage for the Change Proposal under this Clause shall be limited to Fifteen (15) percent.

- 33.2.4 If rates and prices of any change are not available in the Contract, the parties thereto shall agree on specific rates for the valuation of the change and all matters therein related to the change. Based on the same, the Employer shall, if it intends to proceed with the Change, issue the Contractor with a Change Order.
- 33.2.5 The Employer shall issue the Contractor with a Change Order pursuant to GCC Sub-Clause 33.2 by way of amendment to the Contract or in any other manner deemed appropriate. Even if the Employer and the Contractor cannot reach agreement on the price for the Change, an equitable adjustment to the Time for Completion, or any other matters related to the Change Proposal, the Employer may nevertheless instruct the Contractor to proceed with the Change by issue of a "Pending Agreement Change Order" ("Pending Agreement Amendment").

Upon receipt of a Pending Agreement Change Order, the Contractor shall immediately proceed with effecting the Changes covered by such Order. The parties shall thereafter attempt to reach agreement on the outstanding issues under the Change Proposal.

If the parties cannot reach agreement within sixty (60) days from the date of issue of the Pending Agreement Change Order, then the matter may be

referred to the Arbitrator in accordance with the provisions of GCC Clause 38 & 39.

33.3 Changes Originating from Contractor

33.3.1 If the Contractor proposes a Change pursuant to GCC Sub-Clause 33.1.2, the Contractor shall submit to the Project Manager a written “Request for Change Proposal”, giving reasons for the proposed Change and which shall include the following:

- (a) Brief description of the Change
- (b) Effect on the Time for Completion
- (c) Estimated cost of the Change
- (d) Effect on Functional Guarantees (if any)
- (e) Effect on any other provisions of the Contract.

Upon receipt of the Request for Change Proposal, the parties shall follow the procedures outlined in GCC Sub-Clauses 33.2.1 and 33.2.5. However, should the Employer choose not to proceed, the Contractor shall not be entitled to recover the costs of preparing the Request for Change Proposal.

34. Extension of Time for Completion

34.1 The Time(s) for Completion specified in the GCC shall be extended if the Contractor is delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following:

- (a) Any Change in the Facilities as provided in GCC Clause 33
- (b) Any occurrence of Force Majeure as provided in GCC Clause 32
- (c) Any suspension order given by the Employer under GCC Clause 35 hereof or reduction in the rate of progress pursuant to GCC Sub-Clause 35.2 or
- (d) Any changes in laws and regulations as provided in GCC Clause 31 or
- (e) Any other matter specifically mentioned in the Contract by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Contractor.

34.2 Except where otherwise specifically provided in the Contract, the Contractor shall submit to the Project Manager a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and

supporting particulars of the claim, the Employer and the Contractor shall agree upon the period of such extension. In the event that the Contractor does not accept the Employer's estimate of a fair and reasonable time extension, the Contractor shall be entitled to refer the matter to Arbitration, pursuant to GCC Sub-Clause 39.

- 34.3 The Contractor shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract.

35. Suspension

- 35.1 The Employer may request the Project Manager, by notice to the Contractor, to order the Contractor to suspend performance of any or all of its obligations under the Contract. Such notice shall specify the obligation of which performance is to be suspended, the effective date of the suspension and the reasons therefor. The Contractor shall thereupon suspend performance of such obligation (except those obligations necessary for the care or preservation of the Facilities) until ordered in writing to resume such performance by the Project Manager.

If, by virtue of a suspension order given by the Project Manager, other than by reason of the Contractor's default or breach of the Contract, the Contractor's performance of any of its obligations is suspended for an aggregate period of more than one hundred eighty(180) days, then at any time thereafter and provided that at that time such performance is still suspended, the Contractor may give a notice to the Project Manager requiring that the Employer shall, within twenty-eight (28) days of receipt of the notice, order the resumption of such performance or request and subsequently order a change in accordance with GCC Clause 33, excluding the performance of the suspended obligations from the Contract.

If the Employer fails to do so within such period, the Contractor may, by a further notice to the Project Manager, elect to treat the suspension, where it affects a part only of the Facilities, as a deletion of such part in accordance with GCC Clause 33 or, where it affects the whole of the Facilities, as termination of the Contract under GCC Sub-Clause 36.1.

- 35.2 If the Contractor's performance of its obligations is suspended or the rate of progress is reduced pursuant to this GCC Clause 35, then the Time for Completion shall be extended in accordance with GCC Sub-Clause 34.1, and any and all additional costs or expenses incurred by the Contractor as a result of such suspension or reduction shall be paid by the Employer to the Contractor in addition to the Contract Price, except in the case of suspension order or reduction in the rate of progress by reason of the Contractor's default or breach of the Contract.
- 35.3 During the period of suspension, the Contractor shall not remove from the Site any Plant and Equipment, any part of the Facilities or any Contractor's Equipment, without the prior written consent of the Employer.

36. Termination

36.1 Termination for Employer's Convenience

36.1.1 The Employer may at any time terminate the Contract for any reason by giving the Contractor a notice of termination that refers to this GCC Sub-Clause 36.1.

36.1.2 Upon receipt of the notice of termination under GCC Sub-Clause 36.1.1, the Contractor shall either immediately or upon the date specified in the notice of termination

(a) Cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition

(b) Terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii) below

(c) Remove all Contractor's Equipment from the Site, repatriate the Contractor's and its Subcontractors' personnel from the Site, remove from the Site any wreckage, rubbish and debris of any kind, and leave the whole of the Site in a clean and safe condition

(d) In addition, the Contractor, subject to the payment specified in GCC Sub-Clause 36.1.3, shall

(i) Deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination

(ii) To the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant and Equipment as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors

(iii) Deliver to the Employer all non-proprietary drawings, specifications and other documents prepared by the Contractor or its Subcontractors as at the date of termination in connection with the Facilities.

36.1.3 In the event of termination of the Contract under GCC Sub-Clause 36.1.1, the Employer shall pay to the Contractor the following amounts:

(a) The Contract Price, properly attributable to the parts of the Facilities executed by the Contractor as of the date of termination

- (b) The costs reasonably incurred by the Contractor in the removal of the Contractor's Equipment from the Site and in the repatriation of the Contractor's and its Subcontractors' personnel
- (c) Any amounts to be paid by the Contractor to its Subcontractors in connection with the termination of any subcontracts, including any cancellation charges
- (d) Costs incurred by the Contractor in protecting the Facilities and leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC Sub-Clause 36.1.2
- (e) The cost of satisfying all other obligations, commitments and claims that the Contractor may in good faith have undertaken with third parties in connection with the Contract and that are not covered by paragraphs (a) through (d) above.

36.2 Termination for Contractor's Default

36.2.1 The Employer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons there for to the Contractor, referring to this GCC Sub-Clause 36.2:

- (a) If the Contractor becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, if the Contractor is a corporation, a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Contractor takes or suffers any other analogous action in consequence of debt
- (b) If the Contractor assigns or transfers the Contract or any right or interest therein in violation of the provision of GCC Clause 37.
- (c) If the Contractor, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purpose of this Sub-Clause:

“corrupt practice” is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

“fraudulent practice” is any act or omission, including a misrepresentation, that knowingly or recklessly misleads or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

“collusive practice” is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;

“coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

“obstructive practice” is

(aa)deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Employer’s investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation;

or

(bb) acts intended to materially impede the exercise of the Employer’s inspection and audit rights.

I In persuasions of its policy, the Employer will sanction a firm or individual, including declaring ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for, or in executing, a contract.

36.2.2 If the Contractor

- (a) has abandoned or repudiated the Contract
- (b) has without valid reason failed to commence work on the Facilities promptly or has suspended (other than pursuant to GCC Sub-Clause 35.2) the progress of Contract performance for more than twenty-eight (28) days after receiving a written instruction from the Employer to proceed
- (c) persistently fails to execute the Contract in accordance with the Contract or persistently neglects to carry out its obligations under the Contract without just cause
- (d) refuses or is unable to provide sufficient materials, services or labor to execute and complete the Facilities in the manner specified in the program furnished under GCC Sub-Clause 14.2 at rates of progress that give reasonable assurance to the Employer that the Contractor can attain Completion of the Facilities by the Time for Completion as extended, then the

Employer may, without prejudice to any other rights it may possess under the Contract, give a notice to the Contractor stating the nature of the default and requiring the Contractor to remedy the same. If the Contractor fails to remedy or to take steps to remedy the same within fourteen (14) days of its receipt of such notice, then the Employer may terminate the Contract forthwith by giving a notice of termination to the Contractor that refers to this GCC Sub-Clause 36.2.

36.2.3 Upon receipt of the notice of termination under GCC Sub-Clauses 36.2.1 or 36.2.2, the Contractor shall, either immediately or upon such date as is specified in the notice of termination,

- (a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition
- (b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) below
- (c) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination
- (d) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant and Equipment as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors
- (e) deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its Subcontractors as of the date of termination in connection with the Facilities.

36.2.4 The Employer may enter upon the Site, expel the Contractor, and complete the Facilities itself or by employing any third party. The Employer may, to the exclusion of any right of the Contractor over the same, take over and use with the payment of a fair rental rate to the Contractor, with all the maintenance costs to the account of the Employer and with an indemnification by the Employer for all liability including damage or injury to persons arising out of the Employer's use of such equipment, any Contractor's Equipment owned by the Contractor and on the Site in connection with the Facilities for such reasonable period as the Employer considers expedient for the supply and installation of the Facilities.

Upon completion of the Facilities or at such earlier date as the Employer thinks appropriate, the Employer shall give notice to the Contractor that such Contractor's Equipment will be returned to the Contractor at or near the Site

and shall return such Contractor's Equipment to the Contractor in accordance with such notice. The Contractor shall thereafter without delay and at its cost remove or arrange removal of the same from the Site.

- 36.2.5 Subject to GCC Sub-Clause 36.2.6, the Contractor shall be entitled to be paid the Contract Price attributable to the Facilities executed as of the date of termination, the value of any unused or partially used Plant and Equipment on the Site, and the costs, if any, incurred in protecting the Facilities and in leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC Sub-Clause 36.2.3. Any sums due to the Employer from the Contractor accruing prior to the date of termination shall be deducted from the amount to be paid to the Contractor under this Contract.
- 36.2.6 If the Employer completes the Facilities, the cost of completing the Facilities by the Employer shall be determined.

If the sum that the Contractor is entitled to be paid, pursuant to GCC Sub-Clause 36.2.5, plus the reasonable costs incurred by the Employer in completing the Facilities, exceeds the Contract Price or the entire Facilities if entire Facilities have been completed or the price for part of the Facilities if part of the Facilities have been completed, the Contractor shall be liable for such excess.

If such excess is greater than the sums due the Contractor under GCC Sub-Clause 36.2.5, the Contractor shall pay the balance to the Employer, and if such excess is less than the sums due the Contractor under GCC Sub-Clause 36.2.5, the Employer shall pay the balance to the Contractor. For facilitating such payment the Employer shall encash the Bank Guarantees of the Contractor available with the Employer and retain such other payments due to the Contractor under the Contract in question or any other Contract that the Employer may have with the Contractor.

The Employer and the Contractor shall agree, in writing, on the computation described above and the manner in which any sums shall be paid.

- 36.3 In this GCC Clause 36, the expression "Facilities executed" shall include all work executed, Installation Services provided, and all Plant and Equipment acquired (or subject to a legally binding obligation to purchase) by the Contractor and used or intended to be used for the purpose of the Facilities, up to and including the date of termination.
- 36.4 In this GCC Clause 36, in calculating any monies due from the Employer to the Contractor, account shall be taken of any sum previously paid by the Employer to the Contractor under the Contract, including any advance payment paid pursuant to the corresponding Appendix (Terms and Procedures of Payment) to the Contract Agreement.

37. Assignment

37.1 Neither the Employer nor the Contractor shall, without the express prior written consent of the other party (which consent shall not be unreasonably withheld), assign to any third party the Contract or any part thereof, or any right, benefit, obligation or interest therein or there under, except that the Contractor shall be entitled to assign either absolutely or by way of charge any monies due and payable to it or that may become due and payable to it under the Contract.

I. Resolution of Disputes

38. Settlement of Disputes

38.1 If any dispute of any kind whatsoever shall arise between the Employer and the Contractor in connection with or arising out of the Contract, including without prejudice to the generality of the foregoing, any question regarding its existence, validity or termination, or the execution of the Facilities, whether during the progress of the Facilities or after their completion and whether before or after the termination, abandonment or breach of the Contract, the parties shall seek to resolve any such dispute or difference, to the extent possible, amicably by mutual consultation.

38.2 If the parties fail to resolve such a dispute or difference by mutual consultation at the execution site level, then the dispute shall be referred by the Contractor to the Project Manager, who, within a period of thirty (30) days after being requested by Contractor to do so, shall give written notice of his decision.

38.2.1 The decision/instruction of the Project Manager shall be deemed to have been accepted by the Contractor unless notified by the Contractor of his intention to refer the matter for Arbitration within thirty (30) days of such decision/instruction.

38.2.2 In the event the Project Manager fails to notify his decision as aforesaid within thirty (30) days, the Contractor, if he intends to go for Arbitration, shall notify his intention to the Project Manager within 30 days of expiry of the first mentioned period of thirty days failing which it shall be deemed that there are no dispute or difference between the Employer and the Contractor.

38.3 In case of dispute or difference between the Employer and the Contractor, if the Employer intends to go for Arbitration, he shall notify such intention to the Contractor.

39. Arbitration

39.1 All disputes or differences in respect of which the decision, if any, of the Project Manager and/or the Head of the Implementing Authority has not become final or

binding as aforesaid shall be settled by arbitration in the manner provided herein below:

- 39.2 The arbitration shall be conducted by three arbitrators, one each to be nominated by the Contractor and the Employer and the third to be appointed by both the arbitrators in accordance with the Indian Arbitration Act. If either of the parties fails to appoint its arbitrator within sixty (60) days after receipt of a notice from the other party invoking the Arbitration clause, the arbitrator appointed by the party invoking the arbitration clause shall become the sole arbitrator to conduct the arbitration.
- 39.3 The language of the arbitration proceedings and that of the documents and communications between the parties shall be English. The arbitration shall be conducted in accordance with the provisions of the Indian Arbitration and Conciliation Act, 1996 or any statutory modification thereof. The venue of arbitration shall be Patiala.
- 39.4 The decision of the majority of the arbitrators shall be final and binding upon the parties. In the event of any of the aforesaid arbitrators dying, neglecting, resigning or being unable to act for any reason, it will be lawful for the party concerned to nominate another arbitrator in place of the outgoing arbitrator.
- 39.5 During settlement of disputes and arbitration proceedings, both parties shall be obliged to carry out their respective obligations under the Contract.

SECTION – IV

SAMPLE FORMS AND PROCEDURES (FORMS)

Preamble

- 1 Bid Forms and price Schedule
 2. Bid Security Form
 - 3 a) Form of Notification by the Employer to the Bank
(Applicable for Forfeiture of Bank Guarantee)
b) Form of Notification by the Employer to the Bank
(Applicable for conditional claim pending extension of Bank Guarantee by the Bidder)
 4. Form of 'Notification of Award of Contract'
 - a) Form of Notification of Award of contract for supply of Plant and Equipment
 - b) Form of Notification of Award of contract for installation of Plant & Equipment
 5. Form of Contract Agreement (Alternative-a)
 5. Form of Contract Agreement (Alternative-b)
- Appendix-1
- Appendix-2
- Appendix-3
- Appendix-4
- Appendix-5
- Appendix-6
- Appendix-7
- Appendix-8
6. Performance Security Form
 7. Form of Taking Over Certificate

8. Form of Indemnity Bond (Equipment Handed over)
9. Form of Indemnity Bond (Equipment Handed over in Installments)
10. Form of Authorization Letter
11. Form of Trust Receipt for Plant, Equipment & Materials received
12. Form of Extension of Bank Guarantee
13. Form of Power of Attorney for Joint Venture
14. Form of Undertaking by the Joint Venture Partners
15. Format for Evidence of Access to or availability of credit/facilities
16. Form of Operation Acceptance
17. Form of Safety Plant to be submitted by the Contractor within sixty days of Award of Contract
18. Form of Joint Deed of undertaking by the Collaborator/Patent company along with the Bidder/Manufacturer
19. Form of Bank Guarantee for Contract Performance
(To be submitted by Collaborator)
- 20 Deleted.
- 21 Form of Deed of Joint Undertaking to be executed by the Bidder and the Promoter of the Group Company (when the Group Company is yet to be incorporated under Indian Companies Act) of the Bidder for supply at least 25% of OPGW Cable manufactured in the said facilities in.
- 22 Form of Deed of Undertaking to be executed by the Bidder [where the Subsidiary Company / Joint Venture Company is to be incorporated] for supply at least 25% of OPGW Cable manufactured in the said facilities in India
- 23 Form of Bank Guarantee for Contract Performance
- 24 Form of Bank Guarantee for Contract Performance [*as stipulated in GCC Sub-clause 5.1.2*]

(To be submitted by Joint Venture Company of a Qualified OPGW Cable Manufacturer / Other Promoter (Indian OPGW Cable Manufacturer) Having 51% or Higher Equity participation in the Joint Venture Company)

25 Form of Deed of Undertaking to be executed by the Bidder/Manufacturer for extended warranty of two (02) years over and above the warranty period specified for OPGW cable *{as per requirements of Clause 1.1.2 (A) (II) of Qualification Requirement Annexure-A (ITB)}*.

26 Form of Joint Deed of Undertaking to be executed by the Bidder/Manufacturer alongwith Parent Company (Principal) or Collaborator for technological support and for extended warranty obligations of additional two (2) years over and above the warranty period specified for OPGW *{as per requirements of para 1.1.2(A)(III) of Annexure-A (ITB)}*

27 Form of Bank Guarantee for Contract Performance to be submitted Parent Company (Principal) or Collaborator to furnish Performance Guarantee for an amount of 10% of the cost of OPGW cable *{as per requirements of para 1.1.2(A)(III) of Annexure-A (ITB)}*.

28. Form of Joint Deed of Undertaking to be executed by the Bidder alongwith proposed Sub-Contractor for Installation of OPGW by the proposed Sub-contractor *{as per requirements of para 1.1.2(B) of Annexure-A (ITB)}*

29. Performance Security Form with Initial validity of 5 years.

(to be submitted by the contractor opting for submission of performance security with initial validity of 5 years in accordance with clause GCC 9.3.1.1)

Preamble

This Section (Section –IV) of the bidding documents [named as Sample Forms and Procedures (FORMS)] provides pro-forma to be used by the bidders at the time of their bid preparation and by the Contractor subsequent to the award of Contract.

The Bidder shall complete, sign and submit with its bid the relevant FORMS to be used un-amended, in accordance with the requirements included in the Bidding Documents.

The Bidder shall provide the Bid Security, either in the form included hereafter or in another form acceptable to the Employer, pursuant to the provisions in the instructions to Bidders.

The Form of Contract Agreement shall be used un-amended, except for the need to complete Article 1.1 (Contract Documents), as appropriate and as may be required to suit the specific requirement of the Contract. The form shall also include the Appendices listed, as required, which should be completed according to the instructions for their completion provided at the beginning of each Appendix. The Price Schedule deemed to form part of the contract shall be modified according to any corrections or modifications to the accepted bid resulting from price corrections, pursuant to the provisions of the Instructions to Bidders.

The Performance Security(ies) and Bank Guarantee for Advance Payment forms should not be completed by the bidders at the time of their bid preparation. Only the successful Bidder will be required to provide the Performance Security(ies) and Bank Guarantee for Advance Payment, according to one of the forms indicated herein or in another form acceptable to the Employer and pursuant to the provisions of the General and Special Conditions of Contract, respectively.

Depending on specific facts and circumstances related to the Bid, other specific agreement, if any, and the contract, the text of the Forms herein may need to be modified to some extent. The Employer reserves the right to make such modifications in conformity with such specific facts and circumstances and rectify and consequent discrepancies, if any. However, modifications, if any, to the text of the Forms that may be required in the opinion of the Bidder/Contractor shall be effected only if the same is approved by the Employer. The Employer's decision in this regard shall be final and binding.

1. BID FORMS AND PRICE SCHEDULES

1.1 Bid Form

Please see Volume – IV.

1.2 Price Schedule

Please see Volume – IV.

2. BID SECURITY FORM

(To be stamped in accordance with Stamp Act, the Non-Judicial Stamp Paper should be in the name of the issuing Bank)

Bank Guarantee No.:

Date:

Name of the Package:

Specification No.:

To: *(insert Name and Address of Employer)*

WHEREAS M/s. *(insert name of Bidder)*..... having its Registered/Head Office at *(insert address of the Bidder)* (hereinafter called "the Bidder") has submitted its Bid for the performance of the above-named Contract (hereinafter called "the Bid")

KNOW ALL PERSONS by these present that WE *(insert name & address of the issuing bank)* having its Registered/Head Office at*(insert address of registered office of the bank)*..... (hereinafter called "the Bank"), are bound unto*(insert name of Employer)*..... (hereinafter called "the Employer" which expression shall include Punjab State Transmission Corporation Limited. for the said Contract) in the sum of*(insert amount of Bid Security in figures & words)*..... for which payment well and truly to be made to the said Employer, the Bank binds itself, its successors and assigns by these presents.

Sealed with the Common Seal of the said Bank this day of 20....

THE CONDITIONS of this obligation are:

- (1) If the Bidder withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form; or
- (2) In case the Bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid; or
- (3) If the Bidder does not accept the corrections to arithmetical errors identified during preliminary evaluation of his bid pursuant to ITB Clause 27.2; or
- (4) If, as per the requirement of Qualification Requirements the Bidder is required to submit a Deed of Joint Undertaking and he fails to submit the same, duly attested by Notary Public of the place(s) of the respective executant(s) or registered with the Indian Embassy/High

Commission in that Country, within ten days from the date of intimation of post – bid discussion; or

- (5) in the case of a successful Bidder, if the Bidder fails within the specified time limit
 - (i) to sign the Contract Agreement, in accordance with ITB Clause 33, or
 - (ii) to furnish the required performance security, in accordance with ITB Clause 34.

or

- (6) In any other case specifically provided for in ITB.

WE undertake to pay to the Employer up to the above amount upon receipt of its first written demand, without the Employer having to substantiate its demand, provided that in its demand the Employer will note that the amount claimed by it is due to it, owing to the occurrence of any of the above-named CONDITIONS or their combination, and specifying the occurred condition or conditions.

This guarantee will remain in full force up to and including *(insert date, which shall be the date 30 days after the period of bid validity)*....., and any demand in respect thereof must reach the Bank not later than the above date.

For and on behalf of the Bank

.....

(Signature)

in the capacity of

.....

Common Seal of the Bank

Note: Successful Bidder shall furnish the performance security for 5% (Five percent) of the total project cost within twenty-eight (28) days after receipt of the Notification of Award. In case the successful bidder is submitted by a Joint Venture, within 28 days Lead partner shall submit 5% of total project cost as security while other partner(s) shall deposit 5% of its own scope of work/supply separately either in cash or in shape of BG which shall be other than normal performance guarantee.

3a. FORM OF NOTIFICATION BY THE EMPLOYER TO THE BANK

(Applicable for Forfeiture of Bank Guarantee)

To: *(insert Name and Address of the issuing Bank)*

Ref.: Forfeiture of Bid Security Amount against Bank Guarantee No. dated for, issued by you on behalf of M/s.*(insert name of the Bidder)*

Dear Sirs,

Please refer to the subject Bank Guarantee executed by you in our favour for as Bid Security for the bid submitted by M/s.*(insert name of the Bidder)* against *(insert name of the Package)* ; Specification No.

As per the terms of the said guarantee, the bank has guaranteed and undertaken to pay immediately on demand by the Employer the amount of without any reservation, protest, demur and recourse. Further, any demand made by the Employer shall be conclusive and binding on the Bank irrespective of any dispute or difference raised by the Bidder.

In terms of the said guarantee, we hereby submit our claim/demand through this letter for remittance of Bid Security amount to *(insert name of the Employer)* owing to the occurrence of the condition referred to at Sl. No. The Bank is requested to remit the full guaranteed sum towards proceeds of the bid security in the form of Demand Draft in favour of '.... *(insert name of the Employer)*', payable at*(insert place of the Employer)*....'.

Thanking you,

For.....*(Name of the Employer)*

(AUTHORISED SIGNATORY)

Copy to:

.....*(Registered Office of the Bank)*....

3b. FORM OF NOTIFICATION BY THE EMPLOYER TO THE BANK

(Applicable for conditional claim pending extension of Bank Guarantee by the Bidder)

To: *(insert Name and Address of the issuing Bank)*

Ref.: Conditional Claim against Bank Guarantee No. dated for
valid up to issued by you on behalf of M/s.*(insert name of the Bidder)*

Dear Sirs,

Please refer to the subject Bank Guarantee executed by you in our favour on behalf of M/s.*(insert name of the Bidder)*, who have submitted this Bank Guarantee to us towards Bid Security against *(insert name of the Package)* ; Specification No.

We, *(insert name of the Employer)* do hereby request you to lodge our claim/demand against the subject Bank Guarantee for full guaranteed sum. Kindly note that this claim/demand against the subject Bank Guarantee is without any further notice in case the amendment to Bank Guarantee No. dated extending its validity upto is not got arranged by*(insert name of the Bidder)* in our favour and are not received by us upto In such an event you are requested to remit the full guaranteed amount in terms of the subject guarantee in its letter and spirit and proceeds of this Bank Guarantee shall be forwarded to us in form of demand draft in favour of '.... *(insert name of the Employer)*, payable at*(insert place of the Employer)*....'.

This is without prejudice to our right under this guarantee and under the law.

Thanking you,

For.....*(Name of the Employer)*

(AUTHORISED SIGNATORY)

Copy to:

(insert Name and Address of the Bidder)

- You are requested to do the needful so that the amendment to the subject Bank Guarantee extending the validity up to is received by us by

4. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT'

[Alternative - 1 : Applicable for packages under DCB and those packages under GCB wherein the Contractor is an Indian Firm]

4a. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT' FOR SUPPLY OF PLANT AND EQUIPMENT

Ref. No. :

Date :

.....(*insert Contractor's Name & Address*).....

.....

.....

.....

[in case of Joint Venture, the aforesaid details shall be of the Lead Partner and the following shall also be included:

(Lead Partner of the Joint Venture of M/s. and M/s.)]

Attn : Mr.....

Sub. : Notification of Award for Ex-works Supply Contract for (*insert name of the Package*) Specification No.: Domestic/Global Competitive Bidding. (Project Funding: Domestic).

Dear Sir,

1.0 REFERENCE

This has reference to the following:

1.1 Our Invitation for Bids (IFB) dated

1.2 Bidding documents for the subject package issued to you vide our letter Ref. No. dated, comprising the following:

a) Conditions of Contract Volume-I
(Document Code No.)

b) Technical Specifications Volume-II
(Document Code No.)

c) Bid Form, Price Schedules Volume-III
& Technical Data Sheets
(Document Code No.)

1.2.1 Amendment/Errata No. to Bidding Documents issued to you vide our letter no. dated

(Applicable only if any Errata/Amendment to the Bidding Documents has been issued subsequently)

1.2.2 Clarifications to the Bidding Documents, pursuant to pre-bid conference held on, issued to you vide our letters no. dated *(Use as applicable)*

(Applicable only if any clarification to the Bidding Documents has been issued subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO THE BIDDER AFTER ISSUANCE OF BIDDING DOCUMENTS UP TO BID OPENING)

1.3 Your Bid submitted for the subject package under Proposal reference no. dated alongwith discount letter no. dated, was opened on (Use as applicable)

or

Bid submitted by the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) for the subject package under Proposal reference no. dated along with discount letter no. dated, was opened on (Use as applicable)

(Applicable only in case of Joint Venture)

1.4 Post bid discussions we had with you on various dates from to resulting into the Minutes of Meeting/ Record Notes of Post Bid Discussions enclosed as APPENDIX (NOA)-1with this Notification of Award.

2.0 AWARD OF CONTRACT AND ITS SCOPE

2.1 We confirm having accepted your Bid/Bid of the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) (Use as applicable) (referred to at para 1.3 above) read in conjunction with all the specifications, terms & conditions of the Bidding Documents (referred to at para 1.2, 1.2.1 & 1.2.2 [modify as applicable] above) and specific confirmations recorded in the Record Notes of Post Bid Discussions (referred to at para 1.4 above), and award on you/the JV(use as applicable) the 'Ex-works Supply Contract' (also referred to as the 'First Contract') covering inter-alia Ex-works supply of all equipment and materials including Type Testing to be conducted, required for the complete execution of the (insert name of

Package along-with name of the Project), as detailed in the documents referred hereinabove. The scope of work inter-alia includes the following:

..... (Indicate brief Scope of Work)

The scope of work under this Notification of Award (NOA) shall also include all such items which are not specifically mentioned in the Bidding Documents and/or your bid but are necessary for the successful completion of your scope under the Contract for the construction of (insert name of Package along-with name of the Project), unless otherwise specifically excluded in the Bidding Documents or in this NOA.

2.1.1 You, the Lead Partner of the JV, along with M/s., the Other Partner of JV, shall be liable jointly and severally for the execution of the Contract in accordance with terms and conditions of the Contract. As per the Power of Attorney furnished in your favour by the Joint Venture, as enclosed with Bid Proposal of the JV, you shall act as the Partner In-charge (Lead Partner) of the above Joint Venture for execution of the Contract. (This provision shall be included only in case the Bidder is a Joint Venture)

2.2 The notification for award of Contract for performance of all other activities, as set forth in the Bidding Documents, viz.

..... (Indicate brief scope of work of the Second Contract)

has been issued on you vide our NOA no. dated (hereinafter called the "Second Contract" or "Services Contract").

Notwithstanding the award of work under two separate Contracts in the aforesaid manner, you/ the JV (use as applicable) shall be overall responsible to ensure the execution of both the Contracts to achieve successful completion and taking over of the works under the package by the Employer as per the requirements stipulated in the Bidding Documents. It is expressly understood and agreed by you/ the JV (use as applicable) that any default or breach under the 'Second Contract' shall automatically be deemed as a

default or breach of this 'First Contract' also and vice-versa, and any such default or breach or occurrence giving us a right to terminate the 'Second Contract', either in full or in part, and/or recover damages there under, shall give us an absolute right to terminate this Contract, at your/JV's (use as applicable) risk, cost and responsibility, either in full or in part and/or recover damages under this 'First Contract' as well. However, such default or breach or occurrence in the 'Second Contract', shall not automatically relieve you/the JV (use as applicable) of any of your/JV's (use as applicable) obligations under this 'First Contract'. It is also expressly understood and agreed by you/the JV (use as applicable) that the equipment/materials supplied by you/the JV (use as applicable) under this 'First Contract', when erected, installed & commissioned by you under the 'Second Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

3.0 CONTRACT PRICE

3.1 The total Contract Price for the entire scope of work under this Contract shall be (Specify the currency and the amount in figures & words) as per the following breakup:

Sl. No.	Price Component	Amount
1.	Ex-Works Price component	
2	Taxes and duties not included in 1 above	
Total for Supply of Goods Contract		

3.2 Notwithstanding the break-up of the Contract Price, the Contract shall, at all times, be construed as a single source responsibility Contract and any breach in any part of the Contract shall be treated as a breach of the entire Contract.

4.0 You/The JV (use as applicable) are/is required to furnish at the earliest a Performance Security(ies), as per the Bidding Documents, for an amount of (Specify the value) i.e. equal to 10% (Ten percent) of the Contract Price, and valid up to and including and any other securities as per the Bidding Documents.

(The contract shall have an option to furnish CPG with initial validity period of 5 years whenever the required validity of CPG comes out to be more than 5 years based on the stipulated completion period and Defect Liability Period. In such cases, however, the contractor shall be required to extend the validity at any time but not later than 6 months prior to expiry of the Bank Guarantee. In case of non-extension, the CPG shall be encashed and further action shall be taken accordingly.)

(In case any other performance security is required to be furnished, the same is to be mentioned here)

5.0 For release of advance payment (admissible as per the bidding documents) equal to% of the Ex-works Price component of the Contract Price, you are, inter-alia, required to furnish a Bank Guarantee for the equivalent advance amount. The validity of the Advance Bank Guarantee shall be up to and including Further, please note that furnishing of all the Contract Performance Securities under the 'First Contract' and 'Second Contract' shall be one of the conditions precedent to release of advance under this Contract.

6.0 All the bank guarantees shall be furnished from an eligible bank as described in the Bidding Documents.

7.0 The schedule for Taking Over/Completion of Facilities by the Employer upon successful completion of the *(insert name of Package alongwith name of the Project)* shall be ... *(indicate the completion schedule)* months from the date of issue of this Notification of Award for all contractual purposes.

8.0 This Notification of Award constitutes formation of the Contract and comes into force with effect from the date of issuance of this Notification of Award.

9.0 You shall enter into a Contract Agreement with us within twenty-eight (28) days from the date of this Notification of Award.

10.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including the enclosed Appendix as a token of your acknowledgement.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,

For and on behalf of

.....(*Name of the Employer*).....

(*Authorised Signatory*)

Enclosures:

APPENDIX (NOA) - 1 Record Notes of Post - Bid Discussions held on various dates from to

4b. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT' FOR INSTALLATION OF PLANT AND EQUIPMENT

Ref. No. :

Date :

.....(*insert Contractor's Name & Address*).....

.....

.....

.....

[in case of Joint Venture, the aforesaid details shall be of the Lead Partner and the following shall also be included:

(Lead Partner of the Joint Venture of M/s. and M/s.)]

Attn : Mr.....

Sub. : Notification of Award for Services Contract for (*insert name of the Package*) Specification No.: Domestic/Global Competitive Bidding. (Project Funding: Domestic).

Dear Sir,

1.0 REFERENCE

This has reference to the following:

1.1 Our Invitation for Bids (IFB) dated

1.2 Bidding documents for the subject package issued to you vide our letter Ref. No. dated, comprising the following:

a) Conditions of Contract Volume-I
(Document Code No.)

b) Technical Specifications Volume-II
(Document Code No.)

c) Bid Form, Price Schedules Volume-III
& Technical Data Sheets
(Document Code No.)

1.2.1 Amendment/Errata No. to Bidding Documents issued to you vide our letter no. dated

(Applicable only if any Errata/Amendment to the Bidding Documents has been issued subsequently)

1.2.2 Clarifications to the Bidding Documents, pursuant to pre-bid conference held on, issued to you vide our letters no. dated *(Use as applicable)*

(Applicable only if any clarification to the Bidding Documents has been issued subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO THE BIDDER AFTER ISSUANCE OF BIDDING DOCUMENTS UP TO BID OPENING)

1.3 Your Bid submitted for the subject package under Proposal reference no. dated along with discount letter no. dated, was opened on (*Use as applicable*)

or

Bid submitted by the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) for the subject package under Proposal reference no. dated along with discount letter no. dated, was opened on (*Use as applicable*)

(Applicable only in case of Joint Venture)

1.4 Post bid discussions we had with you on various dates from to resulting into the Minutes of Meeting/ Record Notes of Post Bid Discussions enclosed as APPENDIX (NOA)-1 with this Notification of Award.

2.0 AWARD OF CONTRACT AND ITS SCOPE

2.1 We confirm having accepted your Bid/Bid of the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) (*Use as applicable*) (referred to at para 1.3 above) read in conjunction with all the specifications, terms & conditions of the Bidding Documents (referred to at para 1.2, 1.2.1 & 1.2.2 [*modify as applicable*] above) and specific confirmations recorded in the Record Notes of Post Bid Discussions (referred to at para 1.4 above), and award on you/the JV (*use as applicable*) the 'Services Contract' (also referred to as the 'Second Contract') for performance of all other activities, as set forth in the documents, viz. (*Indicate brief scope of work*) for the (*insert name of Package along with name of the Project*)....

The scope of work under this Notification of Award (NOA) shall also include all such items which are not specifically mentioned in the Bidding Documents and/or your bid but are necessary for the successful completion of your scope under the Contract for the

construction of (*insert name of Package alongwith name of the Project*), unless otherwise specifically excluded in the Bidding Documents or in this NOA.

2.1.1 You, the Lead Partner of the JV, along with M/s., the Other Partner of JV, shall be liable jointly and severally for the execution of the Contract in accordance with terms and conditions of the Contract. As per the Power of Attorney furnished in your favour by the Joint Venture, as enclosed with Bid Proposal of the JV, you shall act as the Partner In-charge (Lead Partner) of the above Joint Venture for execution of the Contract. (*This provision shall be included only in case the Bidder is a Joint Venture*)

2.2 The notification for award of Contract for Ex-works Supply of all equipment and materials including Type Testing to be conducted, as set forth in the documents, viz.

..... (*Indicate brief scope of work of the First Contract*)

has been issued on you vide our NOA no. dated (hereinafter called the "Ex-works Supply Contract" or "First Contract").

Notwithstanding the award of contract under two separate contracts in the aforesaid manner, you/the JV(*use as applicable*) shall be overall responsible to ensure the execution of both the contracts to achieve successful completion and taking over of the works under the package by the Employer as per the requirements stipulated in the Bidding documents. It is expressly understood and agreed by you/the JV(*use as applicable*) that any default or breach under the 'First Contract' shall automatically be deemed as a default or breach of this 'Second Contract' also and vice-versa, and any such default or breach or occurrence giving us a right to terminate the 'First Contract', either in full or in part, and/or recover damages there under, shall give us an absolute right to terminate this Contract, at your/JV's (*use as applicable*) risk, cost and responsibility, either in full or in part and/or recover damages under this 'Second Contract' as well. However, such default or breach or occurrence in the 'First Contract', shall not automatically relieve you/the JV(*use as applicable*) of any of your obligations under this 'Second Contract'. It is also expressly understood and agreed by you/the JV(*use as applicable*) that the equipment/materials supplied by you/the JV(*use as applicable*) under the 'First Contract', when erected, installed & commissioned by you/the JV(*use as applicable*) under this

'Second Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

3.0 CONTRACT PRICE

3.1 The total Contract Price for the entire scope of work under this Contract shall be (Specify the amount in figures & words) as per the following breakup:

Sl. No.	Price Component	Amount
1.	Local Transportation, In-transit Insurance, loading and unloading.	
2.	Installation Services	
3.	Training charges	
4.	Maintenance charges	
5.	Taxes and duties not included in 1& 2 above	
Total for Supply of Services Contract		

3.2 Notwithstanding the break-up of the Contract Price, the Contract shall, at all times, be construed as a single source responsibility Contract and any breach in any part of the Contract shall be treated as a breach of the entire Contract.

4.0 You/the JV(*use as applicable*) are/is required to furnish at the earliest a Performance Security(ies), as per the Bidding Documents, for an amount of (*Specify the value*) i.e. equal to 10% (Ten percent) of the Contract Price, and valid up to and including and any other securities as per the Bidding Documents.

(The contract shall have an option to furnish CPG with initial validity period of 5 years whenever the required validity of CPG comes out to be more than 5 years based on the stipulated completion period and Defect Liability Period. In such cases, however, the contractor shall be required to extend the validity at any time but not later than 6 months prior to expiry of the Bank

Guarantee. In case of non-extension, the CPG shall be encashed and further action shall be taken accordingly.)

(In case any other performance security is required to be furnished, the same is to be mentioned here)

5.0 All the bank guarantees shall be furnished from an eligible bank as described in the Bidding Documents.

6.0 The schedule for Taking Over/Completion of Facilities by the Employer upon successful completion of the *(insert name of Package along with name of the Project)* shall be ... *(indicate the completion schedule)* months from the date of issue of this Notification of Award for all contractual purposes.

7.0 This Notification of Award constitutes formation of the Contract and comes into force with effect from the date of issuance of this Notification of Award.

8.0 You shall enter into a Contract Agreement with us within twenty-eight (28) days from the date of this Notification of Award.

9.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including the enclosed Appendix as a token of your acknowledgement.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,

For and on behalf of

.....(*Name of the Employer*).....

(*Authorised Signatory*)

Enclosures:

APPENDIX (NOA) - 1 Record Notes of Post - Bid Discussions held on various
dates from to

Note:

Instructions indicated in italics in this notification of award are to be taken care of by the issuing authority. The Forms may be modified appropriately to suit the specific requirement of the Contract.

[Applicable for packages under GCB, if the Contractor is a foreign firm]

4a. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT' FOR SUPPLY OF GOODS i.e PLANT AND EQUIPMENT FROM ABROAD

[Option - a]

Ref. No. :

Date :

.....(*insert Main Contractor's Name & Address*).....

.....

.....

.....

[in case of Joint Venture, the aforesaid details shall be of the Lead Partner and the following shall also be included:

(Lead Partner of the Joint Venture of M/s. and M/s.)]

Attn : Mr.....

Sub. : Notification of Award for **Supply of Goods from abroad Contract** for
(insert name of the Package) Specification No.: Global
Competitive Bidding. (Project Funding: Domestic).

Dear Sir,

1.0 REFERENCE

This has reference to the following:

1.1 Our Invitation for Bids (IFB) dated

1.2 Bidding documents for the subject package issued to you vide our letter Ref. No. dated, comprising the following:

a) Conditions of Contract Volume-I

(Document Code No.)

b) Technical Specifications Volume-II

(Document Code No.)

c) Bid Form, Price Schedules Volume-III

& Technical Data Sheets

(Document Code No.)

1.2.1 Amendment/Errata No. to Bidding Documents issued to you vide our letter no. Dated

(Applicable only if any Errata/Amendment to the Bidding Documents has been issued subsequently)

1.2.2 Clarifications to the Bidding Documents, pursuant to pre-bid conference held on, issued to you vide our letters no. Dated *(Use as applicable)*

(Applicable only if any clarification to the Bidding Documents has been issued subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO THE BIDDER AFTER ISSUANCE OF BIDDING DOCUMENTS UP TO BID OPENING)

1.3 First envelope of your Bid submitted/the Bid submitted by the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) for the subject package under Proposal reference no. dated was opened on (Use as applicable)

1.4 Intimation for Opening of Second Envelope issued to you vide our letter no. Dated

1.5 Second Envelope of your Bid/the Bid by the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) under proposal reference no. Dated was opened on.....(Use as applicable)

1.6 Post bid discussions we had with you on various dates from To Resulting into the Minutes of Meeting/ Record Notes of Post Bid Discussions enclosed as APPENDIX (NOA)-1 with this Notification of Award.

2.0 AWARD OF CONTRACT AND ITS SCOPE

2.1 We confirm having accepted your Bid/Bid of the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) (Use as applicable) (referred to at para 1.3 & 1.5 above) read in conjunction with all the specifications, terms & conditions of the Bidding Documents (referred to at para 1.2, 1.2.1 & 1.2.2 [modify as applicable] above) and specific confirmations recorded in the Record Notes of Post Bid Discussions (referred to at para 1.6 above), and award on you/the JV(Use as applicable) the '**Supply of Goods from abroad Contract**' (also referred to as the 'First Contract') covering inter-alia CIP Entry Border Point/ CIF Indian Port of Entry supply of all Plant and Equipment including mandatory Spares and Type Testing to be conducted outside India, (insert here the words 'training to be conducted outside India' if the same is in Contractor's scope as per the Contract), required for the

complete execution of the (insert name of Package alongwith name of the Project), as detailed in the documents referred hereinabove. The scope of work inter-alia includes the following:

..... (*Indicate brief Scope of Work*)

The scope of work under this Notification of Award (NOA) shall also include all such items which are not specifically mentioned in the Bidding Documents and/or your bid but are necessary for the successful completion of your scope under the Contract for the construction of (*insert name of Package alongwith name of the Project*), unless otherwise specifically excluded in the Bidding Documents or in this NOA.

2.1.1 You, the Lead Partner of the JV, along with M/s., the Other Partner of JV, shall be liable jointly and severally for the execution of the Contract in accordance with terms and conditions of the Contract. As per the Power of Attorney furnished in your favour by the Joint Venture, as enclosed with Bid Proposal of the JV, you shall act as the Partner In-charge (Lead Partner) of the above Joint Venture for execution of the Contract. (*This provision shall be included only in case the Bidder is a Joint Venture*)

2.2 As per paras 1.3 above and the specific confirmation at para Of Record Notes of Post Bid Discussions (referred to at para 1.4 above), we have notified your Associate - M/s. vide our Notification of Award Ref. No. dated for award of ‘**Supply of Goods from within India Contract**’ (also referred to as the ‘Second Contract’) for the subject package which includes the Ex-works supply of all equipment/materials including Type Testing to be conducted within India, required for the complete execution of (*insert name of Package alongwith name of the Project*), as set forth in the documents , viz. (*Indicate brief scope of work of the Second Contract*) We have also notified your Associate - M/s. vide our Notification of Award Ref. No. dated for award of ‘**Supply of Services from within India Contract**’ (also referred to as the ‘Third Contract’) for performance of all other activities, as set forth in the documents, viz. (*Indicate brief scope of work of the Third Contract*)

Notwithstanding the award of work under three separate Contracts in the aforesaid manner, you/the JV (*Use as applicable*) shall be overall responsible to ensure the

execution of all the three Contracts to achieve successful completion and taking over of the works under the package by the Employer as per the requirements stipulated in the Bidding Documents. It is expressly understood and agreed by you/the JV (*Use as applicable*) that any default or breach by your Associate, M/s. under the 'Second Contract' and/or the 'Third Contract' shall automatically be deemed as a default or breach of this 'First Contract' also and vice-versa, and any such default or breach or occurrence giving us a right to terminate the 'Second Contract' and/or 'Third Contract', either in full or in part, and/or recover damages under those contract(s), shall give us an absolute right to terminate this Contract, at your/JV's (*Use as applicable*) risk, cost and responsibility, either in full or in part and/or recover damages under this 'First Contract' as well. However, such default or breach or occurrence in the 'Second Contract' and/or 'Third Contract', shall not automatically relieve you/the JV (*Use as applicable*) of any of your/JV's (*Use as applicable*) obligations under this 'First Contract'. It is also expressly understood and agreed by you/the JV (*Use as applicable*) that the equipment/materials supplied by you/the JV (*Use as applicable*) under this 'First Contract' and by your associate M/s. under the 'Second Contract', when erected, installed & commissioned by your associate M/s. under the 'Third Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

3.0 CONTRACT PRICE

3.1 The total Contract Price for the entire scope of work under this Contract shall be (*Specify the currency and the amount in figures & words*) As per the following breakup:

Sl. No.	Price Component	Amount
1.	CIF Price component	
1.1	FOB Price	
1.2	Marine/ Air Insurance Charges	
1.2	Marine/ Air Freight Charges	
	Total for CIF Price Component	

2.	Type Test Charges	
3.	Training Charges (<i>insert if applicable</i>)	
Total for Supply of Goods from Abroad Contract		

3.2 Notwithstanding the break-up of the Contract Price, the Contract shall, at all times, be construed as a single source responsibility Contract and any breach in any part of the Contract shall be treated as a breach of the entire Contract.

4.0 You/The JV(*Use as applicable*) are/is required to furnish at the earliest a Performance Security(ies), as per the Bidding Documents, for an amount of (*Specify the value*) i.e. equal to 10% (Ten percent) of the Contract Price, and valid upto and including and any other securities as per the Bidding Documents.

(The contract shall have an option to furnish CPG with initial validity period of 5 years whenever the required validity of CPG comes out to be more than 5 years based on the stipulated completion period and Defect Liability Period. In such cases, however, the contractor shall be required to extend the validity at any time but not later than 6 months prior to expiry of the Bank Guarantee. In case of non-extension, the CPG shall be encashed and further action shall be taken accordingly.)

(In case any other performance security is required to be furnished, the same is to be mentioned here)

5.0 For release of advance payment (admissible as per the bidding documents) equal to% of the CIF Price component of the Contract Price, you are, inter-alia, required to furnish a Bank Guarantee for **110% (one hundred ten percent) of the amount of Advance**. The validity of the Advance Bank Guarantee shall be up to and including Further, please note that furnishing of all the Contract Performance Securities under the 'First Contract', 'Second Contract' & 'Third Contract' by you/the JV (*use as applicable*) and Contract Performance Securities under the 'Second Contract' & 'Third Contract' by your Associate shall be one of the conditions precedent to release of advance under this Contract.

6.0 All the bank guarantees shall be furnished from an eligible bank as described in the Bidding Documents.

7.0 The schedule for Taking Over/Completion of Facilities by the Employer upon successful completion of the (*insert name of Package alongwith name of the Project*) shall be ... (*indicate the completion schedule*) months from the date of issue of this Notification of Award for all contractual purposes.

8.0 This Notification of Award constitutes formation of the Contract and comes into force with effect from the date of issuance of this Notification of Award.

9.0 You shall enter into a Contract Agreement with us within twenty-eight (28) days from the date of this Notification of Award.

10.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including the enclosed Appendix as a token of your acknowledgement.

We also request you to furnish us a copy of each of the 'Second Contract' and 'Third Contract' awarded to duly signed and stamped on each page including the enclosed Appendix as a token of acknowledge of the same by you.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,

For and on behalf of

.....(*Name of the Employer*).....

(*Authorised Signatory*)

Enclosures:

APPENDIX (NOA) 1 Record Notes of Post - Bid Discussions held on various
dates from to

4b. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT' FOR SUPPLY OF GOODS i.e PLANT AND EQUIPMENT FROM WITHIN INDIA

[Option - b]

Ref. No. :

Date :

.....(*insert Associate's Name & Address*).....

.....

.....

.....

Attn : Mr.....

Sub. : Notification of Award for **Supply of Goods from within India Contract'** for (*insert name of the Package*) Specification No.: Global Competitive Bidding. (Project Funding: Domestic).

Dear Sir,

1.0 REFERENCE

This has reference to the following:

1.1 Our Invitation for Bids (IFB) dated

1.2 Bidding documents for the subject package issued to M/s.(*insert name of the Main Contractor*) vide our letter Ref. No. dated, comprising the following:

a) Conditions of Contract Volume-I
(Document Code No.)

b) Technical Specifications Volume-II
(Document Code No.)

c) Bid Form, Price Schedules Volume-III
& Technical Data Sheets
(Document Code No.)

1.2.1 Amendment/Errata No. to Bidding Documents issued to M/s.(*insert name of the Main Contractor*) vide our letter no. Dated

(Applicable only if any Errata/Amendment to the Bidding Documents has been issued subsequently)

1.2.2 Clarifications to the Bidding Documents, pursuant to pre-bid conference held on, issued to M/s.(*insert name of the Main Contractor*) vide our letters no. Dated (*Use as applicable*)

(Applicable only if any clarification to the Bidding Documents has been issued subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO THE BIDDER AFTER ISSUANCE OF BIDDING DOCUMENTS UP TO BID OPENING)

1.3 First envelope of your Bid submitted/the Bid submitted by the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) for the subject package under Proposal reference no. dated was opened on (Use as applicable)

1.4 Intimation for Opening of Second Envelope issued to you vide our letter no. Dated

1.5 Second Envelope of your Bid/the Bid by the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) under proposal reference no. Dated was opened on.....(Use as applicable)

1.6 Post bid discussions we had with you on various dates from To Resulting into the Minutes of Meeting/ Record Notes of Post Bid Discussions enclosed as APPENDIX (NOA)-1 with this Notification of Award.

2.0 AWARD OF CONTRACT AND ITS SCOPE

2.1 We confirm having accepted Bid of M/s.(insert name of the Main Contractor)..... /Bid of the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) (Use as applicable) (referred to at para 1.3 & 1.5 above) read in conjunction with all the specifications, terms & conditions of the Bidding Documents (referred to at para 1.2, 1.2.1 & 1.2.2 [modify as applicable] above) and specific confirmations recorded in the Record Notes of Post Bid Discussions (referred to at para 1.6 above), and award on you the '**Supply of Goods from within India Contract**' (also referred to as the 'Second Contract') covering inter-alia Ex-works supply of all Plant and Equipment including mandatory Spares and Type Testing to be conducted within India, required for the complete execution of the (insert name of Package alongwith name of the Project), as detailed in the documents referred hereinabove. The scope of work inter-alia includes the following:

..... (*Indicate brief Scope of Work*)

The scope of work under this Notification of Award (NOA) shall also include all such items which are not specifically mentioned in the Bidding Documents and/or the bid but are necessary for the successful completion of your scope under the Contract for the construction of (*insert name of Package alongwith name of the Project*), unless otherwise specifically excluded in the documents or in this NOA.

2.2 We have notified M/s.(*insert name of the Main Contractor*)..... /the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) (*use as applicable*) vide our Notification of Award Ref. No. dated for award of '**Supply of Goods from abroad Contract**' (also referred to as the 'First Contract') for the subject package which includes the CIF supply of all equipment/materials including Type Testing to be conducted outside India, (*insert here the words 'training to be conducted outside India' if the same is in Contractor's scope as per the Contract*), required for the complete execution of (*insert name of Package alongwith name of the Project*), as set forth in the documents , viz. (*Indicate brief scope of work of the First Contract*) We have also notified you vide our Notification of Award Ref. No. dated for award of '**Supply of Services from within India Contract**' (also referred to as the 'Third Contract') for performance of all other activities, as set forth in the documents, viz. (*Indicate brief scope of work of the Third Contract*)

It is expressly understood and agreed by you that any default or breach by M/s.(*insert name of the Main Contractor*)or the JV/you under the 'First Contract' and/or the 'Third Contract' shall automatically be deemed as a default or breach of this 'Second Contract' also and vice-versa, and any such default or breach or occurrence giving us a right to terminate the 'First Contract' and/or 'Third Contract', either in full or in part, and/or recover damages under those contract(s), shall give us an absolute right to terminate this Contract, at your risk, cost and responsibility, either in full or in part and/or recover damages under this 'Second Contract' as well. However, such default or breach or occurrence in the 'First Contract' and/or 'Third Contract', shall not automatically relieve you of any of your obligations under this 'Second Contract'. It is also expressly understood and agreed by you that the equipment/materials supplied by you under this 'Second Contract' and by M/s.(*insert name of the Main Contractor*)/the JV (*use as applicable*) under the 'First Contract', when erected, installed & commissioned by you under the 'Third Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

3.0 CONTRACT PRICE

3.1 The total Contract Price for the entire scope of work under this Contract shall be (Specify the currency and the amount in figures & words) As per the following breakup:

Sl. No.	Price Component	Amount
1.	Ex-Works Price component	
2.	Type Test Charges	
Total for Supply of Goods from within India Contract		

3.2 Notwithstanding the break-up of the Contract Price, the Contract shall, at all times, be construed as a single source responsibility Contract and any breach in any part of the Contract shall be treated as a breach of the entire Contract.

4.0 You are required to furnish at the earliest a Performance Security, as per the Bidding Documents, for an amount of (Specify the value) i.e. equal to 10% (Ten percent) of the Contract Price, and valid upto and including

(The contract shall have an option to furnish CPG with initial validity period of 5 years whenever the required validity of CPG comes out to be more than 5 years based on the stipulated completion period and Defect Liability Period. In such cases, however, the contractor shall be required to extend the validity at any time but not later than 6 months prior to expiry of the Bank Guarantee. In case of non-extension, the CPG shall be encashed and further action shall be taken accordingly.)

(In case any other performance security is required to be furnished, the same is to be mentioned here)

5.0 For release of advance payment (admissible as per the bidding documents) equal to% of the Ex-works Price component of the Contract Price, you are, inter-alia, required to furnish a Bank Guarantee for the amount equal to **[[110% (one hundred ten percent) of the amount of Advance] Plus {amount of GST reimbursable on Advance as per the Proforma invoice}]**. The validity of the Advance Bank Guarantee shall be up to and including Further, please note that furnishing of all the Contract Performance Securities under the 'First Contract', 'Second Contract' and 'Third Contract' by M/s.(*insert name of the Main Contractor*)/the JV (*use as applicable*) and Contract Performance Securities under the 'Second Contract' and 'Third Contract' by you shall be one of the conditions precedent to release of advance under this Contract.

6.0 All the bank guarantees shall be furnished from an eligible bank as described in the Bidding Documents.

7.0 The schedule for Taking Over/Completion of Facilities by the Employer upon successful completion of the (*insert name of Package alongwith name of the Project*) Shall be ... (*indicate the completion schedule*) Months from the date of issue of this Notification of Award for all contractual purposes.

8.0 This Notification of Award constitutes formation of the Contract and comes into force with effect from the date of issuance of this Notification of Award.

9.0 You shall enter into a Contract Agreement with us within twenty-eight (28) days from the date of this Notification of Award.

10.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including the enclosed Appendix as a token of your acknowledgement.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,

For and on behalf of

.....(Name of the Employer).....

(Authorised Signatory)

Enclosures:

APPENDIX (NOA) - 1 Record Notes of Post - Bid Discussions held on various
dates from To

4c. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT' FOR SUPPLY OF SERVICES FROM WITHIN INDIA

Ref. No. :

Date :

.....(*insert Associate's Name & Address*).....

.....

.....

.....

Attn : Mr.....

Sub. : Notification of Award for **Supply of Services from within India** Contract for (*insert name of the Package*) Specification No.: Global Competitive Bidding. (Project Funding: Domestic).

Dear Sir,

1.0 REFERENCE

This has reference to the following:

1.1 Our Invitation for Bids (IFB) dated

1.2 Bidding documents for the subject package issued to M/s.(*insert name of the Main Contractor*) vide our letter Ref. No. dated, comprising the following:

a) Conditions of Contract Volume-I
(Document Code No.)

b) Technical Specifications Volume-II
(Document Code No.)

c) Bid Form, Price Schedules Volume-III
& Technical Data Sheets
(Document Code No.)

1.2.1 Amendment/Errata No. to Bidding Documents issued to M/s.(*insert name of the Main Contractor*) vide our letter no. Dated

(Applicable only if any Errata/Amendment to the Bidding Documents has been issued subsequently)

1.2.2 Clarifications to the Bidding Documents, pursuant to pre-bid conference held on, issued to M/s.(*insert name of the Main Contractor*) vide our letters no. Dated *(Use as applicable)*

(Applicable only if any clarification to the Bidding Documents has been issued subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO THE BIDDER AFTER ISSUANCE OF BIDDING DOCUMENTS UP TO BID OPENING)

1.3 First envelope of your Bid submitted/the Bid submitted by the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) for the subject package under Proposal reference no. dated was opened on (Use as applicable)

1.4 Intimation for Opening of Second Envelope issued to you vide our letter no. Dated

1.5 Second Envelope of your Bid/the Bid by the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) under proposal reference no. Dated was opened on.....(Use as applicable)

1.6 Post bid discussions we had with you on various dates from To Resulting into the Minutes of Meeting/ Record Notes of Post Bid Discussions enclosed as APPENDIX (NOA)-1 with this Notification of Award.

2.0 AWARD OF CONTRACT AND ITS SCOPE

2.1 We confirm having accepted Bid of M/s.(insert name of the Main Contractor)..... /Bid of the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) (Use as applicable) (referred to at para 1.3 & 1.5 above) read in conjunction with all the specifications, terms & conditions of the Bidding Documents (referred to at para 1.2, 1.2.1 & 1.2.2 [modify as applicable] above) and specific confirmations recorded in the Record Notes of Post Bid Discussions (referred to at para 1.6 above), and award on you the **'Supply of Services from within IndiaContract'** (also referred to as the 'Third Contract') for performance of all other activities, as set forth in the documents, viz. (Indicate brief scope of work for Third Contract)....., required for the complete execution of the (insert name of Package alongwith name of the Project)

The scope of work under this Notification of Award (NOA) shall also include all such items which are not specifically mentioned in the Bidding Documents and/or the bid but are necessary for the successful completion of your scope under the Contract for the

construction of (*insert name of Package alongwith name of the Project*), unless otherwise specifically excluded in the Bidding Documents or in this NOA.

2.2 We have notified M/s.(*insert name of the Main Contractor*)..... /the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) (*use as applicable*) vide our Notification of Award Ref. No. dated for award of '**Supply of Goods from Abroad Contract**' (also referred to as the 'First Contract') for the subject package which includes the CIF supply of all equipment/materials including Type Testing to be conducted outside India, (*insert here the words 'training to be conducted outside India' if the same is in Contractor's scope as per the Contract*), required for the complete execution of (*insert name of Package alongwith name of the Project*), as set forth in the documents, viz. (*Indicate brief scope of work of the First Contract*) We have also notified you vide our Notification of Award Ref. No. dated for award of '**Supply of Goods from within India Contract**' (also referred to as the 'Second Contract') for Ex-works Supply of all equipment and materials including Type Testing to be conducted within India, as set forth in the documents, viz. (*Indicate brief scope of work of the Second Contract*)

It is expressly understood and agreed by you that any default or breach by M/s.(*insert name of the Main Contractor*)or the JV/you under the 'First Contract' and/or the 'Second Contract' shall automatically be deemed as a default or breach of this 'Third Contract' also and vice-versa, and any such default or breach or occurrence giving us a right to terminate the 'First Contract' and/or 'Second Contract', either in full or in part, and/or recover damages under those contract(s), shall give us an absolute right to terminate this Contract, at your risk, cost and responsibility, either in full or in part and/or recover damages under this 'Third Contract' as well. However, such default or breach or occurrence in the 'First Contract' and/or 'Second Contract', shall not automatically relieve you of any of your obligations under this 'Third Contract'. It is also expressly understood and agreed by you that the equipment/materials supplied by you under the 'Second Contract' and by M/s.(*insert name of the Main Contractor*)/the JV (*use as applicable*) under the 'First Contract', when erected, installed & commissioned by you under this 'Third Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

3.0 CONTRACT PRICE

3.1 The total Contract Price for the entire scope of work under this Contract shall be (Specify the currency and the amount in figures & words) As per the following breakup:

Sl. No.	Price Component	Amount
1.1	Port handling and custom clearance of supplies from abroad	
1.2	Local/Inland Transportation, In-transit Insurance and loading, unloading Charges	
2.	Installation Charges	
3.	Training Charges	
4.	Maintenance Charges	
Total for Supply of Services from within India Contract		

3.2 Notwithstanding the break-up of the Contract Price, the Contract shall, at all times, be construed as a single source responsibility Contract and any breach in any part of the Contract shall be treated as a breach of the entire Contract.

4.0 You are required to furnish at the earliest a Performance Security, as per the Bidding Documents, for an amount of (Specify the value) i.e. equal to 10% (Ten percent) of the Contract Price, and valid upto and including

(The contract shall have an option to furnish CPG with initial validity period of 5 years whenever the required validity of CPG comes out to be more than 5 years based on the stipulated completion period and Defect Liability Period. In such cases, however, the contractor shall be required to extend the validity at any time but not later than 6 months prior to expiry of the Bank Guarantee. In case of non-extension, the CPG shall be encashed and further action shall be taken accordingly.)

(In case any other performance security is required to be furnished, the same is to be mentioned here)

5.0 All the bank guarantees shall be furnished from an eligible bank as described in the Bidding Documents.

6.0 The schedule for Taking Over/Completion of Facilities by the Employer upon successful completion of the *(insert name of Package alongwith name of the Project)* Shall be ... *(indicate the completion schedule)* Months from the date of issue of this Notification of Award for all contractual purposes.

7.0 This Notification of Award constitutes formation of the Contract and comes into force with effect from the date of issuance of this Notification of Award.

8.0 You shall enter into a Contract Agreement with us within twenty-eight (28) days from the date of this Notification of Award.

9.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including the enclosed Appendix as a token of your acknowledgement.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,

For and on behalf of

.....*(Name of the Employer)*.....

(Authorised Signatory)

Enclosures:

APPENDIX (NOA) - 1 Record Notes of Post - Bid Discussions held on various
dates from To

Note:

(1) *Instructions indicated in italics in this notification of award are to be taken care of by the issuing authority. The Forms may be modified appropriately to suit the specific requirement of the Contract.*

5. FORM OF CONTRACT AGREEMENT

: Applicable for packages under DCB and those packages under GCB]

EX-WORKS SUPPLY CONTRACT AGREEMENT BETWEEN (*Name of Employer*)
AND M/s. (*Name of Contractor*)/JOINT VENTURE (JV) OF M/s. (*Name
of Lead Partner*).... (THE LEAD PARTNER OF THE JV) AND M/s.(*Name of Other Partner*).....
(THE PARTNER OF THE JV) [*Use as applicable*]

THIS CONTRACT AGREEMENT No. (also referred to as 'Ex-Works Supply
Contract/the First Contract') is made on the day of 20.....

BETWEEN

(1) (*Name of Employer*)..... a company incorporated under the laws of
Companies Act 1956 and having its Registered Office at(*registered address of the
Employer*) and its Corporate Office at(*address of the Employer*).....
(hereinafter called "the Employer" and also referred to as ".....(*insert abbreviated name of the
Employer*)")

and

(2) M/s (*Name of Contractor*), a company incorporated under the laws of
Companies Act 1956 and having its Principal place of business at(*Address of Contractor*)
..... and Registered Office at(*Registered address of Contractor*)
(hereinafter called "the Contractor" and also referred to as ".....(*insert abbreviated name of the
Contractor*)")

or

Joint Venture (JV) of M/s (*Name of Lead Partner*) (the Lead Partner of JV),
a company incorporated under the laws of Companies Act 1956 and having its Principal place of
business at(*Address of Lead Partner*) and Registered Office at
.....(*Registered address of Lead Partner*) and M/s (*Name of Other
Partner*) (the Partner of JV), a company incorporated under the laws of Companies
Act 1956 and having its Principal place of business at(*Address of Other Partner*)
..... and Registered Office at(*Registered address of Other Partner*)
..... (hereinafter called "the Contractor" and also referred to as "Joint Venture"/the
'JV"')

(Applicable only in case of Joint Venture)

WHEREAS the Employer desires to engage the Contractor for the Ex-works supply of all equipment and materials including Type Testing to be conducted inter-alia including (Indicate brief scope of work) for the complete execution of the (insert name of Package along with name of the Project)..... as detailed in the Contract Document ("the Facilities"), and the Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

Article 1. Contract Documents

1.1 Contract Documents (Reference GCC Clause 2.2)

The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:

VOLUME – A

1. This Contract Agreement and the Appendices thereto.
2. Notification of Award Ref. No. dated

VOLUME – B

3. "Bidding Documents" comprising of the following:
 - (a) Volume –I of Bidding Documents (Document Code No.:), read in conjunction with Amendments to to the Bidding Documents.
 - (b) Volume –II of Bidding Documents (Document Code No.:) comprising of Technical Specifications.

VOLUME – C

4. Bid Submitted by the Contractor.

(Only relevant extracts are attached herewith for easy reference. Should the circumstances warrant, the original Bid along with the enclosures thereof, shall be referred to.).

1.2 Order of Precedence (Reference GCC Clause 2)

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions (Reference GCC Clause 1/SCC Clause 1)

1.3.1 Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions of Contract/Special Conditions of Contract.

Article 2. Contract Price and Terms of Payment

2.1 Contract Price (Reference GCC Clause 7)

The Employer hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of (<i>amount in words</i>) (<i>amount in figures</i>)), or such other sums as may be determined in accordance with the terms and conditions of the Contract. The break-up of the Contract price is as under: Sl. No.	Price Component	Amount
1.	Ex-Works Price Component	
2.	Freight & Insurance Charges. (in Rs.)	
3.	Total GST (in Rs.)	
4.	Total Price (1+2+3) (in Rs.)	
Total for Supply of Goods Contract		

The detailed break-up of Contract Price is given in the relevant Appendices hereto.

2.2 Terms of Payment (Reference GCC Clause 8)

The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in Appendix 1 (Terms and Procedures of Payment) hereto.

Article 3. Effective Date for Determining Time for Completion

3.1 Effective Date (Reference GCC Clause 1)

The Time of Completion of Facilities shall be determined from the date of the Notification of Award i.e., from

Article 4. Appendices

The Appendices listed in the List of Appendices, as mentioned below, shall be deemed to form an integral part of this Contract Agreement.

Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

List of Appendices

- Appendix 1 Terms and Procedures of Payment
- Appendix 2 Price Adjustment
- Appendix 3 Insurance Requirements
- Appendix 4 Time Schedule
- Appendix 5 List of Approved Subcontractors
- Appendix 6 Scope of Works and Supply by the Employer
- Appendix 7 List of Document for Approval or Review
- Appendix 8 (Deleted)
- Appendix 9 Contract Co-ordination Procedure
- Appendix 10^ Summary of Detailed Price Break-up
- Appendix 10A^ Detailed Price Break-up of Supply Price
- Appendix 10B^ Detailed Price Break-up of type test Charges
- Appendix 10C^ Detailed Price Break-up of taxes & duties
not included in Appendix10A^ & 10B^ above

[^ to be appended at the Stage of Contract Award.]

Article 5.

The Contract Agreement No. has also been made on the day of 20...., between the Employer and the Contractor for the Services Contract (hereinafter referred to as the "Second Contract") for the subject package which includes performance of all the services inter alia including (*Indicate brief scope of work*) for the complete execution of the (*insert name of Package along with name of the Project*).....

Notwithstanding the award of contract under two separate contracts in the aforesaid manner, the Contractor shall be overall responsible to ensure the execution of both the contracts to achieve successful completion and taking over of the facilities by the Employer as per the requirements stipulated in the Contract. It is expressly understood and agreed by the Contractor that any default or breach under the 'Second Contract' shall automatically be deemed as a default or breach of this 'First Contract' also and vice-versa and any such breach or occurrence or default giving the Employer a right to terminate the 'Second Contract' either in full or in part, and/or recover damages there under that Contract, shall give the Employer an absolute right to terminate this Contract at the Contractor's risk, cost and responsibility, either in full or in part and /or recover damages under this 'First Contract' as well. However, such breach or default or occurrence in the 'Second Contract' shall not automatically relieve the Contractor of any of its responsibility/ obligations under this 'First Contract'. It is also expressly understood and agreed by the Contractor that the equipment /materials supplied by the Contractor under this 'First Contract' when installed and commissioned by the Contractor under the 'Second Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

<p>Signed by for and on behalf of the Employer</p> <p>.....</p> <p>Signature</p> <p>.....</p>	<p>Signed by for and on behalf of the Contractor</p> <p>.....</p> <p>Signature</p> <p>.....</p>
---------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------

<p>Title</p> <p>in the presence of</p>	<p>Title</p> <p>in the presence of</p>
-------------------------------------------------------------------------------	-------------------------------------------------------------------------------

5. FORM OF CONTRACT AGREEMENT

[]

SERVICES CONTRACT AGREEMENT BETWEEN (*Name of Employer*) AND M/s. (*Name of Contractor*)/JOINT VENTURE (JV) OF M/s. (*Name of Lead Partner*).... (THE LEAD PARTNER OF THE JV) AND M/s.(*Name of Other Partner*)..... (THE PARTNER OF THE JV) [*Use as applicable*]

THIS CONTRACT AGREEMENT No. (also referred to as 'Services Contract/the Second Contract') is made on the day of 20....

BETWEEN

(1) (*Name of Employer*)..... a company incorporated under the laws of Companies Act 1956 and having its Registered Office at(*registered address of the Employer*) and its Corporate Office at(*address of the Employer*)..... (hereinafter called "the Employer" and also referred to as "....(*insert abbreviated name of the Employer*)")

and

(2) M/s (*Name of Contractor*), a company incorporated under the laws of Companies Act 1956 and having its Principal place of business at(*Address of Contractor*) and Registered Office at(*Registered address of Contractor*) (hereinafter called "the Contractor" and also referred to as "....(*insert abbreviated name of the Contractor*)")

or

Joint Venture (JV) of M/s (*Name of Lead Partner*) (the Lead Partner of JV), a company incorporated under the laws of Companies Act 1956 and having its Principal place of business at(*Address of Lead Partner*) and Registered Office at(*Registered address of Lead Partner*) and M/s (*Name of Other Partner*) (the Partner of JV), a company incorporated under the laws of Companies Act 1956 and having its Principal place of business at(*Address of Other Partner*) and Registered Office at(*Registered address of Other Partner*) (hereinafter called "the Contractor" and also referred to as "Joint Venture"/the 'JV'")

(Applicable only in case of Joint Venture)

WHEREAS the Employer desires to engage the Contractor for providing all the services inter-alia including (*Indicate brief scope of work*) for the complete execution of the (*insert name of Package alongwith name of the Project*)..... as detailed in

the Contract Document ("the Facilities"), and the Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

Article 1. Contract Documents

1.1 Contract Documents (Reference GCC Clause 2.2)

The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:

VOLUME – A

1. This Contract Agreement and the Appendices thereto.
2. Notification of Award Ref. No. dated

VOLUME – B

3. "Bidding Documents" comprising of the following:
 - (a) Volume –I of Bidding Documents (Document Code No.:), read in conjunction with Amendments to to the Bidding Documents.
 - (b) Volume –II of Bidding Documents (Document Code No.:) comprising of Technical Specifications.

VOLUME – C

4. Bid Submitted by the Contractor.

(Only relevant extracts are attached herewith for easy reference. Should the circumstances warrant, the original Bid along with the enclosures thereof, shall be referred to.).

1.2 Order of Precedence (Reference GCC Clause 2)

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions (Reference GCC Clause 1/SCC Clause 1)

1.3.1 Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions of Contract/Special Conditions of Contract.

Article 2. Contract Price and Terms of Payment

2.1 Contract Price (Reference GCC Clause 7)

The Employer hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of (<i>amount in words</i>) (<i>amount in figures</i>)), or such other sums as may be determined in accordance with the terms and conditions of the Contract. The break-up of the Contract price is as under: Sl. No.	Price Component	Amount
1.	Erection, Testing and Commissioning charges	
2.	Total GST	
3.	Total charges (1+2)	
Total for Supply of Services Contract		

The detailed break-up of Contract Price is given in the relevant Appendices hereto.

2.2 Terms of Payment (Reference GCC Clause 8)

The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in Appendix 1 (Terms and Procedures of Payment) hereto.

Article 3. Effective Date for Determining Time for Completion

3.1 Effective Date (Reference GCC Clause 1)

The Time of Completion of Facilities shall be determined from the date of the Notification of Award i.e., from

Article 4. Appendices

The Appendices listed in the List of Appendices, as mentioned below, shall be deemed to form an integral part of this Contract Agreement.

Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

List of Appendices

Appendix 1 Terms and Procedures of Payment

Appendix 2 Price Adjustment

Appendix 2A (Deleted)

Appendix 3 Insurance Requirements

Appendix 4 Time Schedule

Appendix 5 List of Approved Subcontractors

Appendix 6 Scope of Works and Supply by the Employer

Appendix 7 List of Document for Approval or Review

Appendix 8 (Deleted)

Appendix 9 Contract Co-ordination Procedure

Appendix 10^ Summary of Detailed Price Break-up

Appendix 10A^ Detailed Price Break-up of Local Transportation, In transit insurance ,loading and unloading.

Appendix 10B^ Detailed Price Break-up of Installation & Civil Works Charges

Appendix 10C^ Detailed Price Break-up of taxes & duties

not included in Appendix10A^& 10B^above

[^ to be appended at the Stage of Contract Award.]

Article 5.

The Contract Agreement No. has also been made on the day of 20...., between the Employer and the Contractor for the Ex-Works Supply Contract (hereinafter

referred to as the “First Contract”) for the subject package which includes Ex-works supply of all equipment and materials including Type Testing to be conducted inter alia including *(Indicate brief scope of work)* for the complete execution of the *(insert name of Package along with name of the Project)*.....

Notwithstanding the award of contract under two separate contracts in the aforesaid manner, the Contractor shall be overall responsible to ensure the execution of both the contracts to achieve successful completion and taking over of the facilities by the Employer as per the requirements stipulated in the Contract. It is expressly understood and agreed by the Contractor that any default or breach under the ‘First Contract’ shall automatically be deemed as a default or breach of this ‘Second Contract’ also and vice-versa and any such breach or occurrence or default giving the Employer a right to terminate the ‘First Contract’ either in full or in part, and/or recover damages there under that Contract, shall give the Employer an absolute right to terminate this Contract at the Contractor’s risk, cost and responsibility, either in full or in part and /or recover damages under this ‘Second Contract’ as well. However, such breach or default or occurrence in the ‘First Contract’ shall not automatically relieve the Contractor of any of its responsibility/ obligations under this ‘Second Contract’. It is also expressly understood and agreed by the Contractor that the equipment /materials supplied by the Contractor under the ‘First Contract’ when installed and commissioned by the Contractor under this ‘Second Contract’ shall give satisfactory performance in accordance with the provisions of the Contract.

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

<p>Signed by for and on behalf of the Employer</p> <p>.....</p> <p>Signature</p> <p>.....</p> <p>Title</p>	<p>Signed by for and on behalf of the Contractor</p> <p>.....</p> <p>Signature</p> <p>.....</p> <p>Title</p>
----------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------

in the presence of	in the presence of
--------------------	--------------------

[Applicable for packages under GCB, if the Contractor is a foreign firm]

SUPPLY OF GOODS FROM ABROAD CONTRACT AGREEMENT BETWEEN
 (Name of Employer) AND M/s. (Name of Contractor)
/JOINT VENTURE (JV) OF M/s. (Name of Lead Partner).... (THE LEAD
 PARTNER OF THE JV) AND M/s.(Name of Other Partner)..... (THE PARTNER OF
 THE JV) [Use as applicable]

THIS CONTRACT AGREEMENT No. (also referred to as ‘Supply of
 Goods from Abroad Contract/the First Contract’) is made on the day of
 20.....

BETWEEN

(1) (Name of Employer)..... a company incorporated under the laws
 of Companies Act 1956 and having its Registered Office at(registered address of the
 Employer) and its Corporate Office at(address of the
 Employer)..... (hereinafter called "the Employer" and also referred to as
 “.....(insert abbreviated name of the Employer)”)

and

(2) M/s (Name of Contractor), a company incorporated under the
 laws of(Country of Contractor) and having its Principal place of
 business at(Address of Contractor) and Registered Office at
(Registered address of Contractor) (hereinafter called "the
 Contractor" and also referred to as “.....(insert abbreviated name of the Contractor)”)

or

Joint Venture (JV) of M/s (*Name of Lead Partner*) (the Lead Partner of JV), a company incorporated under the laws of(*Country of Lead Partner*) and having its Principal place of business at(*Address of Lead Partner*) and Registered Office at(*Registered address of Lead Partner*) and M/s (*Name of Other Partner*) (the Partner of JV), a company incorporated under the laws of(*Country of Other Partner*) and having its Principal place of business at(*Address of Other Partner*) and Registered Office at(*Registered address of Other Partner*) (hereinafter called "the Contractor" and also referred to as "Joint Venture"/the 'JV'")

(Applicable only in case of Joint Venture)

WHEREAS the Employer is desirous of setting up (*insert name of Package alongwith name of the Project*)..... and had invited bids for complete project management, design, engineering, type testing, manufacture, testing, supply, port handling and customs clearance for the imported goods, further handling, inland transportation and delivery at destination Site, unloading, storage, handling at site, erection/installation including associated civil works, employer staff training, testing and commissioning including performance testing of equipment/materials and any other services as required for complete execution of the package.

WHEREAS (*insert name of the Contractor*) participated in the above referred bidding vide its bid proposal reference no. dated

WHEREAS, as per the provisions of the Bidding Documents (Volume I) and specific confirmation at para of the Record Notes of Discussions enclosed as Appendix (NOA)-1 to the Notification of Award referred under Article 1 below, the entire scope of work shall be split into three Contracts and the construction of contracts shall be as follows:

'First Contract' for CIF supply of Goods i.e. equipment and material from outside India, Testing outside India (also referred to as **Supply of Goods from Abroad Contract**),

'Second Contract' for Ex-works supply of equipment and material from within India, Testing in India (also referred to as **Supply of Goods from within India Contract**), and

'Third Contract' for all services to be performed in India covering, inter alia, (Indicate brief scope of work) of all the equipment supplied under the Supply of Goods from Abroad Contract and Supply of Goods from within India Contract, Training in India, etc. (also referred to as **Supply of Services from within India Contract**).

WHEREAS (insert name of the Contractor)/the JV (use as applicable) in their Bid, had proposed M/s.(insert name of the Associate) having its Registered Office at(Registered address of the Associate) and business address as(Address of the Associate) (hereinafter referred to as “.....(insert abbreviated name of the Associate)” as their Associate for the purpose of executing the **Supply of Goods from within India Contract** and **Supply of Services from within India Contract** and furnished “.....(insert abbreviated name of the Associate)”) written unequivocal consent vide their letter ref. dated (enclosed in their bid) to work as Employer's independent Contractor, on the terms and conditions as laid down in the Bidding Documents.

WHEREAS the assignment proposed by(insert abbreviated name of the Contractor)/the JV (use as applicable) has been accepted by the Employer, as above, subject to the condition that ..(insert abbreviated name of the Contractor)/the JV (use as applicable) shall be overall responsible and liable for the execution of all the three Contracts irrespective of the fact that the Employer will enter into the 'First Contract' with them and the 'Second Contract' and the 'Third Contract' with(insert abbreviated name of the Associate) Further, in the Contract documents, for 'First Contract' the word 'Contractor' shall mean(insert abbreviated name of the Contractor)/the JV (use as applicable), who had submitted the bid and shall, for the purpose of 'Second Contract' and 'Third Contract', include(insert abbreviated name of the Associate) - the Permitted Assignee of(insert abbreviated name of the Contractor)/the JV (use as applicable). Accordingly, without prejudice to the overall responsibility and the

liability of(*insert abbreviated name of the Contractor*)/the JV (*use as applicable*) for the execution of all the three Contracts, the word 'Contractor' wherever appearing in the 'Second Contract' and the 'Third Contract' shall also mean(*insert abbreviated name of the Associate*)

WHEREAS the Employer desires to engage the Contractor for the CIF supply of all equipment and materials including Type Testing to be conducted outside India inter-alia including (*Indicate brief scope of work*) for the complete execution of the (*insert name of Package alongwith name of the Project*)..... as detailed in the Contract Document ("the Facilities"), and the Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

Article 1. Contract Documents

1.1 Contract Documents (Reference GCC Clause 2.2)

The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:

VOLUME - A

- 1. This Contract Agreement and the Appendices thereto.
- 2. Notification of Award Ref. No. dated

VOLUME - B

- 3. "Bidding Documents" comprising of the following:

(a) Volume -I of Bidding Documents (Document Code No.:), read in conjunction with Amendments to to the Bidding Documents.

(b) Volume -II of Bidding Documents (Document Code No.:)
comprising of Technical Specifications.

VOLUME - C

4. Bid Submitted by the Contractor.

(Only relevant extracts are attached herewith for easy reference. Should the circumstances warrant, the original Bid along with the enclosures thereof, shall be referred to.).

1.2 Order of Precedence (Reference GCC Clause 2)

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions (Reference GCC Clause 1/SCC Clause 1)

1.3.1 Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions of Contract/Special Conditions of Contract.

Article 2. Contract Price and Terms of Payment

2.1 Contract Price (Reference GCC Clause 7)

The Employer hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of (*amount of currency in words*) (*.....(amount in figures)*), or such other sums as may be determined in accordance with the terms and conditions of the Contract. The break-up of the Contract price is as under:

Sl. No.	Price Component	Amount
1.	CIF Price component	
1.1	FOB price	
1.2	Marine/ Air Insurance charges	
1.2	Marine/ Air Freight charges	
	Total for CIF Price Component	
2.	Type Test Charges	
3.	Training Charges (<i>insert if applicable</i>)	
4.	Maintenance Charges	
Total for Supply of Goods from Abroad Contract		

The detailed break-up of Contract Price is given in the relevant Appendices hereto.

2.2 Terms of Payment (Reference GCC Clause 8)

The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in Appendix 1 (Terms and Procedures of Payment) hereto.

Article 3. Effective Date for Determining Time for Completion

3.1 Effective Date (Reference GCC Clause 1)

The Time of Completion of Facilities shall be determined from the date of the Notification of Award i.e., from

Article 4. Appendices

The Appendices listed in the List of Appendices, as mentioned below, shall be deemed to form an integral part of this Contract Agreement.

Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

List of Appendices

- Appendix 1 Terms and Procedures of Payment
- Appendix 2 Price Adjustment
- Appendix 3 Insurance Requirements
- Appendix 4 Time Schedule
- Appendix 5 List of Approved Subcontractors
- Appendix 6 Scope of Works and Supply by the Employer
- Appendix 7 List of Document for Approval or Review
- Appendix 8 Guarantees, Liquidated Damages for Non-Performance
- Appendix 9 Contract Co-ordination Procedure
- Appendix 10^ Summary of Detailed Price Break-up
- Appendix 10A^ Detailed Price Break-up of Price
- Appendix 10B^ Detailed Price Break-up of Charges
- Appendix 11^ Integrity Pact.

[^ to be appended at the Stage of Contract Award.]

Article 5.

...(insert abbreviated name of the Contractor)/the JV (use as applicable) having proposed(insert abbreviated name of the Associate) as its Associate for the purpose of executing the **Supply of Goods from within India** Contract and **Supply of Services from within India** Contract and furnished(insert abbreviated name of the Associate)’s written unequivocal consent to work as the Employer’s independent Contractor, on the terms and conditions as laid down in the Bidding Documents and, in accordance with the specific confirmation at para of Record Notes of Discussions enclosed as Appendix(NOA) - 1 to the Notification of Award referred to under Article 1.1 above, Contract Agreement Nos. and between the Employer and the Contractor’s Associate -(insert abbreviated name of the Associate) has also been made on respectively for the **Supply of Goods from within India** Contract (also referred to as the ‘Second Contract’) and **Supply of Services from within India** Contract (also referred to as the ‘Third Contract’).

The scope of ‘Second Contract’ includes (Indicate brief scope of work under the Second Contract), as detailed in the Contract Documents of said contract, required for the complete execution of (insert name of Package alongwith name of the Project)..... The scope of ‘Third Contract’ includes all services to be performed covering, inter alia, (Indicate brief scope of work under the Third Contract) of all the equipment supplied under the **Supply of Goods from Abroad** Contract and **Supply of Goods from within India** Contract, Training in India etc. and any other services specified in the Contract documents of said contract, for complete execution of (insert name of Package alongwith name of the Project).....

Notwithstanding the award of work under three separate Contracts in the aforesaid manner, ...(insert abbreviated name of the Contractor)/the JV (use as applicable) shall be overall responsible to ensure the execution of all the three Contracts to achieve successful completion and operational acceptance / taking over of the facilities by the Employer as per the requirements stipulated in the respective Contract Documents. It is expressly understood and agreed by ...(insert abbreviated name of the Contractor)/the JV (use as applicable) that any default or breach by its Associate,(insert abbreviated name of the Associate) under the ‘ Second Contract’ and/or ‘Third

Contract' shall automatically be deemed as a default or breach of this 'First Contract' also and vice-versa, and any such default or breach or occurrence giving the Employer a right to terminate the 'Second Contract' and/or 'Third Contract', either in full or in part, and/or recover damages under those contract(s), shall give the Employer an absolute right to terminate this Contract, at ...*(insert abbreviated name of the Contractor)*/JV's *(use as applicable)* risk, cost and responsibility, either in full or in part and/or recover damages under this 'First Contract' as well. However, such default or breach or occurrence in the 'Second Contract' and/or 'Third Contract', shall not automatically relieve ...*(insert abbreviated name of the Contractor)*/the JV *(use as applicable)* of any of its obligations under this 'First Contract'. It is also expressly understood and agreed by ...*(insert abbreviated name of the Contractor)*/the JV *(use as applicable)* that the equipment/materials supplied by ...*(insert abbreviated name of the Contractor)*/the JV *(use as applicable)* under this 'First Contract' and by its associate,*(insert abbreviated name of the Associate)* under the 'Second Contract', when erected and commissioned by its associate,*(insert abbreviated name of the Associate)* under the 'Third Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

Article 6.

In line with the confirmations in regard to assignment of the 'Second Contract' and 'Third Contract' and the Contractor's overall responsibility and liability, notwithstanding three separate Contracts entered into the manner described in Article 5 above, the Contractor/JV *(use as applicable)* shall witness and ensure that the 'Second Contract' and 'Third Contract' are signed by the Contractor's Associate,*(insert abbreviated name of the Associate)* with the Employer.

Further, as per the provisions of the Contract Documents including specific confirmation at para of Record Notes of post bid discussions enclosed as Appendix (NOA) - 1 to the Notification of Award referred to under Article 1.1 above, ...*(insert abbreviated name of the Contractor)*/JV *(use as applicable)* shall provide Contract Performance Security for Ten percent (10%) of the value of 'First Contract', 'Second Contract' and 'Third Contract' and*(insert abbreviated name of the Associate)* shall provide Contract Performance Security equivalent to Ten percent (10%) of the value of 'Second Contract' and 'Third Contract' for the due performance of Contract.

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by for and
on behalf of the Employer

.....

Signature

.....

Title

in the presence of

Signed by for and
on behalf of the Contractor

.....

Signature

.....

Title

in the presence of

Appendix-1

TERMS AND PROCEDURES OF PAYMENT

In accordance with the provisions of GCC Clause 8 (Terms of Payment), the Employer shall pay the Contractor in the following manner and at the following times, on the basis of the Price Breakdown given in the section on price schedules. Payments will be made in the currencies quoted by the Bidder unless otherwise agreed between the parties. The Contractor may make applications for payment in respect of part deliveries as work proceeds.

1. TERMS OF PAYMENT

All the payments to Foreign (non-resident) Suppliers will be subject to Foreign Exchange Management Act 1999 (FEMA) and other statutory requirements viz IT Act, RBI guidelines etc. and subject to fulfilling conditions as per GCC 5.3.

In addition to the Conditions stipulated under GCC Clause 8, the following terms & Conditions will apply.

1.1 Supply Portion

A. It is mandatory to fulfill the following conditions within 28 days of issuance of NOA:

- (a) Signing the Contract Agreement
- (b) Submission of Performance Securities in line with GCC Clause 9.3, and
- (c) Submission of Detailed PERT Network/Bar chart and its approval by the Employer. Supply will be regulated as per PERT chart approved by the employer.
- (d) Approval of all designs, drawings & guaranteed technical particulars as identified in Technical Specifications, Volume-II of the Bidding Documents.
- (e) Approval of all quality plans and sub-vendor list.
- (f) Approval of type test reports in case type tests are not required to be repeated.

It is mandatory for Contractor to submit the documents listed at Sl.No. (b) & (c) above within twenty eight (28) days of issuance of NOA and Contractor shall also fulfill the conditions mentioned at Sl. No. (d), (e) and (f) above as per terms & conditions of Contract and agreed work schedule.

B Progressive Payment

Payment of the CIF/Ex-works price of Main Equipment/Materials (including Mandatory Spares) for each consignment shall be made progressively on certification of the Employer and on the basis of work performed using the following guidelines:

B.1 70% payment of CIF/ex-works price of respective equipment shall be made on receipt and storage at site and on physical verification and furnishing of necessary certificate by the employer's representative and on furnishing of the following documents :

- (a) Evidence of despatch (R/R or receipted L/R)
- (b) Contractor's GST invoice, claim & packing list identifying contents of each shipment.
- (c) Insurance policy/certificate

- (d) Manufacturer's/Contractor's guarantee certificate of Quality.
- (e) Material Inspection Clearance Certificate (MICC) for dispatch issued by the Employer's representative and the Contractor's factory inspection report.
- (f) Test certificate

B.2 20 % payment of CIF/ex-works price of the respective equipment shall be made on installation of the respective equipment and furnishing of necessary certificate regarding the same by employer's representative.

C Final Payment

Balance 10% (ten percent) of the CIF/Ex-works price of Main Equipment/Materials shall be paid on:

- a) Successful completion of erection, testing and commissioning of the Substations/Substations Extensions and issuance of Taking Over Certificate.
- b) Proof of submission of required number of reproducibles, O&M Manuals, approved drawings, data sheets, test report, pamphlets and manuals of mandatory spares, maintenance & testing equipment.

However, in case of delay in testing and commissioning & issuance of taking over certificate by Employer beyond six (6) months from the date of receipt of equipment at site, the last 10% of Ex-Works price of respective equipment shall be paid after issuance of a certificate by Employer's representative that the equipment have been received in good condition and stands installed and on submission of a bank guarantee of equivalent amount, which shall be kept valid initially for a period of twelve (12) months or until three (3) months after the expected date of commissioning (in case it is possible to anticipate the same), whichever is earlier, provided all other conditions as per above are complied with by the Contractor. If the commissioning does not take place within the validity period of BG, the validity of BG shall be extended from time to time. The bank guarantee shall, however, be released within one month of successful commissioning of respective equipment by the Employer.

1.2 Type Test Charges

Not Applicable

1.3 Port handling and custom clearance charges (in case of CIF supplies) and, Inland Transportation, In-transit Insurance, Loading & unloading Charges.

Port handling & Custom clearance of supplies from abroad, shall be paid to the Contractor on pro-rata basis, as per the unit rates indicated in the Contract Agreement, after receipt of materials/items at site and on presentation of the GST invoices, if

applicable alongwith supporting documents by the Contractor. However, these charges will be subject to a limitation that the aggregate of all invoices does not exceed the total amount indicated in the Contract Agreement.

Inland Transportation ,In-transit Insurance, loading and unloading charges shall be paid to the Contractor on pro-rata basis, as per the unit rates indicated in the Contract Agreement, after receipt of materials/items at site and on presentation of Bill of supply or any other documents prescribed under GST Law along with supporting documents by the Contractor.

However, these charges will be subject to a limitation that the aggregate of all invoices does not exceed the total amount indicated in the Contract Agreement. GST, if payable, on services related to Inland transportation, In-transit insurance, loading and unloading shall be to the Bidder's account and Employer shall not reimburse any GST on this account.

1.4 Price Component for Installation (including Civil Works)

A. It is mandatory to submit the Performance Securities in line with GCC Clause 9.3 within 28 days of issuance of NOA.

B Progressive Payment

Ninety percent (90%) for each of the items of work, shall be paid progressively, monthly on pro-rata basis at unit rates based on quantum of work done and certification by Employer's representative and on successful completion of quality check point involved in Installation and on submission of GST invoice.

Further, one of the conditions for release of first progressive payment / subsequent payment shall be submission of 'Safety Plan' along with all requisite documents in line with GCC clause on Safety Precaution and pro-forma provided in this Section – Sample Forms and Procedure and approval of the same by the Engineer In-Charge.

C. Final Payment

Balance 10% (ten percent) of the Installation price component shall be paid after successful Completion of the Facilities under execution and issuance of Taking Over Certificate.

1.5 Training Charges:

Training Charges shall be paid on successful completion of training and on approval of the same by the Employer (* *applicable for Training to be imparted by an Indian Contractor or Training to be imparted in India by Foreign Contractor/Indian Associate*) and on furnishing GST invoice(s) for the Training Charges.

1.6 AMC Charges

Annual Maintenance Charges shall be paid quarterly **on furnishing GST invoice(s) for the Annual Maintenance Charges** by Contractor and on certification by the Employer in line with provisions of Technical Specifications.

1.7 Payment towards Price adjustment(**NOT APPLICABLE**)

Any variation in Contract price due to price adjustment provision of Appendix-2 shall be effected on presentation of debit note/credit note, as prescribed under the GST law supported by calculations as per formulae specified therein along with documentary evidence for different indices applicable for Price Adjustment.

1.7.1 Any increase in Contract price due to price adjustment provision shall be payable as follows:

Supply Portion:

90% (ninety percent) of the price adjustment amount for the respective shipment shall be paid on receipt of said shipment at site and issuance of Debit Note, as prescribed under the GST law, by the Contractor. Balance 10% (ten percent) of the price adjustment amount shall be paid along with the final payment. Any interest on GST payable due to increase in Contract price due to price adjustment shall be to the Contractor's account and Employer shall not reimburse any amount on this account.

Installation Portion:

90% (ninety percent) of the price adjustment amount for the respective billing period shall be paid after certification by Employer's representative for quantum of work done in the said billing period and issuance of Debit Note, as prescribed under the GST law, by the Contractor. Balance 10% (ten percent) of the price adjustment amount shall be paid along with the final payment. Any interest on GST payable due to increase in Contract price due to price adjustment shall be to the Contractor's account and Employer shall not reimburse any amount on this account.

1.7.2 For any reduction in Contract Price due to price adjustment provisions the Contractor shall issue 'Credit note', as prescribed under the GST law. Further, the reduction in Contract Price shall be effected by recovering 100% of the reduction amount along with applicable GST, if any charged earlier, from Contractor's invoices falling immediately due for payment or any other payments.

1.8 Payment towards Taxes and Duties

Taxes and duties applicable as per Indian Tax laws, concerning Supply of Goods and Services in respect of transaction between the Employer and the Contractor, shall be reimbursed by the Employer as follows:

- (a) In case of Ex-works supply of goods, GST shall be reimbursed along with progressive payment on dispatch.
- (b) In case of Installation, GST shall be reimbursed along with Progressive payment on completion of Erection activity.
- (c) GST on type test shall be reimbursed after successful completion of the Type test and along with the progressive payment on dispatch for the first consignment of Equipment for which the type test has been conducted.
- (d) 100% GST reimbursable on account of increase in Contract price due to price adjustment shall be reimbursed along with the 90% payment of the Price adjustment amount.

All GST payment shall be against GST invoices/debit notes raised by the Contractor as specified under the GST Act and related Rules, Notifications, etc as notified by the Government in this regard. In the event that the Contractor fails to provide the invoice/debit note in the form and manner prescribed under the GST Act and Rules, the Employer shall not be liable to make any payment against such invoice/debit note. Payment towards taxes & duties shall be released by the Employer directly to the Contractor.

2. PAYMENT PROCEDURES

2.1 Method of Payment

The Employer shall make payments promptly within Forty Five (45) days of submission of an invoice/claim by the Contractor, complete in all respects and supported by the requisite documents and fulfilment of stipulated conditions, if any. All the payment shall be released to the Contractor directly.

All payments to be made directly to the Contractor shall be made by the Employer through electronic payment mechanism (e-payment) for which necessary details shall be tied up during execution of the Contract. However, a request for payment to be released through cheque shall be considered on case to case basis and merit of the same.

Note: Pro-rata shall refer to functionally complete part(s) of the facilities, for which unit rates are identified in the contract.

PRICE ADJUSTMENT

The Contract price shall remain **FIRM** and **FIXED** and shall not be subject to Price adjustment for the entire duration of the Contract

INSURANCE REQUIREMENTS

A) Insurances to be taken out by the Contractor

In accordance with the provisions of GCC Clause 30, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld. The inability of the insurers to provide insurance cover in the sums and with the deductibles and other conditions as set forth below, shall not absolve the Contractor of his risks and liabilities under the provisions of GCC Clause 30. However, in such a case the Contractor shall be required to furnish to the Employer documentary evidence from the insurer in support of the insurer's inability as aforesaid.

(a) **Marine Cargo Policy/Transit Insurance Policy:**

(I)(i) Marine Cargo policy for imported equipment

The Contractor shall take the Marine Cargo Policy for Plant and Equipment including mandatory Spares to be supplied from abroad wherein export/import including inland transit is involved for the movement of the Plant and Equipment including mandatory Spares. The policy shall cover movement of Plant and Equipment including mandatory Spares from the manufacturer's works to the project's warehouse at final destination site. The policy shall cover all risk for loss or damage that may occur during transit of Plant and Equipment including mandatory Spares from the Contractor/sub-Contractor's works or stores until arrival at project's warehouse/ store at final destination. Institute Cargo Clause (ICC) 'A' along with war & Strike Riots & Civil Commotion (SRCC) cover shall be taken.

(I)(ii) Transit Insurance Policy for indigenous equipment

Similarly, Transit Insurance Policy shall be taken wherein only inland transit is involved for the movement of Plant and Equipment including mandatory Spares supplied from within India. The policy shall cover movement of Plant and Equipment including mandatory Spares from the manufacturer's works to the project's warehouse at final destination site. Inland Transit Clause(ITC) 'A' along with war & Strike Riots & Civil Commotion (SRCC) extension cover shall be taken.

Amount	Deduc- tible	Parties insured	From	To

	Limits			
120% of CIP Entry Border Point Price /CIF Indian Port of Entry Price of all the Plant and Equipment including mandatory Spares to be supplied from abroad plus customs duties (including BCD, GST, Cess etc.) on merit rate and 120% of Ex-work Price of all the Plant and Equipment including mandatory Spares to be supplied from within India plus GST if additionally payable.	Nil	Contractor & Employer	Mfrs ware-house	Project's ware-house store at final destination

(II) If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.

(III) The Contractor shall take the policy in the joint names of Employer and the Contractor. The policy shall indicate the Employer as the beneficiary. However, if the Contractor is having an open policy for its line of business, it should obtain an endorsement of the open cover policy from the insurance company indicating that the dispatches against this Contract are duly covered under its open policy and include the name of the Employer as jointly Insured in the endorsements to the open policy.

(b) Erection All Risk Policy/Contractor All Risk Policy:

(I) The policy should cover all physical loss or damage to the facility at site during storage, erection and commissioning covering all the perils as provided in the policy as a basic cover and the add on covers as mentioned at Sl. No. (III) below.

Amount	Deductible limits	Parties insured	From	To

<p>105% of CIP Entry Border Point Price /CIF Indian Port of Entry Price of all the Plant and Equipment including mandatory Spares to be supplied from abroad plus customs duties(including BCD, GST, Cess etc.) on merit rate</p> <p>and</p> <p>105% of Ex-work Price of all the Plant and Equipment including mandatory Spares to be supplied from within India plus GST if additionally payable.</p> <p>and</p> <p>100% of erection price component</p>	Nil	Contractor & Employer	Receipt at site of first lot of the Plant and Equipment including mandatory Spares	Up to Operational Acceptance
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----	-----------------------	------------------------------------------------------------------------------------	------------------------------

(II) The Contractor shall take the policy in the joint name of Employer and the Contractor. All these policies shall indicate Employer as the beneficiary. The policy shall be kept valid till the date of the Operational Acceptance of the project and the period of the coverage shall be determined with the approval of the Employer.

If the work is completed earlier than the period of policy considered, the Contractor shall obtain the refund as per provisions of the policy and pass on the benefit to Employer. In case no refund is payable by the insurance company then the certificate to that effect shall be submitted to Employer at the completion of the project.

(III) The following add-on covers shall also be taken by the Contractor:

- i) Earthquake
- ii) Terrorism
- iii) Escalation cost (approximately @10% of sum insured on annual basis)

iv) Extended Maintenance cover for Defect Liability Period

v) Design Defect

vi) Other add-on covers viz., 50-50 clause, 72 hours clause, loss minimization clause, waiver of subrogation clause (for projects of more than Rs.100 crores, cover for offsite storage/fabrication (over Rs.100 crores).

(IV) *Third Party Liability cover with cross Liability within Geographical limits of India as on ADD-on cover to the basic EAR cover:*

The third party liability add-on cover shall cover bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property (including the Employer's property and any parts of the Facilities which have been accepted by the Employer) occurring in connection with supply and installation of the Facilities.

Amount	Deductible limits	Parties insured	From	To
<ul style="list-style-type: none"> For projects upto Rs. 100 crores, the third party liability limit shall be 10% of the project value for single occurrence/multiple occurrences in aggregate during the entire policy period. For projects from Rs. 100 crores to Rs. 500 crores, the third party liability limit shall be Rs. 10 crores for single occurrence/multiple occurrences in aggregate during entire policy period. For projects of more than Rs.500 crores, the third party liability limit shall be Rs. 25 crores for single occurrence/ multiple occurrences in aggregate during entire policy period. 	Nil	Contractor/ Sub-contractor, Employer & all other entities mentioned in foregoing para.	Receipt at site	Upto Defect Liability Period.

(V) As per GCC Clause 30.8, the cost of insurance premium is to be reimbursed to the Contractor for Owner Supplied Materials (OSM) for which the insurer is to be finalized by the Contractor as detailed therein. Alternatively, the Contractor may take a single policy covering

the entire cost of the project including the cost of OSM. For this purpose, the Contractor shall submit documentary evidence for the premium paid for the entire project to the Employer and Employer shall reimburse to the Contractor the proportion of premium equal to value of OSM to total sum insured.

If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.

(c) **Automobile Liability Insurance**

The Contractor shall ensure that all the vehicles deployed by the Contractor or its Subcontractors (whether or not owned by them) in connection with the supply and installation of the Facilities in the project are duly insured as per RTA act. Further the Contractor or its Subcontractors may also take comprehensive policy (own damage plus third party liability) of each individual vehicles deployed in the project on their own discretion in their own name to protect their own interest.

(d) **Workmen Compensation Policy:**

(I) Workmen Compensation Policy shall be taken by the Contractor in accordance with the statutory requirement applicable in India. The Contractor shall ensure that all the workmen employed by the Contractor or its Subcontractors for the project are adequately covered under the policy.

(II) The policy may either be project specific covering all men of the Contractor and its Subcontractors. The policy shall be kept valid till the date of Operational Acceptance of the project.

Alternatively, if the Contractor has an existing 'Workmen Compensation Policy' for all its employees including that of the Subcontractor(s), the Contractor must include the interest of the Employer for this specific Project in its existing 'Workmen Compensation Policy'.

(III) Without relieving the Contractor of its obligations and responsibilities under this Contract, before commencing work the Contractor shall insure against liability for death of or injury to persons employed by the Contractor including liability by statute and at common law. The insurance cover shall be maintained until all work including remedial work is completed including the Defect Liability Period. The insurance shall be extended to indemnify the Principal for the Principal's statutory liability to persons employed by the Contractor.

The Contractor shall also ensure that each of its Subcontractors shall effect and maintain insurance on the same basis as the 'Workmen Compensation Policy' effected by the Contractor.

(e) Contractor's Plant and Machinery (CPM) Insurance

The Employer (including without limitation any consultant, servant, agent or employee of the Employer) shall not in any circumstances be liable to the Contractor for any loss of or damage to any of the Contractor's Equipment or for any losses, liabilities, costs, claims, actions or demands which the Contractor may incur or which may be made against it as a result of or in connection with any such loss or damage.

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 30.1, except for the Third Party Liability, Workmen Compensation Policy Insurances, and the Contractor's Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 30.1 except for the Cargo Insurance During Transport, Workmen Compensation Policy Insurances. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

B) Insurances to be taken out by the Employer

The Employer shall at its expense take out and maintain in effect during the performance of the Contract the following insurances.

Amount	Deductible limits	Parties Insured	From	To
		_____ NIL _____		

-- End --

TIME SCHEDULE

1. The Project Completion Schedule shall be as follows:

Substation	Time of Completion from the date of NOA
Taking over by employer upon successful completion of Supply, Erection, Testing And Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System	36 Months

However, the transmission lines (132kV/220kV/400KV) which will be offered to firm must be completed in a time period of 6 months. Extension only be provided if there is ROW or departmental own issues.

1.1 The activity(ies) under the Contractor's programme for Project Completion shall be in the form of a master network (MNW) and shall identify the various activities like design, engineering, manufacturing, supply, installation, factory testing, transportation to site, site testing and commissioning, trial operation and Taking Over etc. of the Facilities or specific part thereof. The network shall conform to the above Project Completion Schedule.

This master network will be discussed and agreed before Award in line with above, engineering drawing and data submission schedule shall also be discussed and finalised before Award. Liquidated damages for delay in successful completion of the Facilities or specific part thereof and Operational Acceptance at rates specified in Clause 21 of GCC shall be applicable beyond the date specified above.

1.2 The Employer reserves the right to request minor changes in the work schedule at the time of Award of Contract to the successful Bidder.

1.3 The successful Bidder shall be required to prepare detailed Network(s) and project implementation plans & programmes and finalise the same with the Employer as per the requirement specified in Technical Specifications, which shall form a part of the Contract.

LIST OF APPROVED SUBCONTRACTORS

Prior to award of Contract, the following details shall be completed indicating those sub-contractors proposed by the Bidder by Attachment to its bid that are approved by the Employer for engagement by the Contractor during the performance of the contract.

The following Subcontractors are approved for carrying out the item of the facilities indicated. Where more than one Subcontractor is listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. In accordance with GCC Sub-Clause 15.1, the Contractor is free to submit proposals for Subcontractors for additional items from time to time. No Subcontracts shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

Item of Facilities	Approved Subcontractors	Nationality

Further, erection portion of the contract shall not be subcontracted without the prior approval of the Employer. However, such approval shall not be necessary for engaging labour.

SCOPE OF WORKS AND SUPPLY BY THE EMPLOYER

The following personnel, facilities, works and supplies will be provided/supplied by the Employer, and the provisions of GCC 6, 16, 17 and 20 as well as Employer responsibilities stated in technical specifications shall apply as appropriate.

All personnel, facilities, works and supplies will be provided by the Employer in good time so as not to delay the performance of the Contractor in accordance with the approved Time Schedule and Program of Performance pursuant to GCC Sub-Clause 14.2.

Unless otherwise indicated, all personnel, facilities, works and supplies will be provided free of charge to the Contractor.

Personnel Charge to Contractor – None

-----NIL-----

Facilities Charge to Contractor - None except as noted

Electricity and Water Charge to Contractor - as noted

The Contractor shall be entitled to use for the purposes of the facilities such supplies of electricity and water as may be available on the Site and shall provide any apparatus necessary for such use. The Contractor shall pay the Employer at the applicable tariff plus Employer's overheads, if any, for such use. Where such supplies are not available, the Contractor shall make his own arrangement for provision of any supplies he may require.

Works Charge to Contractor - None

-----NIL-----

Supplies Charge to Contractor - None

-----NIL-----

LIST OF DOCUMENTS FOR APPROVAL OR REVIEW

Pursuant to GCC Sub-Clause 16.3.1, the Contractor shall prepare, or cause its Subcontractor to prepare, and present to the Project Manager in accordance with the requirements of GCC Sub-Clause 14.2 (Program of Performance), the following documents for:

A. Approval

1.

2.

3.

B. Review

1.

2.

3.

Note :

Bidder shall furnish the exhaustive list, which shall be discussed and finalised for incorporation into the Contract Agreement.

6. PERFORMANCE SECURITY FORM

Bank Guarantee No.

Date.....

Contract No.....

.....[Name of Contract].....

To: [Name and address of the Employer]

Dear Ladies and/or Gentlemen,

We refer to the Contract ("the Contract") signed on(insert date of the Contract)..... between you and M/s (Name of Contractor), having its Principal place of business at(Address of Contractor) and Registered Office at(Registered address of Contractor) ("the Contractor") concerning (Indicate brief scope of work) for the complete execution of the (insert name of Package alongwith name of the Project)..... [Applicable for Bank Guarantees issued by Contractor/Associate for those Contracts awarded to them]

Or

We refer to the Contract signed on(insert date of the Contract)..... between you and M/s (Name of Contractor), having its Principal place of business at(Address of Contractor) and Registered Office at(Registered address of Contractor) ("the Contractor") and the Contract ("the Contract") signed on(insert date of the Contract)..... between you and M/s (Name of Associate), having its Principal place of business at(Address of Associate) and Registered Office at(Registered address of Associate), the Associate of the Contractor for executing the Facilities concerning (Indicate brief scope of work) for the complete execution of the (insert name of Package alongwith name of the Project)..... [Applicable for Bank Guarantees to be issued by Contractor against those Contracts awarded to their Associate]

By this letter we, the undersigned,(insert name & address of the issuing bank), a Bank (which expression shall include its successors, administrators, executors and assigns) organized under the laws of and having its Registered/Head Office at(insert address of registered office of the bank)..... do hereby irrevocably guarantee payment to you up to i.e., five percent (5%) of the Contract Price until ninety (90) days beyond the Defect Liability Period i.e., up to and inclusive of (dd/mm/yy).

We undertake to make payment under this Letter of Guarantee upon receipt by us of your first written demand signed by your duly authorized officer declaring the Contractor to be in default under the Contract and without cavil or argument any sum or sums within the above named limits, without your need to prove or show grounds or reasons for your demand and without the right of the Contractor to dispute or question such demand.

Our liability under this Letter of Guarantee shall be to pay to you whichever is the lesser of the sum so requested or the amount then guaranteed hereunder in respect of any demand duly made hereunder prior to expiry of the Letter of Guarantee, without being entitled to inquire whether or not this payment is lawfully demanded.

This letter of Guarantee shall remain in full force and shall be valid from the date of issue until ninety (90) days beyond the Defect Liability Period of the Facilities i.e. upto and inclusive of (dd/mm/yy) and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/s. on whose behalf this Letter of Guarantee has been given.

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.

Our liability under this Letter of Guarantee shall become null and void immediately upon its expiry, whether it is returned or not, and no claim may be made hereunder after such expiry or after the aggregate of the sums paid by us to you shall equal the sums guaranteed hereunder, whichever is the earlier.

All notices to be given under shall be given by registered (airmail) posts to the addressee at the address herein set out or as otherwise advised by and between the parties hereto.

We hereby agree that any part of the Contract may be amended, renewed, extended, modified, compromised, released or discharged by mutual agreement between you and the Contractor, and this security may be exchanged or surrendered without in any way impairing or affecting our liabilities hereunder without notices to us and without the necessity for any additional endorsement, consent or guarantee by us, provided, however, that the sum guaranteed shall not be increased or decreased.

No action, event or condition which by any applicable law should operate to discharge us from liability hereunder shall have any effect and we hereby waive any right we may have to apply such law so that in all respects our liability hereunder shall be irrevocable and, except as stated herein, unconditional in all respects.

Yours truly,

Name of the Bank

.....

Authorized Signature

Signature of Witness.....

Name.....

Address.....

Note :

1. The non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee' and the date of purchase should not be earlier than six months of issuance of the Bank Guarantee by the Bank.
2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.

7. FORM OF TAKING OVER CERTIFICATE

Date.....

Name of Contract.....

Contract No.....

To :

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to GCC 20 (Completion of the Facilities) of the General Conditions of the Contract entered into between yourselves and the Employer dated relating to the (*insert brief description of the Facilities*)..... we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below :

1. Description of the Facilities or part thereof
.....

2. Date of Completion :.....

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defects Liability Period.

Very truly yours,

Title

(Project Manager)

8. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN ONE LOT BY(abbreviated name of the Employer)..... FOR PERFORMANCE OF ITS CONTRACT

INDEMNITY BOND

THIS INDEMNITY BOND is made this..... day of 20..... by a Company registered under the Companies Act, 1956/Partnership firm/ proprietary concern having its Registered Office at.....(hereinafter called as 'Contractor' or "Obligor" which expression shall include its successors and permitted assigns) in favour of (*insert name of the Employer*)....., a Company incorporated under the Companies Act, 1956 having its Registered Office at(*insert registered address of the Employer*) and its project at (hereinafter called "*.....(abbreviated name of the Employer).....*") which expression shall include its successors and assigns):

WHEREAS(*abbreviated name of the Employer*)..... has awarded to the Contractor a Contract for.....vide its Notification of Award/Contract No..... dated..... and its Amendment No. (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which(*abbreviated name of the Employer*)..... is required to hand over various Equipment to the Contractor for execution of the Contract.

And WHEREAS by virtue of Clause No.....of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of(*abbreviated name of the Employer*)..... for the Equipment handed over to it by(*abbreviated name of the Employer*)..... for the purpose of performance of the Contract/Erection portion of the contract (hereinafter called the "Equipment").

AND THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipment as mentioned in the Contract, valued at (amount in words.....) handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep(*abbreviated name of the Employer*)..... indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipment as per dispatch title documents handed over to the Contractor duly endorsed in their favour and detailed in the Schedule appended hereto. It is expressly understood by the Contractor that handing over of the dispatch title documents in respect of the said Equipments duly endorsed by(*abbreviated name of the Employer*)..... in favour of the Contractor shall be construed as handing over of the Equipment purported to be covered by such title documents and the Contractor shall hold such Equipment in trust as a Trustee for and on behalf of(*abbreviated name of the Employer*).....

2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at(*abbreviated name of the Employer*)..... project Site against all risks whatsoever till the Equipment are duly used/erected in accordance with the terms of the Contract and the Plant/Package duly erected and commissioned in accordance with the terms of the Contract, is taken over by(*abbreviated name of the*

Employer)..... The Contractor undertakes to keep(*abbreviated name of the Employer*)..... harmless against any loss or damage that may be caused to the Equipment.

3. The Contractor undertakes that the Equipment shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilised for any other work of purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.

4. That(*abbreviated name of the Employer*)..... is and shall remain the exclusive Employer of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The equipment shall at all times be open to inspection and checking by the Employee or Employer's Representative in this regard. Further,(*abbreviated name of the Employer*)..... shall always be free at all times to take possession of the Equipment in whatever form the equipment may be, if in its opinion, the Equipment are likely to be endangered, misutilised or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of(*abbreviated name of the Employer*)..... to return the equipment without any demur or reservation.

5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is misutilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Employer's Representative as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipment at his own cost and/or shall pay the amount of loss to(*abbreviated name of the Employer*)..... without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to(*abbreviated name of the Employer*)..... against the Contractor under the Contract and under this Indemnity Bond.

6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of(*abbreviated name of the Employer*)....., THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE

Particulars of the	Quantity	Particulars of Dispatch title	Value of the	Signature of the
--------------------	----------	-------------------------------	--------------	------------------

Equipment handed over		Documents		Equipment	Attorney in token of receipt
		RR/GR No. date of lading	Carrier		

For and on behalf of

M/s.....

WITNESS

1. Signature.....

Signature.....

Name.....

Name.....

Address.....

Address.....

2. Signature.....

Authorised representative

Name.....

(Common Seal)

Address.....

(In case of Company)

Indemnity Bonds are to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute Indemnity Bonds, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.

9. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN INSTALLMENTS BY(abbreviated name of the Employer)..... FOR PERFORMANCE OF ITS CONTRACT

INDEMNITY BOND

THIS INDEMNITY BOND is made this day of 20..... by a Company registered under the Companies Act, 1956/Partnership firm/proprietary concern having its Registered Office at(hereinafter called as 'Contractor' or 'Obligor' which expression shall include its successors and permitted assigns) in favour of(*insert name of the Employer*)....., a company incorporated under the Companies Act, 1956 having its Registered Office at(*insert registered address of the Employer*)..... and its project at (hereinafter called "*abbreviated name of the Employer*")....." which expression shall include its successors and assigns):

WHEREAS(*abbreviated name of the Employer*)..... has awarded to the Contractor a Contract forvide its Notification of Award/Contract No. datedand Amendment No. (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which(*abbreviated name of the Employer*)..... is required to handover various Equipment to the Contractor for execution of the Contract.

AND WHEREAS by virtue of Clause No.....of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of(*abbreviated name of the Employer*)..... for the Equipment handed over to it by(*abbreviated name of the Employer*)..... for the purpose of performance of the contract/Erection portion of the Contract (hereinafter called the "Equipment".)

NOW THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipments as mentioned in the Contract, valued at (amount in words _____) to be handed over to the Contractor in installments from time to time for the purpose of performance of the contract, the Contractor hereby undertakes to indemnify and shall keep(*abbreviated name of the Employer*)..... indemnified, for the full value of Equipment. The Contractor hereby acknowledges receipt of the initial installment of the equipment per details in the schedule appended hereto. Further, the Contractor agrees to acknowledge receipt of the subsequent installments of the Equipment as required by(*abbreviated name of the Employer*)..... in the form of Schedules consecutively numbered which shall be attached to this Indemnity bond so as to form integral parts of this Bond. It is expressly understood by the Contractor that handing over the dispatch title documents in respect of the said Equipments duly endorsed by(*abbreviated name of the Employer*)..... in favour of the Contractor shall be construed as handing over the Equipment purported to be covered by such title documents and the Contractor shall hold such

Equipments in trust as a Trustee for and on behalf of(*abbreviated name of the Employer*).....

2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at(*abbreviated name of the Employer*)..... project Site against all risks whatsoever till the Equipment are duly used/erected in accordance with the terms of the Contract and the Plant/Package duly erected and commissioned in accordance with the terms of the Contract, is taken over by(*abbreviated name of the Employer*)..... The Contractor undertakes to keep(*abbreviated name of the Employer*)..... harmless against any loss or damage that may be caused to the Equipment.

3. The Contractor undertakes that the Equipment shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilised for any other work or purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.

4. That(*abbreviated name of the Employer*)..... is and shall remain the exclusive Employer of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The equipment shall at all times be open to inspection and checking by the Employer or Employer's Representative in this regard. Further,(*abbreviated name of the Employer*)..... shall always be free at all times to take possession of the Equipment in whatever form the Equipment may be, if in its opinion, the Equipment are likely to be endangered, misutilised or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of(*abbreviated name of the Employer*)..... to return the equipment without any demur or reservation.

5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is misutilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Employer's Representative as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipment at its own cost and/or shall pay the amount of loss to(*abbreviated name of the Employer*)..... without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to(*abbreviated name of the Employer*)..... against the Contractor under the Contract and under this Indemnity Bond.

6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of(*abbreviated name*

of the Employer)....., THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE No. 1

Particulars of the Equipment handed over	Quantity	Particulars of Dispatch title Documents		Value of the Equipment	Signature of the Attorney in token of receipt
		RR/GR No. date of lading	Carrier		

For and on behalf of

M/s.....

WITNESS

1. Signature.....

Signature.....

Name.....

Name.....

Address.....

Address.....

2. Signature.....

Authorised representative

Name.....

(Common Seal)

Address.....

(In case of Company)

Indemnity Bonds are to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute Indemnity Bonds, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.

10. FORM OF AUTHORISATION LETTER

Ref. No:

Date :

To

M/s.....

.....

.....

REF.: Contract No. dated for awarded by
....(*insert name of the Employer*).....

Dear Sir,

Kindly refer to Contract No. dated for You are hereby authorised on behalf of (*Name of Employer*)..... a company incorporated under the laws of Companies Act 1956 and having its Registered Office at(*registered address of the Employer*) and its Project at to take physical delivery of materials/equipments covered under Dispatch Document/Consignment Note No.*..... datedand as detailed in the enclosed schedule for the sole purpose of successful performance of the aforesaid contract and for no other purpose, whatsoever.

(Signature of Project Authority)**

Designation.....

Date.....

Encl: As Above.

** To be signed not below the rank of Manager.

* Mention LR/RR No.

Schedule of Material/Equipment covered under Dispatch Title Document (RR No./LR No.)

Sl. No.	Contract Name	NOA No./ CA No.	Description of Materials/ Equipments	Spec. No.	Qty.	Value	Remarks

(Signature of the Project Authority)

(Designation)

(Date)

11. FORM OF TRUST RECEIPT FOR PLANT, EQUIPMENT AND MATERIALS RECEIVED

We M/s.(*insert name of the Contractor*) having our Principal place of business at having been awarded a Contract No. dated for (*insert Package name along with name of the Project*)..... by(*insert name of the Employer*)

We do hereby acknowledge the receipt of the Plant, Equipment and Materials as are fully described and mentioned under Documents of Title/RR/LR etc. and in the schedule annexed hereto, which shall form an integral part of this receipt as "Trustee" of (*insert name of the Employer*)..... The aforesaid materials etc. so received by us shall be exclusively used in the successful performance of the aforesaid Contract and for no other purpose whatsoever. We undertake not to create any charge, lien or encumbrance over the aforesaid materials etc, in favour of any other person/institution(s)/Banks.

For M/s

(Contractor's Name)

Dated :

(AUTHORISED SIGNATORY)

Place :

SEAL OF COMPANY

12. FORM OF EXTENSION OF BANK GUARANTEE

Ref. No.....

Dated:.....

To: *[Name and address of the Employer]*

Dear Sirs,

Sub.: Extension of Bank Guarantee No. dated for, issued to you on behalf of M/s.*(insert name of the Contractor)* in respect of Contract No. dated for *(insert name of the Package along with the Project name)* (hereinafter called original Bank Guarantee).

At the request of M/s..... *(insert name of the Contractor)*, We*(insert name & address of the issuing bank)*, a Bank organized under the laws of and having its Registered/Head Office at*(insert address of registered office of the bank)*..... do hereby extend our liability under the above-mentioned Guarantee No. Dated for a further period of Years/Months from to expire on Except as provided above, all other terms and conditions of the original Bank Guarantee No. dated shall remain unaltered and binding.

Please treat this as an integral part of the original Guarantee to which it would be attached.

Yours Faithfully,

For

Manager/Agent/Accountant

Power of Attorney No.....

Dated.....

SEAL OF BANK

Note :

1. The non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee' and the date of purchase should not be earlier than six months of issuance of the Bank Guarantee by the Bank.
2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.

13. FORM OF POWER OF ATTORNEY FOR JOINT VENTURE

KNOW ALL MEN BY THESE PRESENTS THAT WE , the Partners whose details are given hereunder have formed a Joint Venture under the laws of and having our Registered Office(s)/Head Office(s) at (hereinafter called the 'Joint Venture' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) acting through M/s being the Partner in-charge do hereby constitute, nominate and appoint M/s..... a Company incorporated under the laws of and having its Registered/Head Office at as our duly constituted lawful Attorney (hereinafter called "Attorney" or "Authorised Representative" or "Partner In-charge") to exercise all or any of the powers for and on behalf of the Joint Venture in regard to Specification No..... Package the bids for which have been invited by (insert name of the Employer along with address) (hereinafter called the 'Employer') to undertake the following acts :

- i) To submit proposal and participate in the aforesaid Bid Specification of the Employer on behalf of the "Joint Venture".
- ii) To negotiate with the Employer the terms and conditions for award of the Contract pursuant to the aforesaid Bid and to sign the Contract with the Employer for and on behalf of the "Joint Venture".
- iii) To do any other act or submit any document related to the above.
- iv) To receive, accept and execute the Contract for and on behalf of the "Joint Venture".

It is clearly understood that the Partner In-charge (Lead Partner) shall ensure performance of the Contract(s) and if one or more Partner fail to perform their respective portions of the Contract(s), the same shall be deemed to be a default by all the Partners.

It is expressly understood that this Power of Attorney shall remain valid binding and irrevocable till completion of the Defect Liability Period in terms of the Contract.

The Joint Venture hereby agrees and undertakes to ratify and confirm all the whatsoever the said Attorney/Authorised Representatives/Partner in-charge quotes in the bid, negotiates and signs the Contract with the Employer and/or proposes to act on behalf of the Joint Venture by virtue of this Power of Attorney and the same shall bind the Joint Venture as if done by itself.

IN WITNESS THEREOF the Partners Constituting the Joint Venture as aforesaid have executed these presents on this day of under the Common Seal(s) of their Companies.

for and on behalf of the

Partners of Joint Venture

.....
.....
.....

The Common Seal of the above Partners of the Joint Venture:

The Common Seal has been affixed there unto in the presence of:

WITNESS

1. Signature.....

Name

Designation

Occupation

2. Signature.....

Name

Designation

Occupation

Note :

1. The non-judicial stamp papers of appropriate value shall be purchased in the name of Joint Venture and the date of purchase should not be earlier than six months of date of execution of the Agreement.

2. The Agreement shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.

14. FORM OF UNDERTAKING BY THE JOINT VENTURE PARTNERS

THIS JOINT DEED OF UNDERTAKING executed on this..... day of..... Two Thousand and..... by a company incorporated under the laws of and having its Registered Office at(hereinafter called the "Party No.1" which expression shall include its successors, executors and permitted assigns) and M/s.....a company incorporated under the laws of and having its Registered Office at (hereinafter called the "Party No.2" which expression shall include its successors, executors and permitted assigns) and M/s. a Company incorporated under the laws of and having its Registered Office at (hereinafter called the "Party No.3" which expression shall include its successors, executors and permitted assigns) for the purpose of making a bid and entering into a contract [hereinafter called the "Contract" {in case of award}] against the Specification No..... for (*insert name of the package along with project name*) of (*insert names of the Employer*), a Company incorporated under the Companies Act of 1956 having its registered office at(*insert registered address of the Employer*)..... (hereinafter called the "Employer").

WHEREAS the Party No.1, Party No.2 and Party No.3 have entered into an Agreement dated

AND WHEREAS the Employer invited bids as per the above mentioned Specification for the design, manufacture, supply, erection, testing and commissioning of Equipment/ Materials stipulated in the bidding documents under (*insert name of the package along with project name*)

AND WHEREAS Clause 9.3, Section-ITB and BDS (documents establishing the Qualification of Bidder) & Qualification Criteria in Annexure-A to BDS forming part of the bidding documents, inter-alia stipulates that an Undertaking of two or more qualified manufacturers as partners, meeting the requirements of Qualification Criteria in Annexure-A to BDS, as applicable may bid, provided, the Joint Venture fulfills all other requirements under Clause 9.3 (c) of ITB and Qualification Criteria in Annexure-A to BDS and in such a case, the Bid Forms shall be signed by all the partners so as to legally bind all the Partners of the Joint Venture, who will be jointly and severally liable to perform the Contract and all obligations hereunder.

The above clause further states that this Undertaking shall be attached to the bid and the Contract performance guarantee will be as per the format enclosed with the bidding document without any restrictions or liability for either party.

AND WHEREAS the bid is being submitted to the Employer vide proposal No.....dated by Party No.1 based on this Undertaking between all the parties; under these presents

and the bid in accordance with the requirements of Clause 9.3, Section-ITB and BDS (documents establishing the Qualification of Bidder) & Qualification Criteria in Annexure-A to BDS, has been signed by all the parties.

NOW THIS UNDERTAKING WITNESSETH AS UNDER:

In consideration of the above premises and agreements all the parties of this Deed of Undertaking do hereby declare and undertake:

1. In requirement of the award of the Contract by the Employer to the Joint Venture Partners, we, the Parties do hereby undertake that M/s..... the Party No.1, shall act as Lead Partner and further declare and confirm that we the parties to the Joint Venture shall jointly and severally be bound unto the Employer for the successful performance of the Contract and shall be fully responsible for the design, manufacture, supply and successful performance of the equipment in accordance with the Contract:
2. In case of any breach or default of the said Contract by any of the parties to the Joint Venture, the party(s) do hereby undertake to be fully responsible for the successful performance of the Contract and to carry out all the obligations and responsibilities under the Contract in accordance with the requirements of the Contract.
3. Further, if the Employer suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance of the equipment in meeting the performances guaranteed as per the specification in terms of the Contract, the Party(s) of these presents undertake to promptly make good such loss or damages caused to the Employer, on its demand without any demur. It shall not be necessary or obligatory for the Employer to proceed against Lead Partner to these presents before proceeding against or dealing with the other Party(s), the Employer can proceed against any of the parties who shall be jointly and severally liable for the performance and all other liabilities/obligations under the Contract to the Employer.
4. The financial liability of the Parties of this Deed of Undertaking to the Employer, with respect to any of the claims rising out of the performance or non-performance of the obligations set forth in this Deed of Undertaking, read in conjunction with the relevant conditions of the Contract shall, however not be limited in any way so as to restrict or limit the liabilities or obligations of any of the Parties of this Deed of Undertaking.
5. It is expressly understood and agreed between the Parties to this Undertaking that the responsibilities and obligations of each of the Parties shall be as delineated in Appendix – I (*to be suitably appended by the Parties along with this Undertaking in its bid*) to this Deed of Undertaking. It is further undertaken by the parties that the above sharing of responsibilities and obligations shall not in any way be a limitation of joint and several responsibilities of the Parties under the Contract.

6. It is also understood that this Undertaking is provided for the purposes of undertaking joint and several liabilities of the partners to the Joint Venture for submission of the bid and performance of the Contract and that this Undertaking shall not be deemed to give rise to any additional liabilities or obligations, in any manner or any law, on any of the Parties to this Undertaking or on the Joint Venture, other than the express provisions of the Contract.

7. This Undertaking shall be construed and interpreted in accordance with the provisions of the Contract.

8. In case of an award of a Contract, we the parties to this Deed of Undertaking do hereby agree that we shall be jointly and severally responsible for furnishing a Contract performance security from a bank in favour of the Employer in the currency/currencies of the Contract.

9. It is further agreed that this Deed of Undertaking shall be irrevocable and shall form an integral part of the bid and shall continue to be enforceable till the Employer discharges the same or upon the completion of the Contract in accordance with its provisions, whichever is earlier. It shall be effective from the date first mentioned above for all purposes and intents.

IN WITNESS WHEREOF, the Parties to this Deed of Undertaking have through their authorised representatives executed these presents and affixed Common Seals of their companies, on the day, month and year first mentioned above.

Common Seal of has been affixed in my/ our presence pursuant to Board of Director's Resolution dated Name Designation Signature WITNESS :	For Lead Partner (Party No.-1) For and on behalf of M/s (Signature of the authorized representative)
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<p>I.</p> <p>II.</p>	
<p>Common Seal of has been affixed in my/ our presence pursuant to Board of Director's Resolution dated</p> <p>Name</p> <p>Designation</p> <p>Signature</p> <p>WITNESS :</p> <p>I.</p> <p>II.</p>	<p>For Party No.-2</p> <p>For and on behalf of M/s.....</p> <p>(Signature of the authorized representative)</p>

<p>Common Seal of</p> <p>has been affixed in my/ our presence pursuant to Board of Director's Resolution dated</p> <p>Name</p> <p>Designation</p> <p>Signature</p> <p>WITNESS :</p> <p>I.</p> <p>II.</p>	<p>For Party No.-3</p> <p>For and on behalf of M/s.</p> <p>(Signature of the authorized representative)</p>
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Note :

1. The non-judicial stamp papers of appropriate value shall be purchased in the name of Joint Venture and the date of purchase should not be earlier than six months of date of execution of the Undertaking.
2. The Undertaking shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.

15. FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT/FACILITIES

BANK CERTIFICATE

This is to certify that M/s. _____ (*insert Name & Address of the Contractor*) _____ who have submitted their bid to(*insert name of the Employer*)..... against their tender specification Vide ref. No. for (*insert name of the package along with the project name*) is our customer for the past years.

Their financial transaction with our Bank have been satisfactory. They enjoy the following fund based and non fund based limits including for guarantees, L/C and other credit facilities with us against which the extent of utilization as on date is also indicated below:

Sl. No.	Type of Facility	Sanctioned Limit as on Date	Utilisation as on Date

This letter is issued at the request of M/s. _____.

Signature _____

Name of Bank _____

Name of Authorised

Signatory _____

Designation _____

Phone No. _____

Address _____

SEAL OF THE BANK

16 FORM OF OPERATIONAL ACCEPTANCE

Date.....

Name of Contract.....

Contract No.....

To :

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to GCC 20 (Completion of the Facilities) of the General Conditions of the Contract entered into between yourselves and the Employer dated relating to the (*insert brief description of the Facilities*)..... we hereby notify you that the we System tests and Acceptance tests of the following part(s) of the Facilities were satisfactorily completed on the date specified below :

1. Description of the Facilities or part thereof
.....
2. Date of Operational Acceptance :.....

This letter does not relieve you of your obligation during the Defects Liability Period and Latent Defect warranty.

Very truly yours,

Title

(Project Manager)

FORM No. 17**FORM OF SAFETY PLAN TO BE SUBMITTED BY THE CONTRACTOR WITHIN SIXTY DAYS OF AWARD OF CONTRACT****[TO BE EXECUTED ON A NON JUDICIAL STAMP PAPER WORTH RS. TWENTY ONLY]****SAFETY PLAN**

THIS SAFETY PLAN is made this day of 20..... by a Company registered under the Companies Act, 1956/Partnership firm/proprietary concern having its Registered Office at[*to be modified suitably for JV Contractor*] (hereinafter called as 'Contractor' which expression shall include its successors and permitted assigns) for approval of(*insert name of the Employer*)....., a company incorporated under the Companies Act, 1956 having its Registered Office at(*insert registered address of the Employer*)..... for its Contract for (*insert package name, project name alongwith Specification number of the Contract*).....

WHEREAS(*abbreviated name of the Employer*)..... has awarded to the Contractor the aforesaid Contract vide its Notification of Award/Contract No. datedand Amendment No. (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which the Contractor is required to submit 'Safety Plan' alongwith certain documents to the Engineer In-Charge/Project Manager of the Employer within Sixty (60) days of Notification of Award for its approval.

NOW THEREFORE, the Contractor undertakes to execute the Contract as per the safety plan as follows:

1. THAT the Contractor shall execute the works as per provisions of Bidding Documents including those in regard to Safety Precautions / provisions as per statutory requirements.
2. THAT the Contractor shall execute the works in a well planned manner from the commencement of Contract as per agreed mile stones of work completion schedule so that planning and execution of construction works goes smoothly and consistently through out the contract duration without handling pressure in last quarter of the financial year/last months of the Contract and the shall be finalized in association with Employer Engineer In-charge/Project Manager from time to time as required.
3. THAT the Contractor has prepared the safe work procedure for each activity i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. to be executed at site, which is enclosed at **Annexure – 1A (SP)** for acceptance and approval of Engineer In-charge/Project Manager. The Contractor shall ensure that on approval of the same from Engineer In-charge/Project Manager , the approved copies will be circulated to Employer's personnel at site

[Supervisor(s)/Executive(s)] and Contractor's personnel at site [Gang leader, supervisor(s) etc.] in their local language / language understood by gang.

THAT the Contractor has prepared minimum manpower deployment plan, activity wise as stated above, which is enclosed at **Annexure – 1B (SP)** for approval of Engineer In-charge/Project Manager.

4. THAT the Contractor shall ensure while executing works that they will deploy minimum 25% of their own experienced work force who are on the permanent roll of the company and balance 75% can be a suitable mix with the hired gangs / local workers / casual workers if required. The above balance 75% work force should be provided with at least 10 days training by the construction agencies at sites and shall be issued with a certificate. No worker shall be engaged without a valid certificate. Hired gang workers shall also follow safe working procedures and safety norms as is being followed by company's workmen. It should also be ensured by the contractor that certified fitters who are climbing towers / doing stringing operations can be easily identifiable with a system like issue of Badge / Identification cards (ID cards) etc. Colour identification batches should be worn by the workers. Contractor has to ensure that inexperienced workers / unskilled workers should not be deployed for skilled job.

5. THAT the Contractor's Gang leader / Supervisor / Senior most member available at every construction site shall brief to each worker daily before start of work about safety requirement and warn about imminent dangers and precautions to be taken against the imminent dangers (Daily Safety Drill). This is to be ensured without fail by Contractor and maintain record of each gang about daily safety instructions issued to workers and put up to Employer site In-charge for his review and record.

6. THAT the Contractor shall ensure that working Gangs at site should not be left at the discretion of their Gang Leaders who are generally hired and having little knowledge about safety. Gang leader should be experienced and well versed with the safe working procedures applicable for transmission line/ Sub Station works. In case gang is having Gang leader not on permanent roll of the company then additional Supervisor from company's own roll having thorough knowledge about the works would be deployed so as to percolate safety instructions upto the grass root level in healthy spirits. Contractor has to ensure close supervision while executing critical locations of transmission lines / sub stations and ensures that all safety instructions are in place and are being followed.

7. THAT the Contractor shall maintain in healthy and working condition all kind of Equipments / Machineries / Lifting tools / Lifting tackles / Lifting gears / All kind of Ropes including wire ropes / Polypropylene ropes etc. used for Lifting purpose during execution of the project and get them periodically examined and load tested for safe working load in accordance with relevant provisions and requirement of Building & other construction workers Regulation of Employment and Conditions of Services Act and Central Rule 1998, Factories Act 1948, Indian Electricity Act 2003 before start of the project. A register of such examinations and tests shall

be properly maintained by the contractor and will be promptly produced as and when desired by the Engineer In-charge/Project Manager or by the person authorised by him. The Contractor has to ensure to give special attention on the formation / condition of eye splices of wire rope slings as per requirement of IS 2762 Specification for wire rope slings and sling legs.

THAT the Contractor has prepared a list of all Lifting machines, lifting Tools / Lifting Tackles / Lifting Gears etc. / All types of ropes and Slings which are subject to safe working load is enclosed at **Annexure – 2 (SP)** for review and approval of Engineer In-charge/Project Manager.

8. THAT the Contractor has to procure sufficient quantity of Personal Protective Equipment (PPE) conforming to Indian / International standards and provide these equipment to every workman at site as per need and to the satisfaction of Engineer-in-charge/Project Manager of Employer. The Contractor's Site Supervisor/ Project Manager has to ensure that all workmen must use Personal Protective Equipment at site. The Contractor shall also ensure that Industrial Safety helmets are being used by all workmen at site irrespective of their working (at height or on ground). The Contractor shall further ensure use of safety shoes by all ground level workers and canvas shoes for all workers working at height, Rubber Gum Boots for workers working in rainy season and concreting job, Use of Twin Lanyard Full body Safety Harness with attachment of light weight such as aluminium alloy etc. and having features of automatic locking arrangement of snap hook, by all workers working at height for more than three meters and also for horizontal movement on tower shall be ensured by contractor. The Contractor shall not use ordinary half body safety harness at site. The Contractor has to ensure use of Retractable type fall arrestors by workers for ascending / descending on suspension insulator string and other similar works etc., Use of Mobile fall arrestor for ascending / descending from tower by all workers. The contractor has to provide cotton / leather hand gloves as per requirement, Electrical Resistance Hand gloves for operating electrical installations / switches, Face shield for protecting eyes while doing welding works and Dust masks to workers as per requirement. The Contractor will have to take action against the workers not using Personal Protective Equipment at site and those workers shall be asked to rest for that day and also their Salary be deducted for that day. Employer may issue warning letter to Project Manager of contractor in violation of above norms.

THAT the Contractor shall prepare a detailed list of PPEs, activity wise, to commensurate with manpower deployed, which is enclosed at **Annexure – 3 (SP)** for review and approval of Engineer In-charge/Project Manager. It shall also be ensured that the sample of these equipment shall be got approved from Employer supervisory staff before being distributed to workers. The contractor shall submit relevant test certificates as per IS / International Standard as applicable to PPEs used during execution of work. All the PPE's to be distributed to the workers shall be checked by Employer supervisory staff before its usage.

The Contractor also agrees for addition / modification to the list of PPE, if any, as advised by Engineer In-Charge/Project Manager.

9. THAT the Contractor shall procure, if required sufficient quantity of Earthing Equipment / Earthing Devices complying with requirements of relevant IEC standards (Generally IECs standards for EarthingEquipments / Earthing Devices are – 855, 1230, 1235 etc.) and to the satisfaction of Engineer In-Charge/ Project Manager and contractor to ensures to maintained them in healthy condition.

THAT the Contractor has prepared / worked out minimum number of healthy EarthingEquipments with Earthing lead confirming to relevant IS / European standards per gang wise during stringing activity/as per requirement, which is enclosed herewith at **Annexure – 4 (SP)** for review and acceptance of Engineer In-Charge/ Project Manager prior to execution of work.

10. THAT the Contractor shall provide communication facilities i.e. Walky – Talkie / Mobile Phone, Display of Flags / whistles for easy communication among workers during Tower erection / stringing activity, as per requirement.

11. THAT the Contractor undertakes to deploy qualified safety personnel responsible for safety as per requirements of Employer/Statutory Authorities.

THAT the Contractor employing more than 250 workmen whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as qualified safety officer having diploma in safety to supervise safety aspects of the equipment and workmen who will coordinate with Engineer In-charge /Project Manager/Safety Co-ordinator of the Employer. In case of work being carried out through sub contractors the sub – contractor’s workmen / employees will also be considered as the contractor’s employees / workmen for the above purpose. If the number of workers are less than 250 then one qualified safety officer is to be deployed for each contract. He will report directly to his head of organization and not the Project Manager of contractor He shall also not be assigned any other work except assigning the work of safety. The curriculum vitae of such person shall be got cleared from Employer Project Manager / Construction staff.

The name and address of such safety officers of contractor will be promptly informed in writing to Engineer In-charge with a copy to safety officer - In-charge before start of work or immediately after any change of the incumbent is made during the currency of the contract. The list is enclosed at **Annexure – 5A (SP)**.

THAT the Contractor has also prepared a list including details of Explosive Operator (if required), Safety officer / Safety supervisor / nominated person for safety for each erection / stringing gang, list of personnel trained in First Aid Techniques as well as copy of organisation structure of the Contractor in regard to safety. The list is enclosed at **Annexure – 5B (SP)**.

12. The Project Manager shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipment. In such cases, the Contractor shall

be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove shortcomings promptly. The Contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of work to the Project Manager within 3 days of such stoppage of work and decision of the Project Manager in this respect shall be conclusive and binding on the Contractor.

13. THAT, if, any Employer's Engineer/ supervisor at site observes that the Contractor is failing to provide safe working environment at site as per agreed Safety Plan / Employer Safety Rule/ Safety Instructions / Statutory safety requirement and creates hazardous conditions at site and there is possibility of an accident to workmen or workmen of the other contractor or public or the work is being carried out in an un safe manner or he continues to work even after being instructed to stop the work by Engineer / Supervisor at site / RHQ / Corp. Centre, the Contractor shall be bound to pay a penalty of Rs. 10,000/ - per incident per day till the instructions are complied and as certified by Engineer / Supervisor of Employer at site. The work will remain suspended and no activity will take place without compliance and obtaining clearance / certification of the Site Engineer / Supervisor of the Employer to start the work.

14. THAT, if the investigation committee of Employer observes any accident or the Engineer In-charge/Project Manager of the Employer based on the report of the Engineer/Supervisor of the Employer at site observes any failure on the Contractor's part to comply with safety requirement / safety rules/ safety standards/ safety instruction as prescribed by the Employer or as prescribed under the applicable law for the safety of the equipment, plant and personnel and the Contractor does not take adequate steps to prevent hazardous conditions which may cause injury to its own Contractor's employees or employee of any other Contractors or Employer or any other person at site or adjacent thereto, or public involvement because of the Contractor's negligence of safety norms, the Contractor shall be liable to pay a compensation of Rs. 10,00,000/- (Rupees Ten Lakh only) per person affected causing death and Rs. 1,00,000/- (Rupees One Lakh only) per person for serious injuries / 25% or more permanent disability to the Employer for further disbursement to the deceased family/ Injured persons. The permanent disability has the same meaning as indicated in Workmen's Compensation Act 1923. The above stipulations is in addition to all other compensation payable to sufferer as per workmen compensation Act / Rules

THAT as per the Employer's instructions, the Contractor agrees that this amount shall be deducted from their running bill(s) immediately after the accident, That the Contractor understands that this amount shall be over and above the compensation amount liable to be paid as per the Workmen's Compensation Act /other statutory requirement/ provisions of the Bidding Documents.

15. THAT the Contractor shall submit Near-Miss-Accident report alongwith action plan for avoidance such incidence /accidents to Engineer – In-charge/ Project Manager. Contractor shall also submit Monthly Safety Activities report to Engineer – In-charge/ Project Manager and copy

of the Monthly Safety Activities report also to be sent to Safety In-charge at RHQ of the Employer for his review record and instructions.

16. THAT the Contractor is submitting a copy of Safety Policy/ Safety Documents of its Company which is enclosed at **Annexure – 6 (SP)** and ensure that the safety Policy and safety documents are implemented in healthy spirit.

17. THAT the Contractor shall make available of First Aid Box [Contents of which shall be as per Building & other construction workers (Regulation of Employment and Conditions of Services Act and Central Rule 1998 / Employer Guidelines)] to the satisfaction of Engineer In-Charge/ Project Manager with each gang at site and not at camp and ensures that trained persons in First Aid Techniques with each gang before execution of work.

18. THAT the Contractor shall submit an 'Emergency Preparedness Plan' for different incidences i.e. Fall from height, Electrocuting, Sun Stroke, Collapse of pit, Collapse of Tower, Snake bite, Fire in camp / Store, Flood, Storm, Earthquake, Militancy etc. while carrying out different activities under execution i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. which is enclosed at **Annexure – 7 (SP)** for approval of the Engineer In-Charge/ Project Manager before start of work.

19. THAT the Contractor shall organise Safety Training Programs on Safety, Health and Environment and for safe execution of different activities of works i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. for their own employees including sub contractor workers on regular basis.

The Contractor, therefore, submits copy of the module of training program, enclosed at **Annexure – 9 (SP)**, to Engineer In-charge/Project Manager for its acceptance and approval and records maintained.

20. THAT the Contractor shall conduct safety audit, as per Safety Audit Check Lists enclosed at **Annexure – 8 (SP)**, by his Safety Officer(s) every month during construction of Transmission Lines / Sub Stations / any other work and copy of the safety audit report will be forwarded to the Employer's Engineer In-charge / Site In-charge/Project Manager for his comments and feedback. During safety audit, healthiness of all Personal Protective Equipments (PPEs) shall be checked individually by safety officer of contractor and issue a certificate of its healthiness or rejection of faulty PPEs and contractor has to ensure that all faulty PPEs and all faulty lifting tools and tackles should be destroyed in the presence of Employer construction staff. Contractor has to ensure that each gang be safety audited at least once in two months. During safety audit by the contractor, Safety officer's feedback from Employer concerned shall be taken and recorded. The Employer's site officials shall also conduct safety audit at their own from time to time when construction activities are under progress. Apart from above, the Employer may also conduct surveillance safety audits. The Employer may take action against the person / persons

as deemed fit under various statutory acts/provisions under the Contract for any violation of safety norms / safety standards.

21. THAT the Contractor shall develop and display Safety Posters of construction activity at site and also at camp where workers are generally residing.

22. THAT the Contractor shall ensure to provide potable and safe drinking water for workers at site / at camp.

23. THAT the Contractor shall do health check up of all workers from competent agencies and reports will be submitted to Engineer In-Charge within fifteen (15) days of health check up of workers as per statutory requirement.

24. THAT the Contractor shall submit information alongwith documentary evidences in regard to compliance to various statutory requirements as applicable which are enclosed at **Annexure – 10A (SP)**.

The Contractor shall also submit details of Insurance Policies taken by the Contractor for insurance coverage against accident for all employees are enclosed at **Annexure – 10B (SP)**.

25. THAT a check-list in respect of aforesaid enclosures along with the Contractor’s remarks, wherever required, is attached as **Annexure – Check List** herewith.

THE CONTRACTOR shall incorporate modifications/changes in this ‘Safety Plan’ necessitated on the basis of review/comments of the Engineer In-Charge/Project Manager within fourteen (14) days of receipt of review/comments and on final approval of the Engineer In-Charge/Project Manager of this ‘Safety Plan’, the Contractor shall execute the works under the Contract as per approved ‘Safety Plan’. Further, the Contractor has also noted that the first progressive payment towards Services Contract shall be made on submission of ‘Safety Plan’ along with all requisite documents and approval of the same by the Engineer In-Charge/Project Manager.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.

For and on behalf of

M/s.....

WITNESS

1.	Signature.....	Signature.....
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	Name.....	Name.....
	Address.....	Address.....
2.	Signature.....	Authorised representative
	Name.....	(Common Seal)
	Address.....	(In case of Company)

Note:

All the annexure referred to in this "Safety Plan" are required to be enclosed by the contractor as per the attached " Check List "

1. Safety Plan is to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute such contract documents etc., (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to this Safety Plan.

2. For all safety monitoring/ documentation, Engineer In-charge / Regional In-charge of safety at RHQ will be the nodal Officers for communication.

CHECK LIST FOR SEFETY PLAN

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
1.	Annexure – 1A (SP) Safe work procedure for each activity i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. to be executed at site.	Yes/No	
2.	Annexure – 1B (SP) Manpower deployment plan, activity wise foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc.	Yes/No	
3.	Annexure – 2 (SP) List of Lifting Machines i.e. Crane, Hoist, Triffor, Chain Pulley Blocks etc. and Lifting Tools and Tackles i.e. D shackle, Pulleys, come along clamps, wire rope slings etc. and all types of ropes i.e. Wire ropes, Poly propylene Rope etc. used for lifting purposes along with test certificates.	Yes/No	
4.	Annexure – 3 (SP)	Yes/No	

	<p>List of Personal Protective Equipment (PPE), activity wise including the following along with test certificate of each as applicable:</p> <ol style="list-style-type: none"> 1. Industrial Safety Helmet to all workmen at site. (EN 397 / IS 2925) with chin strap and back stay arrangement. 2. Safety shoes without steel toe to all ground level workers and canvas shoes for workers working on tower. 3. Rubber Gum Boot to workers working in rainy season / concreting job. 4. Twin lanyard Full Body Safety harness with shock absorber and leg strap arrangement for all workers working at height for more than three meters. Safety Harness should be with attachments of light weight such as of aluminium alloy etc. and having a feature of automatic locking arrangement of snap hook and comply with EN 361 / IS 3521 standards. 5. Mobile fall arrestors for safety of workers during their ascending / descending from tower / on tower. EN 353 -2 (Guided type fall arresters on a flexible anchorage line.) 6. Retractable type fall arrestor (EN360: 2002) for ascending / descending on suspension insulator string etc. 7. Providing of good quality cotton hand gloves / leather hand gloves for workers engaged in handling of tower parts or as per requirement at site. 8. Electrical Resistance hand gloves to workers for handling electrical equipment / Electrical connections. IS : 4770 9. Dust masks to workers handling cement as per requirement. 		
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	<p>10. Fac e shield for welder and Grinders. IS : 1179 / IS : 2553</p> <p>11. Oth er PPEs, if any, as per requirement etc.</p>		
5.	<p>Annexure – 4 (SP)</p> <p>List of Earthing Equipment / Earthing devices with Earthing lead conforming to IECs for earthing equipments are – (855, 1230, 1235 etc.) gang wise for stringing activity/as per requirement</p>	Yes/No	
6.	<p>Annexure – 5A (SP)</p> <p>List of Qualified Safety Officer(s) alongwith their contact details</p>	Yes/No	
7.	<p>Annexure – 5B (SP)</p> <p>Details of Explosive Operator (if required), Safety officer / Safety supervisor for every erection / stringing gang, any other person nominated for safety, list of personnel trained in First Aid as well as brief information about safety set up by the Contractor along with copy of organisation of the Contractor in regard to safety</p>	Yes/No	
8.	<p>Annexure – 6 (SP)</p> <p>Copy of Safety Policy/ Safety Document of the Contractor's company</p>	Yes/No	

9.	<p>Annexure – 7 (SP)</p> <p>'Emergency Preparedness Plan' for different incidences i.e. Fall from height, Electrocutation, Sun Stroke, Collapse of pit, Collapse of Tower, Snake bite, Fire in camp / Store, Flood, Storm, Earthquake, Militancy etc. while carrying out different activities under execution i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc.</p>	Yes/No	
10.	<p>Annexure – 8 (SP)</p> <p>Safety Audit Check Lists (Formats to be enclosed)</p>	Yes/No	
11.	<p>Annexure – 9 (SP)</p> <p>Copy of the module of Safety Training Programs on Safety, Health and Environment, safe execution of different activities of works for Contractor's own employees on regular basis and sub contractor employees.</p>	Yes/No	
12.	<p>Annexure – 10A (SP)</p> <p>Information along with documentary evidences in regard to the Contractor's compliance to various statutory requirements including the following:</p>		

(i)	<p>Electricity Act 2003</p> <p>_____</p> <p><i>[Name of Documentary evidence in support of compliance]</i></p>	Yes/No	
(ii)	<p>Factories Act 1948</p> <p>_____</p> <p><i>[Name of Documentary evidence in support of compliance]</i></p>	Yes/No	
(iii)	<p>Building & other construction workers (Regulation of Employment and Conditions of Services Act and Central Act 1996) and Welfare Cess Act 1996 with Rules.</p> <p>_____</p> <p><i>[Name of Documentary evidence in support of compliance]</i></p>	Yes/No	
(iv)	<p>Workmen Compensation Act 1923 and Rules.</p> <p>_____</p> <p><i>[Name of Documentary evidence in support of compliance]</i></p>	Yes/No	
(v)	<p>Public Insurance Liabilities Act 1991 and Rules.</p>	Yes/No	

	<p>_____</p> <p><i>[Name of Documentary evidence in support of compliance]</i></p>		
(vi)	<p>Indian Explosive Act 1948 and Rules.</p> <p>_____</p> <p><i>[Name of Documentary evidence in support of compliance]</i></p>	Yes/No	
(vii)	<p>Indian Petroleum Act 1934 and Rules.</p> <p>_____</p> <p><i>[Name of Documentary evidence in support of compliance]</i></p>	Yes/No	
(viii)	<p>License under the contract Labour (Regulation & Abolition) Act 1970 and Rules.</p> <p>_____</p> <p><i>[Name of Documentary evidence in support of compliance]</i></p>	Yes/No	
(ix)	<p>Indian Electricity Rule 1956 and amendments if any, from time to time.</p> <p>_____</p> <p><i>[Name of Documentary evidence in support of</i></p>	Yes/No	

	<i>compliance]</i>		
(x)	The Environment (Protection) Act 1986 and Rules. _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(xi)	Child Labour (Prohibition & Regulation) Act 1986. _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(xii)	National Building Code of India 2005 (NBC 2005). _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(xiii)	Indian standards for construction of Low/ Medium/ High/ Extra High Voltage Transmission Line _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	

(iv)	<p>Any other statutory requirement(s)</p> <p><i>[please specify]</i></p> <p>_____</p> <p><i>[Name of Documentary evidence in support of compliance]</i></p>	Yes/No	
13.	<p>Annexure – 10B (SP)</p> <p>Details of Insurance Policies along with documentary evidences taken by the Contractor for the insurance coverage against accident for all employees as below:</p>		
(i)	<p>Under Workmen Compensation Act 1923 and Rules.</p> <p>_____</p> <p><i>[Name of Documentary evidence in support of insurance taken]</i></p>	Yes/No	
(ii)	<p>Public Insurance Liabilities Act 1991</p> <p>_____</p> <p><i>[Name of Documentary evidence in support of insurance taken]</i></p>	Yes/No	
(iii)	<p>Any Other Insurance Policies</p>	Yes/No	

	<hr/> <i>[Name of Documentary evidence in support of insurance taken]</i>		
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18. FORM OF JOINT DEED OF UNDERTAKING BY THE COLLABORATOR/ PARENT COMPANY ALONGWITH THE BIDDER/MANUFACTURER

THIS DEED OF UNDERTAKING executed this day of Two Thousand and by M/s., a Company incorporated under the laws of and having its Registered Office at (hereinafter called the “Collaborator” which expression shall include its successors, executors and permitted assigns), and M/s., a Company incorporated under the laws of having its Registered Office at (hereinafter called the “Manufacturer” which expression shall include its successors, executors and permitted assigns) and Ms/., a Company incorporated under the laws of having its Registered Office at (hereinafter called the “Bidder” which expression shall include its successors, executors and permitted assigns) in favour of (*insert names of the Employer*), a Company incorporated under the Companies Act of 1956 having its registered office at (*insert registered address of the Employer*)..... (hereinafter called the “Employer” which expression shall include its successors, executors and permitted assigns)

WHEREAS the “Employer” invited Bid as per its Specification No. for the execution of (*insert name of the package alongwith project name*).....

AND WHEREAS Clause No., Section, of, Vol.—... forming part of the Bid Documents inter-alia stipulates that the Bidder and/or Manufacturer along with its Collaborator must fulfill the Qualifying Requirements for the *..... and be jointly and severally bound and responsible for the successful performance of the *..... offered in the event the Bid submitted by the Bidder is accepted by the Employer resulting in a Contract.

AND WHEREAS the Bidder has submitted its Bid to the Employer vide Proposal No. dated based on the collaboration/association of the Collaborator with the Bidder/Manufacturer.

NOW THEREFORE THIS UNDERTAKING WITNESSETH as under:

1.0 In consideration of the award of Contract by the Employer to the Bidder (hereinafter referred to as the “Contract”) we, the Collaborator and the Bidder/Contractor and/or manufacturer do hereby declare that we shall be jointly and severally bound unto the (*insert name of the Employer*), for the successful performance of the *..... and shall be fully responsible for the design, manufacture, testing, supply on FOR destination delivery at site basis and supervision of unloading at site, storage, erection, testing & commissioning and successful performance of the *..... in accordance with the Contract Specifications.

2.0 Without in any way affecting the generality and total responsibility in terms of this Deed of Undertaking, the Collaborator in particular hereby agrees to depute their technical experts from time to time to the Bidder’s/ Contractor’s/ Manufacturer’s Works/ Employer’s Project site as mutually considered necessary by the Employer, Bidder/ Contractor, Manufacturer and the

Collaborator to ensure proper design, engineering, manufacture, testing, supply on FOR destination delivery at site basis and supervision of unloading at site, storage, erection, testing & commissioning and successful performance of the equipment in accordance with Contract Specifications and if necessary, the Collaborator shall advise the Manufacturer/ Contractor suitable modifications of designs and implement necessary corrective measures to discharge the obligations under the contract.

3.0 This Deed of Undertaking shall be construed and interpreted in accordance with the laws of India and the Courts in Delhi shall have exclusive jurisdiction in all matters arising under the Undertaking.

4.0 As a security, the Collaborator/ Manufacturer shall apart from the Contractor’s performance guarantee, furnish a Contract Performance Guarantee from its Bank in favour of the Employer in a form acceptable to the Employer. The value of such guarantee shall be equivalent to 10% of the cost of such equipment(s) from the parent company/collaborator as identified in the Contract awarded by the Employer to the Bidder/Contractor and it shall be part of guarantee towards the faithful performance/compliance of this Deed of Undertaking in terms of the Contract. The guarantee shall be unconditional, irrevocable and valid for the entire period of the Contract, namely till the end of the Defect Liability Period of *..... under the Contract. The Bank Guarantee amount shall be payable to the Employer on demand without any reservation or demur.

5.0 We, the Collaborator/ Bidder/ Contractor and/or Manufacturer agree that this Undertaking shall be irrevocable and shall form an integral part of the Contract and further agree that this Undertaking shall continue to be enforceable till the Employer discharges it. It shall become operative from the effective date of Contract.

IN WITNESS WHEREOF the Collaborator, the Manufacturer and/or the Bidder/Contractor have through their Authorised Representatives executed these presents and affixed Common seals of their respective Companies, on the day, month and year first above mentioned.

<p>WITNESS</p> <p>.....</p> <p>Name</p> <p>Office Address</p>	<p>(For Collaborator)</p> <p>(Signature of the authorized representative)</p> <p>Name</p> <p>Common Seal of Company</p>
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WITNESS Signature Name Office Address	(For Bidder) Signature of the authorized representative) Name Common Seal of Company
WITNESS Signature Name Office Address	(For Manufacturer) (Signature of the authorized representative) Name Common Seal of Company

Note:

1. The non-judicial stamp papers of appropriate value shall be purchased in the name of executant(s) and the date of purchase should not be earlier than six months of date of execution of the Undertaking.
2. The Undertaking shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.
3. This Deed of Joint Undertaking duly certified by the Company Secretary shall be submitted along with the bid. Further, the Deed of Joint Undertaking attested by Notary Public of the place(s) of the respective executant(s) or registered with the Indian Embassy/High Commission in that country shall be submitted by the bidder within ten (10) days from the date of intimation of post-bid discussion.
4. In the event the Bidder is a Manufacturer and the Collaboration is between Collaborator and the Bidder, then the Joint deed of undertaking shall be modified accordingly.
5. *The name(s) of equipment for which Joint deed of undertaking is to be submitted is to be inserted.
6. The manufacturer may be having ongoing collaboration agreement or had collaboration agreement in the past with the collaborator.

19. FORM OF BANK GUARANTEE FOR CONTRACT PERFORMANCE (TO BE SUBMITTED BY COLLABORATOR)

Bank Guarantee No. Date.....

Contract No.....

.....[Name of Contract].....

To: [Name and address of the Employer]

Dear Ladies and/or Gentlemen,

We refer to the Contract ("the Contract") signed on(insert date of the Contract)..... between you and M/s (Name of Contractor), having its Principal place of business at(Address of Contractor) and Registered Office at(Registered address of Contractor) ("the Contractor") concerning (Indicate brief scope of work) for the complete execution of the (insert name of Package alongwith name of the Project).....

Whereas, the Contractor has agreed to supply the@..... #[manufactured by M/s. (Name of Manufacturer), having its Principal place of business at(Address of Manufacturer) and Registered Office at(Registered address of Manufacturer) (hereinafter referred to as the "Manufacturer") in collaboration with M/s. (Name of Collaborator), having its Principal place of business at(Address of Collaborator) and Registered Office at(Registered address of Collaborator) (hereinafter referred to as the "Collaborator"), as a pre-requisite for qualification of the Bidder/Contractor and have submitted a deed of joint undertaking declaring that they are jointly and severally bound and responsible for the successful performance of the said equipment in accordance with the Contract Specifications and that the Collaborator having agreed to furnish a Contract Performance Guarantee for the faithful performance/compliance of the Deed of Undertaking equivalent to (5%) five per cent of the cost of@..... to be supplied by the Manufacturer under the Contract, in addition to Contract Performance Guarantee equivalent to 5% (five per cent) of the value of the Contract to be provided by the Contractor for the faithful performance of the entire Contract.

By this letter we, the undersigned,(insert name & address of the issuing bank), a Bank (or Company) organized under the laws of and having its Registered/Head Office at(insert address of registered office of the bank)..... do hereby irrevocably guarantee payment to you up to i.e., five percent (5%) of the cost of@..... to be supplied by the Manufacturer under the Contract until ninety (90) days beyond the Defect Liability Period i.e., up to and inclusive of (dd/mm/yy).

We undertake to make payment under this Letter of Guarantee upon receipt by us of your first written demand signed by your duly authorized officer declaring the Contractor/Manufacturer/Collaborator to be in default under the Contract and without cavil or argument any sum or sums within the above named limits, without your need to prove or show grounds or reasons for your demand and without the right of the Contractor/Manufacturer/Collaborator to dispute or question such demand.

Our liability under this Letter of Guarantee shall be to pay to you whichever is the lesser of the sum so requested or the amount then guaranteed hereunder in respect of any demand duly made hereunder prior to expiry of the Letter of Guarantee, without being entitled to inquire whether or not this payment is lawfully demanded.

This letter of Guarantee shall remain in full force and shall be valid from the date of issue until ninety (90) days beyond the Defect Liability Period of the said equipment i.e. upto and inclusive of (dd/mm/yy) and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/s. on whose behalf this Letter of Guarantee has been given.

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.

Our liability under this Letter of Guarantee shall become null and void immediately upon its expiry, whether it is returned or not, and no claim may be made hereunder after such expiry or after the aggregate of the sums paid by us to you shall equal the sums guaranteed hereunder, whichever is the earlier.

All notices to be given under shall be given by registered (airmail) posts to the addressee at the address herein set out or as otherwise advised by and between the parties hereto.

We hereby agree that any part of the Contract may be amended, renewed, extended, modified, compromised, released or discharged by mutual agreement between you and the Collaborator, and this security may be exchanged or surrendered without in any way impairing or affecting our liabilities hereunder without notices to us and without the necessity for any additional endorsement, consent or guarantee by us, provided, however, that the sum guaranteed shall not be increased or decreased.

No action, event or condition which by any applicable law should operate to discharge us from liability hereunder shall have any effect and we hereby waive any right we may have to apply such law so that in all respects our liability hereunder shall be irrevocable and, except as stated herein, unconditional in all respects.

Yours truly,

Name of the Bank

.....

Authorized Signature

Signature of Witness.....

Name.....

Address.....

Note :

1. The non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee' and the date of purchase should not be earlier than six months of issuance of the Bank Guarantee by the Bank.
2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.
3. @Insert name of the Equipment viz., Auto Transformer/Shunt Reactor/Circuit Breaker
4. # Applicable when the Contractor is not manufacturing the equipment himself.

20. Deleted

21. FORM OF DEED OF JOINT UNDERTAKING TO BE EXECUTED BY THE BIDDER AND THE PROMOTER OF THE GROUP COMPANY (WHEN THE GROUP COMPANY IS YET TO BE INCORPORATED UNDER INDIAN COMPANIES ACT) OF THE BIDDER FOR SUPPLY AT LEAST 25% OF OPGW CABLE MANUFACTURED IN THE SAID FACILITIES IN [STIPULATED IN CLAUSE 1.1.2 (A) (I) OF QUALIFICATION REQUIREMENT ANNEXURE-A (BDS)/ GCC SUB-CLAUSE 5.1.1]

(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

This DEED OF UNDERTAKING executed this day of Two Thousand by M/s....., a Company incorporated under having its Registered Office at hereinafter called the "Bidder" which expression shall include its successors, administrators, executors and permitted assigns and M/s., a Company incorporated under having its Registered Office at hereinafter called the "Promoter" which expression shall include its successors, administrators, executors and permitted assigns, in favour of (*insert names of the Employer*), a Company incorporated under the Indian Companies Act of 1956 having its registered office at(*insert registered address of the Employer*)..... (hereinafter called the "Employer" which expression shall include its successors, executors and permitted assigns)

WHEREAS the "Employer" invited Bid as per its Specification No. for the execution of (*insert name of the package alongwith project name*)

AND WHEREAS Clause No., Section, of, Vol.-... forming part of the Bidding Documents inter-alia stipulates that the Bidder must fulfill the Qualifying Requirements for the *..... and be jointly and severally bound and responsible along with the Group Company for the successful performance of the *..... offered in the event the Bid submitted by the Bidder is accepted by the Employer resulting in a Contract.

AND WHEREAS the Bidder has submitted its Bid to the Employer vide Proposal No. dated based on the association of the Promoter of the Group Company and confirmed that the Group Company shall be incorporated as per Indian Companies Act, within six (06) months from the date of award.

AND WHEREAS the Bidder and the Promoter are required to jointly execute and furnish an irrevocable Deed of Joint Undertaking and be jointly and severally liable to the Employer for ensuring manufacturing facilities of OPGW Cable in India (hereinafter called as the "Equipment") such that the Equipment to be supplied by the Contractor can be repaired and maintained without necessitating it to be taken outside the country and for supply at least 25% of OPGW Cable from such works of Group Company to be set up in India.

AND WHEREAS the Bidder has submitted its Bid to the Employer based on above stipulation and has agreed to furnish this Deed of Undertaking to be enforceable in the event of the award of the Contract by the Employer.

1.0 In consideration of the award of Contract by the Employer to the Bidder/Contractor (hereinafter referred to as the "Contract") we, the Bidder/Contractor and the Promoter do hereby agree and undertake to provide requisite Manufacturing and testing facilities for the Equipment, after sales service and supply of spare parts as per the terms of the Contract.

2.0 Without in any way affecting the generality and total responsibility in terms of this Deed of Undertaking, the Bidder/Contractor hereby agrees to depute their technical experts from time to time to the Group Company Works/ Employer's Project site as mutually considered necessary by the Employer, Bidder/Contractor and the Group Company to ensure:

(i) A valid technology transfer agreement, including license to manufacture and supply from India, between the Bidder / Contractor, the technology provider and the Group Company covering the type, size and rating of the OPGW Cable specified, valid minimum up to the end of the defect liability period of the contract. The technology transfer agreement necessarily covers transfer of technological know-how for OPGW Cable in the form of complete transfer of design dossier, design software, drawings and

documentation, quality system manuals and imparting relevant training by the Bidder / Contractor to the personnel of the Group Company.

- (ii) Design of the OPGW cable manufactured in India shall be identical to the design of OPGW cable to be manufactured and supplied by the Bidder/Contractor
- (iii) Adequate up gradation of the testing facilities of OPGW cable including quality systems at Indian works
- (iv) Training to staff of the Group Company and certification to its trained personnel for carry out each activity
- (v) Involvement and supervision during all phases of manufacturing of OPGW cable by expert of Bidder/Contractor.
- (vi) MQP of Group Company shall be same as that of Bidder/Contractor
- (vii) Source of raw material / major bought out components of shall be same as that of Bidder/Contractor
- (viii) Timely supply of OPGW cable on FOR destination delivery at site basis.
- (ix) Supervision of unloading at site, storage, erection, testing & commissioning and successful performance of the OPGW cable in accordance with contract specifications
- (x) If necessary the Bidder/Contractor shall advise the Group Company, suitable modifications of designs and implement necessary corrective measures to discharge the obligations under the Contract.
- (xi) Warranty obligations for **Thirty Six (36) Months** for the entire quantity to be supplied from the Group Company.

3.0 This Deed of Undertaking shall be construed and interpreted in accordance with the laws of India and the Courts in Delhi shall have exclusive jurisdiction in all matters arising under the Undertaking.

4.0 We, agree that this undertaking shall be irrevocable and shall form an integral part of the Contract.

5.0 We hereby confirm that the above undertaking has also been approved by our Board of Directors and the Resolution passed by our Board(s) is attached with this undertaking.

IN WITNESS WHEREOF the Bidder / Contractor and Promoter of the Group Company have through their Authorised Representatives executed these presents and affixed Common seals of their respective Companies on the day, month and year first above mentioned.

WITNESS

[For Bidder/Contractor]

Signature

(Signature of the Authorized Representative)

Name

Name

Office Address

Common Seal of Company

WITNESS

[For Promoter of the Group Company]

Signature

(Signature of the authorized representative)

Name

Name

Office Address

Common Seal of Company
.....

Note:

1. For the purpose of executing the Deed of Undertaking, the non-judicial stamp papers of appropriate value shall be purchased in the name of executant.

2. The Undertaking shall be signed on all the pages by the authorised representative(s) of the Bidder and Promoter of the Group Company and should invariably be witnessed.

3. The Resolution of the Board of Directors of the Bidder and Promoter of the Group Company, as per the format, shall be attached with this Undertaking.

4. This Deed of Undertaking duly attested by Notary Public of the place(s) of the respective executant, shall be submitted along with the bid.

22. FORM OF DEED OF UNDERTAKING TO BE EXECUTED BY THE BIDDER [WHERE THE SUBSIDIARY COMPANY / JOINT VENTURE COMPANY IS TO BE INCORPORATED] FOR SUPPLY AT LEAST 25% OF OPGW CABLE MANUFACTURED IN THE SAID FACILITIES IN INDIA [STIPULATED IN CLAUSE 1.1.2 (A) (I) OF QUALIFICATION REQUIREMENT ANNEXURE-A (BDS)/GCC SUB-CLAUSE 5.1.1]

(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

This DEED OF UNDERTAKING executed this day of Two Thousand by M/s....., a Company incorporated under having its Registered Office at hereinafter called the "Bidder" which expression shall include its successors, administrators, executors and permitted assigns, in favour of (*insert name of the Employer*), a Company incorporated under the Indian Companies Act of 1956 having its registered office at(*insert registered address of the Employer*)..... (hereinafter called the "Employer" which expression shall include its successors, executors and permitted assigns)

WHEREAS the "Employer" invited Bid as per its Specification No. for the execution of (*insert name of the package alongwith project name*)

AND WHEREAS Clause No., Section, of, Vol.-... forming part of the Bidding Documents inter-alia stipulates that the Bidder must fulfill the Qualifying Requirements for the *..... and be jointly and severally bound and responsible along with the Subsidiary Company / Joint Venture Company for the successful performance of the *..... offered in the event the Bid submitted by the Bidder is accepted by the Employer resulting in a Contract.

AND WHEREAS the Bidder has submitted its Bid to the Employer vide Proposal No. dated and confirmed that the Subsidiary Company / Joint Venture Company shall be incorporated as per Indian Companies Act, within six (06) months from the date of award.

AND WHEREAS the Bidder and the Subsidiary Company / Joint Venture Company are required to jointly execute and furnish an irrevocable Deed of Joint Undertaking and be jointly and severally liable to the Employer for ensuring supply at least 25% of OPGW Cable manufactured in the said facilities in India (hereinafter called as the "Equipment") such that the Equipment to be supplied by the Contractor can be repaired and maintained without necessitating it to be taken outside the country and for supply at least 25% of OPGW Cable from such works of Subsidiary Company / Joint Venture Company to be set up in India.

AND WHEREAS the Bidder has submitted its Bid to the Employer based on above stipulation and has agreed to furnish this Deed of Undertaking to be enforceable in the event of the award of the Contract by the Employer.

1.0 In consideration of the award of Contract by the Employer to the Bidder/Contractor (hereinafter referred to as the "Contract") we, the Bidder/Contractor do hereby agree and undertake to provide requisite Manufacturing and testing facilities for the Equipment, after sales service and supply of spare parts as per the terms of the Contract.

2.0 Without in any way affecting the generality and total responsibility in terms of this Deed of Undertaking, the Bidder/Contractor hereby agrees to depute their technical experts from time to time to the Subsidiary Company / Joint Venture Company Works/ Employer's Project site as mutually considered necessary by the Employer, Bidder/Contractor and the Subsidiary Company / Joint Venture Company to ensure:

(i) A valid technology transfer agreement, including license to manufacture and supply from India, between the Bidder / Contractor, the technology provider and the Subsidiary Company / Joint Venture Company covering the type, size and rating of the OPGW Cable specified, valid minimum up to the end of the defect liability period of the contract. The technology transfer agreement necessarily covers transfer of technological know-how for OPGW Cable in the form of complete transfer of design dossier, design software, drawings and documentation, quality system manuals and imparting relevant training by the Bidder / Contractor to the personnel of the Subsidiary Company / Joint Venture Company.

(ii) Design of the OPGW cable manufactured in India shall be identical to the design of equipments to be manufactured and supplied by the Bidder/Contractor

- (iii) Adequate up gradation of the testing facilities for OPGW cable including quality systems at Indian works
- (iv) Training to staff of the Group Company and certification to its trained personnel for carry out each activity
- (v) Involvement and supervision during all phases of manufacturing of OPGW cable by expert of Bidder/Contractor for the OPGW Cable
- (vi) MQP of Group Company shall be same as that of Bidder/Contractor
- (vii) Source of raw material / major bought out components shall be same as that of Bidder/Contractor
- (viii) Timely supply of OPGW cable on FOR destination delivery at site basis.
- (ix) Supervision of unloading at site, storage, erection, testing & commissioning and successful performance of the equipment in accordance with contract specifications
- (x) If necessary the Bidder/Contractor shall advise the Subsidiary Company / Joint Venture Company, suitable modifications of designs and implement necessary corrective measures to discharge the obligations under the Contract.
- (xi) Warranty obligations for **Thirty Six (36) Months** for the entire quantity to be supplied from the Subsidiary Company / Joint Venture Company.

3.0 This Deed of Undertaking shall be construed and interpreted in accordance with the laws of India and the Courts in Delhi shall have exclusive jurisdiction in all matters arising under the Undertaking.

4.0 We, agree that this undertaking shall be irrevocable and shall form an integral part of the Contract.

5.0 We hereby confirm that the above undertaking has also been approved by our Board of Directors and the Resolution passed by our Board(s) is attached with this undertaking.

IN WITNESS WHEREOF the Bidder / Contractor have through their Authorised Representatives executed these presents and affixed Common seals of their respective Companies on the day, month and year first above mentioned.

WITNESS

[For Bidder]

Signature

(Signature of the Authorized Representative)

Name

Name

Office Address

Common Seal of Company
.....

WITNESS

Signature

Name

Office Address

Note:

1. For the purpose of executing the Deed of Undertaking, the non-judicial stamp papers of appropriate value shall be purchased in the name of executant.

2. The Undertaking shall be signed on all the pages by the authorised representative(s) of the Bidder and should invariably be witnessed.

3. The Resolution of the Board of Directors of the Bidder, as per the format, shall be attached with this Undertaking.

4. This Deed of Undertaking duly attested by Notary Public of the place(s) of the respective executant, shall be submitted along with the bid.

23. FORM OF BANK GUARANTEE FOR CONTRACT PERFORMANCE [as stipulated in GCC Sub-clause 5.1.2]

(TO BE SUBMITTED BY INDIAN SUBSIDIARY COMPANY OF A QUALIFIED OPGW CABLEMANUFACTURER / OTHER PROMOTERS (IF ANY) HAVING 25% OR HIGHER EQUITY PARTICIPATION IN THE INDIAN SUBSIDIARY COMPANY)

Bank Guarantee No.

Date.....

Contract No.....

.....[Name of Contract].....

To: [Name and address of the Employer]

Dear Ladies and/or Gentlemen,

We refer to the Contract ("the Contract") signed on (*insert date of the Contract*) between you and M/s a Company incorporated under having its Registered Office at (hereinafter referred to as "the Contractor" or "Qualified OPGW Cable Manufacturer"), which expression shall, unless repugnant to the Context or meaning thereof, include its successors, administrators, representatives and assignees, concerning (*indicate brief scope of wok*) for the complete execution of the (*insert name of the package along with name of the Project*).

Whereas, the Contractor and M/s....., Indian Subsidiary Company of the Qualified *OPGW Cable* Manufacturer, having its Registered Office at (hereinafter called the "Indian Subsidiary Company")and M/s Promoter of the Indian Subsidiary Company, other than the Qualified *OPGW Cable* Manufacturer, having 25% or higher equity

participation in the Indian Subsidiary Company, having its Registered Office at (hereinafter called the "OTHER PROMOTER"), as a pre-requisite for qualification of the Bidder / Contractor, have submitted a Deed of Joint Undertaking declaring that they are jointly and severally bound and responsible for ensuring a valid technology transfer agreement including license to manufacture in India, between the Qualified *OPGW Cable* Manufacturer, the technology provider and the Indian Subsidiary Company and that the Indian Subsidiary Company shall supply _____ unit of *OPGW Cable* in accordance with the Contract specifications and that the Indian Subsidiary Company and OTHER PROMOTER each having agreed to furnish an '**on demand**' Bank Guarantee towards Contract Performance Guarantee, for the faithful performance/compliance of the Deed of Undertaking, equivalent to (5%) five per cent of the Ex-Works Price of such equipment(s) to be manufactured by the Indian Subsidiary Company, in addition to Contract Performance Guarantee equivalent to 10% (ten per cent) of the value of the Contract to be provided by the Contractor for the faithful performance of the entire Contract.

By this letter we, the undersigned,(*insert name & address of the issuing bank*), a Bank (or Company), which expression shall, unless repugnant to the Context or meaning thereof, include its successors, administrators, representatives and assignees, organized under the laws of and having its Registered/Head Office at(*insert address of registered office of the bank*)..... do hereby irrevocably guarantee payment to you up to i.e., five percent (5%) of the Ex-Works Price of such equipment(s) to be manufactured by the Indian Subsidiary Company until ninety (90) days beyond the Defect Liability Period i.e., up to and inclusive of (*dd/mm/yy*).

We irrevocably undertake to make payment to you under this Letter of Guarantee upon receipt by us of your first written demand signed by your duly authorized officer declaring Indian Subsidiary Company / OTHER PROMOTER (*delete whichever is not applicable*) to be in default under the Contract and without cavil or argument any sum or sums within the above named limits, without your need to prove or show grounds or reasons for your demand and without the right of Indian Subsidiary Company / OTHER PROMOTER (*delete whichever is not applicable*) to dispute or question such demand.

Our liability under this Letter of Guarantee shall be to pay to you the amount guaranteed hereunder in respect of any demand duly made hereunder prior to expiry of the Letter of Guarantee, without being entitled to inquire whether or not this payment is lawfully demanded.

This letter of Guarantee shall remain in full force and shall be valid from the date of issue until ninety (90) days beyond the Defect Liability Period of the said equipment i.e. up to and inclusive of (dd/mm/yy) and shall be extended from time to time for such period, as may be desired by Indian Subsidiary Company / OTHER PROMOTER (*delete whichever is not applicable*) on whose behalf this Letter of Guarantee has been given.

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.

If the Defect Liability Period is extended with respect to such part of the Facilities in accordance with the Contract, the validity of this letter of Guarantee shall be extended until expiry of ninety (90) days beyond such extended Defect Liability Period.

Our liability under this Letter of Guarantee shall become null and void immediately upon its expiry, whether it is returned or not, and no claim may be made hereunder after such expiry or after the aggregate of the sums paid by us to you shall equal the sums guaranteed hereunder, whichever is the earlier.

All notices to be given under shall be given by registered (airmail) posts to the addressee at the address herein set out or as otherwise advised by and between the parties hereto.

We hereby agree that any part of the Contract may be amended, renewed, extended, modified, compromised, released or discharged by mutual agreement between you and the Contractor, and this security may be exchanged or surrendered without in any way impairing or affecting our liabilities hereunder without notices to us and without the necessity for any additional endorsement, consent or guarantee by us, provided, however, that the sum guaranteed shall not be increased or decreased.

No action, event or condition which by any applicable law should operate to discharge us from liability hereunder shall have any effect and we hereby waive any right we may

have to apply such law so that in all respects our liability hereunder shall be irrevocable and, except as stated herein, unconditional in all respects.

Yours truly,

Name of the Bank

.....

Authorized Signature

Signature of Witness.....

Name.....

Address.....

Note :

1. The non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee' and the date of purchase should not be later than six months of issuance of the Bank Guarantee by the Bank.

2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.

24.FORM OF BANK GUARANTEE FOR CONTRACT PERFORMANCE [as stipulated in GCC Sub-clause 5.1.2]

(TO BE SUBMITTED BY JOINT VENTURE COMPANY OF A QUALIFIED OPGW CABLE MANUFACTURER / OTHER PROMOTER (INDIAN OPGW CABLE MANUFACTURER) HAVING 51% OR HIGHER EQUITY PARTICIPATION IN THE JOINT VENTURE COMPANY)

Bank Guarantee No.

Date.....

Contract No.....

.....[Name of Contract].....

To: [Name and address of the Employer]

Dear Ladies and/or Gentlemen,

We refer to the Contract ("the Contract") signed on (*insert date of the Contract*) between you and M/s a Company incorporated under having its Registered Office at (hereinafter referred to as "the Contractor" or "Qualified OPGW Cable Manufacturer"), which expression shall, unless repugnant to the Context or meaning thereof, include its successors, administrators, representatives and assignees, concerning (*indicate brief scope of work*) for the complete execution of the (*insert name of the package along with name of the Project*).

Whereas, the Contractor and M/s....., Joint Venture Company of the Qualified *OPGW Cable* Manufacturer, having its Registered Office at (hereinafter called the "Joint Venture Company") and M/s Indian *OPGW Cable/ OPGW Cable* Manufacturer & Promoter of the

Joint Venture Company, other than the Qualified *OPGW Cable* Manufacturer, having 51% or higher equity participation in the Joint Venture Company, having its Registered Office at (hereinafter called the "OTHER PROMOTER" or "Indian *OPGW Cable/ OPGW Cable* Manufacturer"), as a pre-requisite for qualification of the Bidder / Contractor, have submitted a Deed of Joint Undertaking declaring that they are jointly and severally bound and responsible for ensuring a valid technology transfer agreement including license to manufacture in India, between the Qualified *OPGW Cable* Manufacturer, the technology provider and the Joint Venture Company and that the Joint Venture Company shall supply _____ unit of *OPGW Cable* in accordance with the Contract specifications and that the Joint Venture Company and OTHER PROMOTER each having agreed to furnish an 'on demand' Bank Guarantee towards Contract Performance Guarantee, for the faithful performance/compliance of the Deed of Undertaking, equivalent to (5%) five per cent of the Ex-Works Price of such equipment(s) to be manufactured by the Joint Venture Company, in addition to Contract Performance Guarantee equivalent to 10% (ten per cent) of the value of the Contract to be provided by the Contractor for the faithful performance of the entire Contract.

By this letter we, the undersigned,(*insert name & address of the issuing bank*), a Bank (or Company), which expression shall, unless repugnant to the Context or meaning thereof, include its successors, administrators, representatives and assignees, organized under the laws of and having its Registered/Head Office at(*insert address of registered office of the bank*)..... do hereby irrevocably guarantee payment to you up to i.e., five percent (5%) of the Ex-Works Price of such equipment(s) to be manufactured by the Joint Venture Company until ninety (90) days beyond the Defect Liability Period i.e., up to and inclusive of (*dd/mm/yy*).

We irrevocably undertake to make payment to you under this Letter of Guarantee upon receipt by us of your first written demand signed by your duly authorized officer declaring Joint Venture Company / OTHER PROMOTER (*delete whichever is not applicable*) to be in default under the Contract and without cavil or argument any sum or sums within the above named limits, without your need to prove or show grounds or reasons for your demand and without the right of Joint Venture Company / OTHER PROMOTER (*delete whichever is not applicable*) to dispute or question such demand.

Our liability under this Letter of Guarantee shall be to pay to you the amount guaranteed hereunder in respect of any demand duly made hereunder prior to expiry of the Letter of Guarantee, without being entitled to inquire whether or not this payment is lawfully demanded.

This letter of Guarantee shall remain in full force and shall be valid from the date of issue until ninety (90) days beyond the Defect Liability Period of the said equipment i.e. up to and inclusive of (dd/mm/yy) and shall be extended from time to time for such period, as may be desired by Joint Venture Company / OTHER PROMOTER (*delete whichever is not applicable*) on whose behalf this Letter of Guarantee has been given.

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.

If the Defect Liability Period is extended with respect to such part of the Facilities in accordance with the Contract, the validity of this letter of Guarantee shall be extended until expiry of ninety (90) days beyond such extended Defect Liability Period.

Our liability under this Letter of Guarantee shall become null and void immediately upon its expiry, whether it is returned or not, and no claim may be made hereunder after such expiry or after the aggregate of the sums paid by us to you shall equal the sums guaranteed hereunder, whichever is the earlier.

All notices to be given under shall be given by registered (airmail) posts to the addressee at the address herein set out or as otherwise advised by and between the parties hereto.

We hereby agree that any part of the Contract may be amended, renewed, extended, modified, compromised, released or discharged by mutual agreement between you and the Contractor, and this security may be exchanged or surrendered without in any way impairing or affecting our liabilities hereunder without notices to us and without the necessity for any additional endorsement, consent or guarantee by us, provided, however, that the sum guaranteed shall not be increased or decreased.

No action, event or condition which by any applicable law should operate to discharge us from liability hereunder shall have any effect and we hereby waive any right we may

have to apply such law so that in all respects our liability hereunder shall be irrevocable and, except as stated herein, unconditional in all respects.

Yours truly,

Name of the Bank

.....

Authorized Signature

Signature of Witness.....

Name.....

Address.....

Note :

1. The non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee' and the date of purchase should not be later than six months of issuance of the Bank Guarantee by the Bank.
2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.

25. FORM OF DEED OF UNDERTAKING TO BE EXECUTED BY THE BIDDER/MANUFACTURER FOR EXTENDED WARRANTY OF TWO (02) YEARS OVER AND ABOVE THE WARRANTY PERIOD SPECIFIED FOR OPGW CABLE {AS STIPULATED IN PARA 1.1.2(A)(II) OF ANNEXURE-A (BDS)}.

THIS DEED OF UNDERTAKING executed this day of
 Two Thousand and by M/s., a Company incorporated under
 the laws of having its Registered Office at (hereinafter
 called the “Bidder/Manufacturer” which expression shall include its successors,
 executors and permitted assigns) in favour of (*insert name of the Employer*)
, a Company incorporated under the Companies Act of 1956 having its
 registered office at(*insert registered address of the Employer*).....
 (hereinafter called the “Employer” which expression shall include its successors,
 executors and permitted assigns)

WHEREAS the “Employer” invited Bid as per its Specification No. for
 the execution of (*insert name of the package along with project
 name*).....

AND WHEREAS Clause No., Section, of, Vol.-...
 forming part of the Bid Documents inter-alia stipulates that the
 Bidder/Manufacturer must fulfill the Qualifying Requirements for OPGW package and
 shall be bound and responsible for the successful performance of OPGW offered in the
 event the Bid submitted by the Supplier is accepted by the Employer resulting in a
 Contract. It is also confirmed that Bidder/Manufacturer has established manufacturing
 and routine test facility for OPGW cable in India.

AND WHEREAS the Bidder/Manufacturer has submitted its Bid to the Employer vide
 Proposal No. dated

NOW THEREFORE THIS UNDERTAKING WITNESSETH as under:

1.0 In consideration of the award of Contract by the Employer to the
 Bidder/Manufacturer (hereinafter referred to as the “Contract”) we, the
 Bidder/Manufacturer do hereby undertake that we shall be bound unto the (*insert
 name of the Employer*), for the successful performance of OPGW and shall be
 fully responsible for the design, manufacture, testing, supply on FOR destination
 delivery at site basis of OPGW cable in accordance with the Contract Specifications.

2.0 We confirm the extended warranty obligations of additional two (02) years over and above the warranty period specified for the entire quantity of OPGW to be supplied from the Bidder/Manufacturer.

3.0 We, the Bidder/Manufacturer agree that this Undertaking shall be irrevocable and shall form an integral part of the Contract and further agree that this Undertaking shall continue to be enforceable till the Employer discharges it. It shall become operative from the effective date of Contract.

4.0 This Deed of Undertaking shall be construed and interpreted in accordance with the laws of India and the Courts in Delhi shall have exclusive jurisdiction in all matters arising under the Undertaking.

IN WITNESS WHEREOF the Supplier have through their Authorised Representatives executed these presents and affixed Common seals of their respective Companies, on the day, month and year first above mentioned.

WITNESS

(For Bidder/Manufacturer)

Signature

(Signature of the Authorized Representative)

Name

Name

Office Address

Common Seal of Company
.....

WITNESS

WITNESS

Signature

Signature

Name

Name

Office Address

Office Address

Note:

1. For the purpose of executing the Deed of Undertaking, the non-judicial stamp papers of appropriate value shall be purchased in the name of executants parties.
2. The Undertaking shall be signed on all the pages by the authorised representatives of Supplier should invariably be witnessed.
3. This Deed of Undertaking duly certified by the Company Secretary shall be submitted along with the bid. Further, the Deed of Joint Undertaking attested by Notary Public of the place(s) of the respective executant(s) or registered with the Indian Embassy/High Commission in that country shall be submitted by the bidder within ten (10) days from the date of intimation of post-bid discussion.

26. FORM OF JOINT DEED OF UNDERTAKING TO BE EXECUTED BY THE BIDDER/MANUFACTURER ALONGWITH PARENT COMPANY (PRINCIPAL) OR COLLABORATOR FOR TECHNOLOGICAL SUPPORT AND FOR EXTENDED WARRANTY OBLIGATIONS OF ADDITIONAL TWO (2) YEARS OVER AND ABOVE THE WARRANTY PERIOD SPECIFIED FOR OPGW (In line with requirements of Clause 1.1.2(A)(III) of Annexure-A (BDS))

THIS JOINT DEED OF UNDERTAKING executed this day of Two Thousand and by M/s., a Company incorporated under the laws of having its Registered Office at (hereinafter called the “**Collaborator**” which expression shall include its successors, executors and permitted assigns), and M/s., a Company incorporated under the laws of having its Registered Office at (hereinafter called the “**Bidder**”/“**Manufacturer**” which expression shall include its successors, executors and permitted assigns) in favour of (*insert name of the “Employer”*), a Company incorporated under the Companies Act of 1956 having its registered office at (*insert registered address of the Purchaser*)..... (hereinafter called the “**Employer**” which expression shall include its successors, executors and permitted assigns).

WHEREAS the “**Employer**” invited Bid as per its Specification No. for the execution of (*insert name of the package along with project name*).....

AND WHEREAS Clause No., Section, of, Vol.-... forming part of the Bid Documents inter-alia stipulates that the Bidder/Manufacturer and its Collaborator must fulfill the Qualifying Requirements for OPGW and be jointly & severally bound and responsible for the successful performance of OPGW offered in the event the proposal for supply of OPGW from the Bidder/Manufacturer is accepted by the Employer resulting in a Contract. It is also confirmed that Bidder/Manufacturer has established manufacturing and routine test facility for OPGW cable in India based on technological support of Collaborator who fully meets the requirement of Clause 1.1.2(A)(I) of Qualifying Requirements.

AND WHEREAS the Bidder/Manufacturer has submitted its proposal to the Employer vide Proposal No. dated based on the collaboration/association of the Collaborator with the Bidder/Manufacturer.

NOW THEREFORE THIS UNDERTAKING WITNESSETH as under:

1.0 In consideration of the award of Contract by the Employer to the Bidder/Manufacturer (hereinafter referred to as the "Contract") we, the Bidder/Manufacturer and the Collaborator do hereby declare that we shall be jointly and severally bound unto the (*insert name of the Employer*), for the successful performance of OPGW and shall be fully responsible for the design, manufacture, testing, supply on FOR destination delivery at site basis of OPGW in accordance with the Contract Specifications.

2.0 Without in any way affecting the generality and total responsibility in terms of this Deed of Undertaking, the Collaborator in particular hereby agrees to depute their technical experts from time to time to the Bidder/Manufacturer's Works/Employer's Project site as mutually considered necessary by the Employer, Bidder/Manufacturer and the Collaborator to ensure :

(i) Proper design, engineering, manufacture, testing, supply on FOR destination delivery of OPGW cable at site basis in accordance with Contract Specifications and if necessary, the Collaborator shall advise the Bidder/Manufacturer suitable modifications of designs, manufacturing process and implement necessary corrective measures to discharge the obligations under the contract

- (ii) Adequate up gradation of the testing facilities including quality systems of OPGW cable at Indian works
- (iii) Training to staff of Bidder/Manufacturer's work and certification to its trained personnel for carry out each activity
- (iv) Involvement and supervision during all phases of manufacturing of OPGW cable by expert of collaborator / parent company.
- (v) MQP of Bidder/Manufacturer shall be same as that of Collaborator(s)
- (vi) Source of raw material / major bought out components of OPGW cable shall be same as that of Collaborator(s)
- (vii) Timely supply of OPGW cable on FOR destination delivery at site basis. In the event, the development is taking time and not meeting time schedule, Collaborator(s) shall supply all the equipments from their works to meet the completion schedule without any additional liability to the Employer.
- (viii) Supervision of unloading at site, storage, erection, testing & commissioning and successful performance of the equipment in accordance with contract specifications.
- (ix) If necessary the Collaborator(s) shall advise the Manufacturer suitable modifications of designs and implement necessary corrective measures to discharge the obligations under the Contract.
- (x) **Warranty obligations for extended warranty obligations of additional two (02) years over and above the warranty period specified for the entire quantity of OPGW to be supplied from the Bidder/Manufacturer.**

3.0 As a security, Collaborator shall apart from the Bidder/Manufacturer's performance guarantee, furnish **additional Contract Performance Guarantee** from its Bank in favour of the Employer in a form acceptable to the Employer. The value of such guarantee shall be equivalent to 10% of the cost of OPGW Cable as identified in the Contract awarded by the Employer to the Bidder/Manufacturer and it shall be part of guarantee towards the faithful performance/compliance of this Deed of Undertaking in terms of the Contract. The guarantee shall be unconditional, irrevocable and valid for the entire period of the Contract, and till the end of the **Defect Liability Period of** under the Contract. The Bank Guarantee amount shall be payable to the Purchaser on demand without any reservation or demur.

4.0 We, the Collaborator and Bidder/Manufacturer agree that this Undertaking shall be irrevocable and shall form an integral part of the Contract and further agree that this Undertaking shall continue to be enforceable till the Employer discharges it. It shall become operative from the effective date of Contract.

5.0 This Deed of Undertaking shall be construed and interpreted in accordance with the laws of India and the Courts in Delhi shall have exclusive jurisdiction to adjudicate any dispute under or in connection with this agreement.

IN WITNESS WHEREOF the Collaborator and the Bidder/Manufacturer have through their Authorised Representatives executed these presents and affixed Common seals of their respective Companies, on the day, month and year first above mentioned.

WITNESS

(For Collaborator)

Signature

(Signature of the Authorized Representative)

Name

Name

Office Address

Common Seal of Company
.....

WITNESS

(For Bidder/Manufacturer)

Signature

(Signature of the Authorized Representative)

Name

Name

Office Address

Common Seal of Company

Note:

1. For the purpose of executing the Deed of Joint Undertaking, the non-judicial stamp papers of appropriate value shall be purchased in the name of executants parties.
2. The Undertaking shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.
3. This Deed of Joint Undertaking dully certified by the Company Secretary shall be submitted alongwith the bid. Further, the Deed of Joint Undertaking attested by Notary Public of the place(s) of the respective executant(s) or registered with the Indian Embassy/High Commission in that country shall be submitted by the bidder within 10 (Ten) days from the date of intimation of post bid discussion.

27. FORM OF BANK GUARANTEE FOR CONTRACT PERFORMANCE TO BE SUBMITTED PARENT COMPANY (PRINCIPAL) OR COLLABORATOR TO FURNISH PERFORMANCE GUARANTEE FOR AN AMOUNT OF 10% OF THE COST OF OPGW CABLE (To be submitted by the Collaborator/Parent Company of Bidder/Manufacturer as per requirement of Clause 1.1.2(A)(III) of Annexure-A (BDS)

Bank Guarantee No.

Date.....

Contract No.....

.....[Name of Contract].....

To: [Name and address of the Employer]

Dear Ladies and/or Gentlemen,

We refer to the Contract ("the Contract") signed on(*insert date of the Contract*)..... between you and M/s..... (*Name of Bidder/Manufacturer*), having its Principal place of business at(*Address of Bidder/Manufacturer*) and Registered Office at(*Registered address of Bidder/Manufacturer*) ("the Bidder/Manufacturer") concerning (*Indicate brief scope of work*) for the complete execution of the (*insert name of Package along with name of the Project*).....

Whereas, the Supplier has agreed to supply the OPGW cable in collaboration with M/s. (*Name of Collaborator*), having its Principal place of business at(*Address of Collaborator*) and Registered Office at(*Registered address of Collaborator*) (hereinafter referred to as the "Collaborator"), as a pre-requisite for qualification of the Bidder/Manufacturer and have submitted a deed of joint undertaking declaring that they are jointly and severally bound and responsible for the successful performance of the said equipment in accordance with the Contract Specifications and that the Collaborator having agreed to furnish a Contract Performance Guarantee for the faithful performance/compliance of the Deed of Undertaking equivalent to (10%) ten per cent of the cost of OPGW to be supplied by the Bidder/Manufacturer under the Contract, in addition to Contract Performance Guarantee equivalent to 10% (ten per cent) of the value of the Contract to be provided by the Bidder/Manufacturer for the faithful performance of the entire Contract.

By this letter we, the undersigned,(*insert name & address of the issuing bank*), a Bank (or Company) organized under the laws of and having its Registered/Head Office at(*insert address of registered office of the bank*)..... do hereby irrevocably guarantee payment to you up to i.e., ten percent (10%) of cost of the OPGW to be supplied by the Bidder/Manufacturer under the Contract until ninety (90) days beyond the Defect Liability Period i.e., upto and inclusive of (*dd/mm/yy*).

We undertake to make payment under this Letter of Guarantee upon receipt by us of your first written demand signed by your duly authorized officer declaring the Supplier/Collaborator to be in default under the Contract and without cavil or argument any sum or sums within the above named limits, without your need to prove or show grounds or reasons for your demand and without the right of the Supplier/Collaborator to dispute or question such demand.

Our liability under this Letter of Guarantee shall be to pay to you up whichever is the lesser of the sum so requested or the amount then guaranteed hereunder in respect of any demand duly made hereunder prior to expiry of the Letter of Guarantee, without being entitled to inquire whether or not this payment is lawfully demanded.

This letter of Guarantee shall remain in full force and shall be valid from the date of issue until ninety (90) days beyond the Defect Liability Period of the said equipment i.e. upto and inclusive of (dd/mm/yy) and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/s. on whose behalf this Letter of Guarantee has been given.

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.

Our liability under this Letter of Guarantee shall become null and void immediately upon its expiry, whether it is returned or not, and no claim may be made hereunder after such expiry or after the aggregate of the sums paid by us to you up shall equal the sums guaranteed hereunder, whichever is the earlier.

All notices to be given under shall be given by registered (airmail) posts to the addressee at the address herein set out or as otherwise advised by and between the parties hereto.

We hereby agree that any part of the Contract may be amended, renewed, extended, modified, compromised, released or discharged by mutual agreement between you and the Collaborator, and this security may be exchanged or surrendered without in any way impairing or affecting our liabilities hereunder without notices to us and without the necessity for any additional endorsement, consent or guarantee by us, provided, however, that the sum guaranteed shall not be increased or decreased.

No action, event or condition which by any applicable law should operate to discharge us from liability hereunder shall have any effect and we hereby waive any right we may

have to apply such law so that in all respects our liability hereunder shall be irrevocable and, except as stated herein, unconditional in all respects.

For and on behalf of the Bank
[Signature of the authorised signatory(ies)]
Signature_____

Name_____

Designation_____

POA Number_____

Contact Number(s): Tel._____ Mobile_____

Fax Number_____

email _____

Common Seal of the Bank_____

Witness:

Signature_____

Name_____

Address_____

Contact Number(s): Tel._____ Mobile_____

email _____

Notwithstanding anything contained herein:

1. Our liability under this Bank Guarantee shall not exceed _____ (value in figures) [_____ (value in words) _____].

2. This Bank Guarantee shall be valid upto _____ (validity date) _____.

3. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only & only if we receive a written claim or demand on or before _____ (validity date) _____."

For and on behalf of the Bank

[Signature of the authorised signatory(ies)]

Signature_____

Name_____

Designation_____

POA Number_____

Contact Number(s): Tel._____ Mobile_____

Fax Number_____

email _____

Common Seal of the Bank_____

Witness:

Signature_____

Name_____

Address_____

Contact Number(s): Tel._____ Mobile_____

email _____

Note :

1. For the purpose of executing the Bank Guarantee, the non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee'.

2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.

3. The Bank Guarantee should be in accordance with the proforma as provided. However, in case the issuing bank insists for additional paragraph regarding applicability of ICC publication No: 758, the following may be added at the end of the proforma of the Bank Guarantee [*i.e., end paragraph of the Bank Guarantee preceding the signature(s) of the issuing authority(ies) of the Bank Guarantee*]:

“This Guarantee is subject to Uniform Rules for Demand Guarantee, ICC publication No. 758 except that article 15(a) is hereby excluded.”

28. FORM OF JOINT DEED OF UNDERTAKING TO BE EXECUTED BY THE BIDDER ALONGWITH PROPOSED SUB-CONTRACTOR FOR INSTALLATION OF OPGW BY THE PROPOSED SUB-CONTRACTOR{AS PER REQUIREMENTS OF PARA 1.1.2(B) OF ANNEXURE-A (BDS)}

THIS DEED OF UNDERTAKING executed this day of Two Thousand and by M/s., a Company incorporated under the laws of and having its Registered Office at (hereinafter called the "Sub-contractor" which expression shall include its successors, executors and permitted assigns), and M/s., a Company incorporated under the laws of having its Registered Office at (hereinafter called the "Bidder"/"Contractor" which expression shall include its successors, executors and permitted assigns) in favour of (*insert names of the Employer*), a Company incorporated under the Companies Act of 1956 having its registered office at (*insert registered address of the Employer*)..... (hereinafter called the "Employer" which expression shall include its successors, executors and permitted assigns)

WHEREAS the "Employer" invited Bid as per its Specification No. for the execution of (*insert name of the package alongwith project name*)

AND WHEREAS Clause No., Section, of, Vol.-... forming part of the Bid Documents inter-alia stipulates that the Bidder and/or Manufacturer must fulfill the Qualifying Requirements and be jointly and severally bound and responsible for the quality and timely supply of OPGW cable and its successful performance in the event the Bid submitted by the Bidder is accepted by the Employer resulting in a Contract.

AND WHEREAS the Bidder has submitted its Bid to the Employer vide Proposal No. dated based on tie-up with the Sub-contractor for Installation of OPGW cable.

NOW THEREFORE THIS UNDERTAKING WITNESSETH as under:

1.0 In consideration of the award of Contract by the Employer to the Bidder (hereinafter referred to as the "Contract") we, the Sub-contractor and the Bidder/Contractor do hereby declare that we shall be jointly and severally bound unto the (*insert name of the Employer*), for the installation of OPGW cable in accordance with the Contract Specifications.

2.0 Without in any way affecting the generality and total responsibility in terms of this Deed of Undertaking, the Sub-contractor hereby agrees to depute their representatives from time to time to the Employer’s Project site as mutually considered necessary by the Employer, Bidder/Contractor and the Sub-contractor to ensure proper installation and successful performance of the material in accordance with Contract Specifications. Further, if the Employer suffers any loss or damage on account of non-performance of the material (OPGW cable) fully meeting the performance guaranteed as per Bid Specification in terms of the contract. We the Sub-contractor and the Contractor jointly and severally undertake to pay such loss or damages to the Employer on its demand without any demur.

3.0 This Deed of Undertaking shall be construed and interpreted in accordance with the laws of India and the Courts in Delhi shall have exclusive jurisdiction in all matters arising under the Undertaking.

4.0 We, the Tower Manufacture/ Bidder/Contractor agree that this Undertaking shall be irrevocable and shall form an integral part of the Contract and further agree that this Undertaking shall continue to be enforceable till the Employer discharges it. It shall become operative from the effective date of Contract.

IN WITNESS WHEREOF the Tower Manufacturer and/or the Bidder/Contractor have through their Authorised Representatives executed these presents and affixed Common seals of their respective Companies, on the day, month and year first above mentioned.

WITNESS

(For Sub-contractor)

Signature

(Signature of the Authorized Representative)

Name

Name

Office Address

Common Seal of Company
.....

WITNESS

(For Bidder)

Signature

(Signature of the authorized representative)

Name

Name

Office Address

Common Seal of Company
.....

Note:

1. For the purpose of executing the Deed of Joint Undertaking, the non-judicial stamp papers of appropriate value shall be purchased in the name of executant(s).
2. The Undertaking shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.
3. This Deed of Joint Undertaking duly attested by Notary Public of the place(s) of the respective executant(s), shall be submitted alongwith the bid.
4. In case the bid is submitted by a Joint Venture (JV) of two or more firms as partners, then the Joint deed of undertaking shall be modified accordingly.

29. PERFORMANCE SECURITY FORM

(TO BE SUBMITTED BY THE CONTRACTOR OPTING FOR SUBMISSION OF PERFORMANCE SECURITY WITH INITIAL VALIDITY OF 5 YEARS IN ACCORDANCE WITH CLAUSE GCC 9.3.1.1)

(For the purpose of verification/confirmation of this Bank Guarantee by the Employer, the Bank shall indicate 2 official email ids of the authorized signatories from Issuing Branch and also of the designated higher office (Corporate Office, Zonal Office etc) in the covering letter of the Bank forwarding the Bank Guarantee.)

Bank Guarantee No.

Date.....

NOA/Contract No.....

.....[Name of Contract].....

To: [Name and address of the Employer]

Dear Ladies and/or Gentlemen,

We refer to the Contract ("the Contract")

signed on(insert date of the Contract)..... between you and M/s (Name of Contractor),

(or)

vide notification of award issued on(insert date of the notification of award)..... by you to M/s (Name of Contractor)

having its Principal place of business at(Address of Contractor) and Registered Office at(Registered address of Contractor) ("the Contractor") concerning (Indicate brief scope of work) for the complete execution of the (insert name of Package alongwith name of the Project)..... [Applicable for Bank Guarantees issued by Contractor/Associate for those Contracts awarded to them]

Or

We refer to the Contract

signed on(insert date of the Contract)..... between you and M/s (Name of Contractor),

(or)

vide notification of award issued on(insert date of the notification of award)..... by you to M/s (Name of Contractor)

having its Principal place of business at(Address of Contractor) and Registered Office at(Registered address of Contractor) ("the Contractor") and the Contract ("the Contract") signed on(insert date of the Contract)..... between you and M/s (Name of Associate), having its Principal place of business at(Address of Associate) and Registered Office at(Registered address of Associate), the Associate of the Contractor for executing the Facilities concerning (Indicate brief scope of work) for the complete execution of the (insert name of Package alongwith name of the Project)..... [Applicable for Bank Guarantees to be issued by Contractor against those Contracts awarded to their Associate]

By this letter we, the undersigned,(*insert name & address of the issuing bank*) , a Bank (which expression shall include its successors, administrators, executors and assigns) organized under the laws of and having its Registered/Head Office at(*insert address of registered office of the bank*)..... do hereby irrevocably guarantee payment to you up to i.e., ten percent (10%) of the Contract Price until 60 months i.e., upto and inclusive of (*dd/mm/yy*).

We undertake to make payment under this Letter of Guarantee upon receipt by us of your first written demand signed by your duly authorized officer declaring the Contractor to be in default under the Contract and without cavil or argument any sum or sums within the above named limits, without your need to prove or show grounds or reasons for your demand and without the right of the Contractor to dispute or question such demand.

Our liability under this Letter of Guarantee shall be to pay to you whichever is the lesser of the sum so requested or the amount then guaranteed hereunder in respect of any demand duly made hereunder prior to expiry of the Letter of Guarantee, without being entitled to inquire whether or not this payment is lawfully demanded.

This letter of Guarantee shall remain in full force and shall be valid from the date of issue until 60 months i.e. upto and inclusive of (*dd/mm/yy*) and shall be extended from time to time for such period, as may be desired by M/s. on whose behalf this Letter of Guarantee has been given.

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.

Our liability under this Letter of Guarantee shall become null and void immediately upon its expiry, whether it is returned or not, and no claim may be made hereunder after such expiry or after the aggregate of the sums paid by us to you shall equal the sums guaranteed hereunder, whichever is the earlier.

All notices to be given under shall be given by registered (airmail) posts to the addressee at the address herein set out or as otherwise advised by and between the parties hereto.

We hereby agree that any part of the Contract may be amended, renewed, extended, modified, compromised, released or discharged by mutual agreement between you and the Contractor, and this security may be exchanged or surrendered without in any way impairing or affecting our liabilities hereunder without notices to us and without the necessity for any additional endorsement, consent or guarantee by us, provided, however, that the sum guaranteed shall not be increased or decreased.

No action, event or condition which by any applicable law should operate to discharge us from liability hereunder shall have any effect and we hereby waive any right we may have to apply such law so that in all respects our liability hereunder shall be irrevocable and, except as stated herein, unconditional in all respects.

Notwithstanding anything contained herein:

1. Our liability under this Bank Guarantee shall not exceed _____ (*value in figures*) _____ [*value in words*] _____].

2. This Bank Guarantee shall be valid upto _____ (*validity date*) _____.

3. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only & only if we receive a written claim or demand on or before _____ (*validity date*) _____."

For and on behalf of the Bank

[*Signature of the authorised signatory(ies)*]

Signature_____

Name_____

Designation_____

POA Number_____

Contact Number(s): Tel._____ Mobile_____

Fax Number_____

email_____

Common Seal of the Bank_____

Witness:

Signature_____

Name_____

Address_____

Contact Number(s): Tel._____ Mobile_____

email_____

Note :

1. For the purpose of executing the Bank Guarantee, the non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee'.

2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.

3. The Bank Guarantee should be in accordance with the proforma as provided. However, in case the issuing bank insists for additional paragraph regarding applicability of ICC publication No: 758, the following may be added at the end of the proforma of the Bank Guarantee [*i.e., end paragraph of the Bank Guarantee preceding the signature(s) of the issuing authority(ies) of the Bank Guarantee*]:

"This Guarantee is subject to Uniform Rules for Demand Guarantee, ICC publication No. 758 except that article 15(a) is hereby excluded."

Integrity pact

Between

Punjab State Transmission Corporation Limited

Having its registered office at Shakti Sadan building PSTCL, The Mall Patiala- 147001 herein after referred to as

“PSTCL”

and

Having registered office of

Hereinafter referred to as

“The Bidder / Contractor”

Preamble

PSTCL intends to award, under laid down organisational procedures, contract(s) for Reliable communication scheme against the tender enquiry STQ-7048

(Signature)

(Signature)

(For & On behalf of PSTCL)

(For & On behalf of bidder/ partner(s) of joint venture/contractor)

Reliable communication scheme against the tender enquiry and specification number STQ-7048 PSTCL values full compliance with all relevant laws and regulations and the principles of economical use of resources and of fairness and transparency in its relations with its bidders/contractors.

In order to achieve these goals , PSTCL and the above named bidder/contractor enter into this agreement called integrity pact which will form a part of the bid.

It is hereby agreed by and between the parties as under

Section I- commitments of PSTCL

- (1) PSTCL commits itself to take all measures necessary to prevent corruption and to observe the following principles:

- (a) No employee of PSTCL, personally or through family members will in connection with the tender, or the execution of the contract demand take promise for or accept for him/herself or third person, any material or other benefit which he/she is not legally entitled to.
- (b) PSTCL will, during the tender process treat all Bidder (s) with equity and fairness. PSTCL will in particular before and during the tender process, provide to all bidder(S) the same information and will not provide to any bidder(s) confidential/ additional information through which the bidder (s) could obtain an advantage in relation to the tender process or the contract execution
- (c) PSTCL will exclude from evaluation of bids its such employee(s) who has any personnel interest in the Companies /Agencies participating in the Bidding / Tendering
- (2) If chairman and managing director obtains information on the conduct of any employee of PSTCL which is a criminal offence under the relevant ANTI-Corruption laws of India, or if there be a substantive suspicion in this regard, he will inform its chief vigilance officer and in addition can initiate disciplinary actions under its rules.

SECTION II- Commitments of the bidder/contractor

- (1) The Bidder/Contractor commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles

(Signature)

(Signature)

(For & On behalf of PSTCL)

(For & On behalf of Bidder/ Partner(s) of Joint Venture/contractor)

During his participation in the tender process and during the contract execution:

- a) The bidder/contractor will not, directly or through any other person or firm, offer, promise or give to PSTCL, or to any PSTCL's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange an advantage during the tender process or the execution of the contract.
- b) The Bidder/Contractor will not enter into illegal agreement or understanding, whether formal or informal with other Bidder/Contractors. This applies in particular to prices, specifications, certification, subsidiary contracts, submission or non-submission of bids or actions to restrict competitiveness or to introduce cartelization in the bidding process.
- c) The Bidder/Contractor will not commit any criminal offence under the Anti-corruption Laws of India; further, the Bidder/Contractor will not use for

illegitimate purpose or for purpose of restriction competition or personal gain, or pass on to others, any information provided by PSTCL as part of business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

- d) The Bidder/Contractor of foreign origin shall disclose the name and address of Agents/representative in India, if any, involved directly or indirectly in the Bidding. Similarly, the Bidder/Contractor of Indian Nationality shall furnish the name and address of foreign principals, if any directly or indirectly in the bidding.
 - e) The Bidder/Contractor will, when presenting his bid, disclose any and all payments he has made, or committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of contract and/or with the execution of contract.
 - f) The Bidder/Contractor will not misrepresent facts or furnish false/forged documents/ information's in order to influence the bidding process or execution of the contract to the detriment of PSTCL.
- (2) The Bidder/Contractor will not instigate third persons to commit offences outlines above or be an accessory to such offences.

(Signature)

(For & On behalf of PSTCL)

(Signature)

(For & On behalf of Bidder/ Partner(s) of Joint
Venture/contractor)

SECTION III- Disqualification from tender process and exclusion from future contracts

- (1) If the Bidder, before contract award, has committed a serious transgression through a violation of Section II or in any other form such as to put his reliability or credibility as Bidder into question, PSTCL may disqualify the Bidder from tender process or terminate the contract, if already signed, for such reason.
- (2) If the Bidder/Contractor has committed a serious transgression through a violation of Section II such as put his reliability or credibility into question, PSTCL may after following procedures also exclude the Bidder/ Contractor from future contract award process. The imposition and duration of exclusion will be determined by the severity of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of Bidder/Contractor and the amount of the damage. The exclusion will be imposed for minimum of 12 months and maximum of 3 years.
- (3) If the Bidder/Contractor can prove that he has restored/recouped the damage caused by him and has installed a suitable corruption prevention system, PSTCL may revoke the exclusion prematurely

SECTION IV- Liability for violation of Integrity Pact

- (1) If PSTCL has disqualified the Bidder from the tender process prior to the award under Section II, PSTCL may forfeit the Bid Guarantee under the Bid.
- (2) If PSTCL has terminated the contract under Section II, PSTCL may forfeit the Contract Performance Guarantee of this contract besides resorting to the other remedies under the contract.

SECTION V- Previous Transgression

- (1) The Bidder shall declare in the bid that no previous transgressions occurred in the last 3 year with any other Public Sector Undertaking or Government Department that could justify his exclusion from tender process

(Signature)	(Signature)
(For & On behalf of PSTCL)	(For & On behalf of Bidder/ Partner(s) of Joint Venture/contractor)

(2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

SECTION VI – Equal treatment to all Bidder/Contractors

(1) PSTCL will enter into the agreement with identical condition as this one with all Bidders.

(2) PSTCL will disqualify from the tender process any bidder who does not sign this Pact or violate its provisions

SECTION VII

If PSTCL obtains knowledge of conduct of a Bidder or a contractor or his subcontractor or of an employee or a representative or an associate a Bidder or contractor or his Subcontractor which constitutes corruption, or if PSTCL has substantive suspicion in this regard, PSTCL will inform the Chief Vigilance Officer (CVO).

(*SECTION VIII – Independent External Monitor/Monitors

(1) PSTCL has appointed a panel of Independent External Monitors (IEMs) for this Pact with the approval of Central Vigilance Commission (CVC), Government of Punjab/ India, out of which one of IEMs has been indicted in NIT/IFB.

(2) **The IEM is to** review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement. He has right of access to all project documentation. The IEM may examine any complaint received by him and submit a report to chairman-cum-Managing Director, PSTCL, at the earliest. He may also submit a report directly to the CVO and the CVC, in case of suspicion of serious irregularities attracting the provisions of the PC Act. However, for ensuring the desired transparency and objectivity in the dealing with the complaints arising out of any tendering process, the matter shall be referred to the full panel of IEMs, who would examine the records, conduct the investigations and submit report to chairman-cum-Managing Director, PSTCL, giving joint findings.

(Signature)	(Signature)
(For & On behalf of PSTCL)	(For & On behalf of Bidder/ Partner(s) of Joint Venture/contractor)

- (3) The IEM is not subject to instructions by representatives of the parties and performs his functions neutrally and independently. He reports to the chairman-cum-Managing Director, PSTCL.
- (4) The Bidder/Contractor(s) accepts that the IEM has the right to access without restriction to all documentation of PSTCL related to this contract including that provided by the contractor/Bidder. The Bidder/Contractor will also grant the IEM, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his documentation. The same is applicable to subcontractors. The IEM is under contractual obligation to treat the information and documentation and documents of the Bidder(s)/ Contractor(s)/ Subcontractor(s) with confidentiality.
- (5) PSTCL will provide to the IEM information as sought by him which could have an impact on the contractual relations between PSTCL and the Bidder/Contractor related to this contract.
- (6) As soon as the IEM notices, or believe to notice, a violation of this agreement, he will so inform the Chairman-cum-Managing Director, PSTCL to discontinue or take corrective action, or to take other relevant action. The IEM can in this regard submit non-binding recommendations. Beyond this, the IEM has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the IEM shall give an opportunity to PSTCL and the Bidder/Contractor, as deemed fit, to present its case before making its recommendations to PSTCL.
- (7) The IEM will submit a written report to chairman-cum-Managing Director, PSTCL within 8 to 10 weeks from the date of reference or intimation to him by PSTCL and, should the occasion arise, submit proposals for correcting problematic situation.
- (8) If the IEM has reported the Chairman-cum-Managing Director, PSTCL, a substantiated suspicion of an offence under relevant anti-corruption Laws of India, and the Chairman-cum-Managing Director, PSTCL has not, within the reasonable time taken visible action to proceed against such offence or report it to the CVO, Monitor may also transmit this information directly to the CVC, Government of India/Punjab.

(Signature)

(For & On behalf of PSTCL)

(Signature)

(For & On behalf of Bidder/ Partner(s) of Joint
Venture/contractor)

- (9) The word IEM would include both singular and plural.

(* This Section shall be applicable for only those packages wherein the IEMs have been identified in section-I: Invitation for Bids and/ or Clause ITB 9.3 in Section- III: Bid Data Sheets of Conditions of contract, Volume-I of the Bidding Documents

SECTION IX- Pact Duration

This Pact begins when both parties have legally signed it. It expires for Contractor after the closer of the contract and for all other Bidder's six month after the contract has been awarded.

SECTION X- Other Provisions

- (1) This agreement is subject to India Law. Place of performance and jurisdiction is the establishment of PSTCL. The Arbitration clause provided in the main tender document/ contract shall be applicable for any issue/ dispute arising under Integrity Pact.
- (2) Changes and supplements as well as termination notices need to be made in writing.
- (3) If the contractor is a partnership firm or a consortium or joint Venture, this agreement must be signed by all partners, consortium members and joint Venture Partners.
- (4) Nothing in this agreement shall affect the rights of the parties available under the General Conditions of Contract (GCC) and Condition in Instruction To Bidder (ITB)
- (5) Views expressed or suggestions/submission made by the parties and the recommendation of CVO/IEM[#] in the respect of the violation of this agreement, shall not be relied on or introduced as evidence in the arbitral or judicial proceedings (arising out of the arbitral proceedings) by the parties in connection with the disputes/differences arising out of the subject contract.

CVO shall be applicable for packages wherein IEM are not identified in Section IFB/ITB of Condition of contract, Volume-I. IEM shall be applicable for packages wherein IEM are identified in Section IFB/ITB of the condition of contract, Volume – I.

(Signature)
(For & On behalf of PSTCL)

(Signature)
(For & On behalf of Bidder/ Partner(s) of Joint Venture/contractor)

- (6) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(Signature)
(For & On behalf of PSTCL)

(Signature)
**(For & On behalf of Bidder/ Partner(s) of Joint
Venture/contractor)**

(Office Seal) (Office Seal)

Name:

Designation:

Witness 1:

Name:

Designation:

Witness 1:

Name:

Designation:

Witness 2:

Name:

Designation:

Witness 2:

Name:

Designation:

Volume-II
Specification for Indoor Fibre Optic
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Part-I INTRODUCTION, GENERAL INFORMATION & GENERAL REQUIREMENT

This Document describes the technical specifications for Communication Equipment for Establishment of Fibre Optic Communication System under the contract. This specification describes the functional and performance requirements of the system.

1.1 Scope and General Requirements under the Communication equipment Package

The broad scope of the procurement of this part include the survey, planning, design, engineering, supply, transportation, insurance, delivery at site, unloading, handling, storage, installation, termination, testing, training, and demonstration for acceptance, commissioning and documentation for:

- (i) SDH Equipment along with suitable optical line interfaces & tributary cards.
- (ii) Associated Termination equipment system including E-1 channel banks & drop-insert multiplexer, subscriber line interfacing card and digital access cross-connect switching (DACS).
- (iii) Craft Terminal based Network Management System (NMS)
- (iv) -48 Volts DC Power Supply & Battery System
- (v) VOIP system
- (vi) All cabling, wiring, Digital Distribution Frame patch facilities, equipment MDF's and interconnections to the supplied equipment at the defined interfaces.
- (vii) MDF & DDF cross connects required to route and activate circuits.
- (viii) System integration of the supplied subsystems and also integration with existing communication equipment such as SDH, MUX, TMN and NMS etc. (Wherever applicable)
- (ix) Integration of supplied system with new PMUs, RTUs/SAS, SCADA system, PLCC equipment, EPABX etc. (Wherever applicable)
- (x) Reconfiguration of communication channel in existing communication equipment. (Wherever applicable)
- (xi) Maintenance of the supplied system.

All other associated works/items described in the technical specifications for a viable and fully functional communication network.

1.2 General Requirements

The Contractor is encouraged to offer standard products and designs. However, the Contractor must conform to the requirements and provide any special equipment necessary to meet the requirements stated herein.

It should be noted that preliminary design information and bill of quantity (BoQ) specified in this specifications are indicative only. The Contractor shall verify the design data during the

site surveys & detail engineering and finalise the BoQ as required for ultimate design & system performance.

The Bidder's proposal shall address all functional and performance requirements within this specification and shall include sufficient information and supporting documentation in order to determine compliance with this specification without further necessity for inquiries.

The Bidder's proposal shall clearly identify all features described in the specifications or in any supporting reference material that will not be implemented; otherwise, those features shall become binding as part of the final contract.

An analysis of the functional and performance requirements of this specification and/or site surveys, design, and engineering may lead the Contractor to conclude that additional items are required that are not specifically mentioned in this specification. The Contractor shall be responsible for providing at no added cost to the Employer, all such additional items and services such that a viable and fully functional communication equipment system is implemented that meets or exceeds the capacity, and performance requirements specified. Such materials and services shall be considered to be within the scope of the contract. To the extent possible, the Bidders shall identify and include all such additional items and services in their proposal.

All communication equipment provided shall be designed to interface with existing communication equipments and shall be capable of supporting all present requirements and spare capacity requirement identified in this specification.

The communication equipment shall be designed and provisioned for expansions and reconfigurations without impairing normal operation, including adding and removing circuits. The offered items shall be designed to operate in varying environments. Adequate measures shall be taken to provide protection against rodents, contaminants, pollutants, water & moisture, lightning & short circuit, vibration and electro-magnetic interference etc.

The Contractor shall demonstrate a specified level of performance of the offered items during well-structured factory and field tests.

The Bidders are advised to visit sites (at their own expense), prior to the submission of a proposal, and make surveys and assessments as deemed necessary for proposal submission. The successful bidder (Contractor) is required to visit all sites. The site visits after contract award shall include all necessary surveys to allow the contractor to perform the design and implementation functions. The Contractor shall inform their site survey schedule to the Employer well in advance. The site survey schedule shall be finalised in consultation with the Employer. The Employer may be associated with the Contractor during their site survey activities.

After the site survey, the Contractor shall submit to the Employer a survey report on each link and site. This report shall include at least the following items:

- (a) Proposed layout of all Communication Equipment in the existing rooms and buildings.
- (b) Proposed routing of power, earthing, signal cables and patch cords etc.
- (c) Confirmation of adequacy of Space and AC/DC Power supply requirements
- (d) Proposals for new rooms/buildings if required
- (e) Identification of facility modifications if required
- (f) Identification all additional items required for integration for each site/location.

1.2.1 Synchronization of the Communication Network

The Contractor shall be responsible for synchronization of new communication equipment with existing network utilizing the existing clock. The Contractor shall make an assessment of additional clock requirement for synchronization of the communication equipment.

1.3 General Responsibilities and Obligations

This section describes the general responsibilities and obligations of the Contractor and the Employer.

1.3.1 Responsibilities for the Implementation Plan

The Bidder's technical proposal shall include a project implementation plan and schedule that is consistent with the implementation plan detailed in this specification. The implementation plan shall be modelled such that it provides fibre optic cabling system support for the activation of this project. The Implementation plan shall include the activities of the Contractor, the Owner and the Employer, showing all key milestones such as facilities readiness and clearly identifying the nature of all information and project support expected from the Employer. The Employer and Contractor shall finalise the detailed Implementation plan following award of the contract.

1.3.2 Contractor's Responsibilities and Obligations

The Contractor shall be responsible for the implementation of the associated communication equipments like SDH, PDH, DACS, and DCPS etc. The Contractor shall be responsible for all cables and wiring associated with the equipment provided, both inside and outside buildings in accordance with technical specifications. The Contractor shall also be responsible for determining the adequacy of the local power source for the equipment and for wiring to it, with adequate circuit protective breakers. In addition, the Contractor shall be responsible for shielding equipment and cabling to eliminate potential interference to or from the equipment, and for earthing all cabinets and shields.

Contractor's obligations include, but are not limited to, the following:

- (1) Provide a working system that meets the functional and performance requirements of this specification.

- (2) Site visits and surveys, necessary to identify and provide all equipment needed for implementation in the communication network.
- (3) Equipment Engineering and design specific to each location including review and conformance with local environmental and earthing considerations.
- (4) Overall integration of communication equipments/subsystem procured in present and existing network (Wherever applicable).
- (5) All cabling, wiring including supply, laying and termination etc of the cable, at terminal equipment nodes required for full interconnectivity and proper operation of the telecommunications network including equipment supplied under this package and the connectivity and interfacing of equipment supplied separately PLC, EPABX etc.
- (6) Providing -48 Volts DCPS system & Battery.
- (7) VOIP system
- (8) Connectivity between the FODP and SDH equipment.
- (9) Installation and integration of network management software, hardware and firmware.
- (10) Planning & Implementation for a smooth transition from existing operations to new upgraded network operations including all new equipment.
- (11) Project management, project scheduling, including periodic project reports documenting progress, review meeting during the contract period.
- (12) Engineering and technical assistance during the contract and warranty period & mandatory preventive maintenance period.
- (13) Provide all additional Equipment necessary to ensure compatibility between new and existing equipment (Wherever Applicable).
- (14) Implement all minor civil works and identify any major civil works i.e. expansion or construction of rooms, trenches necessary for installation of proposed equipment and provide the details of such work to the Employer.
- (15) Intimate source power requirements within 30 days after receipt of the order for each cabinet/ rack of equipment provided at each location.
- (16) All hardware, software, and firmware required to satisfy the requirements of this Specification.
- (17) Inter-connection among provided equipments.
- (18) Providing earthing system and extension of earthing system.
- (19) Supply of cable & all equipment/items required for Terminal equipment system.
- (20) Factory and site testing of all items including hardware, software, and firmware provided.
- (21) Provide documented evidence of satisfactory Type Test performance to the Employer and if required by The Employer, conduct type test.
- (22) Provide a Quality Assurance Plan, ensuring the Employer access to the manufacturing process.
- (23) Shipment of all equipment and documentation to the Employer designated locations and/or staging areas.

- (24) Staging, maintenance of staging area and security including full responsibility for protection from theft and fire.
- (25) All documentation and drawings as specified.
- (26) Supply, installation and termination of cables and cabling for all interconnection.
- (27) All required spare parts, maintenance aids, and test equipment.
- (28) Training of the Employer personnel.
- (29) An availability analysis showing MTBF (mean-time-between-failure) and MTTR (mean-time-to-repair) figures for all system components.
- (30) Hardware, software, and firmware maintenance, debugging, and support of the equipment through final acceptance, and maintenance on all new equipment throughout the warranty period.
- (31) Availability of service, spare and expansion parts for the supplied items for the designed life of the equipment or seven (7) years after the declaration of withdrawal of equipment from production, whichever is earlier. However, the termination of production shall not occur prior to Operational Acceptance of the system by the Employer.
- (32) Notification services for field updates to the hardware, software, and firmware for ensuring the availability of the supplied hardware & software including NMS for the entire lifespan.
- (33) The contractor shall appoint key personnel for the project such as Project Manager, Site Manager, Design Engineer, Installation Engineer and Commissioning Engineer only after approval of the experience data by the Employer. Approval of the Employer shall be obtained, whenever the Contractor wants to change key personnel.

Detailed descriptions of the Contractor's obligations, in relation to individual items and services offered, are delineated in other sections of this specification.

1.3.3 The Employer Responsibilities and Obligations

The Employer will provide the following items and services as part of this Project:

- (1) Overall project management of the project.
- (2) Review and approval of the Contractor's designs, drawings, and recommendations.
- (3) Communication network configuration data, including:
 - (a) Channel assignments for voice and data
 - (b) Interconnection drawings for existing equipment.
- (4) Review and approval of test procedures.
- (5) Participation in and approval of factory and site acceptance tests.
- (6) Review and approval of training plans.
- (7) Providing support and access to facilities at the sites.
- (8) Implement the major civil works such as expansions or construction of rooms, trenches etc. as required for the equipment to be provided by the Contractor.

- (9) Coordination of the Contractor's activities with the Employer's and constituents' concerned departments.
- (10) Provide to the extent possible drawings for existing sites and facilities for which equipment installations are planned.
- (11) Approval of the key personnel for the project

1.4 Applicable Standards

The applicable standards are mentioned in the respective technical section. The offered equipment shall conform to the standards mentioned in the specification except to the extent modified by this specification. In case of any discrepancy between the description given in the specification and the standards, the provisions of the technical specification shall be followed. The parameters not specifically mentioned in this specification shall conform to the standard mentioned in this specification:

- (i) IEEE 802.3
- (ii) ITU-T/CCITT Recommendations, G.652, G.701, G.702, G.703, G.711/ 12/ 14/ 35/ 36, G.721, G.742, G.811 and G.823
- (iii) ITU-T/CCITT Recommendations, G.801, G.821, G.822, G.823, G.826.
- (iv) ITU-T/CCITT Recommendations of the V Series
- (v) ITU-T/CCITT Recommendations R35, R37, and R38A (or R38B)
- (vi) ITU-T/CCITT Recommendations M3010, G771
- (vii) Internet Activities Board, RFC-1157 (SNMP)
- (viii) International Electrotechnical Commission standards, IEC 60801-2/3/4/5, IEC-60255-4, IEC 60255-5, IEC 60870-2-1, IEC 60721-3-3, IEC 60529.
- (ix) International Electrotechnical Commission standards, IEC 61000-4-xx series.
- (x) IEC publication 60068, 60068-2-2, 60068-2-3, 60068-2-14, 60068-2-27, 60068-2-32.
- (xi) ITU-T/CCITT Recommendations K.11, K.17, K.20.
- (xii) International CISPR standards

Specifications and codes shall be the latest version, inclusive of revisions, which are in force at the date of the contract award. Where new specifications, codes, and revisions are issued during the period of the contract, the Contractor shall attempt to comply with such, provided that no additional expenses are charged to the Employer without Employer's written consent.

In the event the Contractor offers to supply material and/or equipment in compliance to any standard other than Standards listed herein, the Contractor shall include with their proposal, full salient characteristics of the new standard for comparison.

In case values indicated for certain parameters in the specifications are more stringent than those specified by the standards, the specification shall override the standards.

1.5 General Technical Requirements Communication Equipment

Refer to the Annexure-A (ITB) clause no. 1.4

1.6 Deleted

Note* :In case of works executed under a contract that had been awarded on a Joint Venture, the experience of individual Joint Venture partner shall be considered limited to the scope of that partner under the said contract.

Part-II NETWORK CONFIGURATION AND EQUIPMENT CHARACTERISTICS

2.1 Introduction

This section describes the Fibre Optic Communication network configuration and the equipment characteristics for SDH equipment for communication system to be installed under the project. The sub-systems addressed within this section are:

- (1) Fibre Optic Transmission System (FOTS)
- (2) Termination Equipment Subsystems
- (3) Network Management System (NMS)
- (4) PABX & VOIP system
- (5) MDF, DDF and Cabling

The requirements described herein are applicable to and in support of network configurations depicted in Appendix and Network Management System (NMS) for monitoring and control of this communication network. TMN and NMS have been interchangeably used in this specification.

The security related requirements of the equipment shall be as per DoT (Department of Telecommunication) guidelines and all similar security requirements as amended by DoT on time to time basis shall be followed/complied by the vendor at no additional cost to Employer till the implementation of the project.

The manufacturer shall allow the Employer and/or its designated agencies to inspect the hardware, software, design, development, manufacturing, facility and supply chain and subject all software to a security /threat check any time during the supplies of equipment.

The contractor shall ensure that the supplied equipments have been got tested as per relevant contemporary Indian or International Security Standards e.g. IT and IT related elements against ISO/IEC 15408 standards, for Information Security Management System against ISO 27000 series Standards, Telecom and Telecom related elements against 3GPP security standards, 3GPP2 security standards etc. from any international agency/ labs of the standards e.g. Common Criteria Labs in case of ISO/IEC 15408 standards until 31st March 2013. From 1st April, 2013, the certification shall be got done from authorized and certified agency/lab in India.

The Contractor shall also ensure that the equipment supplied has all the contemporary security related features and features related to communication security as prescribed under relevant security standards. A list of features, equipments, software etc. supplied and implemented in the project shall be given for use by the Employer.

The contractor shall get the Employer's network audited from security point of view once a year from a network audit and certification agency as identified by DoT. The audit of the

network shall be carried once in a financial year till the maintenance service contract in the bid. Network forensics, Network hardening, Network penetration test, Risk assessment, Actions to fix problems and to prevent such problems from reoccurring etc. shall be covered under network audit.

The Contractor shall ensure that all the documents, including software details are supplied to the Employer in English/Punjabi language. A record of all the software updation and changes shall be given to the Employer and any major updation and changes shall be done with the prior approval of the Employer.

In case of any deliberate attempt for a security breach at the time of procurement or at a later stage after deployment/installation of the equipment or during maintenance, liability and criminal proceedings can be initiated against the Contractor as per guidelines of DoT and any other Government department.

2.2 General Network Characteristics

2.2.1 Description

The proposed fibre optic communication network shall support the voice & data communication requirements of RTUs/SAS, SCADA/EMS system and other Power system operational requirements. The communication system shall provide data & voice connectivity across the various locations or connectivity of RTUs/ SAS and Control Centres. The RTUs/ SAS located at various locations will report to Control Center using IEC 60870-5-101 or IEC 60870-5-104 Protocol. The proposed communication system shall provide connectivity of some RTUs/ SAS over TCP/IP protocol using Ethernet interface and other RTUs over serial interface. The offered communication System shall support the communication requirements of RTUs/ SAS and the SCADA/ EMS system described in point to multi point and/or multipoint to multipoint configurations using Ethernet over SDH

The fibre optic network shall be based on the Synchronous Digital Hierarchy (SDH) having bit rate of STM-4. The network shall consist of overhead fibre optic links with a bit rate of Synchronous Transport Module-4. The tentative list of Fiber Optic links to be implemented under this package are given in Appendix-A (Table A-2) of Volume-III. The Contractor can propose a system based on higher bit rate systems, if required, so as to meet the link budget requirements or any other specification requirement. The detailed BOQ is described in appendices. The proposed communication network shall support VLAN configuration.

The proposed network shall also be used for VoIP based voice connectivity and connectivity to various sites at Ethernet Interface level. PABX alongwith interface cards shall be provided at control centre location. VOIP gateways (for min. 4/8 subscribers) shall be provided at other location. VoIP gateways to be provided at the other locations shall be directly connected through telephones.

The contractor shall develop numbering plan for the proposed voice communication system.

2.2.2 Functional Requirement

The primary function of the communication network is to provide a highly reliable voice and data communication system in support of the SCADA/EMS. The communications support requirement for SCADA/EMS system is for low & high speed data, express voice circuits and administrative voice circuits as defined in appendices. A brief summary of the communication system requirements is as follows:

- (a) High speed E1 channel support
- (b) 64kbps & n x 64kbps data channel support
- (c) Low speed (300 -1200 bps) data channel support
- (d) Voice (2 wires, 4 wires) channel support.
- (e) Data transport supporting Network Management channels
- (f) The connectivity envisaged between RTUs and Control Centre is Wide Area Network (WAN) on TCP-IP using IEC 60870-5-104 protocol and IEC 60870-5-101 protocol.

2.2.3 General Systems Requirements

Required characteristics are defined and specified herein at the system level, subsystem level, and equipment level.

2.2.3.1 System Synchronization

The Contractor shall synchronize all the equipments under the contract using a GPS based clock. In addition to GPS input reference, the synchronization clock must have provision to take INPUT reference coming from other clock. The contractor shall submit the synchronization plan as per standard ITU-T G.811. All sync equipments proposed under this contract should meet ITU-T G.811 criterion. The holdover quality of slave clock, if any, shall meet ITU-T G.812 standard requirements.

The Contractor shall provide system wide synchronization fully distributed throughout the telecom network and connected to all equipments new & existing. The Contractor shall submit the synchronization plan for the entire network meeting the requirement of ITU-T G.803.

The system equipment requiring “clock” shall be connected to the master clock using external clocking. For this purpose, appropriate interfaces(s) in the transmission & termination equipment being supplied and all other associated hardware shall be provided by the Contractor.

2.2.3.2 System Maintainability

To facilitate performance trending, efficient diagnosis and corrective resolution, the system shall permit in-service diagnostic testing to be executed both locally and from remote

locations, manually and/or initiated under TMN control. Such testing shall not affect the functional operation of the system.

Preventive and problem oriented maintenance of the communications system shall be performed using diagnostics tools such as TMN and test equipment. They shall support complete maintenance of all system elements and shall permit the diagnosis of any fault without requiring additional test equipment. The Contractor shall provide specialized training required to operate above mentioned diagnostic tools. For all redundant systems, disconnection and repair of any failed device shall not interrupt the operation of the system.

2.2.3.3 System Upgradeability and Expandability

Equipment supplied shall be sized (though not necessarily equipped) to support system/subsystem expansion to full capacity as provided by specified aggregate transmission rates. Equipment units provisioned for equipped subunits shall be terminated at appropriate patching facilities or termination blocks. Power supplies and TMN shall be sized for maximum equipped system capacity.

2.2.3.4 Equipment Availability

The Contractor shall ensure the availability for subscriber to subscriber where they are providing the new equipments (MUX/Drop-Insert) under this contract. The availability requirements are as follows, which shall be demonstrated at site for the equipments being provided under this contract:

- (1) The availability of each fibre optic link (E1 to E1) shall be at least 99.999%.
- (2) The availability of network end to end (E1 to E1) shall be at least 99.998%.
- (3) The average per link subscriber to subscriber availability shall be at least 99.97%.
The per link subscriber to subscriber availability is defined as the availability between any two data or voice subscribers between RTU to reporting Control Centre and between control centres.
- (4) The network-wide subscriber to subscriber availability shall be at least 99.8%. The network-wide subscriber to subscriber availability is defined as the availability between any two data or voice subscribers on the wideband network.

The calculated availability is defined as the theoretical availability determined by a statistical calculation based on the mean-time-between-failure (MTBF) and the mean-time-to-repair (MTTR) of the components and subsystems comprising the FOTS. The down time of the fibre optic cable shall not be considered in the aforesaid availability calculations.

In order to ensure that the equipment & configuration proposed by the bidders shall be capable of demonstrating the specified availability figures it is required that the Bidders shall include in their proposal a calculated availability analysis for the proposed equipment/ sub system. The calculated failure rates of the units and the calculated availabilities of the equipment being offered shall be provided in the proposal. The analysis shall be based on an

availability block diagram and shall include the mean-time-between failure (MTBF) and mean-time-to-repair (MTTR) of all of the components on the link. The Contractor shall indicate in the analysis the MTBF and MTTR and the resulting availability of each point-to-point link. For this analysis, an MTTR of at least 4 hours shall be assumed.

2.2.4 General Equipment Characteristics

All Contractor supplied equipment shall be new and of the finest production quality. The Employer will not accept modules or printed-circuit boards that are modified by appending wires or components. Wired strapping options shall be incorporated in the board design to meet the above requirement.

All applicable requirements stated in this section shall equally apply to the TMN equipment as specified in this Section.

2.2.4.1 Revision Levels and Modifications

All hardware, firmware and software delivered as part of the communications network shall be field proven and at the most of current revision level. All modifications and changes necessary to meet this requirement shall be completed prior to the start of the factory tests or under special circumstances, on written approval by Employer, prior to the completion of SAT.

All field modifications of the hardware, firmware and software that is required to meet installation and/or performance specifications, shall be fully documented as part of the deliverables, both as a separate field modifications record and as corrected equipment/configuration documentation.

2.2.4.2 Equipment Capacities

Equipment supplied shall be sized and equipped with sufficient capacity to support BoQ and configuration requirements as identified in the appendices. Each subsystem supplied shall be sized (to be equipped as specified) to support full subsystem expansion.

Data communications channelization required to support the TMN subsystems specified in Technical Specifications (TS) are not identified in the appendices. Therefore, the Contractor is required to size and equip the system to include all channelization and channel cards required to support the TMN function.

2.2.4.3 Redundancy Requirements and Protection Schemes

Equipment redundancy and Automatic Protection Schemes (APS) are specified in the Table 2-1. The failure of one element shall not prevent the use of any other that has not failed.

**Table 2-1
Equipment Redundancy Requirements Summary**

Fiber Optic transmission Equipment: SDH Equipment Power Supply & Convertors _____ Common Control* Cards DACS (Cross Connect) Power Supply Common Control* Cards Drop/Insert Multiplexer Power Supply * = Common control cards which are essentially required for operation of the equipment.	 1:1 APS or distributed power supply 1:1 APS 1:1 APS or distributed power supply 1:1 APS 1:1 APS or distributed power supply
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The offered equipment shall support at least SNCP as per standard ITU-T G.841. In case the equipment offered by the Bidder does not support the above mentioned minimum protection methods, the bidder shall have to provide all additional equipment needed to provide same level of flexibility, redundancy and functionality at no additional cost to Employer. The bidders shall provide details of protection schemes supported in the Bid document.

The offered equipment shall support automatic switchover function between the redundant modules and all required modules and hardware to support the automatic switch over shall be provided by the Contractor.

2.2.4.4 Lost Signal Recovery

At any digital signal level, reapplication of a lost signal shall result in automatic resynchronization and full restoration to normal operation without manual intervention. All alarms incident to the signal failure, shall be automatically cleared at the equipment, rack and monitoring levels and normal operation indications restored and reported if applicable.

2.2.4.5 Software Upgrades

The Contractor shall provide antivirus software along with all the computer hardware/software which shall be upgraded periodically till the maintenance services contract in the bid. Further, to meet all the specifications requirements during implementation

and maintenance, if upgrade in the hardware/software of supplied item is required, the same shall be done by the contractor without any additional cost to the Employer.

2.2.4.6 General Site Considerations

All fiber optic links up to 250 kms transmission line length shall be implemented by the Contractor without repeaters. In order to meet the link budget requirement, the Contractor shall provide all the necessary equipments only in the end stations. The contractor may provide the optical amplifier, wave length translator, optical cards or high capacity SDH equipment with suitable rack/subrack to meet the maximum distance limit. All the provided equipments shall be monitored by centralized NMS.

2.2.4.7 Proposed Optical Fibre Characteristics

The link budget calculations and equipment design shall be based on the specified fibre parameters. The optical cables shall have Dual Window Single Mode (DWSM) fibres conforming to ITU-T Recommendations G.652D and the major parameters of these optical fibre(s) are defined in Table-2-2:

**Table-2-2
Optical Fibre Characteristics**

Fibre Description:	Dual-Window Single-Mode (DWSM)
Mode Field Diameter:	8.6 to 9.5 μm ($\pm 0.6 \mu\text{m}$)
Cladding Diameter:	125.0 μm + 1 μm
Mode field Concentricity Error:	$\leq 0.6\mu\text{m}$
Core-Clad concentricity error:	$\leq 1.0\mu\text{m}$
Cladding non-circularity	$\leq 1\%$
Cable Cut off Wavelength:	$\leq 1260 \text{ nm}$
1550 loss performance	As per G.652D
Proof Test Level	$\geq 0.69 \text{ Gpa}$
Attenuation coefficient	@1310nm $\leq 0.35 \text{ dB/Km}$ @1550nm $\leq 0.21 \text{ dB/Km}$
Attenuation variation with wavelength 1285 nm - 1330 nm 1525 nm – 1575 nm	Attenuation coefficient @1310 $\pm 0.05 \text{ dB}$ Attenuation coefficient @1550 $\pm 0.05 \text{ dB}$
Point discontinuities	$\leq 0.1\text{dB}$
Chromatic Dispersion; Max.:	18.0 ps/(nm x km) @ 1550 nm 3.5 ps/(nm x km) @ 1288-1339nm 5.3 ps/(nm x km) @ 1271-1360nm
Zero Dispersion Wavelength:	1300 to 1324 nm
Zero Dispersion Slope:	0.092 ps/(nm ² x km) maximum

Polarization mode dispersion coefficient	$< 0.2 \text{ ps/km}^{1/2}$
Temperature Dependence:	Induced attenuation $\leq 0.05 \text{ dB}$ (-60 deg C - +85 deg C)
Bend performance:	@1310nm (75+2 mm dia Mandrel), 100 turns; Attenuation rise $\leq 0.05 \text{ dB}$ @1550nm (30+1 mm dia Mandrel), 100 turns; Attenuation rise $\leq 0.10 \text{ dB}$ @1550nm (32+0.5 mm dia Mandrel), 1 turn; Attenuation rise $\leq 0.50 \text{ dB}$

2.2.5 Fibre Optic Link Lengths

Tentative fiber optic link lengths are as specified in appendix of Volume-III. The exact cable lengths shall be provided during detailed engineering. The same shall be used by the Contractor for final link design during the detailed engineering of the project as per the link budget criteria specified in the TS. In case of change in the specified BoQ, the contract price shall be adjusted accordingly.

2.3 Fibre Optic Transmission System

The Fibre Optic Transmission System (FOTS) is defined herein to include ETSI digital optical line termination equipment. The FOTS shall be based on SDH technology. Minimum aggregate bit rate shall be STM-4 and equipped with minimum 16 E1 interfaces (G.703) and minimum 8 nos. Fast Ethernet interface (IEEE 802.3/IEEE 802.3u) supporting layer 2 switching as tributaries. The Ethernet interfaces shall support VLAN (IEEE 802.1P/Q), spanning tree (IEEE 802.1D) quality of service. Protection scheme for Ethernet traffic should be ERPS based (Ethernet ring protection scheme) as per ITU-T G.8032.

The Contractor shall provide (supply and install) connectorised jumpers (patch cords) for FODP-to-equipment and equipment-to-equipment connection as per BoQ.

2.3.1 SDH Equipment

2.3.1.1 Functional Requirement

There is a requirement for different types of equipment under this project which are described in this section. The BOQ is provided in the appendices. For the purpose of BOQ, the SDH Equipment is considered to be divided in three parts i.e. Optical interface/SFP, Tributary interfaces (Electrical tributaries such as E1, Fast Ethernet 10/100 Mbps) and

BaseEquipment (Consisting of Common Cards, Control Cards, Optical base card, Power supply cards, sub- rack, cabinet, other hardware and accessories required for installation of equipment i.e. everything besides optical interface/SFP and tributary interfaces).

If bidder is offering equipment with multifunction cards such as cross-connect or control card with optical interface/SFP or tributary interface, such type of multifunction card shall be considered as Common control card and shall be the part of base equipment. In case optical interface/SFP is embedded with control card, the adequate number of optical interface/SFPs shall be offered to meet the redundancy requirements of the specifications. Further, main and protection channel shall be terminated on separate cards.

The equipment shall be configurable either as Terminal Multiplexer (TM) as well as ADM with software settings only.

SDH ADM

The aggregate interfaces shall be (at least) STM-4 towards at least five protected directions (Protected as specified in this specifications). At present the equipment shall be equipped with a min. 16 nos. E -1 electrical tributary interface & one no., min. 4 port Ethernet interface card as tributaries. The equipment shall provide access to full STM-4 payload.

The offered STM-4 SDH equipment shall be upgradeable to STM-16 by changing optical line cards only. Cross connection (VC4) capability of offered SDH equipment shall be provided according to STM-16 equipment. The contractor shall demonstrate the STM-16 upgradeability during FAT

2.3.1.2 Redundancy and Protection

Two fibre rings shall be implemented wherever the network permits. On linear sections of the network, protected links using 4 fibres shall be implemented.

2.3.1.3 Service Channel

Service channels shall be provided as a function of the SDH equipment and shall be equipped with Service Channel Moldems that shall provide at a minimum: One voice channel (order wire) with analog interface (0.3 to 3.4 kHz) and one data channel. There shall be a facility to extend the line system order-wire to any other system or exchange lines.

2.3.1.4 Supervision and Alarms

ISM (In Service Monitoring) circuitry shall be provided as a function of the SDH equipment. Local visual alarm indicators shall be provided on the equipment, as a rack summary alarm panel. Alarms shall be as per ITU-T Standards G.774, G.783 and G.784. Additionally, F2/Q2 interfaces for a local craftsperson terminal interface and remote equipment monitoring is required.

The Equipment shall support collection of at least four (4) external alarms for monitoring and control of station associated devices by the TMN.

2.3.1.5 Synchronisation

The equipment shall provide synchronisation as per Table 2-3. One 2MHz synchronisation output from each equipment shall be provided.

2.3.1.6 Electrical and Optical I/O Characteristics and General Parameters

Table 2-3 provides the electrical and optical characteristics as well as other general parameters for SDH equipment.

Table 2-3
Electrical and Optical I/O Characteristics and General Parameters

Optical Wavelength ^{NOTE (1)}	1310/1550nm
Optical Source ^{NOTE (2)}	Laser
Optical Source Lifespan	Better than 5 X10 ⁵ hours
Optical Fibre Type	G.652 D
Optical Connectors	Type FC-PC
Transmission Quality	Per ITU-T G.821, G.823, G.826
Source Primary Power	-48 Vdc
Equipment Specifications	Per ITU-T G.783
Tributary, Electrical Interface	Per ITU-T G.703, 75 Ω
Ethernet Interface	10/100 Mbps
SDH Bit Rates	Per ITU-T G.703
Optical Interfaces	Per ITU-T G.957, G.958
Frame and Multiplexing Structure for SDH	Per ITU-T G.707
Synchronization	Per ITU-T G.813
Management Functions	Per ITU-T G.774, G.784
Protection Architectures	Per ITU-T G.841
Built In Testing and Alarms	Per ITU-T G.774, G.783, G.784

NOTE (1) Optical wavelength shall be selected considering the characteristics of the optical fibre and the link budget.

NOTE (2) Eye Safety for Laser Equipment: To avoid eye damage, when a receiver detects a line interruption, it is required that the optical power of the laser shall be reduced to safe limits on the transmitter in the opposite direction as per ITU-T G.958.

NOTE (3) In case other than FC-PC connector is provided in the equipment, suitable patch cord with matching connector are to be provided to connect with FODP.

2.3.2 Optical Link Performance Requirements

The optical fibre link performance requirements are specified as follows:

2.3.2.1 Link Budget Calculations

The fibre optic link budget calculations shall be calculated based upon the following criteria:

- (1) Fibre attenuation: The fibre attenuation shall be taken to be the guaranteed maximum fibre attenuation i.e. 0.21 dB/Km @1550nm and 0.35 dB/km @1310nm.
- (2) Splice loss: Minimum 0.05 dB per splice. One splice shall be considered for every 3 kms.
- (3) Connector losses: Losses due to connectors shall be considered to be minimum 1.0 dB per link.
- (4) Equipment Parameters: The equipment parameters to be considered for link budget calculations shall be the guaranteed “End of Life (EOL)” parameters. In case, the End of Life parameters are not specified for the SDH equipment, an End of Life Margin of at least 2 dB shall be considered and a similar margin shall be considered for optical amplifiers.
- (5) Optical path Penalty: An optical path penalty of at least 1 dB shall be considered to account for total degradations due to reflections, inter symbol interference, mode partition noise and laser chirp.
- (6) Maintenance Margin: A maintenance margin of at least 2.5 dB/100Km shall be kept towards cabling, repair splicing, cable ageing and temperature variations etc.
- (7) Other losses: Other losses, if any required specifically for system to be supplied shall also be suitably considered.
- (8) Dispersion: The fibre dispersion shall be taken to be the guaranteed maximum dispersion i.e. 18 ps/nm.Km @1550 nm & 3.5 ps/nm.km @ 1310 nm for DWSM fibres.
- (9) Bit Error Rate: The link budget calculations shall be done for a BER of 10^{-10} .

The bidders shall determine the total link loss based on the above parameters and shall submit the system design (including link budget calculations) for each category of fibre optic link during detailed engineering.

For finalizing the FOTS system design & BOQ, above methodology shall be adopted taking into account fibre attenuation, dispersion and splice loss determined during the detailed engineering. Accordingly, additions and deletions from the contract shall be carried out based on unit rates indicated in the contract.

2.3.2.2 Link Performance

The Link performance for ES, SES and BER for the fibre optic links shall correspond to National Network as defined in ITU-T G.826.

2.3.2.3 FODP to SDH Equipment

The Contractor shall be responsible for connectivity between the FODP and the SDH equipment. The Contractor shall provide FC PC coupled patch cords. The location of FODP shall be finalized during detailed engineering.

The patch-cord length between the FODP & equipment rack shall be suitably protected from rodents, abrasion, crush or mechanical damage.

2.4 Termination Equipment Subsystem

The Termination Equipment Subsystem is defined to include the equipment that interfaces (adapts) the subscriber (user) to the Fibre Optic Transmission System (FOTS). Functional descriptions of these equipments are as follows:

2.4.1 Functional Description

The transmission network node provides subscriber interface to the transmission network and/or switching/routing. For clarity, the basic functions accomplished at the network nodal points, are described briefly as follows:

Multiplexer shall be used to accomplish subscriber connectivity to the Digital Communication Network. Subscriber Line Units shall provide analog to digital and direct digital conversion to 64 Kbps digital channel. In the CEPT standard hierarchy, thirty (30) such 64 Kbps digital channels shall be Time Division Multiplexed (TDM) resulting in a single 2.048 Mbps (E-1) digital bit stream with minimum 4 ports (E-1).

Digital Drop-Insert and Branching Equipment shall be used to digitally interface a small number of channels at spur locations without requiring successive D/A and A/D conversions of the throughput channels.

Digital Cross connect Equipment (DACS) shall be used to provide software controlled dynamic routing/rerouting of the primary (E-1) bit stream as well as the 30 channels of the E1 bit stream.

The equipment shall also have an interface for external 2048 kHz synchronisation signal according to ITU-T Recommendation G.703.

All the connectors shall be accessible from the front and comply with international specification.

2.4.2 First Order Multiplexing

The Contractor shall be required to provide E-1 Drop & Insert Multiplexer and E-1 Channel Bank primary multiplexing in compliance with the electrical input-output characteristics provided in Table 2-4.

**Table 2-4
CEPT E-1 Standard First Order Multiplexing**

Electrical Input/ Output Characteristics	
Applicable Standards:	CEPT per CCITT Recommendation G.702, G.703, G.711 and G.712
Number of Tributaries:	30 X 64 Kbps
Alternative Sub-rate	n X 64 Kbps V.36
Tributaries:	64Kb/s V.11/V.36
Output Aggregate Rate:	2.048 Mb/s \pm 50 ppm
Interface Code:	HDB3
Impedance:	75 ohm unbalanced
Peak Level @ 120 ohm:	3.0 volts \pm 10%
Peak Level @ 75 ohm:	2.37 volts \pm 10%
Maximum Insertion Loss:	6 dB
Signal Waveform:	Per CCITT G.703
Frame Structure:	Per CCITT G.742
Jitter Performance:	Per CCITT G.823
Power Supply Voltage:	-48 Vdc

2.4.2.1 Drop & Insert Multiplexing

Drop & Insert multiplexing in conformance with CEPT E-1 characteristics shall be required at locations where the subscriber requirement is minimal. The drop and insertion of up to thirty 64 Kbps channels supporting subscriber line units (SLU) shall be required at intermediate locations. The Drop & Insert Muxes supplied shall be performance and card compatible with the Channel Bank Equipment provided so that all Subscriber Line Interface cards are interchangeable.

2.4.2.2 Channel Banks (Mux, Drop/Insert)

User voice and data equipment interfacing requirements are defined at the subscriber line level. Primary multiplexing in conformance with CEPT E-1 characteristics shall be used to provide first order multiplexing of up to thirty 64 Kbps channels supporting Subscriber Line Units (SLUs).

2.4.2.3 Subscriber Line Units\Subscriber Line Interface Cards

The terms Subscriber Line Interface Cards and Subscriber Line Units have been used interchangeably throughout the specification. Multiple configurations of SLUs shall be required to provide subscriber to primary multiplexer Bank interfacing for a variety of voice and data communications. In case there are changes in number or type of cards because of changes in channel requirements, the contract price shall be adjusted accordingly.

The SLU interface requirements are discussed in the following subparagraphs:

(A) Voice Channels

The voice channel requirement is for (I) 4-Wire E&M trunking in support of PABX trunks & PLC VF and (II) 2-Wire telephonic interfaces. 2 wire SLUs shall be DTMF/TP optioned for 2-wire loop start or 2-wire GND start. The voice cards shall utilize ITU.T A - law companded PCM G.711, 64 kbits/s encoding. The voice card requirements are indicated in the BoQ in appendices.

(B) Sub-Channel Data Multiplexing

For this Project, the RTU data interface to the wideband telecommunications network node shall be defined at the DTE level at low- speed rates of 300, 600 and 1200 baud. The port shall be compatible with RS232C interface. The Contractor shall be required to furnish 64 Kbps SLU asynchronous dataplexing for at least 4 selectable low speed DTE interfaces whenever multiple asynchronous data circuits are required.

(C) N x 64 kbps Synchronous Data

There is also a requirement for N x 64 kbps V.35, X.21 interfaces. The tentative quantities have been identified in the appendices. However the final BOQ shall be worked out during detailed design and contract price shall be adjusted accordingly.

2.4.3 Digital Access Cross connect System

The Contractor shall be required to provide Digital Access Cross connect Systems (DACS) capable of switching 16 or more E-1 lines in compliance with the electrical input-output characteristics provided in Table 2-5. DACS shall be fully compatible with CEPT E-1 tributary standards.

DACSs shall be provided at major locations and shall be used to establish and reconfigure cross-connections at the tributary level of up to 480 x 64Kb/s channels. DACS E-1 line interface shall be fully capable of accessing each E-1 line.

Within the context of this specification, sizing of DACS system is defined as 4 x n where n is the maximum size of the port switching matrix. Thus a DACS sized as 8 x 16 means that 8 E1 ports are interfaced over a 16 port (E1) matrix.

A DACS system shall consist of the switch matrix, all routing logic and timing circuitry for internally sourced, line derived or externally supplied network timing and full software support. The DACSs to be provided under this contract shall consist of at least a 16 port switching matrix, with 16 ports equipped, i.e. 16 X 16 size. The DACS shall also be able to switch the signaling of the voice channels along with the voice channels. The DACS shall not use, decrease or block the specified capacity of the switching matrix while switching the

signaling. The DACS shall support the Channel Associated Signaling (CAS) and Common Channel Signaling (CCS) both as per ITU-T G. 704.

The DACS shall provide user friendly control and management software. The user shall be able to operate the DACS locally through craft terminal, via an RS-232 interface or remotely under TMN supervisory control.

**Table 2-5
CEPT E-1 Digital Access Cross Connect System**

Required Operating Characteristics	
E1 Trunk Capacity:	Minimum 16-Port Switch Matrix Minimum 4-Port I/O per card
Tributary Capacity:	30 X 64 Kbps
Compatibility:	CEPT E-1, CEPT E-1 tributary channel
Frame Delay:	Minimum < 1 frame Maximum < 2 frames
E-1 Port Interface:	2.048 Mb/s \pm 50 ppm
Interface Code:	HDB3
Impedance:	75 ohm unbalanced/120 ohm balanced
Peak Level @ 75 ohm:	2.37 volts \pm 10%
Maximum Insertion Loss:	6 db
Signal Waveform:	Per CCITT G.703
Frame Structure:	Per CCITT G.742
Jitter Performance:	Per CCITT G.823
Synchronization:	Internal, external source and synchronized on incoming E-1
Routing:	Fully non-blocking tributary to/from E-1 channel
Routing Table Capacity:	Minimum of 9 routing tables for reconfiguration
Supervisory Ports:	Serial Com Ports
Supervisory Port Interface:	RS-232
Interface:	Standard ASCII ANSI compatible terminal
Supervisory Channel:	Async data rates, software selectable: speed of 110-9600 bps, odd or even parity 7 or 8 bits.
Power Supply Voltage:	-48 VDC

2.4.3.1 Required DACS Applications

The DACS provided shall be fully capable of implementing standard applications such as "Groom and Fill", Drop & Insert/Bypass, Broadcast and Alternative Routing.

2.4.3.2 Menus and Reports

DACSs throughout the network shall be required to function as fully integrated subsystems of the Telecommunications Management Network (TMN).

The DACS software shall provide menu driven management of DACS and shall provide at least the following:

- (I) Active Configuration: The user shall be able to modify the current active configuration.
- (II) Configuration: The configurations other than the active one shall be listed, edited, viewed, renamed, deleted and activated. Actions shall be allowed manually, upon a carrier failure or specified alarm condition, remotely or on a scheduled basis.
- (III) Reports: The user shall have selection of pre formatted specific reports and "Report Options" to be used to select where the next reports will be sent.
- (IV) Administration: This shall provide the user, options to control, view and maintain various logs and the DACS software.
- (V) Alarms: This shall display Alarm Status on all active ports and shall have an alert mechanism that readily identifies an alarm event to the user through TMN (locally as well as remotely). The alarms shall have different colours based on the importance of the alarm.

2.5 MDF, DDF and Cabling

For the purposes of the specification, the contractor shall provide cabling, wiring, DDF patching facilities and MDFs interfacing to the wideband telecommunications system. Equipment and material components for MDF, DDF and cabling are also part of this procurement. It shall be the Contractor's responsibility to provide all cable support required for full supplied equipment interconnection with the MDF and shall be in accordance with communications industry standard practices and the requirements mentioned in the technical specifications.

2.5.1 MDF and DDF Patching Facilities

The Contractor shall supply and install all cabling, wiring, connectors, cross connects and Digital Distribution Frames (DDF) and Main Distribution Frames (MDF) associated with the installation and interconnection of equipments procured under this package as follows:

- (i) DDF for termination of new SDH equipment E-1 ports
- (ii) Cabling (including connectors) for E1 level connections from DDF to existing SDH equipments. DDF to Existing & new PDH equipments. To the extent possible, existing cable at site shall be used.
- (iii) All Ethernet ports shall be terminated with RJ-45 connector. Provision for 100% expansion with connector for terminating additional Ethernet ports shall be provided.
- (iv) MDF for termination of all the subscriber channels at new PDH node

- (v) Cabling and connectors required to enable subscriber-to-subscriber circuits over the telecom network. The Line side of the MDF shall be cabled to the Primary Multiplex and the equipment side shall be cabled to the MDF of the assigned subscriber (PLCC, PABX, Telephone at wideband locations etc).
- (vi) Any other cables, connections etc required for a fully functional, integrated telecom system.

The connections amongst various equipments such as FOTS, termination equipment and subscriber MDFs etc shall always be routed through DDF and MDF to provide maintenance access.

2.5.2 Digital Distribution Frame Functional Requirements

The Contractor shall provide DDF for Digital Signal Cross connect (DSX) Broadband-quality (better than 20 MHz) patching facilities configured "normally -thru" with Equipment, Line and Monitor Patch Jacks. DDFs shall provide the following basic functions:

- (i) "Normally thru" circuit routing
- (ii) Circuit rerouting via patch cord assemblies
- (iii) Circuit disconnect and termination

All DDFs shall be sized and equipped to support the offered configuration of the provided equipment. Independent Transmit and Receive patch jack assemblies (line and equipment) shall provide for separate transmit and receive single-plug patching. Transmit and receive patch jack assemblies shall be located side-by-side such that dual- plug patch cord assemblies may be used to route both transmit and receive for the same circuit.

2.5.3 Main Distribution Frames

The Contractor shall make provision for cross connection of subscriber services to the subscribers utilizing Krone type or equivalent and shall provide full connectivity up to and terminated on the equipment side of the appropriate DDFs and line side of MDFs. The Contractor shall terminate on the equipment side of patching facilities provided by other contracts and shall provide DSX type patching facilities supporting aggregate bit streams (i.e.dataplexers and E-1 Channel Banks). Separate Patch panels or MDFs shall be provided for Data and Voice. All cross connects shall be accomplished utilizing one, two or three pair patch cords. Patch plugs are permissible for direct one-to-one circuit "cut-thru".

2.6 Patch Cords

The Contractor has to supply FC PC coupled Patch cords as per requirement of specification. The Patch cord return loss shall be equal to or better than 40 dB and insertion loss equal to or less than 0.5 dB. Fiber jumpers shall be of sufficient lengths as to provide at least 0.5m of service loop when connected for their intended purpose.

2.7 Telecommunication Management Network / Network Management System

The Contractor shall provide a Telecommunications Management Network System (TMN) for operational support to the FOTS and associated Termination equipment subsystems. This TMN shall provide the capability to monitor, reconfigure, and control elements of the telecommunications network from a centralized location and at each node of the network where equipment is located. This TMN system shall assist Employer/Owner in the operations and maintenance of the wideband communication resources of the including detection of degraded circuits, system performance, the diagnosis of problems, the implementation of remedial actions and the allocation or reallocation of telecommunications resources and addition/deletion of network elements.

The contractor shall supply preferably a single TMN for all the NEs (Network Elements) such as SDH equipment, Mux, Drop-Insert, DACS etc. In case a single TMN cannot be provided for all the NEs, the contractor may supply separate TMNs. Each of the offered TMN shall meet the requirements indicated in this section. The bidder shall provide details of the offered TMN in the bid. TMN and NMS (Network Management System) have been interchangeably used in this specification.

The Network Management System shall be provided with following two configuration as per the requirement;

- (i) The Network Management System shall be provided with main and back-up configuration. The location of same shall be finalised during detailed engineering. The operation of main and backup NMS will be co-ordinated in such a way that the database in both the NMS are in synchronism. The synchronisation of database shall be done automatically and periodicity of synchronisation shall not be more than one (1) hour under any circumstances. The management functions of the network elements under this subject procurement encompass from any to any and the operation and maintenance of all the network elements shall be seamless. In case of failure of main NMS, the control function shall be fully taken care of by backup NMS by manual take-over. Restoration of main NMS shall be done after synchronism of database is achieved and after proper validation, which should be done automatically. Similar methodology shall be adopted for restoration of back up NMS from a failover situation.
- (ii) The Network Management System shall be provided at centralised NMS location. The location of same shall be finalised during detailed engineering.

The offered TMN shall meet the requirements indicated in this section. The bidder shall provide details of the offered TMN in the bid. TMN and NMS (Network Management System) have been interchangeably used in this specification.

2.7.1 Applicable Standards

The TMN design concept, functional and informational architecture and physical architecture, shall be in compliance with ITU-T Recommendation M.3010.

2.7.2 TMN Architecture

The TMN shall provide

- (a) Collection of Management data from all Network Elements (NEs) supplied under this package. The minimum monitoring and control requirements for the communication equipment shall be as defined in this section.
- (b) Processing of above management data by using processor(s) located at control Centre and additional intermediate station processor(s), wherever required.
- (c) Monitoring and control of the NEs as defined below:
 - i) The Control Centre for all the network elements being procured under this package (including local operator console) shall support management of all equipments supplied under this package. At minimum functions of Network management layer (NML) and Element management layer (EML) as defined in CCITT M3010. The detailed functions are listed in TS.
 - ii) Monitoring and control of NEs using Craft Terminals as defined in this Section.
- (d) Supervisory monitoring and control of the following station associated devices:
 - I) Intrusion Detection Alarms
 - II) Power Failure
 - III) Fire and Smoke Detection
 - IV) Environmental Control (Temperature, Humidity etc.)
- (e) Communication channel support for TMN System as specified in Technical Specifications (TS).

The supplied TMN system shall be capable of handling all management functions for at least 150% of the final network elements. The NMS location shall be finalized during detailed engineering. TMN system should not be dependent on each other for their working.

The TMN system hardware shall be so designed that failure of single processor/component (router, switch, converter etc.) shall not inhibit any of the functionality of the TMN system. The Contractor shall submit for Employer's approval the TMN architecture describing in detail the following subsystems/features:

- (a) Database used in TMN
- (b) Master Processor, server/workstation, LAN, Peripherals and hardware

- (c) Software and operating system
- (d) Local Consoles/remote consoles
- (e) Craft Terminals
- (f) Data communication between NEs, Remote/Local Consoles and TMN Processor(s)
- (g) Routers/Bridges
- (h) Expansion Capabilities
- (f) The offered TMN system shall be capable of integration to other supplier's Network Management System (NMS) upwardly through SNMP/CORBA - TMF418 compliant North bound interface. The interface shall accommodate all required functionalities to implement OSS but not limited to the following:
 - i) Real time forwarding and synchronization
 - ii) Provisioning of circuits
 - iii) Upload of network topology
 - iv) Monitoring of events for topology and circuit changes
 - v) Alarm handling

The details shall be finalised and discussed during detailed engineering and the Contractor shall be obliged to provide/share all necessary information and co-ordinate with the implementation vendor of OSS.

2.7.3 Management Functions

The TMN shall support following Management functions:

2.7.3.1 Configuration Management

Configuration management is concerned with management, display, and control of the network configuration. Minimum specific requirements that shall be satisfied include the following:

- a. Provide tools to establish and maintain the backbone topology and configuration information and provide graphical maps depicting the configurations.
- b. Gather descriptive information about the current configuration of the equipment, provide operator displays, and prepare reports.
- c. Provide tools for planning, establishing, and changing the static equipment configuration. Provide for changes to the equipment configuration in response to equipment failures, planned upgrades, and operator requests to take equipment offline for testing.
- d. Provide verification testing to support new equipment installation.

2.7.3.2 Fault Management

Fault management is concerned with detecting, diagnosing, bypassing, directing service restoration, and reporting on all the backbone network equipment, systems, and links. Minimum specific requirements that shall be satisfied include the following:

- a. Display equipment status in a consistent fashion regardless of the source of the data on a graphical topological, map-type display. Status shall be displayed through the use of colours on links and nodes as well as through text.
- b. Obtain status and detect faults through periodic polling, processing of unsolicited alarms and error events, and periodic testing for connectivity.
- c. Maintain an alarm summary of unacknowledged alarm events on the management station display and maintain a log of all received alarms. The operator shall be able to acknowledge and clear alarms individually and as a group. The use of alarm correlation techniques is encouraged to minimize the proliferation of alarms caused by a single, common event. All alarms shall be configurable as critical alarms, major alarms and minor alarms with different colours.
- d. Provide the capability to diagnose and isolate failures through analysis of error and event reports and through the use of both on-line and off-line diagnostic tests and display of monitored data.
- e. The criteria for fail over shall be configurable as automatic fail over to redundant equipment wherever possible and through operator-initiated actions where automatic fail over is not possible. The status of fail over shall be reported to the NMS.
- f. Track network equipment failure history.

2.7.3.3 Performance Management

Performance management is concerned with evaluation of the use of network equipments and their capability to meet performance objectives. Minimum specific requirements that shall be satisfied include the following:

- a. Provide support for an operator to initiate, collect, and terminate performance metrics under both normal and degraded conditions. For example, BER of each link, together with other data measured at each node, shall be available on operator request.
- b. Monitor point to point & end to end signal quality and history. Provide operator controls to monitor performance of specified events, measures, and resources . Specifically provide displays to permit the operator to:
 1. Select/deselect network equipments, events, and threshold parameters to monitor
 2. Set monitoring start time and duration or end time
 3. Set monitoring sampling frequency
 4. Set/change threshold values on selected performance parameters

5. Generate alarm events when thresholds are exceeded.
6. Set multiple thresholds on certain performance parameters. Alarm categories include as a minimum a warning and a failure.
7. Calculate selected statistical data to measure performance on selected equipment based on both current and historical performance data maintained in performance logs. Performance data provided is limited to what is available from the equipment Contractors.
8. Provide graphical displays of point to point and end to end current performance parameter values. Provide tabular displays of current, peak, and average values for performance parameters.
9. Generate reports on a daily, weekly, monthly, and yearly basis containing system statistics.

2.7.3.4 Security Management

The TMN shall be provided with security features to limit access to monitoring and control capabilities to only authorized personnel. One access level of System Administrator and at least two levels of operator access shall be provided - read (view) only, and write (configure). The system administrator shall be able to create, define and modify operators with different access levels, network domains and perform all kind of maintenance and up gradation of the TMN system. With "read only" access level, network parameters should only be viewed. Access to database maintenance, command control and test functions shall be available with "write" access level. Means shall be provided to ensure only one authorized user has write capability for a selected domain of the network. It shall be possible to define multiple domains for purposes of monitoring and control.

Human error and conflict detection are also required. Such errors and access violations shall be reported to the offending user as error messages and warnings.

2.8 Communication Channel Requirement and Integration

Communication requirements for TMN system have not been considered in Appendices and the Contractor shall provide these as a part of TMN system. The Contractor shall provide all required interface cards / devices, LAN, routers/bridges, channel routing, cabling, wiring etc. and interfacing required for full TMN data transport.

The TMN data transport shall utilize the wideband communications transmission system service channel in the overhead whenever possible. This will provide inherent critical path protection.

Should the configuration requirements dictate multiple TMN station processors, the TMN Master Station shall require bidirectional data transport with its station processor(s) . This communications interfacing shall be via critically protected data channels. It shall be the Contractor's responsibility to provide for and equip all necessary critically protected TMN data channel support.

In case supervisory channels are not available, the Contractor shall provide suitable interfaces in their supplied equipment for transport of TMN data. The Contractor shall also be responsible for providing suitable channels with appropriate interfaces to transport the TMN data.

The NMS information of existing SDH system shall be transported through the new communication network, wherever required, up to the NMS location. The NMS information of the new SDH system being procured under the package shall be transported through the existing communication network using 64 kbps/2Mbps (G.703) interfaces. Any hardware required for above interfacing shall be provided by the Contractor.

The bidders shall describe in the proposal the TMN data transport proposed to be used by the bidder in detail including capacity requirements and various components/equipment proposed to be used.

2.9 Craft Terminal

Each equipment (SDH equipment, Mux, Drop/Insert and DACS etc.) on the fibre optic communication network shall include provision for connecting a portable personal computer (PC) to be known as craft terminal to support local commissioning and maintenance activities. Through the use of this PC and local displays/controls, the operator shall be able to:

- a. Change the configuration of the station & the connected NEs.
- b. Perform tests
- c. Get detailed fault information

The craft terminal shall be connected to the interface available in the communication equipment. Portable (laptop) computers (Craft terminals), each complete with necessary system and application software to support the functions listed above, shall be supplied to the employer as per BOQ given in the appendices.

2.10 Hardware Requirements

2.10.1 Master Processor, Server/Workstation and Craft Terminal

The server/workstation and craft terminal shall have suitable processor(s) which shall be sufficient to meet all the functional requirement and expansion capabilities stipulated in this specification. Only reputed make like Dell, IBM, HP, Compaq make shall be supplied.

The server shall have minimum configuration of 2.4 GHz Quad-Core processor, 3 GB RAM, DVD-RW drive, redundant 160 GB internal Hard Disk Drive, 101-Enhanced style keyboards, mouse, serial, USB (2.0) ports and hot swap redundant power supply. VDUs shall be 19" TFT active matrix colour LCD with a minimum resolution of 1024 X 768. Appropriate network drive card shall also be provided wherever required. However, the

internal hard disk drive for the server shall be redundant and all the data shall be mirrored. Further, the TMN software shall support data mirroring on redundant disk drives.

The workstation shall have minimum configuration of 3 GHz Core 2 Duo, 2 GB RAM, DVD-RW drive, 320 GB Hard Disk Drive, 101-Enhanced style keyboards, mouse, serial and USB (2.0) ports. VDUs shall be 19" TFT active matrix colour LCD with a minimum resolution of 1024 X 768. Appropriate network drive card shall also be provided wherever required.

CPU enclosures shall be desktop type and shall include available expansion slots except for the Craft Terminal which shall be a laptop. The craft terminal shall have minimum configuration of 2.4 GHz, 2 GB RAM, 256 MB Video Graphics Memory, DVD RW drive, 160 GB Hard Disk Drive, keyboard, mouse/trackball etc., serial/USB (2.0) ports to accommodate printers, and Internal/external Data/Fax modem and a battery back-up of at least 3 hours. VDUs shall be 15" TFT active matrix colour LCD with a minimum resolution of 1024 X 768.

2.10.2 Peripherals and hardware

TMN system shall be provided with laser printer. The laser printer shall have a minimum print speed of 17 pages per minute and a minimum resolution of 1200 x 1200 dpi. The laser printer shall have LAN ports for connecting to TMN system.

The laser printer under this specification shall be black & white and include print enhanced buffering to prevent loss of print data in the event of a print failure.

2.10.3 Local/Remote Operator Consoles

The Contractor shall provide operator consoles sized and equipped to support the subsystem(s) furnished and in compliance with the specification. The console shall provide hardware interfacing for the TMN users to the software operating support systems. At a minimum, a console shall include the hardware similar to a workstation.

2.10.4 Power Supplies

The TMN system shall use 220 volts 50 Hz A.C or -48 volt D.C as available at site for its operation as available at site.

2.11 General Software/Firmware Requirements

Due to various alternative design approaches, it is neither intended nor possible to specify all software and firmware characteristics. It is the intent herein to provide design boundaries and guidelines that help to ensure a demonstrated, integrated program package that is maintainable and meets both hardware systems requirements and the customer's operational requirements.

2.11.1 Operating System Software

Operating system software shall be provided to control the execution of system programs, application programs, and management devices to allocate system resources and manage communications among the system processors. The contractor shall make no modifications to the OEM's operating system, except as provided as USER installation parameters.

2.11.2 Applications Software

All applications software shall be written in a high-level programming language unless developed using industry proven application programs and development tools provided with the system. The contractor shall make no modifications to the applications program except as provided as USER development tools.

2.11.3 Software Utilities

A utility shall be provided to convert all reports into standard PC application formats such as excel.

2.11.4 Revisions, Upgrades, Maintainability

All firmware and software delivered under this specification shall be the latest field proven version available at the time of contract approval. Installed demonstration for acceptance shall be required. All firmware provided shall support its fully equipped intended functional requirements without additional rewrite or programming.

All software shall be easily user expandable to accommodate the anticipated system growth, as defined in this specification. Reassembly recompilation or revision upgrades of the software or components of the software shall not be necessary to accommodate full system expansion.

Software provided shall be compliant with national and international industry standards.

2.11.5 Database(s)

The contractor shall develop all the databases for final wideband network following the global acronyms for all stations. Database(s) to be provided shall contain all structure definitions and data for the integrated functional requirements of TMN system.

TMN operator Groups shall share the same virtual database. This means that they shall share the same database and database manager, whether or not physically separate databases are maintained.

2.11.6 Help

All applications shall be supported by USER accessible HELP commands that shall assist the user in the performance of its tasks. HELP commands for an application shall be available to the user from within the active application and shall not interfere with the activities of the application.

2.12 PABX

2.12.1 General

The bidder shall offer PABX equipment from a manufacturer who has been designing & manufacturing PABX equipment for the last three (3) years. The bidder shall submit with their proposal, performance certificates of the offered equipment from at least one power utility. The performance certificates shall provide evidence of successful operation of the proposed equipment in sub-station environment for at least 1 year as on date of opening of the bid. The PABX must be capable of operating in the high EMI environment of substations and power plants, and without air conditioning. The Contractor shall be responsible for the installation and implementation of the PABX provided under this procurement and shall provide suitable interface for the same. This shall include the development of the database, system tests and training of Employer staff.

2.12.2 Technical Requirement

The Contractor shall be responsible to provide state of the art PABX equipment. It shall be equipped with 50 local subscribers, 120 remote subscribers & 120 VOIP trunks. The PABX shall be integrated with the MUX/SDH equipment/ VOIP gateways with suitable interface for communication with subscribers located at other locations over VoIP using proposed communication network. The exchange transmission performance shall comply with the ITU-T standards. The Contractor shall provide the details of standards conforming to the product supplied. The offered PABX shall be modular in nature to facilitate configuration growth as per requirements. The PABX shall be sized to accommodate 100% expansion in the future. Expansion shall be accomplished through the installation of line and trunk cards. Expansion shall require only procurement and installation of appropriate line cards and trunk cards.

The exchange transmission performance shall comply with the ITU-T standards. The Contractor shall provide the details of standards conforming to the product supplied. In addition, the PABX must be capable of interfacing with 4-wire E&M VF channels provided by power line carriers, E1 (G.703) / Ethernet channels provided by wideband communication equipment and 2 wire LS or 4 wire E&M channels provided by primary multiplexers.

All interfacing equipment necessary for satisfactory operation and to comply with the local regulation shall be provided under this procurement. The Contractor shall ensure that the speech level and signal -to-noise ratio are satisfactory under all conditions likely to be encountered on the system. The offered PABX shall be capable of integrating with PABX of other make. It shall support at a minimum the following features:

- (a) SPC (Stored Program Control) type
- (b) 100% non-blocking switch with PCM-TDM
- (c) Redundant processors or distributed processing architecture
- (d) 2 Wire interfaces for local subscribers & remote subscriber
- (e) 4 Wire E&M interfaces for two way trunks
- (f) Extensions should be extendable over a distance of 300meters
- (g) Extensions shall support DTMF & Pulse dial phones
- (h) Extensions shall support analog phones/fax machines
- (i) Ringer/Tone card for different tones and ring generation
- (j) DID (Direct Inward dialling)
- (k) DOD(Direct Outward dialling))
- (l) Executive Override enabled
- (m) Integrated Voice mail
- (n) Call forwarding and Call pickup
- (o) Circular hunting within a defined group
- (p) Automatic call back (For internal lines as well as external trunks)
- (q) Calling Line Identification Presentation (CLIP) support
- (r) Howler tone for receiver-not-on-hook warning
- (s) Provision of E-1 interface
- (t) Provision of suitable interface for integration with VOIP gateways
- (u) Provision of Printer interface

The Contractor shall provide the suitable system for PABX configuration such as class of service, feature assignment, line and trunk access etc. Further, it shall be possible to make on-line changes to the database and shall be user friendly. In case, the bidder offers a PC based PABX configuration system, the PC/workstation shall be of reputed make (Compaq/HP/IBM/Dell) with 15" TFT Color monitor.

The Contractor shall install the telephone extensions as well as terminate the voice trunks along with requisite cable, PVC conduit/channels and other installation hardware. The PABX shall be supplied with a MDF which may be housed inside the PABX cabinet or in a separate enclosure suitable for wall mounting.

The PABX shall be able to operate on -48 Volt DC (nominal). It shall have power supply and control cards in hot-standby mode so that in case of failure of one the other takes over automatically. Alternatively, distributed architecture is also acceptable.

2.12.3 Equipment Availability

PABX system shall have 99.99% availability. Equipment shall be capable of providing suitable alarm indication in order to determine malfunction/fault condition.

2.12.4 Testing & Inspection of PABX

The offered PABX shall be type approved by TEC. The contractor shall submit the TEC certificate in support of the same. The FAT & SAT for PABX shall be conducted as per requirement specified in this Section

Part-III ENVIRONMENT, EMI, POWER SUPPLY, CABLING AND EARTHING

The purpose of this section is to describe the minimum general equipment characteristics and specifications for environmental conditions, source power conditioning and backup, equipment construction, and installation. The section also highlights the stringent Electro Magnetic Compatibility (EMC) guidelines for equipment that will be operated under the severest Electro Magnetic Interference (EMI) and Electro Static Discharge (ESD) conditions expected in an Extra High Voltage (EHV) power system environment.

3.1 Environmental Requirements

Equipment and their components provided under this specification shall operate reliably under the following environmental conditions.

3.1.1 Temperature and Humidity

Most of the equipment will not be installed in environmentally controlled shelters. Therefore, equipment shall operate in accordance with the limits shown in Table 3-1.

**Table 3-1
Environmental Operating Limits**

Temperature Range:	(Un-Controlled Environmental)
Specification:	
Operation without damage	0 to 45°C
Shipping/storage	-10 to 55°C
	-40 to 60°C
Relative Humidity, non-condensing	Upto 90%
Elevation:	
Operating	to 3,000 m
Non-operating	to 10,000 m

For each location, the Contractor is required to assess the environmental conditions for the equipment to be installed under this specification. The Contractor is responsible for all necessary enclosure, rack or equipment upgrades to ensure the proper operation of the installed equipment.

3.1.2 EMI and Electrostatic Interference

At each location, the Contractor shall assess the need for shielding against radiated emissions and shall provide recommended solutions for any EMI problem found at each location. Specifications provides the type of immunity tests for which the equipment shall be required

to pass without failure. For the individual tests to be carried out at the different interfaces, references are made to the relevant IEC and ITU-T recommendations.

3.1.3 Vibration and Shock Resistance

As per testing requirements indicated in this specification.

3.1.4 Tropicalization

Communications equipment will often be stored and operated in uncontrolled environment areas and will be subject to mould, growth of fungus, corrosion and oxidation. The equipment and components shall be suitably tropicalized during manufacture through commissioning, as necessary.

3.1.5 Contaminants

Communications equipment may be located in areas of poor air quality with the main contaminant being dust. Cabinets shall be tight fitting utilizing filtered ventilation openings only.

3.2 Primary Source AC/DC Power Requirements

Facilities will be required to support both AC and DC power load requirements of telecommunications equipment as specified below:

3.2.1 Primary Source AC Power

It will be the Employer's responsibility to provide required Primary AC source Power for communications equipment installed under this specification. The Primary AC Power supplied will be 240 VAC \pm 10%, 50Hz with a frequency variance between 46 and 55 Hz. Harmonic distortion will not exceed five (5) percent.

All equipment and components provided under this specification requiring Primary AC Power, shall be designed for normal operation under the above stated tolerances for 240 VAC supply.

The Contractor shall provide in their Bid as well as in the survey report to the Employer the projected 240 VAC Primary Power load requirement per equipment and totals, by location, for equipment provided under this specification. The Contractor shall provide suitable UPS for communication equipment/module etc. requiring AC power supply at locations other than control centre.

3.2.2 -48V DC Power

Power supplies/converters for communications equipment (except computer system supplied as part of NMS which shall use 240 VAC) shall use -48Vdc uninterrupted primary source

power. The power supply may vary normally within the voltage range -42 to -58 Vdc and the supplied equipment shall operate satisfactorily within this range.

3.2.3 Power Distribution and Protection

The Employer will furnish only one source primary 240 VAC and/or -48 VDC power. It shall be the Contractor's responsibility for the connection and distribution of all Primary AC and -48V dc source power, in full compliance with all local and national electrical codes.

The Employer shall indicate during the survey by Contractor, on the primary source, the feeders/points that can be used by the Contractor. The Contractor shall supply & install Primary AC and -48Vdc feeder cables to Contractor-furnished distribution panels.

The Contractor shall provide required distribution panels, circuit breakers and appropriate Panel Disconnects. Distribution Panel feeders, Panel Disconnects, distribution panels and circuit breakers shall be sized and equipped to support at least 100% expanded load requirements.

The Contractor shall provide and install all required primary power distribution sourced from the distribution panels. The Contractor shall also be responsible for Load Balancing.

The Contractor is responsible for all inter-rack (enclosure) and intra-rack (enclosure) power distribution required to support equipment supplied under this specification. The Contractor shall provide all cabling, fusing, switching and circuit breaker and surge protection required.

Partially equipped subsystems shall be installed with provision for expansion. Equipment power supplies shall be sized to support fully equipped subsystems. Primary power distribution protection shall be sized to support and protect maximum operating load potential whether or not the actual projected load shall meet that maximum load potential.

The Contractor shall provide equipment and rack safety earthing in compliance with this specification.

3.3 Equipment Construction, Assembly and Installation

All equipment supplied under this specification shall be constructed, assembled and installed in accordance with the following requirements:

3.3.1 Identification

All cabling, racks/enclosures, equipment, modules and materials shall be uniquely identifiable as per the following:

3.3.1.1 Equipment

Each equipment component to the level of printed circuit card, shall be clearly marked with the manufacturer's part number, serial number, month/year of manufacture and revision level. Changes to components shall be identified by an unambiguous change to the marked revision level. The Contractor shall be responsible for maintaining the master revision level list until the Contractor has complied with all requirements of this specification.

Where custom components and parts are provided, each component/part shall be marked to specifically identify that component/part. Printed circuit card cages are defined as an equipment component and as such, shall be clearly identified as stated within this specification.

Equipment chassis and printed circuit card cages having wired backplanes, shall be clearly marked with the manufacturer's part number, serial number, month/year of manufacture, revision level and an additional identifier corresponding directly to the applicable backplane wiring diagram/list.

3.3.1.2 Power Distribution

Power distribution panels shall be clearly marked with their unique identifier, source feed information, and remote source feed emergency disconnect location and identity.

Power distribution panel "Main Disconnect" and circuit breakers shall be clearly marked with a unique identifier. Circuit breaker feed lists shall be clear, accurate and the feed list information shall be posted inside each distribution panel door.

Inter-rack and intra-rack (enclosure) power distribution shall be clearly identified with source feed, voltage and power rating information. All power feed cabling shall be clearly identified near the point of termination.

All power distribution identification shall utilize heat-resistant permanent marking techniques such as stamped non-metallic tags, embossed labels, etc. Marking techniques are subject to approval by the Employer. Power distribution identifiers and information shall agree with the Contractor's power cable plant drawings.

3.3.1.3 Signal Cabling

Connectorised signal cabling/wiring requires marking with a unique identifier at each connectorised end. The signal cable/wire identifier shall include a cable identifier and the location of both terminations.

Signal cable/wiring installed on terminal blocks requires marking with the cable identifier and distant end location. The cable tag shall be clearly visible at the cable fanout point.

All signal cable, wiring and terminations shall be clearly labeled/tagged with identifiers consistent with Contractor supplied cable plant records. Marking techniques are subject to approval by the Employer.

3.3.1.4 Equipment Racks and Enclosures

All equipment racks, enclosures and equipment, including distribution frames, shall be clearly labeled with unique identifiers consistent with Contractor supplied floor plans and rack elevations.

3.3.2 Installation Hardware

Equipment racks, enclosures, cable raceways and installation hardware shall, at a minimum, comply with the following requirements:

3.3.2.1 Equipment Sub-Racks and Cabinets (Enclosures)

All equipment provided under this specification, shall be physically mounted in sub-racks and cabinets (enclosures). The Contractor shall determine and propose for the Employer approval, the type, size, weight and manner of installation for each location.

Selection of equipment sub-racks and cabinets (enclosures) shall meet the following requirements:

(A) Equipment Sub-Rack Construction

Equipment Sub Racks provided for installation in environmentally controlled facilities, shall meet the following minimum requirements:

- (1) Equipment Sub Racks shall be steel/aluminium fabricated and finished on all surfaces. All metal and welds shall be thoroughly cleaned and sanded to obtain a smooth finish. All surfaces shall be treated for rust and primed to form a bond between metal and the finish coats of paint.
- (2) Equipment covers shall be provided for exposed components mounted in equipment sub Racks.
- (3) Dust and moisture protection shall meet or exceed IP20 standards.

(B) Equipment Cabinet (Enclosure) Construction

- (1) Equipment cabinets (enclosures) shall be steel/ steel & Aluminium extrusion fabricated and finished on all surfaces. All metal and welds shall be thoroughly cleaned and sanded to obtain a smooth finish. All surfaces shall be treated for rust and primed to form a bond between metal and the finish coats of paint.
- (2) Equipment cabinets (enclosures) shall be designed 19 inch, free-standing but shall be mounted to the floor. The Dimension of the cabinet shall be minimum 2200mmx600mmx600mm. Cabinets (enclosures) shall have secure fitting, lockable, full-length front doors for access to hardware and wiring. Equipment covers for exposed components mounted inside cabinets are not required unless specifically recommended..

- (3) All doors and removable panels shall be fitted with long life rubber beading. All panels shall be fabricated from minimum 2.0mm thickness steel sheet. However, for racks with load bearing Aluminium extrusion frame, door panels and side panels may be fabricated from minimum 1.6mm thickness steel sheet and the top & bottom panels shall be fabricated from minimum 2.0mm thickness steel sheet.
- (4) Equipment cabinets (enclosures) shall be dust and moisture-proof as per IP41 specification, or better (supporting test certificates/documents for meeting IP41 protection class of offered cabinets shall be submitted during detailed engineering).

3.3.2.2 Cable Raceways

The Contractor is required to provide and install all additional necessary indoor and outdoor cable raceways. The cable raceways shall be in conformance with the following:

- (1) Signal cabling and power cabling shall require separate cable raceways. Signal and power cabling shall not share the same raceways and shall be installed as far apart as is practical. Adequate shielding shall be provided as required.
- (2) All cable raceways shall be sized to support full loading requirements plus at least a 200% safety loading factor.
- (3) Outdoor cable raceways shall be of corrugated construction and shall be fitted with solid covers overlapping all sides of the cable raceways.
- (4) Outdoor cable raceways shall be fabricated from construction grade aluminum, galvanized iron or anodized sheet metal or any other suitable material approved by the Employer. Suitable anti-corrosion measures shall be taken. Steel fabricated raceways shall be finished inside and out, treated to resist rust and to form a metal-to-paint bond.
- (5) Indoor cable raceways fabricated of aluminum or galvanized iron, shall not normally need special finishing or painting, unless otherwise stipulated by the Employer. Steel fabricated raceways shall require a red oxide primer coat at a minimum.

3.3.3 Signaling Distribution

The Contractor shall be responsible for all signal wiring associated with furnished equipment in accordance with the following:

- (1) All signal wiring connections to the communications equipment shall be via Krone type or equivalent terminal blocks.
- (2) The Contractor shall provide subscriber level wiring and patching wherever required.

3.3.4 Lightning and Transient Voltage Protection

The Contractor shall be required to provide protection from lightning and transient voltages for all wideband communications equipment, in accordance with the following:

- (1) At the outside cable plant point-of-entry of all cabling penetrations for all cabling installed by the Contractor, the Contractor shall provide lightning and transient voltage isolation for the inside plants cabling, wiring, and all terminations and equipment.
- (2) All equipment installed under this specification that requires 240VAC primary power, shall be surge protected.

3.3.5 Station Safety Earthing and Signal Grounding

For each facility, the Contractor is responsible for meeting the following station and equipment earthing requirements:

- (1) All safety earthing and signal grounding shall be in full compliance with EMI/EMC requirements as per relevant international standards
- (2) Each cabinet (enclosure) or cabinet (enclosure) group shall include suitable signal ground and safety earth networks. The signal ground network shall terminate at a separate signal ground stud connection isolated from safety earth.
- (3) Each earth/ground network shall utilize copper bus bars, copper braids and/or 16 sqmm or bigger earth cable. All equipment earth/ground connections shall be made directly to the equipment chassis utilizing grounding lugs and secured metal-to-metal with star washers. Use of the enclosure frame, skin or chassis mounting hardware as part of the earthing/grounding networks, is not acceptable.
- (4) The safety earth network shall be connected to "earth ground" at the safety earth stud. The earth stud connection shall be sized for an external earthing cable equipped with a 2/0 solid copper lug secured metal-to-metal with star washers. Primary AC feeds and distribution within enclosures requires earthing wire connection to the safety earth stud.
- (5) The safety earth and signal ground networks shall be inter-connected only at the safety earth stud and signal ground stud.

The Contractor shall extend the existing station earth to the equipment room using suitable G.I. earthing strip (50 x 6 mm), wherever required. .

The Contractor is responsible for providing all required earthing/grounding cable and installation. Cabinet (Enclosure) and equipment safety earthing and signal grounding shall be subject to the Employer's approval.

The Contractor shall be responsible for determining the suitability of existing station earth for the equipment to be supplied under this contract. In case existing earthing arrangement at the site is not adequate, the Contractor shall either make improvement in the existing earthing arrangement or make new earthing as per requirement.

3.3.6 Interconnections

All power and signal cabling between component units of the communications systems shall be supplied and installed by the Contractor and shall be shown on contractor-supplied as-built drawings.

The Contractor shall supply and install all primary power cords, powerstrips, receptacles, circuit breakers, fuse panels, switches, earth fault detectors, surge protectors, distribution cabling, and power connectors required to support all equipment enclosures and system components furnished and installed under this specification, except as specifically excluded.

Plug-type power connectors with captive fastening (such as "Twist-Lock") shall be used for interconnection of source power to the equipment enclosures or racks.

Plug-type connectors with captive fasteners (i.e. DB-25, etc) shall be used for the interconnection of all inter and intra-enclosure signalling cable.

3.3.7 Finish Colors

Unless otherwise specified, finish colors for enclosures shall be gloss white enamel on the inside, and semi-gloss medium grey enamel on the outside. Only brushed aluminum trim shall be used. Employer reserves the right to approve the proposed color scheme.

3.4 Location of Equipment, Cable Routes and Associated Civil Works

During the Site Surveys, the Contractor shall determine and propose locations for all equipment to be supplied under this contract. Further, the Contractor shall locate and identify proposed routing for all cabling between all equipment locations including existing and planned equipment not provided under this contract, but required to be connected under the scope of this contract. This subsection defines the requirements and clarifies the responsibilities of the Employer and the Contractor regarding equipment siting, intra and inter facility interconnectivity and necessary associated civil works.

3.4.1 Locations for Supplied Equipment

All transmission equipment, the NMS and associated DDFs and MDFs, shall generally be co-located in the same communications room located in Control Building whenever possible.

3.4.2 Associated Civil Works

The Contractor shall provide all required minor civil works necessary for full connectivity as required in the Contractor's scope of work as follows:

- (1) All wall and floor penetrations necessary for the installation of all cabling to be performed in accordance with the requirements of this specification.
- (2) Installation of racks, cabinets, cable raceways, and cabling supplied as part of this contract.

3.4.3 Cable Trenches

A network of cable trenches and/or ducts may exist at some sites but shall require expansion and/or new construction at some stations. It shall be a responsibility of the contractor to cooperate fully with the Employer and all other on-going project contractors in the planning and efficient use of existing and new cable trenches. The existing cable trenches/ cable raceways proposed to be used shall be identified in the survey report. The contractor shall make its best effort to route the cable through the existing available cable trenches. Where suitable existing cable trenches are not available, suitable alternatives shall be proposed for Employer approval. The Employer shall provide any additional cable trenches required for such approved alternatives.

It may be noted that in order to utilise the existing trenches, the Contractor supplied cables may be required to be co-located with LV cables. Accordingly, the contractor shall ensure that selection and installation of cables is suitable for the purpose. The contractor shall be responsible for new building penetrations required for supplied cabling. Caution shall be taken to ensure existing equipment and site personnel are protected from dust and debris incident to the cable penetration work. Penetration shall be neatly formed and sealed for protection from moisture, dust wind and vermin intrusion.

All required fitting, supports, accessories, ducts, inner ducts, conduits, riser and any item not specially mentioned but required for lay and installation of cables in trenches shall be supplied and installed by the Contractor.

Part-IV**DC POWER SUPPLY SYSTEM**

In order to provide reliable power supply to communication equipment at various locations, 48V DC Power Supply (DCPS) system is to be provided as a part of this project. This section describes the technical requirement of DC power supply & associated Battery.

The DC Power Supply system shall be capable of meeting the load requirements for various Telecom equipments. The required load (in Amps) for each location along with the Battery capacity is indicated in the Appendices. The rating of offered SMPS modules shall meet Employer's requirements of DCPS system as stipulated in the BoQ.

The DC Power supply system shall have a single DCPS system as per conceptual configuration diagram given in Fig.3-1, shall be supplied.

Surge protection devices shall be installed in the DCPS panel to provide adequate protection against current and voltage transients introduced on input mains AC due to load switching and low energy lightning surges. These protection devices shall be in compliance with IEC 61312, IEC 61024 and VDE 0100-534 for following surges:

It shall be provided with Class 'B' & 'C' type surge protection device. The device must be provided with Class B type lightning current arrester (Switching Type) with a discharge current capacity of at least 50kA, 10/350 μ s, and Class C type surge arrester (linear device) as per IEC 61643-1. The blind spots shall be avoided in accordance to IEC 61312. The Class 'C' surge protection devices should be pluggable type, equipped with features of thermal disconnection, & health indication and potential free contacts for surge arrestors connected between phase & neutral.

The surge protection device shall comply to IEC 61643.

- a) Lightning Electromagnetic impulse and other High Surges (Class B):

Between	Requirement
Ph&N	$I_{imp} \geq 50 \text{ kA}$, 10/350 μ S for each phase
N&PE	$I_{imp} \geq 100 \text{ kA}$,
	10/350 μ S I_{imp} = Value of Lightning Impulse Current
	Rated input voltage of Class 'B' surge arrestors shall not be less than 320 V.

- b) Low Voltage Surges (Class C)

Between	Requirement
Ph&N	$I_n \geq 10 \text{ kA}$, 8/20 μ S for each phase
N&PE	$I_n \geq 20 \text{ kA}$,
	8/20 μ S I_n = Value of Nominal Discharge Current.
	Voltage rating of Class 'C' surge arrestors shall be minimum 320 V.

The Class 'B' & 'C' Surge protection devices shall work in tandem and in perfect co-ordination to

give complete protection to the DCPS system against lightning and switching surges.

4.1 General Technical Requirements for SMPS based DC power supply units

SMPS based DC power supply system is to be used in Auto Float-cum-Boost Charge mode as a regulated DC Power source. DCPS system is to be installed indoors and shall be provided with IP21 panels. The System shall consist of the following:

- (a) SMPS modules
- (b) Controller module to control and monitor all DCPS modules.

The Panel, Distribution/Switching arrangement shall be provided for the ultimate system capacity. Ultimate System capacity is defined as 150% of the present capacity specified in **Appendix, BoQ**. The ultimate capacity is over and above the requirement of redundancy wherever specified. All factory wiring for the panel shall be for the ultimate capacity so that only plugging-in of SMPS module shall enhance the DC power output.

The size of fuses, MCBs, switch, bus etc shall be suitable for the ultimate capacity.

The system shall be sufficiently flexible to serve any load depending on manufacturer's design, rating and number of SMPS modules used in panel and system configuration. To cater for higher load requirements, same type of SMPS modules mounted in the same rack or different racks shall be capable of working in parallel load sharing arrangement. The SMPS modules of DCPS system shall be suitable for operation from single phase A.C. mains/DG set supply. However, the input AC mains supply to DCPS system shall be 3-phase, 4 wire which shall be evenly distributed among all the offered SMPS modules.

4.1.1 Operational/Component Requirements

The basic modules shall operate at specified ratings and conform to requirements stipulated in this specification. The DCPS system shall meet requirement of the latest TEC specification / IEC/BS for other parameters as applicable. The component parts of the equipment shall be of professional grade of reputed manufacturer to ensure prompt and continuous service and delivery of spare parts. The component shall conform to relevant IEC/IS standards. The contractor shall obtain Employers approval of major component before procurement of the same.

4.1.2 Wiring

All insulated conductors except those within the confines of a printed circuit board assembly shall be of the rating enough to withstand the maximum current and voltage during fault and overload. All insulated conductors/cables used shall conform to IS 1554 or equivalent international standard.

All wiring shall be neatly secured in position and adequately supported. Where wires pass through any part of metal panel or cover, the hole through which they pass shall be

suitably secured.

4.1.3 Bus Bars

High conductivity Cu bus bar shall be provided and shall be sized to take care of the current of ultimate DCPS system capacity for which it is designed. However, it shall not be less than 25mm X 5mm.

4.1.4 Earthing

Two earth terminals shall be provided in the frame of the system. The Contractor shall connect these earth terminals to the earth bus. All modules and devices shall be connected to these earth terminals. The hinged door, if provided shall be connected to the panel with braided Cu at two points at least.

4.1.5 Finish and Painting

The finish of Steel/Aluminium alloy structure and panels shall conform to relevant IS specification (or equivalent international specifications). The colour code scheme for Panel & Door (if provided) shall be decided during detailed engineering.

4.1.6 Marking and Labelling of Cables

The Contractor shall propose a scheme for marking and labelling the inter panel cables by Halogen & Silicon free labels of polyamide ensuring scratch proof labelling with the use of solvent free ink & latest UV Technology making it environment friendly printing with a WIPE RESISTANCE according to DIN EN 61010-1/VDE 0411-1 and get it approved from the Employer. A cabling diagram, screen printed or any other better arrangement ensuring better life expectancy shall be placed in the inside of the front door or any other convenient place for ready reference of the maintenance staff.

4.1.7 Name Plate

A name plate etched, engraved, anodized or any other better arrangement ensuring better life expectancy shall be suitably fixed on each panel /module and contain at least the following information :

- (a) Specification Number
- (b) Type of the Unit
- (c) Manufacturer's Name and identification
- (d) Model No
- (e) Unit serial No
- (f) Input voltage and phase
- (g) Output Voltage and Current
- (h) Year of manufacture

4.1.8 System and Panel Configuration

The mechanical and electrical requirements of the Panel are described as below:

4.1.9 System Configuration

The SMPS modules shall be accommodated in panels. The system shall employ a modular configuration to provide flexibility, keeping in view the future load requirements of DC Power. The system shall be configured for ultimate capacity as brought out in Section 3.1. The Control, Monitoring, Alarm arrangement and DC & AC distribution shall be provided suitably in the panel.

The SMPS modules shall be provided as per the load requirement stipulated in the Appendix, BOQ. The DCPS system shall comprise of $N+2$ Modules. In case of DCPS system having $N=1$, the SMPS shall comprise of $N+1$ modules. Here N refer to number of SMPS module to meet the load requirements specified in the Appendix, BOQ and battery charging current. The current rating of each module shall be considered as output current of the SMPS module at nominal voltage (48V).

Total current = load current + battery charging current

Where, battery charging current is equal to the 20 % AH of the battery supplied.

$$N = \frac{\text{Total Current}}{\text{Current rating of each SMPS module at 48 V}}$$

The Distribution/switching/Alarm unit shall be provided for the ultimate system capacity. All AC, DC or control/alarm cabling/wiring shall be pre-wired for the ultimate capacity so that mere plugging-in of SMPS module shall add to the DC power output.

It shall be possible to easily mount/remove the modules from the front side of the panel. The SMPS modules/SMPS module sub-racks shall be designed to slide into the panels and fixed securely by a suitable mechanical arrangement.

4.1.10 Constructional Features of Panel

Panel (Enclosure) shall be freestanding type of design, in case if specifically it is not mentioned in the relevant section. Cable entry shall be from the bottom/top of the enclosures (to be finalized during detailed engineering). For the enclosures/panel, the front door (if provided) shall not be wider than 80 cm and rear door may be of hinged or removable type with locking as per standard design of the manufacturer. Keyed locking is required with identical keys for all enclosures. The enclosures shall not exceed 220 cm in height. The thickness of the structural frames and load bearing members shall be minimum 2.0 mm and for others shall be minimum 1.6 mm. The

panels/boards shall be equipped with necessary cable gland plates. The Contractor shall state the type, size, and weight of all enclosures and indicate the proposed manner of installation. The degree of protection of DCPS enclosures shall preferably be IP21, however in case no door is provided then the top of the enclosure/panel shall be fully covered except for proper ventilation and bus bar or cable entries.

Wiring within panel shall be neatly arranged and securely fastened to the enclosure by non-conductive fasteners. Wiring between all stationary and moveable components, such as wiring across hinges or to components mounted on extension slides, shall allow for full movement of the component without binding or chafing of the wire. Conductors in multiconductor cables shall be individually colour coded, and numbered at both ends by Halogen & Silicon free labels of polyamide ensuring scratch proof labelling with the use of solvent free ink & latest UV Technology making it environment friendly printing with a WIPERESISTANCE according to DIN EN 61010-1/VDE 0411-1 within enclosures.

The enclosure shall be painted inside and outside. The finish colour of all enclosures shall be aesthetically pleasing and shall be approved by the Employer. Further, finish colour of external surfaces shall be preferably of same colour for all enclosures/panels.

Each panel shall be supplied with 240V AC, 50Hz single-phase sockets with switch and lighting lamp for panel illumination.

The manufacturers shall ensure the uninterrupted use of the equipment shall do proper thermal engineering of hardware design. The Panel shall be designed to allow cooling preferably by natural convection. The Contractor shall submit detail design of proposed Panel/enclosure and heat dissipation calculations during detailed engineering. Forced cooling is permitted (DC Fans are permitted in the Panel or SMPS module) for equipment mounted indoors (buildings/rooms/shelters). If cooling is provided at Panel level it shall be provided with additional fan with facility for manual switchover. Proper filtering shall be provided to control dust ingress. There shall be an arrangement for automatic Switching-OFF of fans during AC input failure. The required individual modules may be separated by air baffle to provide effective convection. The manufacturer shall also ensure that the failure of fan does not cause any fire hazards. The failure of any of the fans shall draw immediate attention of the maintenance staff.

4.1.11 Electrical Requirements:

AC input supply: The nominal input frequency is 50 Hz, which may vary from 47.5-52.5Hz. The input voltage shall be as mentioned below:

Field Site Application – Three phase/4 Wire (Nominal 415/240V): 415+10%-15%. However, at site the voltage may vary from 160V to 300V (Ph-N). An Auto-Mains Changeover unit shall be provided for each field site DC power supply system. The Auto-Mains Changeover unit shall accept input from two AC sources and extend any one of the available

healthy sources to the DC Power supply system.

The suitable HVD (High Voltage Disconnecter) Protection shall be provided at input of each DCPS system. This HVD protection shall protect the SMPS modules of DCPS system against the sustained over voltage at the input.

There shall be an automatic arrangement for shutting off of the SMPS module whenever the input voltage is beyond the specified operating limits with suitable alarm indication. The SMPS modules shall resume normal working automatically when the input is restored within the working limits. Hysteresis within specified working limits shall not cause shutting down of the SMPS. A tolerance of $\pm 5V$ may be acceptable for protection & alarm operation.

4.1.12 DC output Characteristics of Modules

The modules shall be capable of operating in "Auto Float-cum-Boost Charge" mode depending on the condition of the battery sets being sensed by the Control unit.

- (a) The float voltage shall be continuously adjustable & pre-settable at any value in the range of 48 to 56V or as per battery manufacturer's recommendation either at the module or may be set from the common controller configuration. Further, the prescribed float voltage setting shall be based on recommendations of the battery supplier.
- (b) In Boost charge mode, DCPS shall supply battery & equipment current till terminal voltage reaches set value, as recommended by the battery supplier & shall change over to constant voltage mode
- (c) The DC output voltage variation shall not be more than 2% for load variation from 25% load to full load.

4.1.13 Current Limiting (Voltage Droop)

The current limiting (Voltage Droop) shall be provided in DCPS SMPS modules in float and boost charge modes of operation. The float/boost charge current limiting shall be continuously adjustable between 50 to 100% of rated output current for output voltage range of 44.4 volts to 56 Volts or as per manufacturer's specified catalogue.

The float and boost charge current limit adjustments shall be provided in the DCPS system. The SMPS modules shall be fully protected against short circuit. It shall be ensured that short circuit does not lead to any fire hazard.

4.1.14 Soft/Slow Start Feature

Soft/Slow start circuitry shall be employed such that SMPS module input current and output voltage shall reach their nominal value within 10 seconds.

The maximum instantaneous current during start up shall not exceed the peak value of the

rectifier input current at full load at the lowest input voltage specified.

4.1.15 Voltage Overshoot/Undershoot

The requirements of (a) to (c) given below shall be achieved without a battery connected to the output of SMPS modules.

- (a) The SMPS modules shall be designed to minimize DC output voltage Overshoot/Undershoot such that when they are switched on the DC output voltage shall be limited to $\pm 5\%$ of the set voltage & return to their steady state within 20ms for load variation of 25% to 100%.
- (b) The DC output voltage overshoot for a step change in AC mains as specified in clause 4.3.12 Electrical Requirements shall not cause shut down of SMPS module and the voltage overshoot shall be limited to $\pm 5\%$ of its set voltage and return to steady state within 20ms.
- (c) The modules shall be designed such that a step load change of 25 to 100% and vice versa shall not result in DC output voltage Overshoot/Undershoot of not more than 5% and return to steady state value within 10 ms without resulting the unit to trip.

4.1.16 Electrical Noise

The Rectifier (SMPS) Modules shall be provided with suitable filter at output with discharge arrangements on shutdown of the modules. The Psophometric Noise (e.m.f weighted at 800Hz) with battery connected across the output should be within 2mV at full load at nominal input AC supply. For test purposes, this shall be taken as equivalent to 4mV when the battery is not connected and in accordance to ITU-T Rec.O.41.

Voltage at the output of the Rectifier (SMPS) module, without battery connected, shall not exceed 300 mV at the switching frequency measured by an Oscilloscope of 50/60 MHz bandwidth (Typical).

4.1.17 Parallel Operation

SMPS modules shall be suitable for operating in parallel with one or more modules of similar type, make and rating, other output conditions remaining within specified limits.

The current sharing shall be within $\pm 10\%$ of the average current per rectifier module in individual capacity of each rectifier module in the system (mounted in the same or different Panels) when loaded between 50 to 100% of its rated capacity for all other working conditions.

4.1.18 Protection

The SMPS module, which has failed (for any reason) shall be automatically isolated from the rest of

the modules and an alarm shall be initiated for the failure.

4.1.19 DC Over voltage protection

DCPS shall be fitted with an internal over voltage protection circuit.

In case output DC voltage exceeds $\pm 57V$ or as per the recommendations of the manufacturer of batteries, the overvoltage protection circuit shall operate & shut off the faulty module. A tolerance of $\pm 0.25V$ is permitted in this case.

Shutting off of faulty SMPS module shall not affect the operation of other SMPS modules operating in the Panel. Operation of over voltage shut down shall be suitably indicated and extended monitoring/control unit. The circuit design shall ensure protection against the discharge of the Battery through the SMPS module in any case. The overvoltage protection circuit failure shall not cause any safety hazard.

4.1.20 Fuse/Circuit Breakers

Fuses or miniature circuit breakers (MCB) shall be provided for each SMPS module as follows:

1. Live AC input line
2. Control Circuit

All fuses/circuit breaker used shall be suitably fault rated.

4.1.21 AC Under/Over Voltage Protection

AC input Under/Over voltage protection shall be provided as per clause 3.1.11 for Electrical Requirements. The DC side of the SMPS should also be provided with surge protection device to protect the SMPS in case of transients being generated by the loads or due to induction in the DC line from the AC line running parallel together. The Surge protection device should be able to discharge a current of at least $10kA$ of $8/20\mu s$ (Class 'C' surge arrester), pluggable and should have indication to show its health to facilitate the replacement on fault condition.

4.1.22 Over Load/Short Circuit Protection

The SMPS shall be protected for Over load/Short circuit as per clause 3.1.13 Current Limiting (Voltage Droop).

4.1.23 Alarms and indicating lamps

Visual indications/display such as LEDs, LCDs or a combination of both shall be provided on each SMPS module for detection of SMPS module failure.

4.1.24 Termination

Suitable termination arrangements shall be provided in the panel for termination of inter-cubicle

cables from other equipment such as Employers ACDB, Telecom and other associated equipments and alarm cables. All the termination points shall be easily accessible from front and top. AC and DC terminals shall be separated by physical barriers to ensure safety. All the terminals except AC earth shall be electrically isolated.

4.1.25 DCTerminations

All terminations including through MCBs shall be through lock and screw type terminations.

Load and batteries shall be connected to DCPS through appropriate MCBs. The isolation of any of the battery from the load shall create an alarm. DC distribution shall be provided with adequate no. of feeders with appropriate MCBs (6 Amp thru 32 Amp) for termination of the loads. Actual rating of the MCBs shall be finalized during the detail engineering. The no. of feeders shall be minimum 10 (ten) nos.

DC distribution may be done either on wall mounted panel or on the DCPS panel. The proper rated MCB shall be provided at the combined output of the SMPS modules (if not provided at each SMPS module). All the AC, DC and Control/alarm cabling shall be supplied with the Panel. All DC +ve and -ve leads shall be clearly marked. All conductors shall be properly rated to prevent excessive heating.

4.1.26 EarthingCables

Earthing cables between equipment and grounding bus bars shall be minimum size 70 mm² stranded conductors copper/copper strip, rated at 300 volts. All hinged doors shall be earthed through flexible earthing braid. Signal and Safety earthing shall be provided separately.

4.1.27 Alarms

Following Visual indications/display such as LEDs, LCDs or a combination of both shall be provided to indicate :

Functional Indications for local monitoring:

- a) Mains available
- b) DCPS/SMPSs in Float charge Mode
- c) DCPS/SMPSs in Boost Charge Mode Alarm

Indication for local monitoring:

- a) Load Voltage High/Low
- b) DCPS module/SMPS fail
- c) Mains out of range
- d) System OverLoad

- e) Mains “ON”/Battery Discharge
- f) Battery fail/isolated

All the protections/alarms shall be within tolerance of 0.25V in case of DC voltage, 1% in case of DC current and $\pm 5V$ for AC voltage

Alarm Indication for remote monitoring:

- a) Input AC mains supply fail alarm
- b) Battery low voltage (Pre cut off) alarm
- c) DCPS module fail

Potential free contacts in two numbers for each of the above remote monitoring alarms (one for remote alarm interfaced through communication equipments and one redundant for local monitoring at suitable location) shall be provided. All these potential free contacts are to be wired and terminated at the suitable location for interfacing purpose.

4.1.28 Digital Meters/Display Unit

There shall be provision to monitor the following parameters through digital meters or digital display units:

- (a) Input AC voltage.
- (b) Output DC voltage
- (c) Output DC current of charger
- (d) Battery current
- (e) Load current.

The Digital display of meters or LCD based display unit shall be with minimum 3^{1/2} digital display of height 12mm and shall have accuracy 1.5% or better.

4.2 Cabling & Enclosure Requirements

The contractor shall supply, install and commission all power cables, control cables, network interface cables and associated hardware (lugs, glands, cable termination boxes etc.) as required for all equipment. The contractor shall be responsible for Cable laying and termination at both ends of the cable. The Contractor shall also be responsible for termination of feeder cables at contractor's equipment end including supply of suitable lugs, glands, terminal blocks & if necessary cable termination boxes etc. All cabling, wiring, and interconnections shall be installed in accordance with the following requirements.

4.2.1 Power Cables

All external power cables shall be stranded Aluminium conductor, armoured XLPE/PVC insulated and sheathed, 1100V grade as per IS 1554 Part-I.

4.2.2 Enclosure/Panel Earthing

Each enclosure shall include suitable earth networks within the enclosure. Earth networks shall be a copper bus bar, braid or cable inside enclosures.

The safety earth network shall terminate at two/more studs for connecting with the earthing grid. Safety earthing cables between equipment and enclosure grounding bus bars shall be minimum size 6sq. mm, stranded copper conductors, rated at 300 volts. All hinged doors (if provided) shall be earthed through flexible earthing braid.

For all enclosures requiring AC input power, the green earthing wire from the AC input shall be wired to the safety earthing stud. The Contractor shall provide all required cabling between enclosures for earthing. The contractor shall connect safety and signal earths (as applicable) of each enclosure to the Employer provided nearest earth grid/earth riser through suitable 50X6sq. mm. GI strips or suitably sized copper cable.

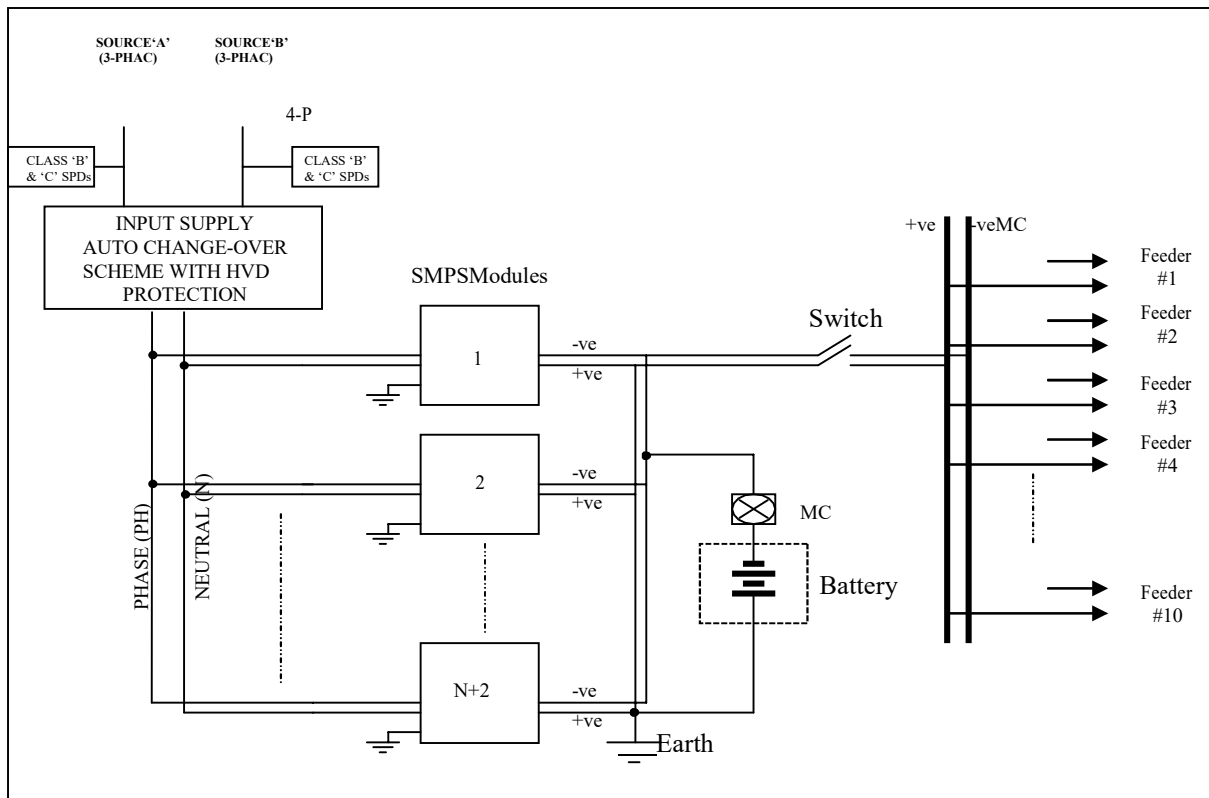
The signal earthing network shall terminate at a separate stud connection, isolated from safety ground. The stud connections shall be sized for an external earthing cable equipped with a suitable lug.

All earthing connections to equipment shall be made directly to each equipment chassis via earthing lug and star washer. Use of the enclosure frame, skins, or chassis mounting hardware for the earthing network is not acceptable.

4.3 Temperature Compensation for Battery

There shall be provision for monitoring the temperature of battery and consequent arrangement for Automatic temperature compensation of the SMPS output voltage to match the battery temperature dependant charge characteristics. The output voltage of the rectifier in Float/Charge operations shall decrease or increase at the rate of 72mV (3mV/cell, 24cell battery) per degree increase or decrease in temperature over the set voltage or as may be recommended by the VRLA Battery supplier. A tolerance of +/- 5mV may be acceptable over the specified rate of 72 mV/degree C. The output voltage shall decrease till the open circuit voltage of the battery is reached. The open circuit voltage range shall be settable between 2.1V/cell to 2.2V/cell. The increase in output voltage due to decrease in temperature has been taken care of by the tripping of the unit due to output voltage high (57V) protection. Failure of temperature compensation circuit including sensor shall create an alarm and shall not lead to abnormal change in output voltage. The nominal distance between the battery & DCPS system may be 20 metres. The Contractor shall provide the necessary sensor and cord for the purpose with DCPS system to sense the Battery temperature.

FIG. 4-1 : CONCEPTUAL CONFIGURATION OF DC POWER SUPPLY (DCPS) SYSTEM (For Field Sites Locations)



4.4 Battery Requirements

4.4.1 Valve Regulated Lead Acid (VRLA) maintenance free Battery

The contractor shall supply Valve Regulated Lead Acid (VRLA) maintenance free Battery (200AH) and battery charger. Each battery set shall have sufficient capacity to maintain output at full rated load as indicated in BOQ in **Appendix**. The battery shall be capable of being recharged to 90% State of Charge (SOC) from the fully discharged condition (1.75V/cell) within 8hrs. In all cases, the battery is normally not allowed to discharge beyond 80% of rated capacity (80% DOD) at 10 hours rate of discharge.

The supplier, supplying the cells/batteries as per this document shall be responsible to replace/repair free of charge, the battery/cell becoming faulty, owing to defective workmanship or material as per the provisions of the bid document

4.4.1.1 Constructional Requirements

The design of battery shall be as per field proven practices. Partial plating of cells is not permitted. Paralleling of cells externally for enhancement of capacity is not permitted. Protective transparent front covers with each module shall be provided to prevent accidental contact with live module/electrical connections.

4.4.1.2 Containers

The container material shall have chemical and electro-chemical compatibility and shall be acid resistant. The material shall meet all the requirements of VRLA batteries and be consistent with the life of battery. The containers shall be fire retardant and shall have an Oxygen Index of at least 28%. The porosity of the containers shall be such as not to allow any gas to escape except from the regulation valve. The tensile strength of the material of the container shall be such as to handle the internal cell pressure of the cells in the worst working condition. Cells shall not show any deformation or bulge on the sides under all working conditions. The containers shall be capable of withstanding the rigour of transport, storage and handling. The containers shall be enclosed in a steel tray.

4.4.1.3 Cell Covers

The cell covers shall be made of suitable material compatible with the container material and permanently fixed with the container. It shall be capable to withstand internal pressure without bulging or cracking. It shall also be fire retardant. Fixing of Pressure Regulation Valve & terminal posts in the covers shall be such that theseepage of electrolyte, gas escapes and entry of electro-static spark are prevented.

4.4.1.4 Separators

These separators used in manufacturing of battery cells, shall be of glass or synthetic material having high acid absorption capability, resistant to sulphuric acid and good insulating properties. The design of separator shall ensure that there is no misalignment during normal operation and handling.

4.4.1.5 Pressure Regulation Valve

Each cell shall be provided with a pressure regulation valve. The valve shall be self-sealable and flame retardant. The valve unit shall be such that it cannot be opened without a proper tool. The valve shall be capable to withstand the internal cell pressure specified by the manufacturer.

4.4.1.6 Terminal Posts

Both the +ve and -ve terminals of the cells shall be capable of proper termination and shall ensure its consistency with the life of the battery. The surface of the terminal post extending above the cell cover including bolt hole shall be coated with an acid resistant and corrosion retarding material. Terminal posts or any other metal part which is in contact with the electrolyte shall be made of the same alloy as that of the plates or of a proven material that does not have any harmful effect on cell performance. Both +ve and -ve posts shall be clearly and unambiguously identifiable.

4.4.1.7 Connectors, Nuts & Bolts, Heat Shrinkable Sleeves

Where it is not possible to bolt the cell terminals directly to assemble a battery, separate non-corroding lead or copper connectors of suitable sizes shall be provided to enable connection of the cells. Copper connections shall be suitably lead coated to withstand corrosion due to sulphuric acid at a very high rate of charge or discharge.

Nuts and bolts for connecting the cells shall be made of copper, brass or stainless steel. Copper or brass nuts and bolts shall be effectively lead coated to prevent corrosion. Stainless steel bolts and nuts can be used without lead coating.

All intercell connectors shall be protected with heat shrinkable silicone sleeves for reducing the environmental impact including a corrosive environment.

4.4.1.8 Flame Arrestors

Each cell shall be equipped with a Flame Arrestor to defuse the Hydrogen gas escaped during charge and discharge. Material of the flame arrestor shall not affect the performance of the cell.

4.4.1.9 Battery Bank Stand

All batteries shall be mounted in a suitable metallic stand/frame. The frame shall be properly painted with the acid resistant paint. The suitable insulation shall be provided between

stand/frame and floor to avoid the grounding of the frame/stand.

4.5 Capacity Requirements

When the battery is discharged at 10 hour rate, it shall deliver 80% of C (rated capacity, corrected at 27°C Celsius) before any of the cells in the battery bank reaches 1.85V/cell.

The battery shall be capable of being recharged from the fully exhausted condition (1.75V/cell) within 8 hrs. All the cells in a battery shall be designed for continuous float operation at the specified float voltage throughout the life. Float voltage of each cell in the strings shall be within the average float voltage/cell ± 0.05 V band.

The capacity (corrected at 27°C Celsius) shall also not be less than C and not more than 120% of C before any cell in the battery bank reaches 1.75V/cell. The battery voltages shall not be less than the following values, when a fully charged battery is put to discharge at C/10 rate:

- (a) After Six minutes of discharge : 1.98V/cell
- (b) After Six hours of discharge : 1.92V/cell
- (c) After 8 hours of discharge : 1.85V/cell
- (d) After 10 hours of discharge : 1.75V/cell

Loss in capacity during storage at an average ambient temperature of 35°C Celsius for a period of 6 months shall not be more than 60% and the cell/battery shall achieve 85% of its rated capacity within 3 charge/discharge cycles and full rated capacity within 5 cycles, after the storage period of 6 months. Voltage of each cell in the battery set shall be within ± 0.05 V of the average voltage throughout the storage period. Ampere hour efficiency shall be better than 90% and watt hour efficiency shall be better than 80%.

4.6 Expected Battery Life

The battery shall be capable of giving more than 1200 charge/discharge cycles at 80% Depth of discharge (DOD) at an average temperature of 27°C Celsius. DOD (Depth of Discharge) is defined as the ratio of the quantity of electricity (in Ampere-hour) removed from a cell or battery on discharge to its rated capacity. The battery set shall have a minimum expected operational life of 5 years at normal operating conditions or 1200 charge/discharge cycles (whichever is early).

4.7 Routine Maintenance of Battery system

For routine maintenance of battery system, the contractor shall supply one set of following tools:

- a. Torque wrench.
- b. Tool for opening /closing of pressure regulation valve of battery.

4.8 Testing requirements

The Contractor shall submit type test reports for the battery for the same make, model & rating as offered as per the IEC 60896 or equivalent IS/EN/BS/TEC standards. In the event, the type test reports for exact rating is not available, the Contractor shall submit type test reports for higher rating Battery.

Part-V INSPECTION, TEST AND AVAILABILITY

All materials furnished and all work performed under this Contract shall be inspected and tested. Deliverables shall not be shipped until all required inspections and tests have been completed, and all deficiencies have been corrected to comply with this Specification and approved for shipment by the Employer.

Except where otherwise specified, the Contractor shall provide all manpower and materials for tests, including testing facilities, logistics, power and instrumentation, and replacement of damaged parts. The costs shall be borne by the Contractor and shall be deemed to be included in the contract price.

The entire cost of testing for factory & site acceptance, routine tests, production tests and other test during manufacture & site activities specified herein shall be treated as included in the quoted unit price of materials, except for the expenses of Inspector/Employer's representative.

Acceptance or waiver of tests shall not relieve the Contractor from the responsibility to furnish material in accordance with the specifications.

All tests shall be witnessed by the Employer and/or its authorized representative (hereinafter referred to as the Employer) unless the Employer authorizes testing to proceed without witness. The Employer representative shall sign the test form indicating approval of successful tests.

Should any inspections or tests indicate that specific item does not meet Specification requirements, the appropriate items shall be replaced, upgraded, or added by the Contractor as necessary to correct the noted deficiencies at no cost to the Employer. After correction of a deficiency, all necessary retests shall be performed to verify the effectiveness of the corrective action.

The Employer reserves the right to require the Contractor to perform, at the Employer's expense, any other reasonable test(s) at the Contractor's premises, on site, or elsewhere in addition to the specified Type, Acceptance, Routine, or Manufacturing tests to assure the Employer of specification compliance.

All security related features shall be demonstrated during FAT/SAT as required by the Employer.

5.1 Inspection

Access to the Contractor's facilities during system manufacturing and testing and to any facility where systems/ equipment are being produced/ tested/ integrated for the fibre optic communication network, shall be available to the Employer. At all times the Employer shall

have full facilities for unrestricted inspection of such materials or equipment. To facilitate this, the Contractor shall submit for the Employer approval, a comprehensive Quality Assurance Plan using ISO 9000 as a general guideline. In addition, the Quality Assurance Plan shall satisfy the following:

- (a) Sufficient office facilities, equipment, and documentation necessary to complete all inspections and to verify that the equipment is being fabricated and maintained in accordance with the Specification shall be provided by the Contractor to the Employer.
- (b) Inspections to be performed by the Employer will include visual examination of hardware, cable dressings and labeling. Contractor's documentation will also be examined to verify that it adequately identifies and describes all offered items and spare parts.
- (c) Access to inspect the Contractor's standards, procedures, and records that are applicable to the supplied equipment shall be provided to the Employer. Documents will be inspected to verify that the Contractor has performed the required quality assurance activities.
- (d) The inspection rights described above shall also apply to sub Contractors who are responsible for supplying major components described in this Specification. These items shall be inspected and tested at the sub Contractor's factory by the Employer's representatives prior to shipping this equipment to the Contractor's facility or directly to the Employer.
- (e) The above inspection rights shall also apply to sub Contractors supplying assemblies, subassemblies and components. However, such items will normally be inspected and tested by the Employer's representatives at the Contractor's site before acceptance.

5.2 Test Plans and Procedures

Test plans and test procedures for both factory and site acceptance tests shall be provided by the Contractor. Test plans and test procedures shall ensure that each factory and site test is comprehensive and verify all the features of the equipment to be tested. Test plans and test procedures shall be modular to allow individual test segments to be repeated upon request.

5.2.1 Factory and Site Test Plans

A test plan for factory and site acceptance tests shall be submitted for approval to the Employer before the start of testing. The test plan shall be a single overview document that defines the overall schedule and individual responsibilities associated with conducting the tests, documenting the test results, and successfully completing the test criteria. Test Plans shall include, at a minimum, the information contained in Table 5-1.

Table 5-1

Factory & field Test Plan Requirements

Item:	Description
1.	Test schedule.
2.	Record-keeping assignments, procedures and forms.
3.	Procedures for monitoring, correcting and retesting variances.
4.	Procedures for controlling and documenting all changes made to the communications equipment after the start of testing.

5.2.2 Test Procedures

Test procedures for factory and site testing shall be submitted for the Employer approval before each individual test. Fully approved test procedures shall be submitted to the Employer prior to the commencement of testing. Testing shall not commence without approved test procedures. At a minimum, test procedures shall include the items listed in Table 5-2.

All test equipment and/or instruments shall bear calibration stickers indicating valid calibration on and beyond the testing date. The time lapsed since last calibration shall not exceed the test equipment/ jig manufacturer recommended calibration interval or the interval recommended in the test lab's internal quality procedures.

The Contractor shall ensure that all testing will be performed by qualified testing personnel well experienced in performing such tests.

**Table 5-2
Test Procedure Requirements**

Item:	Description:
1.	Test Title and Revision Level, if applicable
2.	List of Standard(s) complied with
3.	Function(s) / parameter(s) to be tested
4.	Purpose of each test segment
5.	List of required test equipment
6.	Description of any special test conditions or special actions required. This includes complete descriptions, listings and user interface procedures for all special hardware and software tools and/or display formats to be used during the test.
7.	Test setup including test configuration block diagrams and/or illustrations.
8.	Test procedures to be followed.
9.	Required inputs and expected outputs for each test segment
10.	Acceptance criteria for each test segment.
11.	List of test data to be supplied by the Contractor(s) and copies of any certified

	data to be used.
12.	Format of test reports.

5.2.3 Test Records

Complete and indexed records of all factory and site acceptance tests results shall be maintained and provided to the Employer by the Contractor in hardcopy. The records shall be keyed to the steps enumerated in the test procedures. The minimal items required in test records are described in Table 5-3.

**Table 5-3
Test Recorded Requirements**

Item:	Description:
1.	Test Title and Revision Level, if applicable; contract references
2.	Date and time for test start and test completed
3.	Test title and reference to the appropriate section of the test procedures
4.	Description of any special test conditions or special actions taken (Includes test-case data).
5.	Test results for each test segment including an indication of Passed, Conditional Pass, Incomplete or Failed.
6.	Test procedure modifications made during testing.
7.	Variance Report(s) tracking information and copies (if variance(s) was detected).
8.	Contractor's test engineer(s) identification, signature and remarks
9.	Employer's test witness identification, signature and remarks
10.	List of all attachments
11.	Attachments (including system logs, printouts, variances, hard copies of visual test result displays, etc.)

All principle test records, test certificates and performance curves shall be supplied for all tests carried out as proof of compliance with the specifications and/or each and every specified test. These test certificates, records and performance curves shall be supplied for all tests, whether or not they have been witnessed by the Employer within the specified duration after the completion of test. Information given on such test certificates and curves shall be sufficient to identify the material or equipment to which the certificates refer, and shall also bear the Contractor's reference and heading.

5.2.4 Rejection of Elements

Any item or component which fails to comply with the requirements of this Specification in any respect, at any stage of manufacture, test, erection or on completion at site may be rejected by the Employer either in whole or part as considered necessary.

Material or components with defects of such a nature that do not meet the requirements of the Specification by adjustment or modification shall be replaced by the Contractor at his own expense. After adjustment or modification, the Contractor shall submit the items to the Employer for further inspection and/or tests.

5.2.5 Test Periods Defined

The terminology used in Volume I, General Conditions of Contract and their correlation with the tests requirements described within this section is as follows:

Pre-Commissioning & Commissioning Period - The Site Acceptance Test (SAT)

Operational Acceptance - Successful completion of SAT

5.3 Type Testing

"Type Tests" shall be defined as those tests which are to be carried out to prove the design, process of manufacture and general conformity of the materials to this Specification. Type Testing shall comply with the following:

- (a) All cable & equipment being supplied shall conform to type tests as per technical specification.
- (b) The test reports submitted for Telecom equipment and DCPS system shall be of the tests conducted within last seven (7) years prior to the date of bid opening. In case the test reports are older than seven years (7) ago for Telecom equipment and DCPS system on the date of bid opening, the Contractor shall repeat these tests at no extra cost to the purchaser.
- (c) The Contractor shall submit, along with Tender Documents, copies of test reports for all of the Type Tests that are specified in the specifications and that have previously been performed. These reports may be accepted by the Employer only if they apply to materials and equipment that are essentially identical to those due to be delivered under the Contract and only if test procedures and parameter values are identical to those specified in this specifications carried out at accredited labs and witnessed by third party / customer's representatives.

5.3.1 List of Type Tests

The type testing shall be conducted on the following equipment/ Items.

- (a) SDH Equipment with all types of cards (optical card, Tributary card or any other equipment/ devices as part of repeater less links for the maximum fibre lengths)
- (b) Drop – Insert Multiplexer with subscriber interface card.
- (c) DACS

(d) DCPS & Battery

5.3.1.1 List of type test to be conducted on Telecom equipment

The type tests for SDH Equipment with all types of cards, Primary Multiplexer & Drop – Insert Mux with subscriber interface card and DACS are described below:

5.3.1.1.1 Temperature and Humidity Tests

The tests listed below are defined in IEC Publication 60068.

(a) Low Temperature Test: Operation to Specifications

Low temperature tests shall be conducted as defined in IEC Publication 60068-2-1, test method Ad, with the following specifications:

- (1) Test Duration: The equipment is started up as soon as thermal equilibrium has been reached and operated for sixteen (16) hours. Its performance is checked during the test.
- (2) Degree of Severity: Test shall be done at 0°C
- (3) Acceptance Criteria: No degradation of performance during and after the test.

(b) Low Temperature Test : Operation without Damage

Low temperature tests shall be conducted as defined in IEC Publication 60068-2-1, test method Ad, with the following specifications:

- (1) Test Duration: The equipment is started up as soon as thermal equilibrium has been reached and operated for 72 hours. Its performance is checked during the test and after the test as soon as the thermal equilibrium is reached at the room temperature (*Post-test*).
- (2) Degree of Severity: Test shall be done at -10° C
- (3) Acceptance Criteria: Degradation of performance is allowable during the test, however there shall be no degradation of performance in the *post-test*.

(c) Dry Heat Test: Operation to Specifications

Dry heat test shall be done as defined in IEC Publication 60068-2-2, test method Bd, with the following specifications:

- (1) Test Duration: The equipment is started up as soon as thermal equilibrium has been reached and operated for 96 hours. Its performance is checked during the test.

- (2) Degree of Severity: As per table 4-1: operation to specification range.
- (3) Acceptance Criteria: No degradation of performance during and after the test.

(d) Dry Heat Test: Operation without Damage

Dry heat tests shall be done as defined in IEC Publication 60068-2-2, test method Bd, with the following specifications:

- (1) Test Duration: The equipment is started up as soon as thermal equilibrium has been reached and operated for 96 hours. Its performance is checked during the test and after the test as soon as the thermal equilibrium is reached at the room temperature (*Post-test*).
- (2) Degree of Severity: Test shall be done at 55°C.
- (3) Acceptance Criteria: Degradation of performance is allowable during the test, however there shall be no degradation of performance in the *post-test*.

(e) Damp Heat Test

Damp heat testing reveals aging with respect to the humidity level and applies basically to electronic equipment. This test shall be done as defined in IEC Publication 60068-2-3 with the following specifications:

- (1) Test Duration: The equipment is started up as soon as thermal equilibrium has been reached and operated for 10 days. Its performance is checked during the test.
- (2) Degree of Severity: Test shall be done at $(40 \pm 2) ^\circ\text{C}$ & $(93 \pm 3) \% \text{RH}$
- (3) Acceptance Criteria: The equipment shall meet the specified requirement and there shall not be any degradation in BER.

(f) Temperature Variation Test

Temperature variation testing shall be as per IEC Publication 60068-2-14 (Gradual Variations, Method Nb). The equipment shall be powered on and various parameters shall be monitored continuously during the test period.

- (1) Number of cycles required is five (5)
- (2) The degree of severity: temperature TL:0°C, TH: As per table 4-1 (Operation to specification range)
- (3) Cycle duration for each temperature is three (3) hours.
- (4) Ramp : 1 °C/minute.

- (5) Acceptance Criteria: The equipment shall meet the specified requirement and there shall not be any degradation in BER.

5.3.1.1.2 Power Supply and EMI/EMC tests

The test procedure and acceptance criteria shall be as defined in IEC 60870-2-1.

(a) Immunity Tests

The list of Immunity tests are specified below in Table 5-4:

Table 5-4
Recommended Immunity Tests

Sr. No.	Immunity Test	AC Power Supply	DC Power Supply	Control & Signal	Telecom Line	Parameters
1.	Voltage Fluctuations	Yes	Yes	N/A	N/A	Table 11 of IEC 60870-2-1: 1995 - Level : 1
2.	Voltage dips and Interruptions	Yes	Yes	N/A	N/A	
3.	1.2/50 - 8/20 μ s surges	Yes	Yes	Yes	N/A	Table 12 of IEC 60870-2-1: 1995 - Level : 4
4.	Fast transient bursts	Yes	Yes	Yes	Yes	
5.	Damped oscillatory waves	Yes	Yes	Yes	Yes	
6.	10/700 μ s surges	N/A	N/A	N/A	Yes	
7.	Electrostatic discharge	Yes				Table 13 of IEC 60870-2-1: 1995 - Level : 4
8.	Power frequency magnetic field	Yes				Table 14 of IEC 60870-2-1: 1995 - Level : 4
9.	Damped oscillatory magnetic field	Yes				
10.	Radiated electromagnetic field	Yes				Table 15 of IEC 60870-2-1: 1995 - Level : 4
11.	Power Frequency voltage on control and signal lines	N/A	N/A	Yes	Yes	IEC 61000-4-16: 2002-07 - Level : 4
12.	DC voltage on control and signal lines	N/A	N/A	Yes	N/A	IEC 61000-4-16: 2002-07 - Level : 4

(b) Emission Tests

The list of Emission tests are specified below in Table 4-5

**Table 5-5:
Recommended Emission Tests**

Sr. No.	Immunity Test	AC Power Supply	DC Power Supply	Control & Signal	Telecom Line	Parameters
1.	LF disturbance voltages CCITT recommendation P.53	N/A	Yes	N/A	N/A	Table 17 of IEC 60870-2- 1: 1995 - Class : B
2.	RF disturbance voltages CISPR 22	Yes	Yes	N/A	N/A	
3.	RF disturbance currents CISPR 22	N/A	N/A	N/A	Yes	
4.	RF radiated fields CISPR 22	Yes				

(c) Insulation Withstand Voltages

As per section 6 of IEC 870-2-1. Recommended class: VW1 of Table 18.

5.3.1.1.3 Mechanical Tests**(a) Mechanical Vibration Test**

The procedure for this test is described in IEC Publication 60068-2-6. The testing procedure shall be carried out in the sequence 8.1 + 8.2.1 + 8.1 as described in document 60068-2-6.

For the vibration response investigation (clause 8.1 of 60068-2-6), the test shall be carried out over a sweep cycle under the same conditions as for the endurance test (described later), but the vibration amplitude and the sweep rate may be decreased below these conditions so that the determination of the response characteristics can be obtained.

The endurance test conditions are selected according to the vibration withstand requirements.

Transportation tests shall be performed with the equipment packed according to the Contractor's specifications.

(b) Shock Test

The procedure of this test is defined in IEC Publication 60068-2-27 (each test) with a semi-sinusoidal shape (clause 3.1.1.2).

The recommended severity shall be $A = 294 \text{ m/s}^2$, $D = 18 \text{ ms}$. Three shocks per axis per direction shall be applied to the equipment packed according to the Contractor's specifications.

(c) Free Fall Test

This test could be performed as an alternative to the shock or Bump test. The procedure is defined in IEC publication 60068 -2-32. The equipment shall be packed according to the Contractor's specifications. The drop height shall be defined in accordance with IEC 68-2-32. The surface of the packing case which comes into contact with the ground is the surface on which the packing case normally rests; if the packing does not have any features (inscription, special shape, etc.) identifying this surface, the test is carried out successively on all the surfaces of the packing.

(d) Bump Test

This test could be performed as an alternative to Shock test or Free Fall test. The procedure is defined in IEC 60068-2-29.

5.3.1.2 Type Testing of DCPS

The test reports for Immunity, Emission and safety must be in accordance with relevant IEC/CISPR standards shall be submitted. The Contractor shall submit the DCPS type test reports of earlier conducted tests on the same make, model, type & rating which shall include the following tests listed in Table 5-6.

**Table 5-6
Type Tests on DCPS**

1.	Surge immunity (Level 4- as per IEC 61000-4-5)
2.	Electrical Fast Transients/Burst (Level 4 – as per IEC 61000-4-4)
3.	Electrostatic Discharge (Level 4 – as per IEC 61000-4-2)
4.	Radiated Electromagnetic Field (Level 3 – as per IEC 61000-4-3)
5.	Conducted disturbances induced by radio-frequency field (Level 3 – as per IEC 61000-4-6)
6.	Damped oscillatory magnetic field (Level 3 – as per IEC 61000-4-10)
7.	Voltage dips, short interruptions and voltage variations (Level 2 – as per IEC 61000-4-11)
8.	Conducted Emission (Level - Class A, Group 1 as per IEC CISPR 11)
9.	Radiated Emission (Level - Class A, Group 1 as per IEC CISPR 11)

10.	Safety Tests (as per IEC 60950)
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5.3.1.3 Testing requirements of Battery

Table 5-7
List of tests for VRLA battery

Sr. No.	Test	Type Test As per IEC 60896	FAT	SAT
1.	Verification of marking - Visual observation - Dimensional inspection - Polarity checking	Yes	Yes	Yes
2.	Capacity test	Yes	Yes	Yes
3.	Suitability for floating battery operation	Yes		
4.	Endurance in discharge/charge cycles	Yes		
5.	Charge Retention	Yes		
6.	Short-circuit current and internal resistance	Yes		
7.	Mechanical Tests -Vibration Test (procedure as per IEC 60068-2-6) - Free fall Test (procedure as per IEC 60068-2-32)	Yes		
NOTE : The batteries shall meet the general requirements as per IEC 60896 or equivalent.				

5.4 Factory Acceptance Tests

Factory acceptance tests shall be conducted on randomly selected final assemblies of all equipment to be supplied. Factory acceptance testing shall be carried out on SDH Equipments, associated line & tributary cards, Network Management System, Termination Equipments (Drop/Insert Multiplexer, DACS, associated Subscriber Line Interface Cards etc), DCPS, Battery etc. and all other items for which price has been identified separately in the Bid Price Schedules.

Equipment shall not be shipped to the Employer until required factory tests are completed satisfactorily, all variances are resolved, full test documentation has been delivered to the Employer, and the Employer has issued Material Inspection & Clearance Certificate (MICC).

Successful completion of the factory tests and the Employer approval to ship shall in no way constitute final acceptance of the system or any portion thereof. These tests shall be carried out in the presence of the Employer's authorized representatives at the works unless waiver for witnessing by Employer's representatives is intimated to the contractor.

Factory acceptance tests shall not proceed without the prior delivery to and approval of all test documentation by the Employer.

The factory acceptance test shall demonstrate the technical characteristics of the equipment in relation to this specifications and approved drawings and documents. List of factory acceptance tests for Fibre Optic Transmission system, Termination Equipment Sub-system, NMS, DCPS and Battery are given in specified Tables in this section. This list of factory acceptance tests shall be supplemented by the Contractor's standard FAT testing program. The factory acceptance tests for the other items shall be proposed by the Contractor in accordance with technical specifications and Contractor's (including Sub-Contractor's / supplier's) standard FAT testing program. In general the FAT for other items shall include at least: Physical verification, demonstration of technical characteristics, various operational modes, functional interfaces, alarms and diagnostics etc.

For Test equipment & clock, FAT shall include supply of proper calibration certificates, demonstration of satisfactory performance, evidence of correct equipment configuration and manufacturer's final inspection certificate/ report.

5.4.1 Sampling for FAT

From each batch of equipment presented by the Contractor for Factory acceptance testing, the Employer shall select random sample(s) to be tested for acceptance. Unless otherwise agreed, all required FAT tests in the approved FAT procedures, shall be performed on all samples. The Sampling rate for the Factory acceptance tests shall be minimum 10% of the batch size (minimum 1) for all items. The physical verification shall be carried out on 100% of the offered quantities as per the approved FAT procedure. In case any of the selected samples fail, the failed sample is rejected and additional 20% samples shall be selected randomly and tested. In case any sample from the additional 20% also fails the entire batch may be rejected. In case a number of equipments are required for demonstration of the performance of any equipment during FAT, the sample size shall be taken as that number of equipments which are necessary to demonstrate the performance, irrespective of the percentage.

Since FAT testing provides a measure of assurance that the Quality Control objectives are being met during all phases of production, the Employer reserves the right to require the Contractor to investigate and report on the cause of FAT failures and to suspend further testing/ approvals until such a report is made and remedial actions taken, as applicable.

5.4.2 Production Testing

Production testing shall mean those tests which are to be carried out during the process of production by the Contractor to ensure the desired quality of end product to be supplied by him. The production tests to be carried out at each stage of production shall be based on the Contractor's standard quality assurance procedures. The production tests to be carried out shall be listed in the Manufacturing Quality Plan (MQP), alongwith information such as sampling frequency, applicable standards, acceptance criteria etc.

5.4.3 FAT/SAT for Fibre Optic Transmission System

The factory/site tests to be carried out on Fibre Optic Transmission System/module in the factory and site are listed respectively in Table 5-8 below.

**Table 5-8:
Factory Acceptance Testing for Fibre Optic Transmission System**

1.	Physical inspection for conformance to DRS, BOQ, drawings and appearance of equipment
2.	Optical output power
3.	Transmitter lightwave spectral analysis
4.	Low receive level threshold
5.	Generation of bit error rate curve
6.	Measurement of analog and digital service channel parameters as well as service channel functionality
7.	Performance of supervision, alarm, Craftsperson interface, diagnostics, loop backs etc.
8.	Electrical interface tests which include: output and input jitter, bit error rate, pulse shape, cable compensation, and line rate tolerance for multiplexers
9.	At a minimum tests on Ethernet interface shall include demonstration of ping test, throughput test, Latency test, Packet Loss test as per RFC 2544
10.	Simulation of failure conditions and failover of each redundant unit.
11.	VLAN (Layer-2 switching) feature testing with atleast three equipments configuration
12.	Protection scheme for Ethernet Traffic (ERPS)
13.	Test of spare card slots
14.	Checks of power supply/converter voltage margins
15.	Random inspections to verify the accuracy of documentation
16.	Test of spare parts/modules/cards as per applicable tests

5.4.4 FAT/SAT for Termination Equipment (MUX & DACS)

The factory/site tests to be carried out on Termination Equipment (MUX & DACS) System/module in the factory and site are listed respectively in Table 5-9 below.

Table 5-9
Factory Acceptance Testing for Termination Equipment
(MUX & DACS)

Item No.	Description:
1.	Physical Inspection for conformance to DRS, BOQ, drawings and appearance of equipment
2.	Performance of supervision, alarm, control and switching systems, diagnostics, loopbacks, Craftsperson interface etc.
3.	Electrical interface tests which include: output and input jitter, bit error rate, pulse shape, cable compensation, and line rate tolerance for the channel banks/low-level multiplexers
4.	Framing, signaling, and operational and maintenance tests consistent with applicable ITU-T requirements
5.	Simulation of failure conditions and failover of each redundant unit
6.	Test of spare card slots and test of spare parts/modules/cards as per applicable tests
7.	Checks of power supply/converter voltage margins and short circuit and overvoltage protection
8.	Random inspections to verify the accuracy of documentation

5.4.5 FAT/SAT for NMS

The factory/site tests to be carried out on NMS System/module in the factory and site are listed respectively in Table 5-10 below.

Table 5-10
FAT on NMS

1.	Physical inspection of NMS hardware for conformance to approved BoQ, DRS & drawing.
2.	Test to demonstrate the expansion capability of the NMS system.
3.	Test to demonstrate the functionality of North bound interface.
4.	Testing of NMS to demonstrate proper operation of all functions: Configuration Management, Performance Management, Fault Management and Security Management. All standard features and required customization of the NMS shall be demonstrated for proper functioning.

5.4.6 FAT/SAT of DCPS

The factory/site tests to be carried out on DCPS system/module in the factory and site are listed respectively in Table 5-11 below.

Table 5-11
Lists of tests for FAT/SAT of DCPS

Sr. No.	Test	FAT	SAT
Tests on DCPS System			
1.	Mechanical & Visual Check Tests	Yes	Yes
2.	Insulation Test.	Yes	
3.	High Voltage Withstand Test	Yes	
4.	Switch On Test	Yes	Yes
5.	DCPS Low voltage & High voltage limits check Test	Yes	Yes
6.	Pre-alarm test for Battery Voltage Low	Yes	Yes
7.	Battery Low Voltage Disconnect Level Test	Yes	Yes
8.	AC Input Low and High voltage limits check Test	Yes	
9.	Rectifier Fail Alarm Test	Yes	Yes
10.	Voltage Regulation Test	Yes	
11.	Current Sharing Test	Yes	
12.	Total Output Power Test	Yes	Yes
13.	Hot Plug In Test (if applicable)	Yes	Yes
14.	Calibration & Parameter settings	Yes	Yes
15.	Automatic Float cum Boost Charge Mode Change Over	Yes	Yes
	Test	Yes	Yes
16.	Battery Path Current Limiting Test	Yes	Yes
17.	Battery Charging and full load Current Test	Yes	Yes
18.	Total Harmonic distortion Test	Yes	
19.	Burn in Test at 50 ° C (for 8 hrs duration)	Yes	
	Test on SMPS Module		
20.	Mechanical & Visual Check Test	Yes	
21.	Module-On Test	Yes	
22.	Input low/high voltage cut-off test	Yes	
23.	Voltage Drop Test	Yes	
24.	Voltage Regulation Test	Yes	
25.	Power Output & Current Limit Test	Yes	
26.	DC High Voltage Test	Yes	
27.	O/P Voltage Ripple Test	Yes	
28.	Psophometric Noise Test	Yes	
29.	Efficiency Test	Yes	

30.	Power Factor	Yes	
31.	Input Current Limit	Yes	
32.	Input AC Frequency Range Test	Yes	
33.	Rectifier Dynamic Response	Yes	
34.	Output Short Circuit Test	Yes	
35.	Hold up Time Test	Yes	

5.5 Site Acceptance Tests

The Contractor shall be responsible for the submission of all equipment & test equipment supplied in this contract for site tests and inspection as required by the Employer. All equipment shall be tested on site under the conditions in which it will normally operate.

The tests shall be exhaustive and shall demonstrate that the overall performance of the contract works satisfies every requirement specified. At a minimum Site Acceptance Testing requirement for Telecom equipment, NMS etc. is outlined in following section. This testing shall be supplemented by the Contractor's standard installation testing program, which shall be in accordance with his quality plan(s) for Telecom equipment installation. The tests to be conducted during SAT of Battery & DCPS are specified in respective Tables in this section.

During the course of installation, the Employer shall have full access for inspection and verification of the progress of the work and for checking workmanship and accuracy, as may be required. On completion of the work prior to commissioning, all equipment shall be tested to the satisfaction of the Employer to demonstrate that it is entirely suitable for commercial operation.

5.5.1 Phases for Site Acceptance Testing

The SAT shall be completed in following phases:

5.5.2 Installation Testing

The field installation test shall be performed for all equipment at each location. If any equipment has been damaged or for any reason does not comply with this Specification, the Contractor shall provide and install replacement parts at its own cost and expense.

In the installation test report, the Contractor shall include a list of all hardware or components replaced or changed between the completion of factory tests and the start of field tests and show that documentation and spare parts have been updated.

The minimal installation testing requirements for fiber optic transmission subsystem, Termination equipment sub-system and NMS are provided in respective Tables in this section.

5.5.2.1 Link Commissioning Tests

The commissioning tests shall verify that communication can be performed over the fiber optic link under test. Delay measurement, Bit Error measurements & service channel performance monitoring shall be made on the fibre optic links to verify compliance with designed link performance.

For Ethernet interface: At a minimum the following test requirements shall be demonstrated as per RFC 2544:

- a) Ping test
- b) Throughput test
- c) Latency test
- d) Packet Loss

VLAN (Layer -2 switching) feature testing with equipments as per network configuration shall be demonstrated.

10% of the total communication links (Chosen by the Employer, generally to cover links from all configurations used) shall be tested for a duration of 12 Hours.

Rest of the links shall be tested for 1 Hour. In case a link does not meet the performance requirements during 1 hour, then the duration of the test shall be increased to 12 hours.

In case any link does not meet the performance requirements during 12 hour, then the cause of failure shall be investigated and the test shall be repeated after rectifying the defects.

This phase of testing shall be conducted by the Contractor and witnessed by the Employer. Field adjustments shall be made to meet established standard, however if the field adjustments fail to correct the defects the equipments may be returned to the Contractor for replacement at his own expense. In case any adjustments are required to be made during the interval of the test then the test shall be repeated.

5.5.2.2 Integrated Testing

Prior to commencement of integrated testing the overall system shall be configured as required to provide all the data and voice channel required to interconnect the various control centres and RTU. The integrated testing for a batch shall include end-to-end testing of back-bone network included in that batch. Integrated testing for last batch shall include testing of the entire back-bone. The intent of integrated testing is to demonstrate that the equipment is operational end to end under actual conditions, that all variances identified during factory and field installation and communications testing have been corrected, and that the communication equipment is compatible with other equipment at all locations. The Integrated System Test shall include all fibre optic transmission equipment, termination equipment, the network management subsystem and other components.

At a minimum the following tests shall be included in the integrated testing:

- (1) Installation testing for NMS as per tables below
- (2) Equipment configuration shall be checked to establish that it supports the channel routing.
- (3) End to end testing of all individual voice circuits originating from PLCC, PABX or Phones and to establish proper interfacing with PLCC\PABX\Phones and to demonstrate proper operation of channels over wideband systems. Operation shall be checked in terms of quality of voice, call initiation and call termination processes. The requirements for integrated testing for PABX system is described separately below.
- (4) End-to-end testing of all individual Data Circuits originating from PLCC, RTU and SCADA Front Ends and to establish proper interfacing with PLCC\RTU\Front End and to demonstrate proper operation of channels over wideband systems. Operation shall be checked in terms of monitoring of BER/packet loss.
- (5) Testing of NMS to demonstrate proper operation of all functions: Configuration Management, Performance Management, Fault, Management and Security management. All the standard features of the NMS shall be demonstrated for proper functioning.
- (6) Demonstration of Protection switching and synchronization of equipment as per synchronization plan.

Table 5-12
Fibre Optic Transmission system Installation Testing

Item:	Description:
1.	Physical Inspection for conformance to drawings, rack elevations and appearance of equipment and cabling
2.	Station power supply input and equipment power supply (DC-DC converter) output voltage measurements
3.	Terminal transceiver performance testing (Tx power, Tx spectrum, receive signal strength, connector losses etc.)
4.	Service channel performance.
5.	Craftsperson interface, alarm and control functional performance
6.	Rack and local alarms: No alarms shall be present and all alarms shall be demonstrated to be functional.
7.	Network management interface and supervision performance.
8.	Correct configuration, level setting & adjustments and termination of Input/ output interfaces.
9.	Proper establishment of Safety and signalling earthing system and resistance to ground to be checked.

10.	Simulation of failure conditions and failover of protected components.
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Table 5-13
Termination Equipment Sub-system Installation Testing

Item:	Description:
1.	Physical Inspection for conformance to drawings, rack elevations and appearance of equipment and cabling.
2.	Power supply/converter voltage measurements.
3.	Muldem performance testing
4.	Craftsperson interface, alarm and control functional performance
5.	Rack and Local alarms
6.	Network management interface and supervision performance
7.	Channel performance
8.	Safety and signalling earthing system
9.	Simulation of failure conditions and failover of protected components.

Table 5-14
NMS Installation Testing

Item:	Description:
1.	Physical inspection for conformance to drawings, rack elevations and appearance of equipment and cabling
2.	Workstation hardware inventory, configuration and characteristics
3.	Demonstration of proper operation of all hardware, including workstations peripherals

5.5.2.3 Integrated Testing for PABX system

The Contractor shall perform integrated system tests, check system configuration, check successful integration of supplied equipment & subsystems and demonstrate end to end communication network operation. The test program for the Integrated testing shall be sufficiently detailed and comprehensive to ensure and demonstrate to the satisfaction of the Employer, that

- End to end voice and data connectivity is established and the end to end voice/ data channel quality is maintained.
- Existing PABX equipment.

Part-V TRAINING AND SUPPORT SERVICES

This section describes the requirements for Contractor-supplied training, support services, and maintenance of the FOTS. The intent of the training and support program is to ensure a smooth transfer of systems and technologies from the Contractor to the Employer, and to ensure that Employer staff is fully trained to operate, maintain and expand the integrated telecommunication network.

6.1 Training

The Contractor shall provide a comprehensive training program that prepares the Employer's personnel for on-site installation support, operation, and maintenance of the telecommunication network.

Training may be conducted by the Contractor, the Contractor's subcontractors, and/or original equipment manufacturers (OEMs). The training requirements of this Specification shall apply to all such courses.

Training courses shall be conducted by personnel who speak understandable English/Hindi/Punjabi and who are experienced in instruction. All necessary training material shall be provided by the Contractor. The training charges quoted by the Contractor shall include training materials and all associated expenses. However, for all training courses in India or abroad, the travel (e.g., airfare) and per diem expenses of the participants will be borne by the Employer. For courses conducted abroad, however, the Contractor shall extend all necessary assistance for making appropriate lodging arrangement.

Hands-on training shall be provided with equipment identical to that being supplied to the Employer.

The schedule, location and detailed training contents shall be submitted by the Contractor to the Employer for approval.

6.1.1 System Design & Overview Training

This training shall provide a functional description of the fibre optic transmission system and a discussion of the failover and alternate routing schemes inherent in the configuration. The training shall include an overview of the network configuration and indicate the functional responsibilities of all major subsystems including the network monitoring system hardware and software. The training shall highlight all significant methodologies or concepts utilized by the hardware and software to perform the required functions. High-level hardware configuration block diagrams and network/sub-network block/flow diagrams shall be included to enhance the understanding of the overall capability incorporated into all network and sub-network equipment.

The training shall be oriented to a user's point of view. The Employer/Owner users will include managers, design & planning personnel, communication support staff and maintenance personnel. As part of the proposal, the Contractor shall identify the number of days deemed appropriate for this training.

The overview training shall be customized for the specific functions, features, and equipment purchased by the Employer; it shall not be a general presentation of the Contractor' standard equipment repertoire. Personnel assigned by the Contractor to implement the Employer's system shall conduct this overview training.

6.1.2 Installation & Maintenance Training

There shall be separate modules of the installation & maintenance training for the FO Transmission System.

The installation & maintenance trainings shall enable the Employer to be self-sufficient in preventive & restorative maintenance of the respective communications subsystems purchased by the Employer.

6.1.3 Network Management Training

The Network Management training shall familiarize the Employer's telecommunication personnel with the concepts and techniques for configuring, programming, maintaining, and troubleshooting the Contractor supplied NMS and its associated database. The Network Management training course shall provide the course participants with hands-on experience using the actual system being supplied.

6.1.4 Training Course Requirements

This section describes general requirements that apply to all training courses.

6.1.4.1 Class Size

The Employer plans to send a number of participants to the training courses for a specified duration as described in Appendices.

6.1.4.2 Training Schedule

The Contractor shall provide training in a timely manner that is appropriate to the overall project schedule. All training courses shall be available to the Employer for a minimum of five years after final acceptance of the communication system.

The training courses shall be offered in one cycle, such that none of the courses within the cycle overlap. The Contractor shall take the above requirements into account in developing

the preliminary training schedule. Contractor shall develop a final training schedule in consultation with the Employer after contract award.

6.1.4.3 Manuals and Equipment

The Contractor, subcontractor, or OEM shall prepare training manuals and submit them to the Employer for review at least one month prior to the start of classroom instruction. The training manuals shall be prepared specifically for use as training aids; reference manuals, maintenance manuals, and user's manuals may be used as supplementary training material. Principal documents used for training shall be tailored to reflect all the Employer requirements specified.

Each course participant shall receive individual copies of training manuals and other pertinent material at least two weeks prior to the start of each course. The Employer shall retain the master and two additional copies of all training manuals and materials as reference documentation. A complete set of instructor's manuals and training aids shall also be provided.

Upon completion of each course, instructor's manuals, training manuals, and training aids shall become the property of the Employer. As part of the delivered system documentation and the final documentation, the Contractor shall supply the Employer with all changes and revisions to the training manuals and other training documentation. The Employer reserves the right to copy all training manuals and aids for use in the Employer-conducted training courses. The Contractor shall furnish for use during training courses all special tools, equipment, training aids, and any other materials required to train course participants.

6.2 Support Services

Throughout design, implementation, factory testing, and field installation and testing, the Contractor shall supply consulting assistance, as required by the Employer for site preparation, field installation, and other areas where technical support may be required.

The Contractor shall be responsible for minor facility renovation, and maintenance of the supplied system up to and including successful completion of the Site Acceptance Test.

After final acceptance of the communications equipment, the Contractor shall offer continuing technical support and spare parts for the designed life of the equipment or 7 years after the declaration of withdrawal of equipment from production whichever is earlier. However the termination of production shall not occur prior to Operational Acceptance of the system by the Employer.

6.2.1 Technical Support

Consultation with Contractor's technical support personnel and trained field service personnel shall be readily available on a short-term/long-term basis to assist the Employer personnel in maintaining, expanding, and enhancing the telecommunication network upon expiration of the warranty period. The Contractor shall include in their offer(s), a proposal for ensuring continued technical support as stated above.

6.2.2 Contractor's Future Hardware/Software Changes

The Employer shall be informed of all alterations or improvements to the hardware supplied under this Specification. The Employer shall be placed on the Contractor's mailing list to receive announcements of the discovery, documentation, and solution of hardware/software problems as well as other improvements that could be made to supply equipment. The service shall begin at the time of contract award, and shall continue for 10 years. The Contractor shall also include a subscription to the hardware subcontractors' change notification service from the time of contract award through the warranty period, with a Employer renewable option for extended periods.

6.3 Spare Parts and Test Equipment

The spare parts and test equipment shall be provided for each subsystem as described below.

6.3.1 Mandatory Spare Parts

Appendices provides the Mandatory Spare Parts Requirements described in subsystem sets. The mandatory spare parts table represents the minimum spares the Contractor shall be required to supply. The subsystem set of spare parts is defined to include all equipment modules, subunits and parts required to effect replacement, repair and restoration to full operational status of a defined unit of a subsystem.

6.4 System Maintenance

As per DoT guidelines, operation and maintenance of the network shall be entirely by Indian engineers and dependence on foreign engineers shall be minimal within a period of two years from the date of LoA. The contractor shall be responsible to maintain the confidentiality of the Employer's System Information that Employer shares with the contractor for maintenance period.

6.5 Miscellaneous Supplies

The Contractor shall provide all required consumable and non-consumable supplies necessary to support all installation and test activities through final operational acceptance. However, if there are any problems in the SAT and additional consumables are required, the same shall also be supplied by the Contractor at no additional cost.

6.6 Documentation

The Contractor shall submit following documents during detailed engineering:

- (a) Data Requirement sheets
- (b) Link Budget calculations
- (c) MQP, FQP
- (d) Bill of Quantity including mandatory spares
- (e) Previous Type test reports
- (f) Factory Test report
- (g) Manuals for each equipment
- (h) Schematic drawing
- (i) Numbering, Marking, labelling document
- (j) Synchronization plan
- (k) Test schedule
- (l) Training manual
- (m) Configuration diagram
- (n) Transportation & handling Procedure
- (o) Installation Manuals
- (p) Maintenance Manuals

ANNEXURE-I**Technical Specifications for Maintenance after operational acceptance during maintenance period (i.e. Warranty/defect liability period)****A -1.0 GENERAL**

The Contractor shall be responsible for the maintenance during warranty of all the communication equipment installed under this Contract as follows:

- (i) Non-comprehensive Maintenance during warranty: Non-comprehensive maintenance during warranty shall be on call basis and shall not require deployment of manpower on Employer's location but the maintenance Engineer shall reach the site and restore the system within 24 hours (including travel time) after the complaint is registered. However, in case of non-comprehensive maintenance also, semi-annual planned site visit will be required as detailed here.

The maintenance contract shall commence after completion of the project i.e. after Operational Acceptance. Contractor shall meet system availability of 99.5% for fibre optic system.

Contractor will arrange for adequate transportation for their staff as per the work demand.

All the spares (Material/Equipment and T&P) required during warranty/defect liability period shall be provided by the Contractor at no additional cost to the Employer. Tenure of Warranty period shall be reckoned as per GCC Clause 22.2 of Volume-I.

A - 1.1 RESOURCE DEPLOYMENT

The contract shall identify maintenance coordinator who will interact with the Employer for maintenance requirement.

The contractor shall deploy the maintenance/service engineer at the required locations of the link on call basis for rectification of fault as well as carry out preventive maintenance (Half Yearly) of the system.

A 1.2 MONITORING

Network will be monitored by the Employer Network Monitoring Team (NMT), whenever, notices any fault/abnormality in the system shall notify to the Contractor's maintenance Coordinator, over phone with an event no. An event report shall be generated by the Employer as per the formats finalized during detailed engineering. On issuance of Event report (may be recorded over phone) by NMT, corrective action/s shall be carried out by Contractor's

maintenance personnel for rectification. Contractor's representative must report within twenty four (24) hours at required location (including travel time). Time mentioned here is irrespective of normal working hours or holidays. The NMT shall co-ordinate and control any site visits to ensure that communication network is operating with a minimum of disruption during these visits. The NMT will inform the relevant Employer representative to facilitate the access to the site/equipment where fault is suspected.

The main responsibilities of the Employer's Network Monitoring Team are:

- a) Communication Network monitoring by NMT
- b) Detect faults, prioritizing them and notifying to the Contractor for immediate corrective actions.
- c) Follow up on corrective actions to verify that the agreed time frames are met.
- d) Record all faults in the fault record sheet and summary of action taken for fault rectifications.
- e) Co-ordinate all planned / breakdown site visits to minimize disturbance of service.
- f) Update status information of operated network to user's communication network.

A 1.3 PREVENTIVE MAINTENANCE

Preventive Maintenance activities are either Event Based (Fault/breakdown maintenance,) or planned site visits (Semi annual site visit, testing of channel/s, augmentation and modification in the network if end equipment does not communicate with corresponding equipment as and when required. Planned visit shall mainly carried out during working days.

Event based work is to be carried out on call basis. A start status shall be jointly filled by Employer & Contractors representative at 10.00 Hrs of commencement date of maintenance contract.

Planned site visits shall be carried out twice in a year (semi-annually) at all the sites in the network or time to time if speech/data is affected at a particular site. Thus, in a year, not less than two planned site visits to all locations will be undertaken.

Contractor will maintain record of events during the maintenance services; simultaneously Employer shall also record the events in the LOG BOOK.

The tasks during the planned site visits for the system include but are not limited to following:

- Visual inspection of equipment
- Alarm measurement verification
- Status report of site
- Updating
- Cleaning the equipment

- Tightening of connectors
- Sealing of cabinets to arrest entry of rodents etc.
- Measurement of earth resistance

Formats for the works to be taken up during semi-annual site visits shall be finalized during detailed engineering.

Fault/Breakdown maintenance is a process of fault correction / trouble shooting/interfacing with other contractor as per the fault reported by NMT. Contractor will maintain a log of activities carried out at all locations and necessary History will include site name, visit date, actions taken and site condition. Detailed report in this respect shall be submitted by the contractor in the monthly meeting.

The Employer representatives will associate in trouble shooting, change of unit as per programme notified/intimated by the contractor however, due to any reason if Employer cannot depute their representative, contractor will proceed for the work so as to attend the breakdown/testing as per their programme.

The scope of corrective maintenance is as follows:

- Troubleshooting on a network element and its interfaces as and when required and directed by NMT, engineer/coordinator of Employer.
- Diagnostics on interfaces to locate problems in network elements. If required, the contractor shall depute maintenance engineer for joint inspection with other vendors for pin-pointing the fault.
- Identification of the faulty hardware unit/equipment which includes both FOTE and OPGW along with its accessories and subsequently replacing it. Equipment to be replaced if any during preventive maintenance shall be provided by Employer (PSTCL).
- Performance of function verification in co-ordination with the NMT operators.
- Handing over of faulty unit to Employer at site or Control Centre.

A 1.4 HARDWARE SERVICES

In case any failure or malfunction is discovered, the maintenance team shall identify the problem, organise to promptly attend the fault, replace the faulty equipment/card/module or any other hardware component with a spare unit and ship the faulty unit to specified location. Each faulty unit shall be accompanied with correctly filled-out Event Report. Contractor shall ensure maximum utilisation of the channel capacity, hence healthy channel/s will be put in use and hardwired to respective DDF point, in coordination with Employer, without disturbing end user connection so that outright replacement of card is avoided. Card shall be replaced

when all the healthy channels are faulty. Necessary modification (temporary) in drawing/s in site copy will have to be done without changing original document.

The Contractor shall be responsible for providing all the spares (cards/modules/accessories etc.) for supplied & installed equipment. The spares shall be provided/arranged by the contractor at no extra cost to Employer. For early restoration during the emergency condition, if spares are made available by Employer, the same shall have to be replenished by the Contractor within thirty (30) days.

Contractor will carry out the following tasks for hardware services:

- a) Handover the faulty unit/s to Employer
- b) Replace faulty units from their own spares stock.
- c) Send faulty units to Original equipment supplier's representative in India on Employer behalf with the correctly completed Failure Report with site information and symptoms of failure.
- d) Test the repaired unit for their healthiness after the same is rectified by the original manufacturer.

A 1.5 MAINTENANCE SERVICES SUMMARY

The Maintenance Services are summarised below:

MAINTENANCE FAULT/BREAKDOWN	
Equipment Scope	As per BoQ enclosed in Appendices.
Scope	Rectification /Corrective maintenance.
Availability	On call basis as mentioned above in TS.
PLANNED SITE VISIT	
Equipment Scope	As per BoQ enclosed in Appendices.
Scope	Visual inspection of equipment, alarms measurement verifications, status report of site, updating of log record, cleaning the equipment, modification & augmentation.
Availability	Semi-annual / planned visits.

A 1.6 OUTAGE TIME DEFINITION:

An outage time refers to period in which loss of communication is detected on any part of the telecommunication network / equipment and continues until the fault is cleared by taking into account conditions listed below.

- a) Time of unavailability excludes running with faulty equipment on specific instruction from Employer/Constituent (not affecting communication or monitoring of other units other than faulty unit).
- b) The time of unavailability excludes the transportation time to a faulty site average of twelve (12) hours and time to get authorization for access to the telecommunication room and to the equipment.
- c) An event would not be considered as failure when the system features allow to continue the data transmission utilizing redundancies available in the subsystem/equipment.
- d) In case of failure of any E1, no consequential lower level channel failure shall be accounted for.
- e) In case a loss of communication is detected in system of third party (RTU/SCADA, existing SDH equipment procured under separate contract) and no corresponding alarm is detected in NMS the event will be jointly studied with the parties and plan/schedule of fault finding will be made. However, under such conditions of fault attribution to the third party, it would be contractor's responsibility to logically establish such attribution.
- f) If it is needed to identify the fault, it is allowed to disconnect/loop circuits for trouble shootings. This testing time shall not be counted in the outage time calculations. However, interruption time for healthy channel should not exceed 10 minutes. Proper planning and coordination with all concerned may be required while carrying out this activity so as to minimize outage time.
- g) Outage due to force majeure conditions (Not attending fault due to war, curfew, earthquake at the location of fault, serious accident during traveling for attending fault) or outage due to failure in power system equipment other than supplied by the Contractor (or AC/DC).
- h) Outages which are not attributable to equipment faults such as fault in fibre optic cable will not be considered for calculation in system availability.

A 1.7 DOCUMENTATION DURING MAINTENANCE PERIOD

Events shall be recorded by using of event form. The forms shall be filled in duly dated, timed and signed by representatives of both the parties. Absence of one or the other party's representative shall not render the record invalid but assumes only that such representative signs the record at his earliest convenience.

The initial condition of the system shall be recorded on the start status form to constitute or reference for later events. All the events recorded in the start status form shall have to be rectified within 15 days. Faults not attended within 15 days will be considered as outage. Any and all events such as incoming and existing alarms, fault occurrence, action taken for remedies etc. shall be recorded in the event report forms. If a unit is replaced or repaired both the new and the replaced or repaired unit is to be recorded in the event report form. Contractor

shall submit the detailed report for fault occurrence after the cards/equipment is rectified at the works of supplier.

A 1.8 AVAILABILITY REQUIREMENT

The availability of wideband communication equipment shall be measured in categories as below:

- a) management data channels
- b) E-1 /Ethernet channels

The availability requirement for type of channels for wideband communication equipment shall be 99.5%.

However not withstanding the commutation of availability of the communication system as specified above, the prompt restoration of the faulty equipment/part of the network is also of equal importance and any delay in restoration of the faulty system shall be governed as per terms & condition of the contract.

A 1.9 SCOPE OF WORK DURING MAINTENANCE PERIOD

Sr. No.	Description	Detailed Scope
1.	Overall Infrastructure	Infrastructure includes the building, air conditioners, AC/DC system, UPS, cable trenches, Earthing etc provided by Employer. They will be maintained by Employer.
1.1	Equipment site	
1.1.1	General conditions	General checking during semi annual / troubleshooting site visits and advise
1.1.2	Cleanliness of the room	General checking during semi annual / troubleshooting site visits and advise.
1.1.3	Earthing interconnections	Checking, connector cleaning, redoing the connection during semi annual / troubleshooting site visits (limited to the earthing of equipment under scope of maintenance)and as required specifically. Earthing interconnection will be checked upto earthing star point). Earthing interconnection shall also be checked and corrected during troubleshooting site visits if it is considered the probable cause of fault. Measurement of earth resistance during semi-annual site visit.
1.1.4	Air conditioning	General checking during semi annual / troubleshooting site visits and advise.
1.1.5	Cable route	General checking during semi annual / troubleshooting site visits and advise.

1.1.6	EMI issues	Contractor shall study in special case of repeated faults if the probable cause is earthing interconnection at the station or possibility of spurious signals through various cable connections to the wideband equipment and advise.
1.2	Indoor cabling	Checking terminations, re-kroning, if necessary, during semi-annual/troubleshooting site visits. It shall also be checked during troubleshooting site visits if it is the probable cause of faults.
1.3	Out-door cabling	Checking terminations, re-kroning, if necessary, during semi-annual/troubleshooting site visits. It shall also be checked during troubleshooting site visits if it is the probable cause of faults.
1.4	Fibre Optic Cable	Checking with OTDR and advice. Rectification if fault is found to be in the approach cable/ patch cord etc. up to DDF
2	<i>Main Equipment</i>	
2.1	Fibre Optic terminal SDH	Faulty equipment to be replaced at site as per conditions of Maintenance Plan.
2.2	GPS Clock	Faulty equipment to be replaced at site as per conditions of Maintenance Plan. Contractor shall be responsible for providing hardware , if required, during maintenance without any additional cost implication to Employer.
2.4	<i>Craft Terminal based NMS of SDH</i>	
2.4.1	Computer hardware	Contractor shall be responsible for providing all hardware & software required during maintenance without any additional cost implication to Employer.
2.4.2	Alarm handling, Backups etc. - software part	Alarm deletions, Backups as per maintenance plan. Consumables to be provided by Employer. Software corruption to be corrected as per actual requirement.
3	<i>Contractor's set-up</i>	
		Generally in consonance with the set-up mentioned in the maintenance plan.

A 2.0 PENALTY FOR DEFAULT IN SERVICES

(a) Contractor will maintain an adequate level of qualified staff for carrying out this maintenance contract, failing which Rs 50,000/- per month will be deducted by Employer from the amount due to contractor under this contract. In addition 5% of the total payable amount shall be deducted for every fall of 1% or part thereof in the specified availability.

(b) Employer shall have the right to terminate the contract after giving notice of two month if the availability of the system is not attained as per specification consecutively for two months.

A 3.0 CO-ORDINATION REQUIREMENTS A 3.1 MEETING PRACTICE

Regular meeting between Employer and the Contractor is vital for communication and information flow between these two organisations. The purpose of the meeting is to tackle the essential issues concerning the services and network performance. The suggested schedule for meeting is once in every month. The meeting agenda shall be decided between Employer and Contractor and could for example consist of the following issues:

- Services and network performance according to the report during last month
- Review of emergency situation
- Status of spare
- Action plan
- Next Meeting
- Alarms/events unattended till the date of meeting

The following participants should be present in this meeting:

- Co-ordinator (Contractor)
- Members of the Contractor team as needed
- Co-ordinator Employer representative
- Operation and maintenance staff as designated to attend (Employer)

A 3.2 EMERGENCY MEETING

Whenever a major outage occurs in any part of the network, an emergency meeting may be called if desired by Employer. In the meeting, the outage will be discussed in the context of cause, correction and prevention.

A 3.3 REPORTING PROCEDURE

The purpose of report is to summarize the activities performed during the reporting period. The report provides the information on the performance of the services and describes the current status of the network. The report is a monthly report from Contractor to Employer which shows the trends in the network and services provided by the Contractor. By analysing the report data, management and expert of Employer and contractor are able to focus attention on the areas where further improvement is needed.

Emergency Reports: Contractor reports to Employer every time the emergencies call up and call out service is invoked. In these cases, on termination of the emergency all details of the fault and clearance information are submitted within five working days.

Appendix-A
Bill of Quantities
(BOQ)

Table-1
BOQ for Telecom Equipment

SI No.	Item Description	UOM	Qty
I	Part C - 1. Terminal Equipment		
A	SDH Equipment (STM - 4 MADM, at least Five protected directions)		
(i)	Base Equipment (Common cards, Cross-connect/control cards, Optical base card, Power supply cards, power cabling, other hardware & accessories including sub-racks, patch cords, DDF etc. fully equipped excluding (II) and (III) below)	No.	21
B	Optical Interface/SFP# for:		
i	S4.1	No.	80
ii	L4.1	No.	20
C	Tributary Cards		
i	E1 Interface card (Minimum 16 interfaces per card)	No.	42
ii	Ethernet interfaces 10/100 Mbps with Layer-2 switching (Minimum 8 interfaces per card.)	No.	42
II	Termination Equipment		
A	Drop & Insert Multiplexer		
i	Base Equipment (Common cards, Power supply cards., power cabling, other hardware & accessories including sub-racks, etc. fully equipped excluding subscriber line interface cards).	No.	21
B	Subscriber Line Interface Cards		
i	2 wire (sub/sub)voice channel cards (min 8 channels per card)	No.	21
ii	4 wire (E&M) voice channel cards (min 8 channel per card)	No.	21
III	Equipment Cabinets		
(a)	For SDH Equipment, Drop/Insert MUX Equipments Equipment including accessories.	No.	21

**Table -2
DCPS System**

Item No.	Item Description	UNIT	QTY (indicative only)	Qty as per firm
	Auxiliary Power Supply			
A	Main Equipments			
1	48V DC Power Supply (DCPS) system based on SMPS (for 15A rating)	Nos	21	
2	Battery bank for above DCPS (VRLA Type-200 AH)	Nos	21	

Table: - 3
Proposed Training Requirements

Sr. No.	Item Description	Location	No. of Trainees	Duration of working days
1.	SDH equipment, Mux Equipment	Manufacturer works/Training centre		
2.	SDH equipment, NMS & DCPS			
3.	PDH equipment, NMS & DACS			

Appendix-B
Data requirement Sheets

Data Requirement Sheets

The following sets of Data Requirement Sheets are required to be filled up by the bidders to aid in the evaluation process. The response shall be brief and to the point and shall be supported by the printed product description and other literature. The DRS duly filled and the relevant drawings shall also be submitted during the detailed engineering along with the relevant technical brochures.

DRS Form 01

DATA REQUIREMENTS SHEETS for
OPTICAL LINE TERMINATION EQUIPMENT (OLTE)

Manufacturer: _____

Model #: _____

GENERAL OLTE FEATURES

Sr. No.	Parameter	As per Technical Specification	As per Bidding Offering
1.	SDH Hierarchy Level:	STM-4	
2.	Capacity Aggregate Bit-rate:	620 Mbps	
3	CEPT E-1 Ports:	252 x E1	
4.	Minimum No. of protected(MSP) directions	Five	
5.	No. of E1 ports in E1 tributary cards	minimum 16	
6.	No. of ethernet ports in Ethernet interface tributary cards	minimum 4	
7.	Service Channel provision a) Voice Channel b) Data Channel	Yes Minimum 1 Minimum 1	
8.	Power Supply cards of SDH equipment	1:1 APS or distributed power supply	
9.	Common Control* Card of SDH equipment	1:1 APS	
10.	Terminal Equipment	PDH	
11.	DCPS	15 A 25 A	

Volume-III
Specification for OPGW, its cabling &
associated hardware & fittings

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 - 1.1.2 Attenuation
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Part-I SPECIFICATION FOR OPGW CABLING & ASSOCIATED HARDWARE & FITTINGS

The broad scope of this specification include the design, engineering, manufacturing, supply, transportation, insurance, delivery at site, unloading, handling, storage, Supervision of erection/installation , installation, splicing, termination, testing, demonstration for acceptance and commissioning and documentation for:

- a) OPGW fibre optic cable including all associated hardware , accessories & fittings
- b) Fibre Optic approach cable including installation material
- c) Fibre Optic Distribution Panels (FODP) & Joint Box
- d) Supply of spares
- e) Supply of test equipments
- f) All other associated work/items described in the technical specifications.

This section of the technical specification describe the functional and technical specifications of OPGW cabling and associated hardware and fittings.

1.0 Fibre Optic Cabling

In this section of the technical specification, the functional & technical specifications of OPGW cable, associated hardware & fittings for the requirements for G.652D Dual-window Single mode (DWSM) telecommunications grade fibre optic cable is mentioned. Bidders shall furnish with their bids, detailed descriptions of the fibres & cable(s) proposed.

All optical fibre cabling including fibre itself and all associated installation hardware shall have a minimum guaranteed design life span of 25 years. Documentary evidence in support of guaranteed life span of cable & fibre shall be submitted by the Contractor during detailed engineering.

1.1 Required Optical Fibre Characteristics

The optical fibre to be provided should have following characteristic.

1.1.1 Physical Characteristic

Dual-Window Single mode (DWSM), G.652D optical fibres shall be provided in the fibre optic cables. DWSM optical fibres shall meet the requirements defined in Table 1-1(a).

1.1.2 Attenuation

The attenuation coefficient for wavelengths between 1525 nm and 1575 nm shall not exceed the attenuation coefficient at 1550 nm by more than 0.05 dB/km. The attenuation coefficient between 1285 nm and 1330 nm shall not exceed the attenuation coefficient at 1310 nm by more than 0.05 dB/km. The attenuation of the fibre shall be distributed uniformly throughout its length such that there are no point discontinuities in excess of 0.10 dB. The fibre attenuation characteristics specified in table 1-1 (a) shall be “guaranteed” fibre attenuation of any & every fibre reel.

The overall optical fibre path attenuation shall not be more than calculated below:

Maximum attenuation @ 1550nm: 0.21 dB/km x total km + 0.05 dB/splice x no. of splices + 0.5dB/connector x no. of connectors.

Maximum attenuation @ 1310nm: 0.35dB/km x total km + 0.05 dB/splice x no. of splices + 0.5dB/connector x no. of connectors.

Table 1-1(a)
DWSM Optical Fibre Characteristics

Fibre Description:	Dual-Window Single-Mode
Mode Field Diameter:	8.6 to 9.5 μm ($\pm 0.6\mu\text{m}$)
Cladding Diameter:	125.0 μm $\pm 1 \mu\text{m}$
Mode field concentricity error	$\leq 0.6\mu\text{m}$
Cladding non-circularity	$\leq 1\%$
Cable Cut-off Wavelength λ_{cc}	$\leq 1260 \text{ nm}$
1550 nm loss performance	As per ITU-T G.652 D
Proof Test Level	$\geq 0.69 \text{ Gpa}$
Attenuation Coefficient:	@ 1310 nm $\leq 0.35 \text{ dB/km}$ @ 1550 nm $\leq 0.21 \text{ dB/km}$
Chromatic Dispersion; Maximum:	18 ps/(nm x km) @ 1550 nm 3.5 ps/(nm x km) 1288-1339 nm 5.3 ps/(nm x km) 1271-1360nm
Zero Dispersion Wavelength:	1300 to 1324nm
Zero Dispersion Slope:	0.092 ps/(nm xkm) maximum
Polarization mode dispersion coefficient	$\leq 0.2 \text{ ps/km}^{\wedge}1/2$
Temperature Dependence:	Induced attenuation $\leq 0.05 \text{ dB}$ (-60°C - +85°C)
Bend Performance:	@ 1310 nm (75 \pm 2 mm dia Mandrel), 100 turns; Attenuation Rise $\leq 0.05 \text{ dB}$ @ 1550 nm (30 \pm 1 mm radius Mandrel), 100 turns; Attenuation Rise $\leq 0.05 \text{ dB}$ @ 1550 nm (32 \pm 0.5 mm dia Mandrel, 1 turn); Attenuation Rise $\leq 0.50 \text{ dB}$

1.2 Fibre Optic Cable Construction

The OPGW (Optical Ground Wire) cable is proposed to be installed on the EHV transmission lines. The design of cable shall account for the varying operating and environmental conditions that the cable shall experience while in service. The OPGW cable to be supplied shall be designed to meet the overall requirements of all the transmission lines. Normally the tower span of the lines shall not exceed 600 m, however, some of the spans may be up to around 1000 m or more. The exact details shall be collected by the Contractor during survey. To meet the overall requirement of all the transmission lines, the contractor may offer more

than one design without any additional cost to Employer, in case span length of more than 600 m is found during survey. The typical details of transmission lines are indicated in the Appendix A. Any other details, as required for cable design etc. shall be collected by the Contractor during survey.

1.2.1 Optical Fibre Cable Link Lengths

The estimated optical fibre link lengths are provided in Appendices as transmission line route length. However, the Contractor shall supply & install the optical fibre cable as required based on detailed site survey to be carried out by the Contractor during the project execution. The Contractor shall verify the transmission line route length during the survey and the Contract price shall be adjusted accordingly.

For the purpose of payment, the optical fibre link lengths are defined as transmission line route lengths from Gantry at one terminating station to the Gantry in the other terminating station. The actual cable lengths to be delivered shall take into account various factors such as sag, service loops, splicing, working lengths & wastage etc. and no additional payment shall be payable in this regard. The unit rate for FO cable quoted in the Bid price Schedules shall take into account all such factors.

1.2.2 Optical Fibre Identification

Individual optical fibres within a fibre unit and fibre units shall be identifiable in accordance with EIA/TIA 598 or IEC 60304 or Bellcore GR-20 colour-coding scheme.

Colouring utilized for colour coding optical fibres shall be integrated into the fibre coating and shall be homogenous. The colour shall not bleed from one fibre to another and shall not fade during fibre preparation for termination or splicing.

Each cable shall have traceability of each fibre back to the original fibre manufacturer's fibre number and parameters of the fibre. If more than the specified number of fibres is included in any cable, the spare fibres shall be tested by the cable manufacturer and any defective fibres shall be suitably bundled, tagged and identified at the factory by the vendor.

1.2.3 Buffer Tube

Loose tube construction shall be implemented. The individually coated optical fibre(s) shall be surrounded by a buffer for protection from physical damage during fabrication, installation and operation of the cable. The fibre coating and buffer shall be strippable for splicing and termination. Each fibre unit shall be individually identifiable utilizing colour coding. Buffer tubes shall be filled with a water-blocking gel.

1.2.4 Optical Fibre Strain & Sag-Tension chart

The OPGW cable shall be designed and installed such that the optical fibres experience no strain under all loading conditions defined in IS 802. Zero fibre strain condition shall apply even after a 25 year cable creep.

For the purpose of this specification, the following definitions shall apply:

- Maximum Working Tension (MWT) is defined as the maximum cable tension at which there is *no fibre strain*.
- The no fibre strain condition is defined as fibre strain of less than or equal to 0.05%, as determined by direct measurements through IEC/ ETSI (FOTP) specified optical reflectometry.
- The Cable strain margin is defined as the maximum cable strain at which there is no fibre strain.
- The cable Maximum Allowable Tension (MAT) is defined as the maximum tension experienced by the Cable under the worst case loading condition.
- The cable max strain is defined as the maximum strain experienced by the Cable under the worst case loading condition.
- The cable Every Day Tension (EDT) is defined as the maximum cable tension on any span under normal conditions.
- The Ultimate /Rated Tensile Strength (UTS/ RTS/ breaking strength) is defined as the maximum tensile load applied and held constant for one minute at which the specimen shall not break.

While preparing the Sag-tension charts for the OPGW cable the following conditions shall be met:

- The Max Allowable Tension (MAT) / max strain shall be less than or equal to the MWT/ Strain margin of the cable.
- The sag shall not exceed the earth wire sag in all conditions.
- The Max Allowable Tension shall also be less than or equal to 0.4 times the UTS.
- The 25 year creep at 25% of UTS (creep test as per IEEE 1138) shall be such that the 25 year creep plus the cable strain at Max Allowable Tension (MAT) is less than or equal to the cable strain margin.
- The everyday tension (EDT) shall not exceed 20% of the UTS for the OPGW cable.

The Sag-tension chart of OPGW cable indicating the maximum tension, cable strain and sag shall be calculated and submitted along with the bid under various conditions mentioned below:

1. 53° C , no wind and no ice
2. 32° C, no wind and no ice
3. 0°C, no wind and no ice
4. 32° C, full wind and no ice
5. 32° C, 75% full wind and no ice
6. 0° C, 2/3rd / 36% of full wind (IS 802:1977/1995)

The above cases shall be considered for the spans from 100 m to 600 m or higher span length in the range of 50 m spans. Max. Vertical sag, max. tension and max sag at 0° C & no wind shall be considered in line with the design parameter of transmission line. The typical details

are indicated in the Appendix A. The full wind load shall be considered as the design wind load for all the specified transmission lines as per relevant IS 802 version and the sag-tension chart shall be submitted considering the transmission lines. In case of any span higher than 600m, suitable OPGW cable meeting sag-tension requirement of transmission line shall also be provided by the Contractor. The Contractor shall submit the stringing chart for review of Employer.

1.2.5 Cable Materials

The materials used for optical fibre cable construction, shall meet the following requirements:

1.2.5.1 Filling Materials

The interstices of the fibre optic unit and cable shall be filled with a suitable compound to prohibit any moisture ingress or any water longitudinal migration within the fibre optic unit or along the fibre optic cable. The water tightness of the cable shall meet or exceed the test performance criteria as per IEC 60794-1-F-5.

The filling compound used shall be a non-toxic homogenous waterproofing compound that is free of dirt and foreign matter, non-hygroscopic, electrically nonconductive and non-nutritive to fungus. The compound shall also be fully compatible with all cable components it may come in contact with and shall inhibit the generation of hydrogen within the cable.

The waterproofing filling materials shall not affect fibre coating, colour coding, or encapsulant commonly used in splice enclosures, shall be dermatologically safe, non-staining and easily removable with a non-toxic cleaning solvent.

1.2.5.2 Metallic Members

When the fibre optic cable design incorporates metallic elements in its construction, all metallic elements shall be electrically continuous.

1.2.6 Marking, Packaging and Shipping

This section describes the requirements for marking, packaging and shipping the overhead fibre optic cable.

- (a) Drum Markings: Each side of every reel of cable shall be permanently marked in white lettering with the vendors' address, the Purchaser's destination address, cable part number and specification as to the type of cable, length, number of fibres, a unique drum number including the name of the transmission line & segment no., factory inspection stamp and date.
- (b) Cable Drums: All optical fibre cabling shall be supplied on strong drums provided with lagging of adequate strength, constructed to protect the cabling against all damage and displacement during transit, storage and subsequent handling during installation. Both ends of the cable shall be sealed as to prevent the escape of filling

compounds and dust & moisture ingress during shipment and handling. Spare cable caps shall be provided with each drum as required.

The spare cable shall be supplied on sturdy, corrosion resistant, steel drums suitable for long periods of storage and re-transport & handling.

There shall be no factory splices allowed within a continuous length of cable. Only one continuous cable length shall be provided on each drum. The lengths of cable to be supplied on each drum shall be determined by a "schedule" prepared by the Contractor and approved by the owner.

1.3 Optical Ground Wire (OPGW)

OPGW cable construction shall comply with IEEE-1138, 2009. The cable provided shall meet both the construction and performance requirements such that the ground wire function, the optical fibre integrity and optical transmission characteristics are suitable for the intended purpose. The cable shall consist of optical fibre units as defined in this specification. There shall be no factory splices within the cable structure of a continuous cable length.

The composite fibre optic overhead ground wire shall be made up of multiple buffer tubes embedded in a water tight aluminium/aluminium alloy/stainless steel with aluminium coating protective central fibre optic unit surrounded by concentric-lay stranded metallic wires in single or multiple layers. Each buffer tube shall have maximum 12 no. of fibres. All fibres in single buffer tube or directly in central fibre optic unit is not acceptable. The dual purpose of the composite cable is to provide the electrical and physical characteristics of conventional overhead ground wire while providing the optical transmission properties of optical fibre.

1.3.1 Central Fibre Optic Unit

The central fibre optic unit shall be designed to house and protect multiple buffered optical fibre units from damage due to forces such as crushing, bending, twisting, tensile stress and moisture. The central fibre optic unit and the outer stranded metallic conductors shall serve together as an integral unit to protect the optical fibres from degradation due to vibration and galloping, wind and ice loadings, wide temperature variations, lightning and fault current, as well as environmental effects which may produce hydrogen.

The OPGW design of dissimilar materials such as stainless steel tube with aluminium or aluminium –clad-steel wire strands are not allowed. Central fibre optic unit may be of aluminium or stainless steel tube with aluminium protective coating. In case of aluminium protective coating, the coating must completely cover the tubes leaving no exposed areas of tubing that can make electrical contact either directly or indirectly through moisture, contamination, protrusions, etc with the surrounding stranded wires. The tube may be fabricated as a seamless tube, seam welded, or a tube without a welded seam.

1.3.2 Basic Construction

The OPGW cable construction shall conform to the applicable requirements of this specification, applicable clauses of IEC 61089 related to stranded conductors and Table 1.2(a) OPGW Mechanical and Electrical Characteristics. In addition, the basic construction shall include bare concentric-lay-stranded metallic wires with the outer layer having left hand lay. The wires may be of multiple layers with a combination of various metallic wires within each layer. The direction of lay for each successive layer shall be reversed. The finished wires shall contain no joints or splices unless otherwise agreed to by the Employer and shall conform to all applicable clauses of IEC 61089 as they pertain to stranded conductors.

The wires shall be so stranded that when the complete OPGW is cut, the individual wires can be readily regrouped and then held in place by one hand.

1.3.3 Breaking Strength

The rated breaking strength of the completed OPGW shall be taken as no more than 90 percent of the sum of the rated breaking strengths of the individual wires, calculated from their nominal diameter and the specified minimum tensile strength.

The rated breaking strength shall not include the strength of the optical unit. The fibre optic unit shall not be considered a load bearing tension member when determining the total rated breaking strength of the composite conductor.

1.3.4 Electrical and Mechanical Requirements

Table 1-2(a) provides OPGW Electrical and Mechanical Requirements for the minimum performance characteristics. Additionally, the OPGW mechanical & electrical characteristics shall be similar to that of the earthwire being replaced such that there is no or minimal consequential increase in stresses on towers. For the purposes of determining the appropriate Max Working Tension limit for the OPGW cable IS 802:1995 and IS 875: 1987 shall be applied. However the OPGW installation sag & tension charts shall be based on IS 802 version to which the line is originally designed. For the OPGW cable design selection and preparation of sag tension charts, the limits specified in this section shall also be satisfied. The Bidder shall submit sag-tension charts for the above cases with their bids.

Table 1.2(a)
OPGW Electrical and Mechanical Requirements

(1)	Everyday Tension	$\leq 20\%$ of UTS of OPGW
(2)	D.C. Resistance at 20°C:	< 1.0 ohm/Km
(3)	Short Circuit Current	≥ 6.32 kA for 1.0 second

1.3.5 Operating conditions

Since OPGW shall be located at the top of the transmission line support structure, it will be subjected to Aeolian vibration, Galloping and Lightning strikes. It will also carry ground fault currents. Therefore, its electrical and mechanical properties shall be same or similar as those required of conventional ground conductors.

1.4 Installation Hardware

The scope of supply includes all required fittings and hardware such as Tension assembly, Suspension assembly, Vibration dampers, Reinforcing rods, Earthing clamps, Downlead clamps, splice enclosure etc. The Bidder shall provide documentation justifying the adequacy and suitability of the hardware supplied. The quantity of hardware & fittings to meet any eventuality during site installation minimum @ 1% shall also be provided as part of set/km for each transmission line without any additional cost to Employer.

The OPGW hardware fittings and accessories shall follow the general requirements regarding design, materials, dimensions & tolerances, protection against corrosion and markings as specified in clause 4.0 of EN 61284: 1997 (IEC 61284). The shear strength of all bolts shall be at least 1.5 times the maximum installation torque. The OPGW hardware & accessories drawing & Data Requirement Sheets (DRS) document shall consist of three parts: (1) A technical particulars sheet (2) An assembly drawing i.e. level 1 drawing and (3) Component level drawings i.e. level 2 & lower drawings. All component reference numbers, dimensions and tolerances, bolt tightening torques & shear strength and ratings such as UTS, slip strength etc shall be marked on the drawings.

The fittings and accessories described herein are indicative of installation hardware typically used for OPGW installations and shall not necessarily be limited to the following:

- (a) Suspension Assemblies: Preformed armour grip suspension clamps and aluminium alloy armour rods/ reinforcing rods shall be used. The suspension clamps shall be designed to carry a vertical load of not less than 25 KN. The suspension clamps slippage shall occur between 12kN and 17 kN as measured.

The Contractor shall supply all the components of the suspension assembly including shackles, bolts, nuts, washers, split pins, etc. The total drop of the suspension assembly shall not exceed 150 mm (measured from the centre point of attachment to the centre point of the OPGW). The design of the assembly shall be such that the direction of run of the OPGW shall be the same as that of the conductor.

- (b) Dead End Clamp Assemblies: All dead end clamp assemblies shall preferably be of performed armoured grip type and shall include all necessary hardware for attaching the assembly to the tower strain plates. Dead end clamps shall allow the OPGW to pass through continuously without cable cutting. The slip strength shall be rated not less than 95% of the rated tensile strength of the OPGW.
- (c) Clamp Assembly Earthing Wire: Earthing wire consisting of a 1500 mm length of aluminium or aluminium alloy conductor equivalent in size to the OPGW shall be used to earth suspension and dead end clamp assemblies to the tower structure. The earthing wire shall be permanently fitted with lugs at each end. The lugs shall be attached to the clamp assembly at one end and the tower structure at the other.
- (d) Structure Attachment Clamp Assemblies: Clamp assemblies used to attach the OPGW to the structures, shall have two parallel grooves for the OPGW, one on either side of

the connecting bolt. The clamps shall be such that clamping characteristics do not alter adversely when only one OPGW is installed. The tower attachment plates shall locate the OPGW on the inside of the tower and shall be attached directly to the tower legs/cross-members without drilling or any other structural modifications.

- (e) Vibration Dampers: Vibration dampers type 4R Stockbridge or equivalent, having four (4) different frequencies spread within the Aeolian frequency bandwidth corresponding to wind speed of 1m/s to 7 m/s, shall be used for suspension and tension points in each span. The Contractor shall determine the exact numbers and placement(s) of vibration dampers through a detailed vibration analysis as specified in technical specifications.

One damper minimum on each side per OPGW cable for suspension points and two dampers minimum on each side per OPGW cable for tension points shall be used for nominal design span of 400 meters. For all other ruling spans, the number of vibration damper shall be based on vibration analysis.

The clamp of the vibration damper shall be made of high strength aluminum alloy of type LM-6. It shall be capable of supporting the damper and prevent damage or chaffing of the conductor during erection or continued operation. The clamp shall have smooth and permanent grip to keep the damper in position on the OPGW cable without damaging the strands or causing premature fatigue failure of the OPGW cable under the clamp. The clamp groove shall be in uniform contact with the OPGW cable over the entire clamping surface except for the rounded edges. The groove of the clamp body and clamp cap shall be smooth, free from projections, grit or other materials which could cause damage to the OPGW cable when the clamp is installed. Clamping bolts shall be provided with self locking nuts and designed to prevent corrosion of threads or loosening in service.

The messenger cable shall be made of high strength galvanised steel/stain less steel. It shall be of preformed and post formed quality in order to prevent subsequent droop of weight and to maintain consistent flexural stiffness of the cable in service. The messenger cable other than stainless steel shall be hot dip galvanised in accordance with the recommendations of IS:4826 for heavily coated wires.

The damper mass shall be made of hot dip galvanised mild steel/cast iron or a permanent mould cast zinc alloy. All castings shall be free from defects such as cracks, shrinkage, inclusions and blow holes etc. The surface of the damper masses shall be smooth.

The damper clamp shall be casted over the messenger cable and offer sufficient and permanent grip on it. The messenger cable shall not slip out of the grip at a load less than the mass pull-off value of the damper. The damper masses made of material other-than zincalloy shall be fixed to the messenger cable in a suitable manner in order to avoid excessive stress concentration on the messenger cables which shall cause premature fatigue failure of the same. The messenger cable ends shall be suitably and effectively sealed to prevent corrosion. The damper mass made of zinc alloy shall be casted over the messenger cable and have sufficient and permanent grip on the messenger cable under all service conditions.

The contractor must indicate the clamp bolt tightening torque to ensure that the slip strength of the clamp is maintained between 2.5 kN and 5 kN. The clamp when installed on the OPGW cable shall not cause excessive stress concentration on the OPGW cable leading to permanent deformation of the OPGW strands and premature fatigue failure in operation.

The vibration analysis of the system, with and without damper and dynamic characteristics of the damper as detailed in Technical Specification, shall have to be submitted. The technical particulars for vibration analysis and damping design of the system are as follows:

Sr. No.	Description	Technical Particulars
1.	Span Length in meters (i) Ruling Design Span: (ii) Maximum Span: (iii) Minimum Span:	400 meters 1100 meters 100 meters
2.	Configuration:	As per Specifications
3.	Tensile load in each:	As per sag tension calculations
4.	Armour rods used:	Standard preformed armour rods/AGS
5.	Maximum permissible dynamic strain:	+/- 150 micro strains

The damper placement chart for spans ranging from 100m to 1100m shall be submitted by the Contractor. Placement charts should be duly supported with relevant technical documents and sample calculations.

The damper placement charts shall include the following

- (1) Location of the dampers for various combinations of spans and line tensions clearly indicating the number of dampers to be installed per OPGW cable per span.
- (2) Placement distances clearly identifying the extremities between which the distances are to be measured.
- (3) Placement recommendation depending upon type of suspension clamps (viz Free center type/Armour grip type etc.)
- (4) The influence of mid span compression joints, repair sleeves and armour rods (standard and AGS) in the placement of dampers

1.5 Fibre Optic Splice Enclosures (Joint Box)

All splices shall be encased in Fibre Optic Splice Enclosures. Suitable splice enclosures shall be provided to encase the optical cable splices in protective, moisture and dust free environment. Splice enclosures shall comply with ingress protection class IP 66 or better. The splice enclosures shall be designed for the storage and protection of required number of optical fibre splices and equipped with sufficient number of splice trays for splicing all fibres in the cable. No more than 12 fibres shall be terminated in a single splice tray. They shall be

filled with suitable encapsulate that is easily removable should re-entry be required into the enclosures.

Splice enclosures shall be suitable for outdoor use with each of the cable types provided under this contract. Splice enclosures shall be appropriate for mounting on transmission line towers above anti-climb guard levels at about 10 metres from top of the tower and shall accommodate pass-through splicing. The actual mounting height and location shall be finalised after Survey. Contractor shall be responsible for splicing of fibres and installation of splice enclosures.

1.5.1 Optical Fibre Splices

Splicing of the optical fibre cabling shall be minimized through careful Contractor planning. There shall be no mid-span splices allowed. All required splices shall be planned to occur on tower structures. All optical fibre splicing shall comply with the following:

- (a) All fibre splices shall be accomplished through fusion splicing.
- (b) Each fibre splice shall be fitted with a splice protection sheath fitted over the final splice.
- (c) All splices and bare fibre shall be neatly installed in covered splice trays.
- (d) For each link, bi-directional attenuation of single mode fusion splices, shall not average more than 0.05 dB and no single splice loss shall exceed 0.1 dB when measured at 1550 nm.
- (e) For splicing, fibre optic cable service loops of adequate length shall be provided so that all splices occurring at tower structures can be performed at ground level.

1.6 Fibre Optic Approach Cables

For purposes of this specification, a fibre optic approach cable is defined as the Armoured underground fibre optic cable required to connect Overhead Fibre Optic Cable (OPGW) between the final in line splice enclosure on the gantry / tower forming the termination of the fibre cable on the power line and the Fibre Optic Distribution Panel (FODP) installed within the building. The estimated fibre optic approach cabling length requirements are indicated in the appendices. However, the Contractor shall supply & install the optical fibre approach cable as required based on detailed site survey to be carried out by the Contractor during the project execution and the Contract price shall be adjusted accordingly.

1.6.1 Basic Construction

The cable shall be suitable for direct burial, laying in trenches & PVC/Hume ducts, laying under false flooring and on indoor or outdoor cable raceways.

1.6.2 Jacket Construction & Material

The Approach Cable shall be a UV resistant, rodent proof, armoured cable with metallic type of armouring. The outer cable jacket for approach cable shall consist of carbon black polyethylene resin to prevent damage from exposure to ultra-violet light, weathering and high levels of pollution. The jacket shall conform to ASTM D1248 for density.

1.6.3 Optical, Electrical and Mechanical Requirements

Approach cable shall contain fibres with identical optical/ physical characteristics as those in the OPGW cables. The cable core shall comprise of tensile strength member(s), fibre support/bedding structure, core wrap/bedding, and an overall impervious jacket.

1.7 Fibre Optic Distribution Panel

Fibre Optic Distribution Panels (wall mounted) is required for each location for termination of fibres in a manner consistent with the following:

- (a) FODPs shall be suitable for use with each of the cable types provided as part of this contract. FODPs shall accommodate pass-through splicing and fibre terminations.
- (b) FODPs for indoor use shall be supplied in suitable cabinets/racks with locking arrangement.
- (c) All FODPs shall be of corrosion resistant, robust construction and shall allow both top or bottom entry for access to the splice trays. Ground lugs shall be provided on all FODPs and the Contractor shall ensure that all FODPs are properly grounded. The FODP shall meet or exceed ingress protection class IP55 specifications.

1.7.1 Optical Fibre Connectors

Optical fibres shall be connectorised with FC-PC type connectors preferably. Alternatively connector with matching patch cord shall also be acceptable. Fibre optic couplings supplied with FODPs shall be appropriate for the fibre connectors to be supported. There shall be no adapters.

1.8 Service Loops

For purposes of this specification, cable and fibre service loops are defined as slack (extra) cable and fibre provided for facilitating the installation, maintenance and repair of the optical fibre cable plant.

- (a) Outdoor Cable Service Loops: In-line splice enclosures installed outdoors and mounted on the utility towers shall be installed with sufficient fibre optic cable service loops such that the recommended minimum bend radius is maintained while allowing for installation or maintenance of the cable to be performed in a controlled environment at ground level.

- (b) Indoor Cable Service Loops: FODPs shall provide at least three (3) metres of cable service loop. Service loops shall be neatly secured and stored, coiled such that the minimum recommended bend radius' are maintained.
- (c) Fibre Units Service Loops: For all fibre optic cable splicing, the cable shall be stripped back a sufficient length such that the fan-out of fibre units shall provide for at least one (1) metre of fibre unit service loop between the stripped cable and the bare fibre fan-out.
- (d) Pigtail Service Loops : Connectorised pigtails spliced to bare fibres shall provide at least 1 metre of service loop installed in the FODP fibre organizer and at least one (1) metre of service loop to the couplings neatly stored behind the FODP coupling panels.
- (e) Fibre Service Loops : At least 0.5 metre of bare fibre service loop shall be provided on each side of all fibre splices. The bare fibre service loops shall be neatly and safely installed inside covered splice trays.

1.9 Test Equipment

Appendix-B provides mandatory test equipment requirements, to be provided. The parameters / features of the mandatory equipments are enumerated in Table 1.3 below:

Table 1.3

Sr. No.	Test equipment	Parameter
A.	Test Equipments for OPGW cable	
1.	OTDR (Optical Time Domain Reflectometer) for 1310/1550 nm with laser source.	Equivalent to Anritsu MW9076B1 or better.
2.	Optical Attenuators (variable 1310/1550 nm).	Equivalent to JDSU OLA55 or better.
3.	Optical Power meter (1310/1550 nm)	Equivalent to JDSU OLP55 or better.
4.	Laser Light Source (1310/1550 nm)	Equivalent to EXFO FLS300-23BL or better
5.	Optical Fibre Fusion Splicer Incl. Fibre cleaver	Equivalent to Sumitomo T-39-SE or better.
6.	Splicer Kit	FIS-FI-0053-FF or equivalent
7.	Optical test accessory kit including all necessary connectors, adaptors, cables, terminations and other items required for testing	FIS-FI-0053-TS-ST or equivalent

In case the offered make/model of test equipment has multiple options for the parameters, the option of higher range shall be acceptable. The supplied test equipment shall be suitable for use in the high EMI/EMC environment. The Contractor shall submit performance certificate

for offered test equipment from at least one customer. The Contractor shall offer only reputed make test equipment such as Acterna (JDSU)/Anritsu/Sumitomo/Agilent/EXFO etc.

Part-II:**INSPECTION & TESTING REQUIREMENT**

All materials furnished and all work performed under this Contract shall be inspected and tested. Deliverables shall not be shipped until all required inspections and tests have been completed, and all deficiencies have been corrected to comply with this Specification and approved for shipment by the Employer.

Except where otherwise specified, the Contractor shall provide all manpower and materials for tests, including testing facilities, logistics, power and instrumentation, and replacement of damaged parts. The costs shall be borne by the Contractor and shall be deemed to be included in the contract price.

The entire cost of testing for factory, production tests and other test during manufacture specified herein shall be treated as included in the quoted unit price of materials, except for the expenses of Inspector/Employer's representative.

Acceptance or waiver of tests shall not relieve the Contractor from the responsibility to furnish material in accordance with the specifications.

All tests shall be witnessed by the Employer and/or its authorized representative (hereinafter referred to as the Employer) unless the Employer authorizes testing to proceed without witness. The Employer representative shall sign the test form indicating approval of successful tests.

Should any inspections or tests indicate that specific item does not meet Specification requirements, the appropriate items shall be replaced, upgraded, or added by the Contractor as necessary to correct the noted deficiencies at no cost to the Employer. After correction of a deficiency, all necessary retests shall be performed to verify the effectiveness of the corrective action.

The Employer reserves the right to require the Contractor to perform, any other reasonable test(s) at the Contractor's premises, on site, or elsewhere in addition to the specified Type, Acceptance, Routine, or Manufacturing tests to assure the Employer of specification compliance.

2.0 Testing Requirements

Following are the requirements of testing:

1. Type Testing
2. Factory Acceptance Testing
3. Site Acceptance Testing

2.1 Type Testing

"Type Tests" shall be defined as those tests which are to be carried out to prove the design, process of manufacture and general conformity of the materials to this Specification. Type Testing shall comply with the following:

- (a) All cable & equipment being supplied shall conform to type tests as per technical specification.
- (b) The test reports submitted shall be of the tests conducted within last seven (7) years for OPGW cable prior to the date of proposal/offer submitted. In case the test reports are older than seven (7) years for OPGW cable on the date of proposal/offer, the Contractor shall repeat these tests at no extra cost to the Employer.
- (c) The Contractor shall submit, along with Tender Documents, copies of test reports for all of the Type Tests that are specified in the specifications and that have previously been performed. These reports may be accepted by the Employer only if they apply to materials and equipment that are essentially identical to those due to be delivered under the Contract and only if test procedures and parameter values are identical to those specified in this specifications carried out at accredited labs and witnessed by third party / customer's representatives.

2.1.1 List of Type Tests

The type testing shall be conducted on the following items

- (a) Optical fibres
 (b) OPGW Cable
 (c) OPGW Cable fittings
 (d) Vibration Damper
 (e) Splice Enclosure (Joint Box)
 (f) Approach Cable

2.1.1.1 Type Tests for Optical Fibres

The type tests listed below in table 2-1 shall be conducted on DWDM fibres to be supplied as part of overhead cables. The tests specific to the cable type are listed in subsequent sections.

Table 2-1
Type Tests For Optical Fibres

Sr. No.	Test Name	Acceptance Criteria	Test procedure
1.	Attenuation	As per Selection-01 of TS	IEC 60793-1-40 Or EIA/TIA 455-78A
2.	Attenuation Variation with Wavelength	As per Selection-01 of TS	IEC 60793-1-40 Or EIA/TIA 455-78A
3.	Attenuation at Water Peak	As per Selection-01 of TS	IEC 60793-1-40 Or EIA/TIA 455-78A
4.	Temp. Cycling (Temp. dependence of Attenuation)	As per Selection-01 of TS	IEC 60793-1-52 Or EIA/TIA 455-3A, 2 cycles

5.	Attenuation With Bending (Bend Performance)	As per Selection-01 of TS	IEC 60793-1-47 Or EIA/TIA 455-62A
6.	Mode Field Diameter	As per Selection-01 of TS	IEC 60793-1-45 Or EIA/TIA 455-164A/167A/174
7.	Chromatic Dispersion	As per Selection-01 of TS	IEC 60793-1-42 Or EIA/TIA 455-168A/169A/175A
8.	Cladding Diameter	As per Selection-01 of TS	IEC 60793-1-20 Or EIA/TIA 455-176
9.	Point Discontinuities of attenuation	As per Selection-01 of TS	IEC 60793-1-40 Or EIA/TIA 455-59
10.	Core-Clad concentricity error	As per Selection-01 of TS	IEC 60793-1-20 Or EIA/TIA 455-176
11.	Fibre Tensile Proof Testing	As per Selection-01 of TS	IEC 60793-1-30 Or EIA/TIA 455-31B

2.1.1.2 Type Tests for OPGW Cables

The type tests to be conducted on the OPGW cable are listed in Table 2-2 Type Tests for OPGW Cables. Unless specified otherwise in the technical specifications or the referenced standards, the optical attenuation of the specimen, measured during or after the test as applicable, shall not increase by more than 0.05 dB/Km.

Table 2-2
Type tests for OPGW Cable

Sr. No.	Test Name	Test Description	Test Procedure	
1.	Water Ingress Test	IEEE 1138-2009	IEEE 1138-2009 (IEC 60794-1-2 Method F5 or EIA/TIA 455-82B): Test duration : 24 hours	
2.	Seepage of filling compound	IEEE 1138-2009	IEEE 1138-2009 (EIA/TIA 455-81B)	Preconditioning period: 72 hours. Test duration: 24 hours.
3.	Short Circuit Test	IEEE 1138-2009	IEEE 1138-2009	Fibre attenuation shall be continuously monitored and recorded through a digital data logging system or equivalent means. A suitable temperature sensor such as thermocouple shall be used to monitor and record the temperature inside the OPGW tube in addition to

				<p>monitoring & recording the temperatures between the strands and between optical tube and the strand as required by IEEE 1138.</p> <p>Test shall be conducted with the tension clamps proposed to be supplied. The cable and the clamps shall be visually inspected for mechanical damage and photographed after the test.</p>
		Or IEC 60794-4-10/ IEC 60794-1-2 (2003) Method H1		Initial temperature during the test shall be greater than of equal to ambient field temperature.
4.	Aeolian Vibration Test	IEEE 1138-2009 Or IEC 60794-4-10/ IEC 60794-1-2, Method E19	IEEE 1138-2009	<p>Fibre attenuation shall be continuously monitored and recorded through a digital data logging system or equivalent means.</p> <p>The vibration frequency and amplitude shall be monitored and recorded continuously. All fibres of the test cable sample shall be spliced together in serial for attenuation monitoring.</p> <p>Test shall be conducted with the tension/suspension clamps proposed to be supplied. The cable and the clamps shall be visually inspected for mechanical damage and photographed after the test.</p>
5.	Galloping test	IEEE 1138-2009	IEEE 1138-2009	Test shall be conducted with the tension/suspension clamps proposed to be supplied. The cable and clamps shall be visually inspected for mechanical damage and photographed after the test. All fibres of the test cable sample shall be spliced together in serial for

				attenuation monitoring.
6.	Cable Bend Test	Procedure 2 in IEC 60794-1-2 Method E11		The short-term and longterm bend tests shall be conducted in accordance with Procedure 2 in IEC 60794-1-2 E11 to determine the minimum acceptable radius of bending without any increase in attenuation or any other damage to the fibre optic cable core such as bird caging, deformation, kinking and crimping.
7.	Sheave Test	IEEE 1138-2009 OR IEC 60794-1-2 (2003) Method E1B	IEEE 1138-2009	Fibre attenuation shall be continuously monitored and recorded through a digital data logging system or equivalent means. The Sheave dia. shall be based on the pulling angle and the minimum pulley dia employed during installation. All fibres of the test cable sample shall be spliced together in serial for attenuation monitoring.
8.	Crush Test	IEEE 1138-2009	IEEE 1138-2009 (IEC 60794-1-2, Method E3/ EIA/TIA 455-41B)	The crush test shall be carried out on a sample of approximately one (1) metre long in accordance with IEC 60794-1-2 E3. A load equal to 1.3 times the weight of a 400-metre length of fibre optic cable shall be applied for a period of 10 minutes. A permanent or temporarily increase in optical attenuation value greater than 0.1 dB change in sample shall constitute failure. The load shall be further increased in small increments until the measured attenuation of the optical waveguide fibres increases and the failure load recorded along with results.
9	Impact Test	IEEE 1138-2009	IEEE 1138-2009, (IEC 60794-1-2 E4/ EIA/TIA 455-25B)	The impact test shall be carried out in accordance with IEC 60794-1-2 E4. Five separate impacts of 0.1-0.3kgm shall be applied.

				The radius of the intermediate piece shall be the reel drum radius $\pm 10\%$. A permanent or temporary increase in optical attenuation value greater than 0.1 dB/km change in sample shall constitute failure.
10.	Creep Test	IEEE 1138-2009	IEEE 1138-2009	As per Aluminium Association Method, the best-fit straight line shall be fitted to the recorded creep data and shall be extrapolated to 25 years. The strain margin of the cable at the end of 25 years shall be calculated. The time when the creep shall achieve the strain margin limits shall also be calculated.
11.	Fibre Strain Test	IEEE 1138-1994	IEEE 1138-1994	
12.	Strain Margin Test	IEEE 1138-2009	IEEE 1138-2009	
13.	Stress strain Test	IEEE 1138-2009	IEEE 1138-2009	
14.	Cable Cut-off wavelength Test	IEEE 1138-1994	IEEE 1138-1994	
15.	Temperature Cycling Test	IEEE 1138-2009	IEEE 1138-2009 Or IEC 60794-1-2, Method F1	
16.	Corrosion (Salt Spray) Test	EIA/TIA 455-16A		
17.	Tensile Performance Test	IEC 60794-1-2 E1 / EIA/TIA 455-33B		The test shall be conducted on a sample of sufficient length in accordance with IEC 60794-1-2 E1. The attenuation variation shall not exceed 0.05 dB/Km up to 90% of RTS of fibre optic cable. The load shall be increased at a steady rate up to rated tensile strength and held for one (1) minute. The fibre optic cable sample shall not fail during the period. The applied load shall then be increased until the failing load is reached and the value

			recorded.
18.	Lightning Test	IEC 60794-4-10 / IEC 60794-1-2 (2003)	The OPGW cable construction shall be tested in accordance with IEC 60794-1-2, Method H2 for Class 1.
19.	DC Resistance Test (IEC 60228)	On a fibre optic cable sample of minimum 1 metre length, two contact clamps shall be fixed with a predetermined bolt torque. The resistance shall be measured by a Kelvin double bridge by placing the clamps initially zero metre and subsequently one metre apart. The tests shall be repeated at least five times and the average value recorded after correcting at 20°C.	

2.1.1.3 Type Test on OPGW Cable Fittings

The type tests to be conducted on the OPGW Cable fittings and accessories are listed below:

(i) Mechanical Strength Test for Suspension/Tension Assembly

Applicable Standards: IEC 61284, 1997.

Suspension Assembly

The armour rods /reinforcement rods are assembled on to the approved OPGW using the Installation Instructions to check that the assembly is correctly fitted and is the same that will be carried out during installations.

Part 1:

The suspension assembly shall be increased at a constant rate up to a load equal to 50% of the specified minimum Failure Load increased and held for one minute for the test rig to stabilise. The load shall then be increased at a steady rate to 67% of the minimum Failure Load and held for five minutes. The angle between the cable, the Suspension Assembly and the horizontal shall not exceed 16°. This load shall then be removed in a controlled manner and the Protection Splice disassembled. Examination of all the components shall be made and any evidence of visual deformation shall be documented.

Part 2:

The Suspension clamp shall then be placed in the testing machine. The tensile load shall gradually be increased up to 50% of the specified Minimum Failure Load of the Suspension Assembly and held for one minute for the Test Rig to stabilise and the load shall be further increased at a steady rate until the specified minimum Failure Load is reached and held for one minute. No fracture should occur during this period. The applied load shall then be increased until the failing load is reached and the value shall be documented.

Tension Assembly

The Tension Assembly is correctly fitted and is the same that will be carried out during installations.

Part 1:

The tension assembly (excluding tension clamp) shall be increased at a constant rate up to a load equal to 50% of the specified minimum Failure Load increased at a constant rate and held for one minute for the test rig to stabilise. The load shall then be increased at a steady rate to 67% of the minimum Failure Load and held for five minutes. This load shall then remove in a controlled manner and the Tension Assembly disassembled. Examination of the Tension Dead-End and associated components shall be made and any evidence of visual deformation shall be documented.

Part 2:

The Tension Dead-End and associated components shall then be reassembled and bolts tightened as before. The tensile load shall gradually be increased up shall gradually be increased up to 50% of the specified Minimum Failure Load of the Tension Assembly and held for one minute for the Test Rig to stabilise and the load shall be further increased at a steady rate until the specified minimum Failure Load is reached and held for one minute. No fracture should occur during this period. The applied load shall then be increased until the failing load is reached and the value shall be documented.

Acceptance Criteria for Tension/Suspension Assembly:

- No evidence of binding of the Nuts or Deformation of components at end of Part 1 of Test.
- No evidence of Fracture at the end of one minute at the minimum failure load during Part 2 of the Test.

Any result outside these parameters shall constitute a failure.

(ii) Clamp Slip Strength Test for Suspension Assembly

The suspension assembly shall be vertically suspended by means of a flexible attachment. A suitable length fibre optical cable shall be fixed in the clamps. Once the Suspension Clamp has been assembled, the test rig is tensioned to 1 kN and the position scale on the recorder 'zeroed'. The test rig is then tensioned to 2.5 kN and the relative positions of the Reinforcing Rods, Armour Rods and Suspension Clamp shall be marked by a suitable means to confirm any slippage after the test has been completed. The relative positions of the helical Armour Rods and associated Reinforcing Rods at each end shall be marked and also 2 mm relative position between clamp body and Armour Rods shall be marked on one side. The load shall be increased to 12 kN at a loading rate of 3 kN/min and held for one minute. At the end of this one minute period, the relative displacement between clamp body and the armour rods shall be observed. If the slippage is 2 mm or above, the test shall be terminated. Otherwise, at the end of one minute the position of the clamp body and 2 mm. relative positions between clamp body and armour rods shall be marked on the other side. After the one minute pause, the load shall be further increased at a loading rate of 3 kN/min, and recording of load and displacement shall continue until either the relative Position displacement between clamp body and armour rods reaches more

than 2 mm or the load reaches the maximum slip load of 17 kN. On reaching either of the above values the test is terminated. Visual examination of all paint marks shall be recorded, and a measurement of any displacement recorded in the Table of Results.

Acceptance Criteria:

The Suspension Clamp has passed the Slip Test if the following conditions are met:

- No slippage* shall occur at or below the specified minimum slip load.
 - * Definition of no slippage in accordance with IEC 61284, 1997:- Any relative movement less than 2 mm is accepted. The possible couplings or elongations produced by the cable as a result of the test itself are not regarded as slippage.
- Slippage shall occur between the specified maximum and minimum slip load of 12 - 17 kN.
- There shall be no slippage of the Reinforcing Rods over the cable, and no slippage of the Armour Rods over the Reinforcing Rods.
- The relative movement (i.e. more than 2 mm between Armour Rods & Clamp body) between minimum 12 kN and maximum slip 17 kN, shall be considered as slip.
- The Armour Rods shall not be displaced from their original lay or damaged**.
 - ** Definition of no damage in accordance with convention expressed in IEC 61284: 1997 no damage, other than surface flattening of the strands shall occur.

Any result outside these parameters is a failure.

(iii) Slip Strength Test of Tension Clamp

Tension clamps shall be fitted on an 8 m length of fibre optic cable on both ends. The assembly shall be mounted on a tensile testing machine and anchored in a manner similar to the arrangement to be used in service. A tensile load shall gradually be applied up to 20 % of the RTS of OPGW. Displacement transducers shall be installed to measure the relative movement between the OPGW relative to the Reinforcing Rods and Tension Dead -End relative to Reinforcing Rods. In addition, suitable marking shall be made on the OPGW and Dead-End to confirm grip. The load shall be gradually increased at a constant rate up to 50 % of the UTS and the position scale of the recorder is zeroed. The load shall then gradually increased up to 95 % of the UTS and maintained for one minute. After one minute pause, the load shall be slowly released to zero and the marking examined and measured for any relative movement.

Acceptance Criteria:

- No movement* shall occur between the OPGW and the Reinforcing Rods, or between the Reinforcing Rods and the Dead-End assembly.

- No failure or damage or disturbance to the lay of the Tension Dead-End, Reinforcing Rods or OPGW.
 - * Definition of no movement as defined in IEC 61284: Any relative movement less than 2 mm is accepted. The possible couplings or elongations produced by the conductor as a result of the test itself are not regarded as slippage.

Any result outside these parameters shall constitute a failure.

(iv) Grounding Clamp and Structure Mounting Clamp Fit Test

For structure mounting clamp, one series of tests shall be conducted with two fibre optic cables installed, one series of tests with one fibre optic cable installed in one groove, and one series of tests with one fibre optic cable in the other groove. Each clamp shall be installed including clamping compound as required on the fibre optic cable. The nut shall be tightened on to the bolt by using torque wrench with a torque of 5.5 kgm or supplier's recommended torque and the tightened clamp shall be held for 10 minutes. After the test remove the fibre optic cable and examine all its components for distortion, crushing or breaking. Also the fibre optic cable shall be checked to ensure free movement within the core using dial callipers to measure the diameter of the core tube. The material shall be defined as failed if any visible distortion, crushing, cracking or breaking of the core tube is observed or the fibre optic cable within the core tube is not free to move, or when the diameter of the core tube as measured at any location in the clamped area is more than 0.5 mm larger or smaller of the core diameter as measured outside the clamped area.

(v) Structure Mounting Clamp Strength Test

The clamp and mounting assembly shall be assembled on a vertical 200 mm x 200 mm angle and a short length of fibre optic cable installed. A vertical load of 200 kg shall be applied at the end of the mounting clamp and held for 5 minutes. Subsequently, the load shall be increased to 400 kg and held for 30 seconds. Any visible distortion, slipping or breaking of any component of the mounting clamp or assembly shall constitute failure.

2.1.1.4 Type Test on Vibration Damper

(a) Dynamic Characteristic Test

The damper shall be mounted with its clamp tightened with torque recommended by the manufacturer on shaker table capable of simulating sinusoidal vibrations for Critical Aeolian Vibration frequency band ranging from $0.18/d$ to $1.4/d$ – where d is the OPGW cable diameter in meters. The damper assembly shall be vibrated vertically with a ± 1 mm amplitude from 5 to 15 Hz frequency and beyond 15 Hz at 0.5 mm to determine following characteristics with the help of suitable recording instruments.

- (i) Force Vs frequency
- (ii) Phase angle Vs frequency
- (iii) Power dissipation Vs frequency

The Force Vs frequency curve shall not show steep peaks at resonance frequencies and deep troughs between the resonance frequencies. The resonance frequencies shall be suitably spread within the Aeolian vibration frequency-band between the lower and upper dangerous frequency limits determined by the vibration analysis of fibre optic cable without dampers.

Acceptance criteria for vibration damper:

- (i) The above dynamic characteristics test on five damper shall be conducted.
- (ii) The mean reactance and phase angle Vs frequency curves shall be drawn with the criteria of best fit method.
- (iii) The above mean reactance response curve should lie within following limits:
V.D. for OPGW - $0.060 f$ to $0.357 f \text{ kgf/mm}^*$.
Where f is frequency in Hz.
- (iv) The above mean phase angle response curve shall be between 25° to 130° within the frequency range of interest.
- (v) If the above curve lies within the envelope, the damper design shall be considered to have successfully met the requirement.
- (vi) Visual resonance frequencies of each mass of damper is to be recorded and to be compared with the guaranteed values.

(b) Vibration Analysis

The vibration analysis of the fibre optic cable shall be done with and without damper installed on the span. The vibration analysis shall be done on a digital computer using energy balance approach. The following parameters shall be taken into account for the purpose of analysis.

- (i) The analysis shall be done for single fibre optic cable without armour rods. The tension shall be taken as 25% of RTS of fibre optic cable for a span ranging from 100 m to 1100 m.
- (ii) The self damping factor and flexural stiffness (EI) for fibre optic cable shall be calculated on the basis of experimental results. The details to experimental analysis with these data shall be furnished.
- (iii) The power dissipation curve obtained from Damper Characteristics Test shall be used for analysis with damper.
- (iv) Examine the Aeolian Vibration level of the fibre optic cable with and without vibration damper installed at the recommended location or wind velocity ranging from 0 to 30 Km per hour, predicting amplitude, frequency and vibration energy input.
- (v) From vibration analysis of fibre optic cable without damper, antinode vibration amplitude and dynamic strain levels at clamped span extremities as well as antinodes shall be examined and thus lower and upper dangerous frequency limits between which the Aeolian vibration levels exceed the specified limits shall be determined.
- (vi) From vibration analysis of fibre optic cable with damper(s) installed at the recommended location, the dynamic strain level at the clamped span

extremities, damper attachment point and the antinodes on the fibre optic cable shall be determined. In addition to above damper clamp vibration amplitude and antinodes vibration amplitudes shall also be examined.

The dynamic strain levels at damper attachment point, clamped span extremities and antinodes shall not exceed the specified limits. The damper clamp vibration amplitude shall not be more than that of the specified fatigue limits.

(c) Fatigue Tests

(i) Test Set Up

The fatigue tests shall be conducted on a laboratory set up with a minimum effective span length of 30m. The fibre optic cable shall be tensioned at 25% of RTS of fibre optic cable and shall not be equipped with protective armour rods at any point.

Constant tension shall be maintained within the span by means of lever arm arrangement. After the fibre optic cable has been tensioned, clamps shall be installed to support the fibre optic cable at both ends and thus influence of connecting hardware fittings are eliminated from the free span. The clamps shall not be used for holding the tension on the fibre optic cable. There shall be no loose parts, such as suspension clamps, U bolts, on the test span supported between clamps mentioned above. The span shall be equipped with vibration inducing equipment suitable for producing steady standing vibration. The inducing equipment shall have facilities for step less speed control as well as step less amplitude arrangement. Equipment shall be available for measuring the frequency, cumulative number of cycles and amplitude of vibration at any point along the span.

(ii) Fatigue Test

The vibration damper shall be installed on the test span with the manufacturer's specified tightening torque. It shall be ensured that the damper shall be kept minimum three loops away from the shaker to eliminate stray signals influencing damper movement.

The damper shall then be vibrated at the highest resonant frequency of each damper mass. For dampers involving torsional resonant frequencies, tests shall be done at torsional modes also in addition to the highest resonant frequencies at vertical modes. The resonance frequency shall be identified as the frequency at which each damper mass vibrates with the maximum amplitude on itself. The amplitude of vibration of the damper clamp shall be maintained not less than $\pm 25/f$ mm where f is the frequency in Hz.

The test shall be conducted for minimum ten million cycles at each resonant frequency mentioned above. During the test, if resonance shift is observed, the test frequency shall be tuned to the new resonant frequency.

The clamp slip test as mentioned herein shall be repeated after fatigue tests without retorquing or adjusting the damper clamp, and the clamp shall withstand a minimum load equal to 80% of the slip strength for a minimum duration of one minute.

After the above tests, the damper shall be removed from fibre optic cable and subjected to dynamic characteristics test. There shall not be any major deterioration in the characteristics of the damper. The damper then shall be cut open and inspected. There shall not be any broken, loose, or damaged part. There shall not be significant deterioration or wear of the damper. The fibre optic cable under clamp shall also be free from any damage.

For purposes of acceptance, the following criteria shall be applied:

- (1) There shall not be any resonant frequency shift before and after the test by more than $\pm 20\%$
- (2) The power dissipation of the damper before and after test at the individual resonant frequencies do not differ by more than $\pm 20\%$

Beside above tests, the type tests listed below in the table shall also be conducted on Vibration Damper

Sr. No.	Test Name	Test Procedure
1.	Visual Examination & Dimensional and material verification	IEC 61897 Clause 7.1 & 7.2
2.	Clamp Slip test	IEC 61897 Clause 7.5
3.	Clamp bolt tightening test	IEC 61897 Clause 7.7
4.	Attachments of weights to messenger cable	IEC 61897 Clause 7.8
5.	Attachment of clamps to messenger cable	IEC 61897 Clause 7.8
6.	Damper effectiveness evaluation	IEC 61897 Clause 7.11.3.2

2.1.1.5 Type Tests for Splice Enclosures (Joint Box)

Following Type tests shall be demonstrated on the Splice Enclosure(s) (Splice Enclosure/Box). For certain tests, lengths of the fibre optic cable shall be installed in the splice box, and the fibres must be spliced and looped in order to simulate conditions of use. The attenuation of the fibres shall be measured, during certain tests, by relevant Fibre Optic Test Procedures (EIA/TIA 455 or IEC 60794-1 procedures).

(i) Temperature Cycling Test

FO cable is installed in the splice enclosure and optical fibres spliced and looped. The box must be subjected to 5 cycles of temperature variations of -40°C to $+65^{\circ}\text{C}$ with a dwell time of at least 2 hours on each extreme.

Fibre loop attenuation shall be measured in accordance with EIA 455-20 / IEC 60794-1-C10. The variation in attenuation shall be less than $\pm 0.05\text{dB}$. The final humidity level, inside the box, shall not exceed the initial level, at the closing of the box.

(ii) Humid Heat test

The sealed splice enclosure, with fibres spliced and looped inside, must be subjected to a temperature of $+55^{\circ}\text{C} \pm 2^{\circ}\text{C}$ with a relative humidity rate of between 90% and 95% for 5 days. The attenuation variation of the fibres during the duration of the test shall be less than $\pm 0.05\text{dB}$, and the internal humidity rate measured, less than 2%.

(iii) Rain Withstand Test / Water Immersion test

The splice enclosure with optical fibres cable installed and fibres spliced fixed, shall be subjected to 24 hours of simulated rain in accordance with IEC 60060 testing requirements. No water seepage or moisture shall be detected in the splice enclosure. The attenuation variation of the fibres after the test shall be less than $\pm 0.05\text{dB}$.

(iv) Vibration Test

The splice enclosure, with fibres united inside, shall be subjected to vibrations on two axes with a frequency scanning of 5 to 50 Hz. The amplitude of the vibrations shall be constant at 0.450mm, peak to peak, for 2 hours, for each of the vibrations' axes. The variation in attenuation, of the fibres, shall be less than $\pm 0.05\text{dB}$. The splice enclosure shall be examined for any defects or deformation. There shall be no loosening or visible damage of the FO cable at the entry point.

(v) Bending and Torsion test

The splice enclosure, with fibres spliced inside, shall be firmly held in place and be subjected to the following sequence of mechanical stresses on the cable:

- a) 3 torsion cycles of $\pm 180^{\circ}$ shall be exercised on the cable. Each cycle shall be less than one minute.
- b) 3 flexure cycles of the cable, of $\pm 180^{\circ}$ with one cycle less than one minute.

The variation in the attenuation, of the fibres, shall be less than $\pm 0.05\text{dB}$. The cables connection ring shall remain securely fixed to the box with the connection maintained firmly. No defects/fissures shall be noted on the joint ring or on the splice enclosure

(vi) Tensile test

The splice enclosure with cable fixed to the boxes shall be subjected to a minimum tension of 448 N for a period of two minutes. No fissure shall be noted in the connections or on the box.

(vii) Drop Test

With 2 lengths of 11 metres of cable fixed to the box, it shall be dropped five times from a height of 10 metres. There shall be no fissure, at all, of the box, and the connections shall remain tight. The test surface shall be carried out in accordance with IEC 60068-2-32.

2.1.1.6 Type Tests for Fibre Optic Approach Cable

The type tests to be conducted on the Fibre Optic Approach cable are listed in Table 2-3: Type Tests for Fibre Optic Approach Cable. Unless specified otherwise in the technical specifications or the referenced standards, the optical attenuation of the specimen, measured during or after the test as applicable, shall not increase by more than 0.05 dB/Km.

**Table 2-3:
Type Tests Fibre Optic Approach Cable**

Sr. No.	Test Name	Test Procedure
1.	Water Ingress Test	(IEC 60794-1-F5 / EIA 455-82B) Test duration : 24 hours
2.	Seepage of filling compund	(EIA 455-81A) Preconditioning : 72 hours, Test duration : 24 hours.
3.	Crush Test	(IEC 60794-1-E3/ EIA 455-41)
4.	Impact Test	(IEC-60794-1-E4/ EIA 455-25A)
5.	Stress Strain Test	(EIA 455-33A)
6.	Cable Cut-off wavelength Test	(EIA 455-170)
7.	Temperature Cycling Test	(IEC60794-1-F1/EIA-455-3A) – 2 cycles

2.1.1.6.1 Impact Test

The Impact test shall be carried out in accordance with IEC:60794-1-E4. Five separate impacts of 2.0 kg shall be applied at different locations. The radius of the intermediate piece shall be the reel drum radius $\pm 10\%$. A permanent or temporary increase in optical attenuation value greater than 0.05 dB/km shall constitute failure.

2.2 Factory Acceptance Tests

Factory acceptance tests shall be conducted on randomly selected final assemblies of all equipment to be supplied. Factory acceptance testing shall be carried out on OPGW Cable and associated hardware & fittings, Approach Cable, Joint Box, FODP etc. and all other items for which price has been identified separately in the Bid Price Schedules.

Material shall not be shipped to the Employer until required factory tests are completed satisfactorily, all variances are resolved, full test documentation has been delivered to the Employer, and the Employer has issued Material Inspection & Clearance Certificate (MICC). Successful completion of the factory tests and the Employer approval to ship, shall in no way constitute final acceptance of the system or any portion thereof. These tests shall be carried out in the presence of the Employer's authorised representatives unless waiver for witnessing by Employer's representatives is intimated to the contractor.

Factory acceptance tests shall not proceed without the prior delivery to and approval of all test documentation by the Employer.

The factory acceptance tests for the supplied items shall be proposed by the Contractor in accordance with technical specifications and Contractor's (including Sub-Contractor's / supplier's) standard FAT testing program. In general the FAT for other items shall include atleast: Physical verification, demonstration of technical characteristics, various operational modes, functional interfaces etc.

For Test equipment FAT shall include supply of proper calibration certificates, demonstration of satisfactory performance, evidence of correct equipment configuration and manufacturer's final inspection certificate/ report.

2.2.1 Sampling for FAT

From each batch of equipment presented by the Contractor for Factory acceptance testing, the Employer shall select random sample(s) to be tested for acceptance. Unless otherwise agreed, all required FAT tests in the approved FAT procedures, shall be performed on all samples. The Sampling rate for the Factory acceptance tests shall be minimum 10% of the batch size (minimum 1) for all items. The physical verification shall be carried out on 100% of the offered quantities as per the approved FAT procedure. In case any of the selected samples fail, the failed sample is rejected and additional 20% samples shall be selected randomly and tested. In case any sample from the additional 20% also fails the entire batch may be rejected.

For the OPGW cable hardware fittings & accessories, the minimum sampling rate, and batch acceptance criteria shall be as defined in IS 2486.

The Sampling rate for the Factory acceptance tests shall be 10% of the batch size (minimum 2) for FO cable drums, FODPs, Joint box and other similar items.

Since FAT testing provides a measure of assurance that the Quality Control objectives are being met during all phases of production, the Employer reserves the right to require the Contractor to investigate and report on the cause of FAT failures and to suspend further testing/ approvals until such a report is made and remedial actions taken, as applicable.

2.2.2 Production Testing

Production testing shall mean those tests which are to be carried out during the process of production by the Contractor to ensure the desired quality of end product to be supplied by him. The production tests to be carried out at each stage of production shall be based on the Contractor's standard quality assurance procedures. The production tests to be carried out shall be listed in the Manufacturing Quality Plan (MQP), alongwith information such as sampling frequency, applicable standards, acceptance criteria etc.

2.2.3 Factory Acceptance Tests on Optical Fibre to be supplied with OPGW

The factory acceptance tests listed in table below are applicable for the Optical fibres to be supplied. The listed tests follow testing requirements set forth in IEEE standard 1138/IEC 60794. The referenced sections specify the detailed test description. The acceptance norm shall be as specified in the above mentioned IEEE standards unless specified otherwise in the technical specifications.

**Table 2-4
Factory Acceptance Tests for Optical Fibres: Optical Tests**

Sr. No.	Test Name	Acceptance Criteria	Test Procedure
1.	Attenuation Coefficient	TS, Table 1-1(a)	EIA/TIA 455-78A
2.	Point Discontinuities of Attenuation	TS, Section 1.1.2	EIA/TIA 455-59
3.	Attenuation at Water Peak	TS, Table 2-1(a)	EIA/TIA 455-78A
4.	Chromatic Dispersion		EIA/TIA 455-168A/169A/175A
5.	Core-Clad Concentricity Error		EIA/TIA 455-176
6.	Cladding Diameter		EIA/TIA 455-176
7.	Fibre Tensile Proof Testing		EIA/TIA 455-31B

The test report for the above tests for the fibers carried out by the Fiber Manufacturer and used in the OPGW cables shall be shown to the inspector during OPGW cable FAT and shall be submitted along with the OPGW cable FAT report.

2.2.4 Factory Acceptance Test on OPGW Cable

The factory acceptance tests for OPGW cable specified below in Table follow the requirements set forth in IEEE standard 1138 / IEC 60794. The FAT shall be carried out on 10% of offered drums in each lot as specified in technical specifications and the optical tests shall be carried out in all fibres of the selected sample drums. The Rated Tensile Strength test shall be carried out on one sample in each lot.

**Table 2-5
Factory Acceptance Tests on OPGW
Applicable standard: IEEE 1138 / IEC 60794**

Sr.	Factory Acceptance Test on Manufactured OPGW
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No.	
1.	Attenuation Co-efficient at 1310 nm and 1550 nm
2.	Point discontinuities of attenuation
3.	Visual Material verification and dimensional checks as per approved DRS/Drawings
4.	Rated Tensile Strength
5.	Lay Length Measurements

2.2.5 Factory Acceptance Test on OPGW Fittings

The factory acceptance tests for OPGW Fittings as specified below in Table 2-6. The sampling plan shall be as per relevant standard:

**Table 2-6
Factory Acceptance Tests On OPGW Fittings**

Sr. No.	Factory Acceptance Test
Suspension Assembly	
1.	UTS/Mechanical Strength of the assembly
2.	Clamp Slip Test
3.	Visual Material verification and dimensional checks as per approved DRS/Drawings
4.	Mechanical strength of each component
5.	Galvanising test
Tension Assembly	
6.	Clamp Slip Strength test
7.	Visual Material verification and dimensional checks as per approved DRS/Drawings
8.	Mechanical strength of each component
9.	Galvanising Test
Vibration Damper	
10.	Galvanising test on damper, masses and messenger wires
11.	Damper response (resonant frequencies)
12.	Clamp Slip test
13.	Strength of messenger wires
14.	Attachments of weights to messenger cable
15.	Attachments of clamps to messenger cable
16.	Clamp bolt tightening test
17.	Clamp bolt torque test
18.	Dynamic characteristic test
19.	Visual Material verification and dimensional checks as per approved DRS/Drawings
Structure Mounting Clamp	

20.	Clamp fit test
21.	Clamp Strength test
22.	Visual Material verification and dimensional checks as per approved DRS/Drawings

2.2.6 Factory Acceptance Test on Approach Cable

The factory acceptance tests for Approach Cable specified below in Table 2-7:

**Table 2-7
Factory Acceptance Tests On Approach Cable**

Sr. No.	Factory Acceptance Test
1.	Attenuation Co-efficient at 1310 nm and 1550 nm
2.	Point discontinuities of attenuation
3.	Visual Material verification and dimensional checks as per approved DRS/Drawings

2.2.7 Factory Acceptance Test on Splice Enclosure (Joint Box) /FODP

The factory acceptance tests for Splice Enclosures/FODP as specified below in Table: 2-8

**Table 2-8
Factory Acceptance Tests on Splice Enclosures (Joint Box)/FODP**

Sr. No.	Factory Acceptance Test
1.	Visual check of Quantities and Specific Component Number for each component of Splice Enclosure/FODP and dimensional checks against the approved drawings.

2.2.8 Factory Acceptance Test on Test Equipment & other items

As per technical specification and approved DRS/Documents.

2.3 Site Acceptance Tests

The Contractor shall be responsible for the submission of all material & test equipment supplied in this contract for site tests and inspection as required by the Employer. All equipment shall be tested on site under the conditions in which it will normally operate.

The tests shall be exhaustive and shall demonstrate that the overall performance of the contract works satisfies every requirement specified. At a minimum Site Acceptance Testing requirement for FO cable etc. is outlined in following section. This testing shall be supplemented by the Contractor's standard installation testing program, which shall be in accordance with his quality plan(s) for FO installation.

During the course of installation, the Employer shall have full access for inspection and verification of the progress of the work and for checking workmanship and accuracy, as may

be required. On completion of the work prior to commissioning, all equipment shall be tested to the satisfaction of the Employer to demonstrate that it is entirely suitable for commercial operation.

2.3.1 Minimum Site Acceptance Testing Requirement for FO Cabling

Prior to installation, every spooled fibre optic cable segment shall be tested for compliance with the Pre-shipment data previously received from the manufacturer. This requirement will preclude the installation of out of specification cable segments that may have been damaged during shipment.

2.3.1.1 Phases of Site Acceptance Testing

SAT shall be carried out link by link from FODP to FODP. SAT may be performed in parts in case of long links.

The tests, checks, adjustments etc conducted by the Contractor prior to offering the equipment for SAT shall be called Pre-SAT activities. The Pre-SAT activities shall be described in the installation manuals and Field Quality Plan documents.

Sag and tension of OPGW shall generally be as per approved sag-tension chart and during installation, sag and tension of OPGW shall be documented. Upon completion of a continuous cable path, all fibres within the cable path shall be demonstrated for acceptance of

the cable path. Fibre Optic cable site testing minimum requirements are provided in Table 2-9(a) through 2-9(c) below:

**Table 2-9(a)
Fibre Optic Cable Pre-Installation Testing**

Sr. No.	Description
1.	Physical Inspection of the cable assembly for damage
2.	Optical fibre continuity and fibre attenuation with OTDR at 1550 nm
3.	Fibre Optic Cable Length measurement using OTDR

**Table 2-9(b)
Fibre Optic Cable Splicing Testing**

Sr. No.	Description
1.	Per splice bi-directional average attenuation with OTDR
2.	Physical inspection of splice box/enclosure for proper fibre / cable routing techniques

3.	Physical inspection of sealing techniques, weatherproofing, etc.
----	------------------------------------------------------------------

Table 2-9(c)
Fibre Optic Cable Commissioning Testing

Sr. No.	Description
1.	End to End (FODP to FODP) bi-directional average attenuation of each fibre at 1310 nm and 1550 nm by OTDR.
2.	End to End (FODP to FODP) bi-directional average attenuation of each fibre at 1310 nm and 1550 nm by Power meter.
3.	Bi-directional average splice loss by OTDR of each splice as well as for all splices in the link (including at FODP also).
4.	Proper termination and labelling of fibres & fibre optic cables at FODP as per approved labelling plan.

Part-III: INSTALLATION FOR OPGW CABLING

3.1 OPGW cable installation requirements

The OPGW cable shall be installed at the top of the tower by replacing the existing ground wire, if any. In exceptional cases installation of OPGW cable below conductor may also be considered on low voltage lines as well as on existing lines for which shut down of line will be required for installation of OPGW cable due to absence of Earth wire or other reasons which shall be decided during detail engineering. After the installation of OPGW cable, the Earth Wire removed shall have be handed over to Employer at their store.

The OPGW fibre optic cables to be installed under either live line conditions, i.e. with all the circuits of the transmission line charged to their rated voltage or to be installed on a new line which is under construction. The type of installation (i.e live line or on new line) of OPGW cable to be done shall be intimated at the time of award of contract.

In case the OPGW Cable is to be installed on new line transmission line, the stringing shall be carried by the Transmission Line Contractor as per the stringing chart/procedure submitted by them and approved by Employer. The following shall be under the scope of OPGW Cabling Package Contractor:

- Supply of OPGW Cable & Hardware Fittings needed to tie the OPGW cable to the towers/gantries.
- Supervision of stringing of OPGW Cable at sites as per instruction by Employer. The supervision shall include the inspection as per stringing procedure, proper location of drum site, installation of stringing blocks/pulleys, proper sagging, proper installation of hardware, proper tension as per Sag-Tension chart, provision of service loops of OPGW in jointing locations
- The Splicing work of OPGW Cable and after that testing of link.

While handing over the OPGW drums, the testing (fibre loss and length measurement using OTDR) of OPGW in each drum shall be carried out by Fibre Optic Cabling Package Contractor in presence of Tower package contractor(s) and Employer representative. After installation of OPGW cable, the testing of each section shall be carried out again by the Fibre Optic Cabling Package Contractor in presence of Transmission Line Package contractor(s) and Employer representative. In case of any damage/high loss in the fibre, the total length of that particular section of OPGW cable shall be replaced by Transmission Line Package Contractor(s). Fibre Optic Cabling Package Contractor shall supply new OPGW cable in place of damaged cable. The Contract price shall be adjusted accordingly.

3.1.1 Installation

OPGW installed under live line condition, i.e. with all circuits charged to the rated line voltage shall be generally in accordance with the IEEE Guide to the Installation of Overhead Transmission Line Conductors (IEEE STD. 524 with latest revisions), with additional instructions and precautions for live line working and fibre optic cable handling. The stringing procedure shall be submitted by the Contractor prior to stringing for Employer's approval.

A tower structural analysis shall be carried out by the Contractor, based on the relevant data to be provided by Employer, to ensure that with the replacement of existing earthwire with the OPGW cable, the tower members remain within the statutory safety limits as per Indian Electricity rules and if required the Contractor shall carry out the tower strengthening as necessary. The OPGW cable sections shall normally be terminated & spliced only on tension towers. In exceptional circumstances and on Employer specific approval, cable may be terminated on Suspension towers, but in this case tower strength shall be examined to ensure that tower loads are within safe limits and if required, necessary tower strengthening shall be carried out by the Contractor.

3.1.2 Installation Hardware

All required hardware's shall be installed along with OPGW Cable.

3.2 Installation of Approach Cable

The existing cable trenches/ cable raceways proposed to be used shall be identified in the survey report. The Contractor shall make its best effort to route the cable through the existing available cable trenches. Where suitable existing cable trenches are not available, suitable alternatives shall be provided after Employer approval. However, the approach cable shall be laid in the HDPE pipe in all condition.

Suitable provisions shall be made by the Contractor to ensure adequate safety earthing and insulated protection for the approach cable.

All required fittings, supports, accessories, ducts, inner ducts, conduits, risers and any item not specially mentioned but required for laying and installation of approach cables shall be supplied and installed by the Contractor.

3.3 Optical Fibre Termination and Splicing

Optical fibre terminations shall be installed in Fibre Optic Distribution Panels (FODP) designed to provide protection for fibre splicing of pre-connectorized pigtailed and to accommodate connectorized termination and coupling of the fibre cables. The Contractor shall provide rack /wall mounted Fibre Optic Distribution Panels (FODPs) sized as indicated in the appendices and shall terminate the fibre optic cabling up to the FODPs. The location of FODP rack shall be fixed by the Contractor, with the Employer's approval.

3.4 Fibre Optic Distribution Panel

At each location requiring the termination of at least one fibre within a cable, all fibres within that cable shall be connectorized and terminated in Fibre Optic Distribution Panels in a manner consistent with the following:

- (a) All fibre optic terminations shall be housed using FODPs provisioned with splice organizers and splice trays. All fibres within a cable shall be fusion spliced to

preconnectorized pigtails and fitted to the "Back-side" of the provided fibre optic couplings.

- (b) Flexible protection shall be provided to the patch cord bunches going out from FODP to other equipment.

3.5 Methodology for Installation and Termination

All optical fibre cable termination, installation, stringing and handling plans, guides and procedures, and engineering analysis (e.g. tension, sag, vibration etc.) shall be submitted to the Employer for review and approval in the engineering/design phase of the project, prior to establishing the final cable lengths for manufacture. Installation procedures including details of personnel and time required shall be documented in detail and submitted to Employer for approval. All installation practices shall be field proven and ISO accredited.

All cable segments shall include service loops as specified in this specification. The maximum allowable stringing tension, maximum allowable torsional shear stress, crush strength and other physical parameters of the cable shall not be exceeded. The preventative measures to be taken shall be documented in detail and submitted to Employer in advance of installation.

Optical fibre attenuation shall be measured after installation and before splicing. Any increase in attenuation or step discontinuity in attenuation shall not be acceptable and shall constitute a cable segment failure. In the event of cable damage or any fibre damage, the complete section (tension location to tension location) shall be replaced as mid-span joints are not acceptable.

Any or all additional steel work or modifications required to attach the fibre cabling to the overhead transmission/ distribution line towers shall also be carried out by the Contractor. It shall be the Contractors responsibility to provide adequate communications among all crew members and support staff to ensure safe and successful installations.

3.6 Cable Raceways

To the extent possible, existing cable raceways shall be utilised. The Contractor is required to provide and install any additional indoor cable raceways which may be required for proper implementation of the fibre optic cabling system. This requirement shall be finalised during survey. The cable raceways shall conform to the following:

- (a) All cable raceways shall be sized to support full loading requirements plus at least a 200% safety loading factor.
- (b) Indoor cable raceways shall be fabricated from construction grade aluminium, galvanized iron or anodized sheet metal or any other suitable material approved by the Employer. Suitable anti-corrosion measures shall be provided. Steel fabricated raceways shall be finished inside and out, treated to resist rust and to form a metal-to-paint bond.
- (c) Mechanical construction drawings of the cable raceways shall be submitted for Employer's information & review.

APPENDIX - A

Table A-1
Typical transmission line details

Line Voltage	S/C of D/C	Nominal Span (E/W) & Conductors in mtrs.	Wind Zone as per IS 802	Design Tension at Every Day Temp (32°C) and full wind condition-Earthwire in kg for Wind Zone	Wind Pressure (kg/Sq-m) considering guest factor	Max Sag-Ground Wire at 53°C (in mtrs)	UTS-Earthwire (in kg)	Weight-Earthwire (in kg/km)	Minimum Clearance		
									A1	B1	C1
400kV	D/C	400	4	3368	192	10.201	7434	575	8.84	**	8.35
220kV	D/C	350	4	2699	192	6.877	5710	428	7.01	\$\$	8.5
132kV	S/C	320	--	2785	45 (\$)	5.421	5710	428	6.1	2.875	--
	D/C	320	--	2785	45 (\$)	5.421	5710	428	6.1	3.60	--

A1 Minimum clearance between conductor and ground (in meters)

B1 Minimum clearance between two phase conductors (in meters) – vertical in case of D/C towers and horizontal in case of S/C towers.

C1 Minimum clearance between conductor and earth wire (in meters)

\$ As per IS 802-1977

\$\$ A type tower - 5.25 m

B type tower - 5.05 m

C type tower - 5.6 m

** DA 8.00 m
DB 8.00 m
DC 8.00 m
DD 8.250 m

Table A-2

Upcoming / Proposed OPGW Links

Sr. No.	Transmission Lines	Line Rating	Length of line (in KM)	Length of OPGW (in KM)	
				24 Crore fiber	48 crore fiber
1	220 kV D/C line from 400 kV S/S Dhanansu to 220 kV Doraha	220 KV	28084 2	33.17	0
3	220 kV S/C line from 400 kV S/S Dhanansu to 220 kV Kohara	220 KV	6.863	0	7.892
4	LILO of S/C of 220 kV Mansa-Sunam line at 400 kV S/s Patran	220 KV	42.737	0	49.1
5	LILO of both Ckts of 220 Kv S/Stn. Jamalpur - 220 Kv S/Stn. Dhandari Kalan-I line at 220 Kv S/Stn. Sherpur (Focal Point) Cable Termination status	220 KV	1.88	2.162	0
6	220 KV S/Stn. Mansa - 220 KV S/Stn. Budhlada DC line	220 KV	25.915	29.8	0
7	LILO of 220 Kv Gobindgarh-I-Bassi Pathana at 220 Kv Gobindgarh	220 KV	7.0	0	8.05
8	LILO of 220 KV GGSSTP-Gobindgarh at 220 Kv Gobindgarh	220 KV	7.0	0	8.05
9	LILO of SC of 220 KV Sarna Wadalagranthian at Gurdaspur.	220 KV	7.84	0	9.02
10	Laying of OPGW (10Km) on 132 KV UBDC-Ph.I,II,III to 220 KV S/s Sarna	132 KV	10	11.5	
11	LILO of 220 KV sadiq- Talwandi Bhai line at 220 kv Jhoke Harihar (New) (LILO length 13 km approx, 0.4 sq", DC on DC)	220KV	13	0	15.0
12	220kV Shahpur Kandi PH-I – 220kV Shahpur Kandi PH-II [3.5 km (SC on DC, 0.5 sq. in. conductor)]	220 KV	6.056	0	6.96
	LILO of one circuit of 220kV RSD – 220kV Sarna at 220kV Shahpur Kandi PH-I & PH-II, segregated as under:				
	220 kV RSD to 220 KV Shahpur	220 KV	16		

13	Kandi PH-I (SC on DC, 0.5 sq. in., line length: 16 km approx., LILO length 0.5 km approx.)			18.4	0
14	220 kV Shahpur Kandi PH-II to 220 kV Sarna (SC on DC, HTLS of 1200 A capacity, line length: 18 km approx.)	220 KV	18	20.7	0
15	LILO of 220 kV Verpal – Wadala granthian and Verpal – Udhoke lines at proposed 220 kV S/s Nawanpind. 2xDC, conductor size 0.4sq", approx. LILO length 1 KM. 2x100 MVA, 220/66 kV T/Fs. (including 4 line bays, 2 T/F bays and 1 B/C bay and associated 66 kV bays) including SAS	220 KV	2.0	2.3	0
16	LILO of one Ckt. of 220 kV Bahadurgarh- Devigarh line (DC on DC 19 km Zebra conductor 420 mm ²)	220 KV	19	0	21.9
17	220 KV D/C line (with OPGW) from 400 KV Behman Jassa Singh to 220kV Talwandi Sabo(Line length -8km, 0.4 sq")	220 KV	8.0	9.2	0
18	LILO of 220 KV Mansa-Talwandi Sabo at 220 KV Maur (Line length -9km, 0.4 sq")	220 KV	9.0	0	10.4
19	LILO of both circuits of HPCL Mittal -220 KV Mansa at 220 KV bus of 400 KV Behman Jassa Singh(3x2 KM DC on DC , 0.4sq")	220 KV	48/3 LILO portion	55.2	3.45
20	220 KV D/C line on D/C towers from 400 kv Behman Jassa Singh to GNDTP Bathinda with multi circuit towers in GNDTP premises (Line length -35km , 0.4 sq")	220 KV	35	40.25	0
21	Shifting of 220 kV S/C Patti-Verpal line from 220 kV Verpal to 400 kV Amritsar (3km,0.4 sq")	220 KV	3.0	3.45	0
22	LILO of 220 KV Mohali-1-Lalru at 220 KV Mohali-2(Line length- 1 KM,0.4sq" conductor)-Stringing of LILO line.	220 KV	1.0	0	1.15

As the transmission lines are upcoming lines, so the number of lines, name of line and length may vary according to the actual site position. The total time period to complete the project is 36 Months from the date of Notification of Award. However, the line which will be offered to the firm must be completed in a time period of 6 months. If any change in priority of line which may crop up later on within the contract period will be

done with the approval of Chief Engineer/P&M. Extension only be provided if there is ROW or departmental own issues.

Table A-3

Details of SDH/PDH

Sr.No.	Name of Scheme/ Substation	Detailed Description of Work	SDH	PDH
1	220 kv Sherpur	LILO of both Ckts of 220 kv S/S Jamalpur-220 KV S/Stn Dhandari Kalan-I Line at 220 kv S/Stn. Sherpur (Focal Point) Cable Termination Status	2	2
2	220 kv Budhlada	220 kv S/Stn. Mansa-220 Kv S/Stn. Budhlada DC line	1	1
3	220 kv Gurdaspur	LILO of SC of 220 kv Sarna Wadalagrathian at Gurdaspur	3	3
4	UBDC-Ph,I,II,III	Laying of OPGW (10 km) on 132 kv UBDC-Ph-I, II, III to 220 kv S/s Sarna	3	3
5	220 kv S/S Jhoke Harihar (NEW)	LILO of 220 kv Sadiq-Talwandi Bhai line at 220 kv Jhoke Harihar (New) (LILO Length 13 km approx. 0.4 sq, DC on DC)	1	1
6	220 kv Shahpur Kandi Power Project (PH-I and PH-II)	220 kv Shahpur Kandi, PH-I 220 kv Shahpur Kandi PH-II (3.5 km (SC on DC, 0.5 sq. in conductor])	2	2
7	LILO of one circuit of 220 kv RSD-220 kv Sarna at 220 kv Shahpur Kandi PH-I & PH-II segregated as under	220 kv RSD to 220 kv Shahpur Kandi PH-I (SC on DC, 0.5 sq. in line length: 16 km approx. LILO length 0.5 km approx.]	1	1
8	-Do -	220 kv Shahpur Kandi PH-II to 220 kv Sarna (SC on DC HTLS of 1200 A Capacity, line length: 18 km approx.	1	1
9	220 kv Nawalpind (U/G from 66 kv)	LILO of 220 kv Verpal-Wadala granthian and Verpal-Udhoke lines at proposed 220 kv S/s Nawalpind	2	2
10	Upgradation of 66 kv substation old Patiala to 220 kv substation	LILO of one Ckt. Of 220 kv Bahadurgarh-Devirarh line at 220 kv Patiala (U/g from 66 kv)	1	1
11	400 kv S/S Behman Jassa Singh	LILO of both circuits of HPCL Mittal-220 kv Mansa at 220 kv bus of 400 kv Behman Jassa Singh (3x2 km DC on DC, 0.4 sq)	1	1
12	-Do -	220 kv D/C line on D/C Towers from 400 kv Behman Jassa Singh to GNDTP Bathinda with multi circuit tower in	1	1

		GNDTP premises (Line length-35 km, 0.4 sq.)		
13	400 kv PGCIL, Amritsar	Shifting of 220 kv S/C Patti-Verpal line from 220 kv Verpal to 400 kv Amritsar (3 km, 0.4 sq)	1	1
14	220 kv S/S Mohali-2	LILO of 220 kv Mohali-1-Lalru at 220 kv Mohali-2 (Line length 1 km, 0.4 sq. conductor) Stringing of LILO line	1	1
		Total	21	21

As the transmission lines are upcoming lines, so the location and number of SDH and PDH may vary according to the actual site position. The total time period to complete the project is 36 Months from the date of Notification of Award. However, the line which will be offered to the firm must be completed in a time period of 6 months. Extension only be provided if there is ROW or departmental own issues.

Appendix-B
Bill of Quantities

**Table -1
BOQ for Overhead Optical Fibre Cabling**

Sr. No.	Item Description	Unit	TOTAL QTY (indicative only)	Qty. as per firm
A	OPGW cable & Accessories			
1.	24 Fibre (DWSM) OPGW fibre optic cable	Km.	226	
2.	Installation Hardware set for 24 FibreOPGW Fibre Optic cabling including all cable fittings & accessories except joint box.	Set*	226	
3.	Joint box (24 Fibres)	No.	185	
4.	48 Fibre (DWSM) OPGW fibre optic cable	Km.	141	
5.	Installation Hardware set for 48 FibreOPGW Fibre Optic cabling including all cable fittings & accessories except joint box	Set*	141	
6.	Joint box (48 Fibre)	No.	30	
7.	Supervision of stringing of OPGW during installation onlines	Man days	--	
B	FODP(wall mounted)			
1.	FODP 48F : Indoor Type, rack mounted with FCPCcoupling and pig tails	No.	29	
2.	FODP 96 F : Indoor Type, rack mounted with FCPCcoupling and pig tails	No.	03	
C	Fibre Optic approach cable			
1.	24 Fibre (DWSM)	Km	14	
2.	48 Fibre (DWSM)	Km	5	
	Installation hardware set for above 24 Fibre, Fibre Optic Approach Cable	Set*	19	

Note: * One set of installation hardware shall be contain all installation hardware fittings as may be required for 1km of OPGW & Approach Fibre Optic Cable.

Table-2
Proposed Training Requirements

Sr. No.	Item Description	Location	No. of Trainees	Duration of working days
1.	Training regarding OPGW cable & Accessories	Manufacturer works/Training centre		

Appendix-C

Data Requirement Sheets

The following sets of Data Requirement Sheets are required to be filled up by the bidders to aid in the evaluation process. The response shall be brief and to the point and shall be supported by the printed product description and other literature. The DRS duly filled and the relevant drawings shall also be submitted during the detailed engineering along with the relevant technical brochures.

DRS Form 1

**DATA REQUIREMENTS SHEETS for
OVERHEAD FIBRE OPTIC CABLE**

OPTICAL GROUND WIRE (OPGW) – 24 Fibre:

Manufacturer: _____

Part #: _____

Configuration: _____

CABLE CONSTRUCTION			
Sr. No.	Parameter:	As per Technical Specification	As per Bidding Offering
1.	No. of Fibres (DWSM):	24	
2.	Buffer Type:	Loose Tube	
3.	Buffer Tube material	Non-metallic	
4.	No. of Buffer Tubes:	Minimum Two (2)	
5.	No. of Fibers per bufferTube:	Maximum Twelve(12)	
6.	Expected Cable Life:	25 Year	

DRS Form 2

DATA REQUIREMENTS SHEETS for
OVERHEAD FIBRE OPTIC CABLE

OPTICAL GROUND WIRE (OPGW) – 48 Fibre:

Manufacturer: _____

Part #: _____

Configuration: _____

CABLE CONSTRUCTION			
Sr. No.	Parameter:	As per Technical Specification	As per Bidding Offering
1.	No. of Fibres (DWSM):	48	
2.	Buffer Type:	Loose Tube	
3.	Buffer Tube material	Non-metallic	
4.	No. of Buffer Tubes:	Minimum Four (4)	
5.	No. of Fibers per bufferTube:	Maximum Twelve(12)	
6.	Expected Cable Life:	25 Year	

DRS Form 3

DATA REQUIREMENTS SHEETS for
OVERHEAD FIBRE OPTIC CABLE

DUAL WINDOW SINGLE MODE (DW-SM)

OPTICAL PARAMETERS			
Sr. No.	Parameter:	As per Technical Specification	As per Bidding Offering
1.	Fiber manufacturer(s)/Type:		
2.	Attenuation Coefficient@ 1310 nm: @ 1550 nm:	≤ 0.35 dB/km ≤ 0.21 dB/km	
3.	Point discontinuity @ 1310nm: @ 1550nm:	≤ 0.05 dB ≤ 0.05 dB	
4.	Nominal Mode Field Diameter @ 1310 nm: @ 1550 nm:	8.6 to 9.5 μm (\pm 0.6 μm)	
5.	Chromatic Dispersion Coefficient @ 1310 (1288-1339) nm: @ 1310 (1271-1360) nm: @ 1550 nm:	3.5 ps/(nm \times km) 5.3 ps/(nm \times km) 18 ps/(nm \times km)	
6.	Zero dispersion wavelength:	1300 to 1324 nm	
7.	Cutoff wavelength:	≤ 1260 nm	
Physical and Mechanical Properties			
8.	Bend Performance: (37.5 mm radius, 100 turns) @1310 nm (30 mm radius, 100 turn) @1550 nm (16mm radius, 1 turn) @ 1550nm	≤ 0.05 dB ≤ 0.05 dB ≤ 0.50 dB	
9.	Cladding Diameter(nominal \pm deviation):	125.0 $\mu\text{m} \pm 1 \mu\text{m}$	
10.	Polarisation mode dispersioncoefficient	≤ 0.2 ps/km ^{1/2}	
11.	Proof test level	≥ 0.69 Gpa	

Appendix-D

Technical Specification For Maintenance (AMC)

TECHNICAL SPECIFICATIONS:

1. OBJECTIVE OF MAINTENANCE SERVICES:

The maintenance services proposal has the following objectives:

- a) To maintain the correct functioning of Fibre Optic Link (OPGW) installed over various transmission lines as per list for a period of one year. The AMC period may be foreclosed or may be extended up to five years at the same terms and conditions.
- b) To provide efficient, reliable and responsive technical services for both preventive and corrective maintenance, so that communication system is maintained as specified.
- c) To utilize indigenously sourced labor, spare and materials wherever possible and economic.

2. SCOPE OF WORK:

The AMC will start from the date of complete commissioning of the project. The Scope of maintenance services for OPGW links under AMC to be provided by the contractor will include, but will not be limited to the following:

- i) Dismantling/lowering of OPGW links during crossing of new transmission lines.
- ii) OPGW dismantling, installation, reinstallation due to diversion of existing transmission lines due to infrastructural developments (Road widening, upcoming Metro/Rail track etc.)
- iii) Laying of OPGW on LILO portion in case of LILO of existing /new lines as per LOA rates.
- iv) Restoration of OPGW links when OPGW is damaged due to tower collapse, Cyclone Earthquake, lightening, line fault, inadvertent cutting, working on transmission lines by any third party or any other reason not mentioned above.
- v) Contractor will maintain and provide technical services to maintain the OPGW including all accessories, Fiber Optic approach cable up to termination point at FODP.
- vi) Contractor will arrange all the transportation of OPGW & associated hardwares for links which is mentioned in their AMC scope. For OPGW Related Work on Lines,

not covered in the scope of AMC, up to 100 km transportation will be arranged by Contractor and beyond 100 km, it will be paid as per actual by PSTCL.

- vii) Contractor will document the maintenance activities carried out and shall establish a maintenance record for the performance of their duties and location wise history record of the equipment for future reference.
 - viii) Contractor will return the instrument, tool kit any other item issued to them by PSTCL for maintenance work. In case of any loss, damage, theft or malfunctioning of equipment (in part or full) due to reasons (directly or indirectly) attributable to contractor, it shall be rectified/replenished without any cost implication to PSTCL, failing which prevailing market price of a similar make and model of tool/instrument/kit shall be deducted from any due amount payable to contractor.
 - ix) Two copies of monthly report of routine and breakdown maintenance will be submitted to PSTCL by 4th day of every month.
 - x) Contractor shall carry routine maintenance and services without affecting the link availability. However, during testing of live fibre outage/shutdown may be given after prior approval of Engineer-in-charge.
 - xi) If any special installation/testing equipment/s is/are required for OPGW installation/testing and repair of the system, same shall be arranged by the contractor on its own.
 - xii) To arrange any other material, consumables required for the work to maintain the network in working condition but not maintained in this scope shall be included in the contractor's scope.
 - xiii) The working gang shall be supported by head office technical staff for restorative problem and shall have any necessary level assistance as required.
 - xiv) Contractor will arrange for adequate transportation for their staff as per work demand. Contractor's staff should be equipped with necessary tools kit, and mobile phones.
 - xv) Contractors will take all due necessary safety precautions for proper safety of man & machine while carrying out the work at their site. Contractor will also be required to take necessary insurance cover for the personnel deputed for the work covered under this contract. PSTCL shall have no responsibility whatsoever for claims arising out of negligence/accident or any other reason for the personnel employed by the contractor.
- (1) The scope does not cover and excludes tower members and supply of OPGW and associated hard wares.

3. ROUTINE/ PREVENTIVE MAINTENANCE:

The Routine and preventive maintenance shall be carried out once in a year so that OPGW remains in healthy condition. Following shall be included in routine maintenance:

- Visual Inspection of OPGW, Joint boxes, Down-lead clamps, Vibration dampers etc.
- Replacement of missing Vibration Dampers, Down Lead Clamps or any other accessory.
- Testing of all Fibres of each FO link once in a year along with patrolling of link.
- In case of deterioration of any splice in Joint box, high attenuation of fibre in the link, Re-splicing of fibers.
- Attending of abnormalities reported by PSTCL/ detected by contractor such as abnormal sag, vibration in OPGW, twisting of OPGW abnormalities in tension set/suspension set assembly etc.
- Physical checking of Joint Box and FODP
- End-to-end Fiber Loss measurement
- Status report of site
- Updating of the log records

4. BREAKDOWN/ ON CALL MAINTENANCE:

Corrective Maintenance (Breakdown maintenance) is a fault correction process for OPGW link. The corrective maintenance tasks for the system include:

- (i) In the event of any fault in the Fibre optics link the contractor shall carry out checking/testing of the link as per requirement and standard practices. In case of damage being in Cable part, locating fault, mobilising maintenance team immediately, and carrying out rectification work in shortest minimum time will be the essence of the contract. Contractor shall carry out all tests required, both before and after restoration of OPGW/ approach cable.
- (ii) All types of faults in the cable part shall be attended. The faults are to be attended in minimum possible time so as not to affect Grid management and FO link availability. All efforts will be made to carry out rectification work without interruption of Power lines. For works requiring shutdown of Power Lines, contractor shall apply to PSTCL for shutdown indicating details of lines, duration, date and time of shutdown.
- (iii) PSTCL shall arrange right-of-way and shutdowns required for attending faults as well as normal maintenance if requested by the contractor. Time taken in arranging of Right-of-way and shutdowns shall not be taken into account of the contractor.
- (iv) In case of damage to OPGW requiring long restoration time, the FO link shall be restored temporarily by laying OFC over ground.

- (v) Contractor's site engineer shall not leave the site before functional verification of the link in co-ordination with NMS Engineer.

5. CONTRACTOR'S RESPONSIBILITY

In case of any fault noticed in the network, PSTCL will inform Engineer-in- Charge (Coordinator) of contractor through fax/telephone /e-mail for remedial action. Contractor's coordinator shall identify the problem and take corrective action including replacement of the faulty part with the spare supplied by PSTCL/spare of their own. PSTCL shall assist/co-ordinate with the constituents for arranging /issuance of spares from the constituents if required.

Contractor's coordinators shall follow up, corrective actions such as repair/rectification/replacement and shall keep PSTCL's coordinator and representative at network Management System (NMS) updated about the status of restoration.

Contractor will maintain a store for keeping OPGW, joint box, Hardware fittings, T&P and other accessories which may be required for successful execution of the Contracts. PSTCL will hand over spares available with them to the Contractor, which may be required for attending breakdowns etc.to the contractor. The contractor shall insure safe storage of the material issued by PSTCL at convenient location(s) so that fault can attend within stipulated time. For installation material in the scope of contractor, sufficient stock of all such material shall be maintained so that down time can be restricted.

Maintenance activities shall be both events based (corrective maintenance) and planned (preventive/routine maintenance). Planned preventive works shall be mainly carried out during working days as per mutually agreed schedule. Event based work shall be carried out round the clock so as to keep the down time of the link to minimum possible extent.

All the links as per Appendix-A(Vol-III, Outdoor equipment) will be covered under AMC. PSTCL may add/delete lines during pendency of the contract to the extent of 20%.

6. RESOURCE DEPLOYMENT

In order to cover the entire network, it is imperative that contractor's maintenance engineers are strategically located so as to reach the site within shortest possible time frame. Thus, one gang comprising right proportion of skilled/semi-skilled and unskilled personnel with minimum of 15persons (2 Splicer + 07 Fitters + 06 Semi skilled) will be deployed at a suitable place preferably at Ludhiana. This however, does not relieve the contractor to assess the requirement of manpower and place them at suitable location/s to attend the fault/s in specified time. Further on demand basis rate of fitters also mentioned in BOQ. **All the skilled labourers must have at least one-year experience on working on live line condition.** Contractor will inform the 'Organisation' about deployed people, details of general & specialised T&P and Vehicle etc. being maintained the proposed AMC Contract.

PSTCL may permit/allow the contractor to place their personnel in PSTCL premises on chargeable basis. However, if not permitted contractor shall have to make their own arrangement at their cost.

Gang deployed shall be equipped with general T&P, specialized T&P viz. 2 Splicing Machine & 2 nos. OTDR, test equipment, personal safety tools, Rapid restoration kit & live line installation tools etc. The gang shall consist of personnel capable of carrying out Live-line maintenance including OPGW laying/dismantling of OPGW and Earthwire. The T&P shall be suitable for undertaking Live-line maintenance work. Each gang shall be equipped with at least two mobile phones and requisite no. of walkie-talkie sets necessary for live-line maintenance work. In addition to above contractor shall keep minimum one number jeep & one number Truck (TATA 407 or equivalent) for each gang permanently engaged exclusively for maintenance work of PSTCL. All the personnel, Tools, Tackles, plants & transport vehicle shall be fully at the disposal of PSTCL and shall move only at the direction of Engineer-in-charge. List of minimum T&P to be available with each gang is enclosed at **Appendix-E (Vol-III)**.

The central control and monitoring of FO network system will be performed from CPCC/NMS control room in Ablowal by means of Network Management System (NMS) of PSTCL. Immediately on observance of any fault/interruption PSTCL engineer would intimate it to the designated coordinator of contractor. Person deployed by the contractor at other location would work under the control/instructions of the Coordinator located in Patiala. The resource deployment shall be suitably assessed by the contractor so as to ensure the rectification of the link within specified period.

All required tools-tackles, plant and equipment, fuel, consumable for the maintenance work shall be arranged by the contractor and contractor shall mobilise the same from camp station to faulty location at their own cost.

Contractor will arrange all the required facilities for their working gang at site viz Tents, water, electricity Generator, Torch/Emergency light and to and fro transport from camping place working site etc.

Contractor will lift all free issue material like tower parts, Nuts & Bolts, OPGW cable, Vibration damper, download clamp, Suspension/Tension set assembly etc from our specified store at their own cost and shall make necessary arrangement to keep the same in good condition and safe custody till finally erected and handed over to PSTCL's store. All the material issued to contractor shall be fully insured against damage by means of theft burglary, Fire etc. at contractor's own expense. Contractor shall replenish all the material after reconciliation for used item at the end of contract period.

The maintenance contract shall cover all the OPGW cable and accessories excluding approach cables installed at all locations and new addition by means of amendment from time to time. The fibre Optic cable part shall refer to FO cable link up to FODP.

In the event of any fault in the Fibre optics link/s the contractor shall carry out checking/testing of the link as per PSTCL's requirement. In case of damage being in OPGW/Approach cable, locating fault, mobilising maintenance team immediately, and carrying out rectification work in shortest minimum time to attend breakdown will be the essence of the contract. All types of faults in the cable part shall be attended. The faults are to

be attended in minimum possible time so as not to affect Grid management and FO link availability.

7. Reporting time:

Reporting time at site shall be counted from the time fault is reported to the contractor by PSTCL's coordinator/NMS representative through letter/phone/fax/e-mail etc to the time the contractor's team reaches at the fault site and report to PSTCL's personnel/representative at site/control room.

Each team deployed for AMC shall have responsibility to maintain certain links as maintained in the table. Reporting time to each link is maintained against the link name in the table. PSTCL at its discretion and as per requirement may ask contractor to shift base station of team deployed for AMC purpose to any other location within Northern Region. Further, PSTCL as per requirement may add or delete links within the quantity variation limit for AMC purposes.

Reporting time for links due to regrouping/change in base station of team or addition of new links shall be governed as per the following.

- (i) Each link has one start and end point called node.
- (ii) Distance of nearest node of all such links shall be calculated from base station of the team catering this link. Preferably, Google map shall be taken as reference to calculate distance.
- (iii) Allowable reporting time to link based on distance calculated as mentioned above shall be as under.

Distance from base station to nearest Node of the link(Km)	Reporting Time(Hrs)
000-100 Km	6 Hours
101-150 Km	7 Hours
151-200 Km	8 Hours
201-250 Km	9 Hours
251-300 Km	10 Hours
301-350 Km	11 Hours
351-400 Km	12 Hours
401-450 Km	13 Hours
451-500 Km	14 Hours
501-550 Km	15 Hours
551-600 Km	16 Hours
601-650 Km	17 Hours
650-700 Km	18 Hours
701-750 Km	19 Hours
751-800 Km	20 Hours
801-850 Km	21 Hours

851-900 Km	22 Hours
901-950 Km	23 Hours
951-1000 Km	24 Hours

8. **RESTROSTRTION TIME:**

Contractor shall restore the faulty link within six hours (**Permissible Rectification Time**) of the reporting time and clear front made available by PSTCL/Constituents. Outage beyond this **Restoration Time** (Reporting time + permissible rectification time) shall be to the account of contractor and penalty shall be calculated accordingly. Rectification time shall be counted immediately after the reporting time ends. However, if the clear fronts are not made available by PSTCL, rectification time shall be counted only after such fronts are made available to contractor's person. Contractor will visit, inspect the site and make themselves aware of the site conditions before starting of any work. In case of damage to OPGW requiring long restoration time viz in case of collapse of tower etc. the FO link shall be restored temporarily by installing underground FO approach cable/overhead FO cable/OFC over temporary stricture/tower/ground any temporary stricture required to be erected shall be in the scope of contractor only.

No idling charges will be paid for what so ever reason may be.

9. **OTHER OPGW WORKS**

PSTCL has laid OPGW on many lines which may not be covered under the present scope of AMC. Some of the new OPGW links might get commissioned during the currency of contract which is not under the current AMC scope. It shall not be possible to foresee all OPGW links to be covered under AMC at the time of award. Thus, to cover work in all new/additional left out links within the Northern Region covering eight states maintained at Para 2.0 above, contractor shall quote unit rates for rectification, diversion, new OPGW installation as per BOQ. In all such cases, contractor shall be allowed to utilise resources (man and material) deployed for AMC of the links and no additional charges shall be paid for deployment/T&P etc., payment shall be regulated as per unit rate quoted. However, during such deployments, if fault or any other requirement arises at any other link under AMC, contractor at the direction of PSTCL shall attend the site first as required by PSTCL. Availability requirement on all such cases shall be regulated accordingly.

10. **DOCUMENTATION**

Necessary logs and records will be maintained about intimation of fault, response time, and rectification time, rectification work carried out and spared utilized. All works shall be documented and report will be submitted to PSTCL along with Splicing Test reports, end to end test reports.

11. STATUTORY REQUIREMENT

Contractor shall not pay less than the minimum fixed wages to their labourers as declared by Govt. Authority and keep statutory records with them. All the persons deployed shall be property insured against any accident occurred during execution of the contract services. Contractor shall ensure safety of all the workman, material, plants and equipment utilised in the maintenance/ construction activity. Contractor shall ensure sufficient quantity of helmets, safety belts, First Aid Boxes, hand gloves etc for their workman/gang.

Contractor will submit vendor registration number, registration of company including PAN. Xerox copy of sales tax/ Service tax registration number.

12. PSTCL's RESPONSIBILITY

- (a) PSTCL shall immediately notify vendor's coordinator/maintenance staff after noticing any fault.
- (b) PSTCL shall be responsible for obtaining all security passes required by contractor's staff, including passes for Non-PSTCL sites. However, contractor shall provide ID card (PAN /ADHAR/ VOTER ID CARD or any other govt. Approved document for said purpose)
- (c) PSTCL shall ensure vendor's personnel and /or personnel acting on behalf of contractor, free and unrestricted access to site/s during the maintenance period or when the urgent repairing of the link or network is required.
- (d) PSTCL shall be responsible for obtaining Right of Way (ROW) access and other liasioning for cable repair. Contractor shall assist in coordinating the activity for cable repair.
- (e) PSTCL shall provide the contractor with information on any planned expansion, alteration or relocation of the equipment that may have the impact on the system under maintenance.
- (f) PSTCL shall be responsible to supply information regarding observation/s in telecommunication network recorded in the log-book maintained at NMS control room at New Delhi.
- (g) PSTCL shall provide list of spares available if any, and the place where the same is available. During the maintenance period contractor will use the spares and return the faulty OPGW cable/hardware accessories to PSTCL with proper documentation. Contractor shall assess the extent of spares requirement for six months in advance and shall take in their possession from PSTCL for utilisation for the next six months. Contractor shall be responsible for the

spares provided to them for their safe storage and handling. Any loss arising for the spares provided to the contractor shall be to Contractor's account only. PSTCL shall bear no responsibility for any loss for such spares for theft/mishandling/or any other reason.

13. COORDINATION REQUIREMENTS

13.1 Meeting Practices

Regular meeting between PSTCL and the contractor is vital for communication and information flow between these two parties. The purpose of the meeting is to tackle the essential issues concerning the services and network performance. The suggested schedule for meeting is once every month.

The meeting agenda shall be decided between PSTCL and contractor and could for example consist of the following issues:

- Services and network performance according to the report
- Review of logs including spare requirement
- Action plan
- Next meeting

The following participants should be present in this meeting:

- Coordinator (contractor)
- Members of the contractor team as needed
- Coordinator PSTCL
- Operation and maintenance staff as designated to attend (PSTCL)

14. EMERGENCY MEETING:

Whenever a major outage occurs in any part of the network, an emergency meeting may be held if desired by PSTCL. In the meeting, the outage will be discussed in the context of cause, correction and prevention.

16.1 REPORTING PROCEDURE

The purpose of report to summarise the activities performed during the reporting period. The report provides the information on the performance of the services and describes the current status of the network. The report shall be monthly report from Contractor to PSTCL which must show the trends in the network and services provided by contractor. By analysing the report data, management and expert of PSTCL and contractor should be able to focus attention on the areas where further improvement is needed. Contractor will keep a proper record of all event, activity and store transactions for verification and submit a monthly report.

Emergency reports: Contractor must report to PSTCL every time the emergencies call up or call out service is invoked. In these cases, on termination of the emergency all details of the fault and clearance information is/are submitted within five working days.

15. PENALTY CLAUSE:

- (a) Contractor will maintain proper and adequate staff for carrying out this maintenance contract failing which Rs 50,000.00 per month will be deducted by PSTCL from the amount due to contractor under this contract.
- (b) Penalty @ 0.5% of the monthly payable charges for delay of every two (2) hours shall be deducted from monthly bill, which shall be imposed proportionately for any further delay beyond two hours subject to limit of 05% of the monthly payable charges.
- (c) A penalty of Rs. 50,000/- per occasion shall be imposed for not maintaining T&P as per contract. Contractor shall be given a time of fifteen (15) days to make good of shortcomings in T& P as pointed out by PSTCL and confirm the same in writing which PSTCL at its option may get verified. PSTCL shall decide on the gravity of offence and three successive violations may lead to termination of contract.
- (d) In case if, routine and preventive maintenance of FO link is not done in stipulated time, the amount @ unit rate per km shall be deducted at the end of year from the bill.
- (e) All the above penalty clauses may run separately and concurrently.

16. QUANTITY VARIATION:

PSTCL reserves the right to increase or decrease the quantity of individual item mentioned in BOQ to any extent with an overall price variation limit of 20% of contract price. Price for AMC of OPGW links to be added/deleted during the execution of contract in addition to links mentioned in LOA shall be governed on route length basis. Rate of AMC of OPGW on per km basis shall be derived from LOA price for AMC of OPGW divided by quantity of OPGW under AMC. This rate shall be applicable for addition / deletion of OPGW. AMC of Fibre optic approach cable upto FODP point at both ends shall be included in new OPGW added for AMC during the currency of contract.

17. RISK PERFORMANCE:

In the event of failure of the contractor to execute the contract as per terms and conditions of the award, PSTCL reserves the right to get the work done from outside agencies at the risk and cost of the contractor. In such eventuality, PSTCL shall deduct maintenance charges at double the rates applicable or the cost of actual work done plus administrative charges @ 20% of value of work executed, whichever is higher.

Appendix-E

<u>Tools list for live line stringing for One Set</u>		
S. No.	Description	Qty for 1 Set
1	Hydraulic Conductor cutter to cut OPGW imported	1
2	Kitto Clamp 12MM	4
3	Single Aerial Roller dia 450mm with earthling attachment	4
4	Single Aerial Roller dia 300mm with earthling attachment	25
5	Lever Block 1.5Mt Cap (standard 1.5M chain) Best Quality	9
6	Additional 3M chain for Lever Block 1.5MT cap	14
7	Recovery Machine imported	1
8	PP Rope 12mm (220Mtr each)	35
9	16mm Nylon Rope (1000 Mtr Bundle)	6
10	100 mm small Pulley Open (1 Ton Cap)	10
11	Power Winch M/C with Honda Engine 1.5 Ton Cap with 600 mm Capstan	1
12	Swivel joint 3 Ton Cap	10
13	Double End Socks for OPGW	3
14	Single End Socks for OPGW	4
15	Tool Bag Long (1400 mm Long)	10
16	Tool bag Small (400 mm Long)	20
17	D-Shackle (5T)	40
18	Steel Wire 12mm Lead ISI Mark (500Mtr)	0.5
19	Automatic Clamp for OPGW	8
20	Automatic Clamp for OPGW 2 Bolt Type with Steel Sleeve (Automatic)	8
21	Earth Wire Steel Clamp	4
22	Aluminium Ladder Japanese Type	0
23	Aluminium Ladder	0
24	Reel Stand With Shaft	1
25	Drum lifting Jack Capacity 7 Ton	1
26	Aerial/ Manual Cycle	1
27	Traction Machine	1
28	Bolted Type Patta Clamp	8
29	Reel for Rope	4
30	Connector for 16mm Rope	5

LIVE LINE STRINGING TOOLS DETAILS**LIVE LINE STRINGING TOOLS DETAILS**

31	Hanging Pulley Block	250
32	Safety Belt Full	30
33	Safety Helmets	30
34	Safety Jackets	30
35	Safety Hand Gloves	30
36	Safety Shoes	30
37	Gumboots	30
38	Walkie Talkie	12
39	Vehicle Jeep or equivalent	01
40	Vehicle Tata 407 or equivalent	01

Volume-IV
Bid Form, Price Schedules and Technical
Data Sheets

FIRST ENVELOPE

**Supply, Erection, Testing and
Commissioning of OPGW along with
its Terminal Equipment on
132kV/220kV/400kV Transmission
Lines of PSTCL System**

BID FORMS

&

ATTACHMENTS

BID FORM (First Envelope)

Bid Proposal Ref. No.:.....

Date:

To:

Punjab State Transmission Corporation Ltd. ,

Shakti Sadan,

Patiala (Punjab) -147001,

Name of Contract: **Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System.**

(Specification No.: STQ-8055)

Dear Ladies and/or Gentlemen,

1.0 Having examined the Bidding Documents, including Amendment Nos. (*Insert Numbers*) dated the receipt of which is hereby acknowledged, we the undersigned, offer to design, manufacture, test, deliver, install and commission (including carrying out Trial operation, Performance & Guarantee Test as per the provision of Technical Specification) the Facilities under the above-named package in full conformity with the said Bidding Documents. In accordance with ITB Clause 9.1 of the Bidding Documents, as per which the bid shall be submitted by the bidder under "Single Stage - Two Envelope" procedure of bidding. Accordingly, we hereby submit our Bid, in two envelopes i.e. First Envelope – Techno – Commercial Part & Price Part (to be opened subsequently).

2.0 Attachments to the Bid Form (First Envelope)

In line with the requirement of the Bidding Documents, we enclose herewith the following Attachments:

(a) Attachment 1: Bid Security(EMD), in a separate envelope, in the form of Bank Draft/Pay Order/Banks certified Cheque/ for a sum of (*name of currency and amount in words and figures*) initially valid for a

period of thirty (30) days from the date set for opening of bids .

(b) Attachment 2: A power of attorney duly authorized by a Notary Public indicating that the person(s) signing the bid have the authority to sign the bid and thus that the bid is binding upon us during the full period of its validity in accordance with the ITB Clause 14.

(c) Attachment 3: The documentary evidence that we are eligible to bid in accordance with ITB Clause 2. Further, in terms of ITB Clause 9.3 (c) & (e), the qualification data has been furnished as per your format enclosed with the bidding documents[Attachment-3(QR). * Further, the required Joint Venture Agreement signed by us and our Partners has also been furnished as per your format [Attachment-3(JV). * Further the required deed of Joint Undertaking signed by us and our Collaborator/Manufacturers has also been furnished as per your format.

* Delete if not applicable

(d) Attachment 4: The documentary evidence establishing in accordance with ITB Clause 3, Vol.-I of the Bidding Documents that the facilities offered by us are eligible facilities and conform to the Bidding Documents has been furnished as Attachment 4. A list of Special Tools & Tackles to be used by us for erection, testing & Commissioning and to be handed over to Employer, the cost of which is included in our Bid Price, is also enclosed as per your format as Attachment 4A. A list of Special Tools & Tackles to be brought by the contractor for erection, testing & Commissioning and to be taken back after completion of work, whose cost in not included in our bid price, is enclosed as per your format as Attachment 4B.

(e) Attachment 5: The details of all major items of services or supply which we propose subletting in case of award, giving

details of the name and nationality of the proposed subcontractor/sub-vendor for each item.

- (f) Attachment 6: The variation and deviations from the requirements of the Conditions of Contract, Technical Specification and Drawings (excluding critical provisions as mentioned at clause 6.0 below) in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
- (g) Attachment 7: Manufacturer's Authorisation Forms
- (h) Attachment 8: Work Completion Schedule.
- (i) Attachment 9 : Guarantee Declaration.
- (j) Attachment 10: Information regarding ex-employees of Employer in our firm.
- (k) Attachment 11: Filled up information regarding Price Adjustment Data as per the format enclosed in the bidding documents
- (l) Attachment 12: Declaration regarding Social Accountability
- (m) Attachment 13: Information for E-payment, PF Details & declaration regarding Micro/Small & Medium Enterprises
- (n) Attachment 14: Additional Information
- (o) Attachment 15: Declaration for tax exemptions, reductions, allowances or benefits.
- (p) Attachment 16: Declaration.

Attachment-16A: Deleted

Attachment-16B: Declaration regarding percentage of OPGW cable outsource/subcontract from Parent Company (Principal) or Collaborator by an Indian Bidder proposing to qualify through route specified at Clause No. 1.1.2(A)(III) of Annexure A (ITB).

(q) Attachment 17: GTPs.

(r) Attachment 18: Price Bid Form.

(s) Attachment 19: Deleted

(t) Attachment 20: Deleted.

(w) Attachment-21: Declaration of Key Managerial Person jointly with Power of Attorney holder

(x) Attachment-22: Unequivocal consent of the proposed Sub-Contractor(s)

Any other document(s), if applicable, as per Clause ITB 5.1.

- 3.0 We are aware that, in line with Clause No. 27.1 (ITB), our Price Part is liable to be rejected in case the same contains any deviation/omission from the contractual and commercial conditions and technical Specifications other than those identified in this First Envelope.
- 3.1 We are aware that the Price Schedules do not generally give a full description of the Work to be performed under each item and we shall be deemed to have read the Technical Specifications and other sections of the Bidding Documents and Drawings to ascertain the full scope of Work included in each item while filling-in the rates and prices uploaded on n-procure site,
- 3.2 We declare that as specified in Clause 11.5, Section –II:ITB, Vol.-I of the Bidding Documents, prices quoted by us in the uploaded Price Schedules shall be subject to Price Adjustment during the execution of Contract in accordance with Appendix-2 (Price Adjustment) to the Contract Agreement.
- 4.0 Deleted.
- 4.1 100% of applicable Taxes and Duties.i.e GST which are payable by the Employer under the Contract, which are payable by the Employer under the Contract, shall be reimbursed by the Employer after dispatch of equipment on production of satisfactory documentary evidence by the Contractor in accordance with the provisions of the Bidding Documents.

4.2 We further understand that notwithstanding 4.0 above, in case of award on us, you shall also bear and pay/reimburse to us, GST in respect of supplies by us to you, imposed on the Plant & Equipment including Mandatory Spare Parts specified in Schedule No. 1 , Type Test Charges for Type Test to be conducted specified in Schedule 2, Installation Services specified in Schedule 5 of the Price Schedule in Second Envelope, by Indian Laws.

5.0 **Construction of the Contract**

5.1 We declare that we have studied Clause GCC 2.1 relating to mode of contracting for Domestic Bidders and we are making this proposal with a stipulation that you shall award us two separate Contracts viz 'First Contract' for ex-works supply of all equipment and materials including mandatory spares and 'Second Contract' for providing all the services i.e. inland transportation for delivery at site, insurance, unloading, storage, handling at site, installation, testing and commissioning including Trial operation in respect of all the equipment supplied under the 'First Contract' and other services specified in the Contract Documents. We declare that the award of two contracts, will not, in any way, dilute our responsibility for successful operation of plant/equipment and fulfillment of all obligations as per Bidding Documents and that both the Contracts will have a cross-fall breach clause i.e. a breach in one Contract will automatically be classified as a breach of the other contract which will confer on you the right to terminate the other contract at our risk and cost.

6.0 We have read the provisions of following clauses and confirm that the specified stipulations of these clauses are acceptable to us:

- | | | |
|-----|----------|------------------------------|
| (a) | ITB 13 | Bid Security (EMD) |
| (b) | GCC 2.14 | Governing Law |
| (c) | GCC 8 | Terms of Payment |
| (d) | GCC 9.3 | Performance Security |
| (e) | GCC 10 | Taxes and Duties |
| (f) | GCC 21.2 | Completion Time Guarantee |
| (g) | GCC 22 | Defect Liability |
| (h) | GCC 23 | Functional Guarantee-Deleted |

- (i) GCC 25 Patent Indemnity
- (j) GCC 26 Limitation of Liability
- (k) GCC 38 Settlement of Disputes
- (l) GCC 39 Arbitration
- (m) Appendix 2 to Form of Contract Agreement Price Adjustment

Further we understand that deviation taken in any of the above clauses by us may make our bid non-responsive as per provision of bidding documents and be rejected by you.

- 7.0 We undertake, if our bid is accepted, to commence the work immediately upon your Notification of Award to us, and to achieve the delivery of goods and related services within the time stated in the Bidding Documents.
- 8.0 If our bid is accepted, we undertake to provide a Performance Security in the form and amounts, and within the times specified in the Bidding Documents.
- 9.0 We agree to abide by this bid for a period of 180 days from the date fixed for opening of bids as stipulated in the Bidding Documents, and it shall remain binding upon us and may be accepted by you at any time before the expiration of that period.
- 10.0 Until a formal Contract is prepared and executed between us, this bid, together with your written acceptance thereof in the form of your Notification of Award shall constitute a binding contract between us.
- 11.0 We understand that you are not bound to accept the lowest or any bid you may receive.
- 12.0 Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to contract execution, if we are awarded the contract, are listed below:-

Name and address of agent	Amount and Currency	Purpose of Commission or gratuity

_____	_____	_____
_____	_____	_____
(If none, state "none")	_____	_____

*13.0 **(For Joint Venture only)** We, the partners of Joint Venture submitting this bid, do agree and confirm that in case of Award of Contract on the Joint Venture, we shall be jointly and severally liable and responsible for the execution of the Contract in accordance with Contract terms and conditions.

14.0 We, hereby, declare that only the persons or firms interested in this proposal as principals are named here and that no other persons or firms other than those mentioned herein have any interest in this proposal or in the Contract to be entered into, if the award is made on us, that this proposal is made without any connection with any other person, firm or party likewise submitting a proposal is in all respects for and in good faith, without collusion or fraud.

Dated this ____ day of _____ 20__

Thanking you, we remain,

Yours faithfully,

For and on behalf of the [Name of the Bidder#]

(Signature).....

(Printed Name).....

(Designation).....

(Common Seal).....

Date:

Place:

Business Address:

Country of Incorporation:

(State or Province to be indicated)

Name of the Principal Officer:

Address of the Principal Officer:

*Applicable in case of a bid from Joint Venture of firms.

#In case the bid is submitted by a Joint Venture, the name of the Joint Venture should be indicated

Note: Bidders may note that no prescribed proforma has been enclosed for:

(a) Attachment 2: Power of Attorney.

(For Attachments 2 Bidders may use their own proforma for furnishing the required information with the bid).

ATTACHMENT-3

Name of Contract: **Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines of PSTCL System. Substation Package.**

(Qualifying Requirement Data)

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.

Shakti Sadan,

Patiala (Punjab) -147001

Dear Ladies and/or Gentlemen,

We have submitted our bids for the subject package.

In support of the Qualification Requirements (QR) for bidders, stipulated in Annexure-A (BDS) of the Section - III (BDS), Volume-I & Additional Information required as per ITB clause 9.3(c) of the Bidding Documents, we furnish herewith our QR data/details/documents etc., alongwith other information, as follows (The QR stipulations have been reproduced in italics for ready reference, however, in case of any discrepancy the QR as given in BDS shall prevail).

* We have submitted our bid as:

- **Route-1 (Installation Agency)**
- **Route-2 (Manufacturer of OPGW)**
- **JV-1 (Lead Partner through Route-1)**
- **JV-2 (Lead Partner through Route-2)**

(* *Strike off whichever is not applicable*)

We are furnishing the following details/document in support of qualifying requirement for the subject package.

- A. Attached copies of original documents defining:
- a) The constitution or legal status;
 - b) The principal place of business;
 - c) The place of incorporation (for bidders who are corporations); or the place of registration and the nationality of the Owners (for applicants who are partnerships or individually-owned firms).
 - d) Whether bidder anticipate any change in **legal structure/ownership** of their organisation at present.

Yes No

(Strike off whichever is not applicable)*

[If Yes, please enclose details of same and copy of procedural document(s) with reference to the same/ as required statutorily, as of now]

- B. Attached original & copies of the following documents.
- a) Written power of attorney of the signatory of the Bid to commit the bidder.

1.0 GENERAL INFORMATION

Bidder is required to provide general information as per the following format.

[Where the Bidder proposes to use named subcontractor(s) for critical components of the works or for work contents in excess of ten (10) percent of the bid price, the following information should also be supplied for the subcontractor(s)].

Sl.No.	Particulars	For individual firm
1.	Name of the Firm	
2.	Head Office/ Registered Office Address	
3.	Telephone	
4.	Fax	
5.	Contact Person	
6.	Place of Incorporation/ Registration	
7.	Year of Incorporation/ Registration	
8.	Nationality of	
	Owner (i)	
	Owner (ii)	

Sl.No.	Particulars	For individual firm
	Owner (iii)	

[Necessary documents to establish legal status of the bidder should be enclosed with the bid].

1.1 TECHNICAL REQUIREMENTS

[Reference para 1.1 of Annexure-A (BDS), Vol.-I]

1.1.1 Route 1: Installation Agency

(A) The Bidder should have supplied, installed, tested and commissioned at least 200 Kms of OPGW and live line installation of 100 Km of OPGW, on 66 kV or above transmission line(s) as a prime contractor* in the last seven (07) years, which must have been in satisfactory operation# for at least one (1) year as on the originally scheduled date of bid opening i.e. 02/05/2018.

Note* : In case of works executed under a contract that had been awarded on a Joint Venture, the experience of individual Joint Venture partner shall be considered limited to the scope of that partner under the said contract.

Note# : Satisfactory operation means certificate issued by the employer certifying the operation without any adverse remarks.

AND

(B) The Bidder shall offer OPGW from a manufacturer meeting the criteria stipulated at 1.1.2 (A) below:

1.1.2 Route 2: Manufacturer of OPGW

(A) I The Bidder should be a manufacturer who has been manufacturing OPGW for the last three (3) years and at least 100 Kms of OPGW manufactured by the bidder should have been in satisfactory operation # on 66kV or above transmission line(s) for at least two (02) years as on date of bid opening mentioned above.

OR

(II) *The Bidder should be a manufacturer who must have established manufacturing and routine test facility for OPGW in India and at least 100Km of OPGW manufactured by the bidder should have been installed on 66 kV or above Transmission line(s) as on the date of bid opening mentioned above. Further, the bidder shall submit, along with its bid, a legally enforceable undertaking for extended warranty of two (2) years over and above the warranty period specified for OPGW cable.*

OR

(III) *The bidder should be a manufacturer whomust have established manufacturing and routine test facility for OPGW in India based on technological support of a parent company (principal) or collaborator and has commenced manufacturing. The parent company (principal) or collaborator should meet the criteria of clause 1.1.2 (A) (I) above and bidder furnishes along with its bid a legally enforceable joint deed of undertaking along with the collaborator / principal for extended warranty obligations of additional two (2) years over and above the warranty period specified for the OPGW and a confirmation letter from the parent company or the collaborator to furnish performance guarantee for an amount of 10% of the cost of OPGW cable.*

AND

(B) *The bidder as a prime contractor* or as a sub-contractor should have installed at least 50 Kms of OPGW in live-line condition on 66 kV or above transmission line(s) as on date of bid opening mentioned above.*

OR

The bidder proposes to engage a sub-contractor who should have installed at least 50 Kms of OPGW in live-line condition on 66 kV or above transmission line(s), as on date of bid opening mentioned above. The bidder shall submit, along with its bid, a legally enforceable joint deed of undertaking along with the sub-contractor confirming that the installation of OPGW for the Package shall be done by the proposed sub-contractor.

Note* : *In case of works executed under a contract that had been awarded on a Joint Venture, the experience of individual Joint Venture partner shall be considered limited to the scope of that partner under the said contract.*

In case bidder is a holding company, the technical experience referred to in clause 1.1.1 & 1.1.2 above shall be of that holding company only (i.e. excluding its subsidiary / group companies). In case bidder is a subsidiary of a holding company, the technical experience referred to in clause 1.1.1 & 1.1.2 above shall be of that subsidiary company only (i.e. excluding its holding company).

On a separate page, using the following format, each Bidder is requested to list the contracts of a nature similar to the proposed contract(s) for which the Bidder wishes to qualify, undertaken during the last seven (07) years. The information is to be summarised for each such contract separately.

(The bidder shall attach documentary evidence, such as copies of utility certificates etc., in support of its general experience as listed in the following proforma for each experience/ Contract just below it)

Format A1: Format for the bidders who wish to qualify through route 1.1.1 (A) or 1.3(A)/1.3(B):

Name of the Bidder/Lead Partner of JV-1 OR Name of Other Partner of JV-2:		
1.	<i>Name of Contract</i>	
2.	Contract Reference No. & Date of Award	
3.	Name and Address of the Employer/Utility for whom the Contract was executed by bidder/Partner <div style="text-align: right;">e-mail ID</div> <div style="text-align: right;">Telephone No./Mob. No. _____</div> <div style="text-align: right;">Fax No. _____</div>	
4.	Scope of work involved in respect of OPGW under the aforesaid Contract	<input type="checkbox"/> Supply <input type="checkbox"/> Installation <input type="checkbox"/> Testing <input type="checkbox"/> Commissioning - for the above Contract for OPGW. <i>(Tick only whichever is/are applicable)</i>
5.	Quantities of OPGW supplied	_____ KM
6.	Out of the aforementioned quantity of OPGW, please indicate the quantity of OPGW and voltage level of T/L for	

	which live line installation was done	_____KM ; _____kV
6A.	The aforesaid live line was installed as	<input type="checkbox"/> Prime Contractor <input type="checkbox"/> Subcontractor <i>(Tick only whichever is/are applicable)</i>
6B.	Date of completion of the above Contract	_____ (dd/mm/yyyy)
6C.	No. of years the above OPGWs are in satisfactory operation as on the originally scheduled date of bid opening	_____ years
7.	Details of documentary evidence submitted in support of stated experience/Contract	

(Use separate sheet for each experience/ Contract)

Format A2: Format for the bidders who wish to qualify through route 1.1.1 (B) or 1.3(A)/1.3(B):

Name of the Bidder /Other Partner of JV-1		
1.	<i>No. of years the bidder/other partner of JV-1 is a manufacturer of OPGW</i>	Last _____ years.
2.	<i>Name of Contract</i>	
3.	Contract Reference No. & Date of Award	
4.	Name and Address of the Employer/Utility for whom the Contract was executed by bidder/Partner e-mail ID _____ Telephone No. _____ Fax No. _____	
5.	Scope of work in respect of OPGW under the aforesaid Contract	<input type="checkbox"/> Design <input type="checkbox"/> Manufacture <input type="checkbox"/> Supply - for the above Contract for OPGW. (Tick only whichever is/are applicable)
6.	Quantities of OPGW supplied	_____ KM.
7.	Voltage level of Transmission Line in which the above OPGWs were supplied	_____ kV
8.	Countries in which the above OPGWs were supplied	<input type="checkbox"/> Home Country <input type="checkbox"/> Other than the home country Country Name
9.	Date of completion of the above Contract	_____ (dd/mm/yyyy)

10.	No. of years the above OPGWs are in satisfactory operation as on the originally scheduled date of bid opening	_____ years
11.	<i>In case, the above supply of OPGW pertains to bidder's Home Country, then please furnish the following information:</i>	
11A.	Name of Contract	
11B.	Contract Reference No. & Date of Award	
11C.	Name and Address of the Employer/Utility for whom the Contract was executed by bidder/Partner e-mail ID Telephone No. _____ Fax No. _____	
11D.	Scope of work in respect of OPGW under the aforesaid Contract	<input type="checkbox"/> Design <input type="checkbox"/> Manufacture <input type="checkbox"/> Supply - for the above Contract for OPGW. (Tick only whichever is/are applicable)
11E.	Quantities of OPGW supplied	_____ KM.
11F.	Voltage level of Transmission Line in which the above OPGWs were supplied	_____ kV
11G.	Name of Country in which the above OPGWs were supplied	_____
11H.	Date of completion of the above Contract	_____ (dd/mm/yyyy)

11I	<i>Whether the above OPGWs are in satisfactory operation as on the originally scheduled date of bid opening</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No
12.	Details of documentary evidences submitted in support of stated experience/Contract/design, infrastructure and manufacturing facilities and capacity and procedures including quality control	
13.	Deleted	
14.	Deleted	
15	Whether the Bidder has furnished an Undertaking in respect of the above as per Form-19/20/21 (as applicable), Section-VI, Vol.-I, along with their bid ?	<input type="checkbox"/> Yes <input type="checkbox"/> No (Tick only whichever is/are applicable)
16	Deleted	
17	Whether the manufacturer have established manufacturing and routine test facility for OPGW in India ?	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Tick only whichever is/are applicable)</i> If Yes, please furnish the following information:
18	<i>Name of Contract</i>	
19	Contract Reference No. & Date of Award	

20	Name and Address of the Employer/Utility for whom the Contract was executed by bidder/Partner e-mail ID _____ Telephone No. _____ Fax No. _____	
21	Scope of work in respect of OPGW under the aforesaid Contract	<input type="checkbox"/> Design <input type="checkbox"/> Manufacture <input type="checkbox"/> Supply - for the above Contract for OPGW. <i>(Tick only whichever is/are applicable)</i>
22	Quantities of OPGW supplied	_____ KM.
23	Voltage level of Transmission Line in which the above OPGWs were supplied	_____ kV
24	Date of installation of the above OPGW cable	_____ (dd/mm/yyyy)
25	Whether the Bidder has furnished an Undertaking in respect of extended warranty of two (2) years as per Form-19/20/21 (as applicable), Section-VI, Vol.-I, along with their bid ?	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Tick only whichever is/are applicable)</i>

26	<p>Whether the manufacturer have established manufacturing and routine test facility for OPGW in India based on technological support of a Parent Company (Principal) or Collaborator and has commenced manufacturing ?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Tick only whichever is/are applicable)</i></p> <p>If Yes, please indicate the name of Parent Company (Principal) or Collaborator:</p> <p>The quantity of OPGW to be supplied by Parent Company (Principal) or Collaborator:kms.</p> <p>If Yes, please furnish the information from sl. no. (2) to (16B) above.</p>
27	<p>Whether the Bidder has furnished a JDU in respect of extended warranty of two (2) years as per Form-24., Section-VI, Vol.-I, along with their bid ?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Tick only whichever is/are applicable)</i></p>
28	<p>Whether the Bidder has furnished a confirmation letter from the Parent Company/Collaborator to furnish performance guarantee for an amount of 10% of the cost of OPGW cable, along with their bid ?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Tick only whichever is/are applicable)</i></p>
29	<p>Details of documentary evidences submitted in support of stated experience/Contract/design, infrastructure and manufacturing facilities and capacity and procedures including quality control</p>	

Format B1: Format for the bidders who wish to qualify through route 1.1.2 or 1.3(B)/1.3(A):

Name of the Bidder /Lead Partner of JV-2 OR Other Partner of JV-1 OR Collaborator/Parent Company :		
1.	<i>No. of years the bidder/other partner of JV-2 is a manufacturer of OPGW</i>	Last _____ years.
2.	<i>Name of Contract</i>	
3.	Contract Reference No. & Date of Award	
4.	Name and Address of the Employer/Utility for whom the Contract was executed by bidder/Partner	
	e-mail ID	_____
	Telephone No.	_____
	Fax No.	_____

5.	Scope of work in respect of OPGW under the aforesaid Contract	<input type="checkbox"/> Design <input type="checkbox"/> Manufacture <input type="checkbox"/> Supply - for the above Contract for OPGW. <i>(Tick only whichever is/are applicable)</i>
6.	Quantities of OPGW supplied	_____ KM.
7.	Voltage level of Transmission Line in which the above OPGWs were supplied	_____ kV
8.	Countries in which the above OPGWs were supplied	<input type="checkbox"/> Home Country <input type="checkbox"/> Other than the home country Country Name
9.	Date of completion of the above Contract	_____ (dd/mm/yyyy)
10.	No. of years the above OPGWs are in satisfactory operation as on the originally scheduled date of bid opening	_____ years
11.	<i>In case, the above supply of OPGW pertains to bidder's Home Country, then please furnish the following information:</i>	
11A.	<i>Name of Contract</i>	
11B.	<i>Contract Reference No. & Date of Award</i>	
11C.	<i>Name and Address of the Employer/Utility for whom the Contract was executed by bidder/Partner</i> <i>e-mail ID</i> <i>Telephone No.</i> <i>Fax No.</i>	_____ _____ _____

11D	<i>Scope of work in respect of OPGW under the aforesaid Contract</i>	<input type="checkbox"/> Design <input type="checkbox"/> Manufacture <input type="checkbox"/> Supply - for the above Contract for OPGW. (Tick only whichever is/are applicable)
11E	<i>Quantities of OPGW supplied</i>	_____ KM.
11F	<i>Voltage level of Transmission Line in which the above OPGWs were supplied</i>	_____ kV
11G	<i>Name of Country in which the above OPGWs were supplied</i>	_____
11H	<i>Date of completion of the above Contract</i>	_____ (dd/mm/yyyy)
11I	<i>Whether the above OPGWs are in satisfactory operation as on the originally scheduled date of bid opening</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No
12.	Details of documentary evidences submitted in support of stated experience/Contract/design, infrastructure and manufacturing facilities and capacity and procedures including quality control	
13.	Deleted	<input type="checkbox"/> Deleted
14.	Deleted	Deleted
15	Whether the Bidder has furnished an Undertaking in respect of the above as per Form-19/20/21 (as applicable), Section-VI, Vol.-I, along with their bid ?	<input type="checkbox"/> Yes <input type="checkbox"/> No (Tick only whichever is/are applicable)

16	Deleted	
16A	Deleted	_____
16B	Deleted	
17	<p>Whether the manufacturer have established manufacturing and routine test facility for OPGW in India ?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><i>(Tick only whichever is/are applicable)</i></p> <p>If Yes, please furnish the following information:</p>
18	Name of Contract	
19	Contract Reference No. & Date of Award	
20	Name and Address of the Employer/Utility for whom the Contract was executed by bidder/Partner	
	e-mail ID	_____
	Telephone No.	_____
	Fax No.	_____
21	Scope of work in respect of OPGW under the aforesaid Contract	<p><input type="checkbox"/> Design <input type="checkbox"/> Manufacture</p> <p><input type="checkbox"/> Supply</p> <p>- for the above Contract for OPGW.</p> <p><i>(Tick only whichever is/are applicable)</i></p>
22	Quantities of OPGW supplied	_____ KM.
23	Voltage level of Transmission Line in which the above OPGWs were supplied	_____ kV

24	Date of installation of the above OPGW cable	_____ (dd/mm/yyyy)
25	Whether the Bidder has furnished an Undertaking in respect of extended warranty of two (2) years as per Form-19/20/21 (as applicable), Section-VI, Vol.-I, along with their bid ?	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Tick only whichever is/are applicable)</i>
26	Whether the manufacturer have established manufacturing and routine test facility for OPGW in India based on technological support of a Parent Company (Principal) or Collaborator and has commenced manufacturing ?	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Tick only whichever is/are applicable)</i> If Yes, please indicate the name of Parent Company (Principal) or Collaborator: The quantity of OPGW to be supplied by Parent Company (Principal) or Collaborator:kms. If Yes, please furnish the information from sl. no. (2) to (16B) above.
27	Whether the Bidder has furnished a JDU in respect of extended warranty of two (2) years as per Form-25, Section-VI, Vol.-I, along with their bid ?	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Tick only whichever is/are applicable)</i>
28	Whether the Bidder has furnished a confirmation letter from the Parent Company/Collaborator to furnish performance guarantee for an amount of 10% of the cost of OPGW cable, along with their bid ?	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Tick only whichever is/are applicable)</i>

29	<p>Whether the bidder has proposed Indian Associate as per provisions of the bidding documents ?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><i>(Tick only whichever is/are applicable)</i></p> <p>If Yes, please indicate the Name of Associate(s) in the order of preference:</p> <p>1.</p> <p>2.</p> <p>3.</p>
30	Name of Contract	
31	Contract Reference No. & Date of Award	
32	<p>Name and Address of the Employer/Utility for whom the Contract was executed by bidder/Partner</p> <p style="text-align: right;">e-mail ID _____</p> <p style="text-align: right;">Telephone No. _____</p> <p style="text-align: right;">Fax No. _____</p>	
33	Quantities of OPGW installed	_____ KM.
34	Voltage level of Transmission Line in which the above OPGWs were supplied	_____ kV
35	<p>Whether the aforesaid OPGW was installed in live-line condition ?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><i>(Tick only whichever is/are applicable)</i></p>

36	Whether the aforesaid OPGW was installed as a prime contractor or subcontractor ?	<input type="checkbox"/> Prime contractor <input type="checkbox"/> Sub-contractor <i>(Tick only whichever is/are applicable)</i>
37	Date of installation of the above OPGW cable	<hr/> (dd/mm/yyyy)
38	Whether the bidder have proposed a subcontractor ?	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Tick only whichever is/are applicable)</i> If Yes, please mention name of sub-contractor:
39	Whether the information furnished above from sl. no. 30 to 37 pertains to	<input type="checkbox"/> Indian Associate <input type="checkbox"/> Subcontractor <input type="checkbox"/> Bidder <i>(Tick only whichever is/are applicable)</i> If pertains to subcontractor, whether the bidder have furnished JDU along with subcontractor confirming that the installation of OPGW for the package be done by the said subcontractor as per Form-27, Section-VI, Vol.-I <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Tick only whichever is/are applicable)</i>
40	Details of documentary evidences submitted in support of stated experience/Contract/design, infrastructure and manufacturing facilities and capacity and procedures including quality control	

For Technical Experience of parent company (principal) or collaborator use the Format-B1 above.

(Use separate sheet for each experience/ Contract)

1.2 FINANCIAL POSITION

For the purpose of this particular bid, bidders shall meet the following minimum criteria :

1.2.1 For Route 1

(a) Net Worth^{\$} for last 3 financial years should be positive

(b) Minimum Average Annual Turnover^{\$} (MAAT) of the bidder for best three years i.e. 36 months out of last five financial years as annualized should be US \$ 7.366 million or Rs. 477.900 million or equivalent for Package I(a) , US \$ 4.418 million or Rs. 286.609 million or equivalent for Package I(b).

^{\$}Note :

1) Annual total income as incorporated in the profit & loss account except non-recurring income e.g. sale of fixed assets.

2) In case bidder has established manufacturing facility in India and is yet to complete three (03) financial years, the net worth and average of the turnover as per financial statement for completed financial years only shall be considered for the purpose of compliance to the specified net worth and MAAT requirement.

c) Bidder shall have Liquid Assets (LA) and/or evidence of access to or availability of credit facilities of not less than US \$ 1.228 million or Rs. 79.650 million or equivalent for Package I(a), US \$ 0.736 million or Rs. 47.768 million or equivalent for Package I(b).

Bidders to qualify for more than one package, their financial position specified at 1.2.1 (b) & (c) shall not be less than the sum of the requirement for the packages they propose to qualify for (strike through if not applicable).

1.2.2 For Route 2

- (a) *The bidder, who is the manufacturer of OPGW and meets the technical experience criteria of clause 1.1.2 A(I) or A(II) above shall be required to meet the financial position criteria given at clause 1.2.1 above.*
- (b) *The bidder, who is an indigenous manufacturer of OPGW and meets the technical experience criteria of clause 1.1.2 A(III) above shall be required to meet the following minimum criteria:*

The bidder shall be required to have a minimum subscribed and paid up share capital of Rs 30 Crs (Rs. 300 million) as on date of bid opening.

In case bidder is a holding company, Financial Position Criteria referred to in clause 1.2.1 and 1.2.2 above shall be that of holding company only (i.e. excluding its subsidiary/ group companies). In case bidder is a subsidiary of a holding company, Financial Position Criteria referred to in clause 1.2.1 and 1.2.2 above shall be that of subsidiary company only (i.e. excluding its holding company).

- 1.2.3 In support of its 'Financial Position', in line with the above, the Bidder must provide the relevant information, alongwith documentary evidence, in the following formats A & B:

Name of the Bidder
---------------------------	-------

A. Average Annual Turnover details:		
Sl. No.	Financial year	Average annual turnover in Rs. Crore
1		
2		
3		
4		

5		
	Average annual turnover for best three years is:	

B. Liquid Assets	
Details of evidence of having Liquid assets (LA)	
Or	
Details of evidence of access to or availability of credit facilities	

1.3 JOINT VENTURES BIDS

In case a bid is submitted by a Joint Venture (JV) of two or more firms as partners, joint venture must comply with the following minimum criteria stipulated either in clause 1.3 (A) or 1.3 (B) :

1.3 (A) JV-1 (Lead Partner through Route 1):

- (a) *All the partners of JV should meet individually the Financial Position criteria given at clause 1.2.1 (a) above.*
- (b) *The lead Partner should meet the Technical Experience criteria given at clause 1.1.1(A) above and not less than 40 % of the Financial Position criteria given in clause 1.2.1 (b) & (c) above.*
- (c) *Each of the other partner(s) should meet Technical Experience (at least 25% individually and 100 % collectively) criteria given at clause 1.1.2 A(I) or A(II) above and not less than 25% of Financial Position criteria given at clause 1.2.1(b) & (c) above.*

1.3 (B) JV-2 (Lead Partner through Route 2) :

(a) All the partners of JV should meet individually the Financial Position criteria given at clause 1.2.1 (a) above.

(b) The lead Partner should meet the Technical Experience criteria given at 1.1.2 A(I) or A(II) above and not less than 40 % of the Financial Position criteria given in clause 1.2.1 (b) & (c) above.

(c) Each of the other partner(s) should meet Technical Experience (at least 25% individually and 100 % collectively) criteria given at clause 1.1.1 (A) above and not less than 25 % of Financial Position criteria given at clause 1.2.1 (b) & (c) above.

1.3 (C) The JV1 should collectively meet the criteria of Clause 1.1.1 (A) & 1.1.2 A(I) or A(II) and JV2 should collectively meet clause 1.1.2 A(I) or A(II) and 1.1.1 (A) for which purpose the relevant figures of Technical Experience and Financial Position criteria (referred to in clause 1.2.1 (b) & (c) above) for each of the Partner(s) shall be added together to arrive at the Joint Venture's total capacity.

2.0 The bidder shall submit documentary evidence in support of qualification requirement stipulated above.

3.0 In support of its 'Financial Position', in line with 1.2 above, the Bidder must provide the relevant information, alongwith documentary evidence, in the following formats:

[in INR Million]

	Name of the Bidder
1	Whether the Complete Annual Reports together with Audited Financial Statement of accounts/equivalent documents of the Company for the F.Y. 2017-18 is available ?	(YES / NO) <i>(Choose whichever is applicable)</i>

SN	Financial Parameters	2022-23	2021-22	2020-21	2019-20	2018-19	2017-18

2	Net Worth						
a)	Paid Up Capital						
b)	Free Reserves and Surplus *						
c)	Misc expenses to the extent not written off						
	Net Worth (a+b-c)						
3	Annual Turnover **						
4	Liquid Assets (Total Current Asset - Inventories)						

* Free Reserve and Surplus should be Exclusive of Revaluation Reserve, written back of Depreciation Provision and Amalgamation.

** Annual total Income/turnover as incorporated in the Profit and Loss Account excluding non recurring income, i.e. sale of fixed asset etc.

4.0 **The Bidder shall also furnish following documents/details with its bid.**
{Reference ITB clause 9.3 (c)}

4.1 *The complete annual reports together with Audited statement of accounts of the company for last five years of its own (separate) immediately preceding the date of submission of bid.*

Note:

- I. *In the event the bidder is not able to furnish the information of its own (i.e separate), being a subsidiary company and its accounts are being consolidated with its group/holding/parent company, the bidder should submit the audited balance sheets, income statements, other information pertaining to it only (not of its group/Holding/Parent Company) duly certified by any one of the authority [(i) Statutory Auditor of the bidder /(ii) Company Secretary of the bidder or (iii) A certified Public Accountant] certifying that such information/documents are based on the audited accounts as the case may be.*
- II. *Similarly, if the bidder happens to be a Group/Holding/Parent Company, the bidder should submit the above documents/information of its own (i.e. exclusive of its subsidiaries) duly certified by any one of the authority mentioned in Note-I above certifying that these information/documents are based on the audited accounts, as the case may be.*
- 4.2 The Bidder should accordingly also provide the following information/ documents:

Audited balance sheet and income statements for the last five years as per the following:

Years preceding to the bid opening	Audited Balance Sheet and Income Statements enclosed	
1 st Year	<input type="radio"/> Yes	<input type="radio"/> No
2 nd Year	<input type="radio"/> Yes	<input type="radio"/> No
3 rd Year	<input type="radio"/> Yes	<input type="radio"/> No
4 th Year	<input type="radio"/> Yes	<input type="radio"/> No
5 th Year	<input type="radio"/> Yes	<input type="radio"/> No

Date:.....

(Signature).....

Place:.....

(Printed Name).....

(Designation).....

(Common Seal).....

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System.

(Form of Certificate of Origin and Eligibility)

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.

Shakti Sadan,

Patiala (Punjab) -147001

We hereby certify that equipment and materials to be supplied are produced in , an eligible source country.

We hereby certify that our company is incorporated and registered in , an eligible source country.

Date:.....

(Signature).....

Place:.....

(Printed Name).....

(Designation).....

(Common Seal).....

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System.

(List of Special Maintenance Tools & Tackles)

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

We are furnishing below the list of special maintenance tools & tackles for various equipment under the subject package. The prices for these tools & tackles are included in our lumpsum bid price. We further confirm that the list of special maintenance tools & tackles includes all the items specifically identified in your bidding documents as brought out below:

- (a)
- (b)

Notwithstanding what is stated above, we further confirm that any additional special maintenance tools and tackles, required for the equipment under this package shall be furnished by us at no extra cost to the employer.

S.No.	For Equipment	Item Description	Unit	Quantity

Date:.....

(Signature).....

Place:.....

(Printed Name).....
(Designation).....
(Common Seal).....

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System.

(List of Special Maintenance Tools & Tackles)

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

We are furnishing below the list of special maintenance tools & tackles for various equipment under the subject package. The prices for these tools & tackles which are to be taken back after the completion of work by us are not included in our lumpsum bid price. We further confirm that the list of special maintenance tools & tackles includes all the items specifically identified in your bidding documents as brought out below:

(a)

(b)

Date:.....

(Signature).....

Place:.....

(Printed Name).....

(Designation).....

(Common Seal).....

Attachment-5

Page 1 of 1

**Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines& sub-stations of PSTCL System.
(Bought-out & Sub-contracted Items)**

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

We hereby furnish the details of the items/ sub-assemblies, we propose to buy for the purpose of furnishing and installation of the subjectPackage:

Sl. No.	Item Description	Quantity proposed to be bought/sub-contracted	Details of the proposed sub-contractor/sub-vendor	
			Name	Nationality
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

We hereby declare that we would not subcontract the erection portion of Contract without prior approval of the Employer.

Date:.....

(Signature).....

Place:.....

(Printed Name).....

(Designation).....

(Common Seal).....

Attachment-6

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System.

(Alternative, Deviations and Exceptions to the Provisions)

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

The bidder shall itemize any deviation from the Specifications included in his bid. Each item shall be listed (separate sheets may be used and enclosed with this Attachment) with the following information:

Sl. No.	Reference clause in the Specifications	Deviation	Reason for change	Cost of withdrawal of the deviation.

Any proposed deviation will be applicable only for the bidder whose bid is substantially responsive in accordance with Clause 22, Section ITB, Vol. I of the bidding documents. If a bid is not substantially responsive, it will be rejected and may not subsequently be made responsive by the bidder by correction of the non-conformity.

The above deviations and variations are exhaustive. We confirm that we shall withdraw the deviations proposed by us at the cost of withdrawal indicated in this attachment, failing which our bid may be rejected and Bid Security forfeited.

Except for the above deviations and variations, the entire work shall be performed as per your specifications and documents. Further, we agree that any deviations, conditionality or reservation introduced in this Attachment-6 and/or in the Bid form, Price schedules & Technical Data Sheets and covering letter, or in any other part of the

bid will be reviewed to conduct a determination of the substantial responsiveness of the bid.

Date:..... (Signature).....

Place:..... (Printed Name).....

(Designation).....

(Common Seal).....

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System.

(Manufacturer's Authorization Form)

(Manufacturer's Letterhead)

See Clause 9.3(b) of the Instructions to Bidders

To: *[Insert: name of Purchaser]*

WE *[insert: name of Manufacturer]* who are established and reputable manufacturers of *[insert: name and/or description of the plant & equipment]* having production facilities at *[insert: address of factory]* do hereby authorize *[insert: name & address of Bidder]* (hereinafter, the "Bidder") to submit a bid, and subsequently negotiate and sign the Contract with you against IFB *[insert: title and reference number of Invitation for Bids]* including the above plant & equipment or other goods produced by us.

We hereby extend our full guarantee and warranty for the above specified plant & equipment materials or other goods offered supporting the supply, installation and achieving of Operational Acceptance of the plant by the Bidder against these Bidding Documents, and duly authorize said Bidder to act on our behalf in fulfilling these guarantee and warranty obligations. We also hereby declare that we and, *[insert: name of the Bidder]* have entered into a formal relationship in which, during the duration of the Contract (including warranty / defects liability) we, the Manufacturer or Producer, will make our technical and engineering staff fully available to the technical and engineering staff of the successful Bidder to assist that Bidder, on a reasonable and best effort basis, in the performance of all its obligations to the Purchaser under the Contract.

For and on behalf of the Manufacturer

Signed: _____

Date: _____

In the capacity of [*insert: **title of position or other appropriate designation***] and this should be signed by a person having the power of attorney to legal bind the manufacturer.

Date:.....

Place:.....

(Signature).....

(Printed Name).....

(Designation).....

(Common Seal).....

Note 1. The letter of Undertaking should be on the letterhead of the Manufacturer and should be signed by a person competent and having Power of Attorney to legally bind the Manufacturer. It shall be included by the bidder in its bid.

2. Above undertaking shall be registered or notarized so as to be legally enforceable.

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System.

(Work Completion Schedule)

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

We hereby declare that the following Work Completion Schedule shall be followed by us in furnishing and installation of the subject Package for the period commencing from the effective date of Contract to us:

Sr. No.	Description
1.	Detailed Engineering and drawing submission a) commencement b) completion
2.	Procurement of equipment/ components & assembly a) commencement b) completion
3.	Type Tests a) commencement b) completion
4.	Manufacturing a) commencement b) completion
5.	Shipments & Delivery a) commencement b) completion
6.	Establishment of site office
7.	Installation at Site a) commencement b) completion

8.	Testing & Pre-commissioning a) commencement b) completion	
9.	Commissioning of facilities	
10.	Trial Operation a) commencement b) completion	
11.	Completion of Facilities	

Date:..... (Signature).....

Place:..... (Printed Name).....

(Designation).....

(Common Seal).....

Note: Bidders to enclose a detailed network covering all the activities to be undertaken for completion of the project indicating key dates for various milestones for each phase constituent-wise.

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System.

(Guarantee Declaration)

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

We conform that the equipments offered shall have minimum (or a maximum, as the case may be) performance specified in Technical Specification. We further guarantee the performance/efficiency of the equipments in response to the Technical Specifications.

Date:.....

(Signature).....

Place:.....

(Printed Name).....

(Designation).....

(Common Seal).....

Note: Bidders to enclose a detailed network covering all the activities to be undertaken for completion of the project indicating key dates for various milestones for each phase constituent-wise.

Attachment-10

Page 1 of 1

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines& sub-stations of PSTCL System.

(Information regarding Ex-employees of PSTCL in our Organisation)

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

We hereby furnish the details of ex-employees of PSTCL who had retired/ resigned at the level of Assistant Engineer and above from PSTCL and subsequently have been employed by us:

Sl. No.	Name of the person with designation in PSTCL	Date of Retirement/ resignation from PSTCL Organisation	Date of joining and designation in our
1.
2.
3.
4.
5.

Date:.....

(Signature).....

Place:.....

(Printed Name).....

(Designation).....

(Common Seal).....

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System.

(Technical Data Sheets)

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

We hereby furnish the relevant details pertaining to the price adjustment provisions for equipment as specified in your specifications and documents for the - (Supply, Transportation, Erection, Testing, Commissioning and Civil Works for installation Indoor and Outdoor OPGW Equipments.

The necessary documentary evidence is enclosed:

Table-1

Sr. No.	Item Description	Unit	TOTAL QTY. (indicative only)	Qty. as per firm
1.0	Transmission Equipment			
A	SDH Equipment (STM - 4 MADM, upto five protected directions)			
	Base Equipment (Common cards, Cross-connect/control cards, Optical base card, Power supply cards, power cabling, other hardware & accessories including sub-racks, patch cords, DDF etc. fully equipped excluding (II) and (III) below)	No.	21	
(I)				
(II)	Optical Interface/SFP# for:			
(a)	S4.1	No.	80	
(b)	L4.1	No.	20	

(III) Tributary Cards

(a)	E1 Interface card (Minimum 16 interfaces per card)	No.	42
(b)	Ethernet interfaces 10/100 Mbps with Layer-2 switching (Minimum 4 interfaces per card.)	No.	42

2 Termination Equipment**A-1 Drop & Insert Multiplexer**

	Base Equipment (Common cards, Power supply cards., power cabling, other hardware & accessories including sub-racks, etc. fully equipped excluding subscriber line interface cards).	No.	21
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----	----

A-2 Subscriber Line Interface Cards

(i)	2 wire (sub/sub)voice channel cards (min 8 channels per card)	No.	21
(ii)	2 wire (sub/Exch) voice channel cards (min 8 channels per card)	No.	21
3.	PRE CONNECTORIZED OPTICAL FIBRE PATCHCORDS (10 MTRS)- PACK OF 6 PATCH COORDS		15

Table-2

Sr. No.	Item Description	Unit	TOTAL QTY
A	OPGW cable & Accessories		
1.	24 Fibre (DWSM) OPGW fibre optic cable	Km.	
2.	Installation Hardware set for 24 Fibre OPGW Fibre Optic cabling including all cable fittings & accessories except joint box.	Set*	
3.	Joint box (24 Fibres)	No.	
4.	48 Fibre (DWSM) OPGW fibre optic cable	Km.	
5.	Installation Hardware set for 48 Fibre OPGW Fibre Optic cabling including all cable fittings & accessories except joint box	Set*	
6.	Joint box (48 Fibre)	No.	
7.	Supervision of stringing of OPGW during installation on lines	Man days	
B	FODP		
1.	FODP 48F : Indoor Type, rack mounted with FCPC coupling and pig tails	No.	
2.	FODP 96 F : Indoor Type, rack mounted with FCPC coupling and pig tails	No.	
C	Fibre Optic approach cable		
1.	24 Fibre (DWSM)	Km	
2.	Installation hardware set for above 24 Fibre, Fibre Optic Approach Cable	Set*	
3.	48 Fibre (DWSM)	Km	
4.	Installation hardware set for above 48 Fibre, Fibre Optic Approach Cable	Set*	

The Bidders are required to estimate and indicate the values of different coefficients for each of the items in the price variation formulae within the specified range such that their summation is as specified in the Bidding Documents. Where no value or '-' or 'shall be furnished later' is specified against the coefficient, the same will be deemed to be zero and the fixed component would be suitably adjusted. If the values of all coefficients in price variation formulae indicated by the Bidder are within the specified range but their sum exceeds the summation specified in the Bidding Documents, the values of the coefficients shall be pro-rata adjusted such that the summation remains as per the provisions of the Bidding Documents. If the values of all coefficients indicated by the Bidder are within the specified range but their summation is less than the value specified in the Bidding Documents, the values of the coefficients as indicated by the Bidder shall be considered as such and the fixed component in the price variation

formulae would be suitably adjusted. Further, if any of values of the coefficients indicated by the Bidder is out of the range specified in the Bidding Documents, the lower of the values, as indicated by the Bidder vis-à-vis lower value of the range for that coefficient specified in the Bidding Documents, shall be considered and the fixed component would be suitably adjusted.

Date:.....

(Signature).....

Place:.....

(Printed

Name).....

(Designation).....

(Common Seal).....

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines& sub-stations of PSTCL System.

(Declaration regarding Social Accountability)

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

We conform that we stand committed to comply to all requirements of Social Accountability Standards i.e., SA8000 (latest Standard available at www.sa-intl.org) and maintain the necessary records.

Date:.....

(Signature).....

Place:.....

(Printed Name).....

(Designation).....

(Common Seal).....

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System.

(Information for E – payment, PF details and declaration for Micro/Small and Medium Enterprise)

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

We are furnishing the following details of Statutory Registration Numbers and details of Bank for electronic payment.

1.	Name of the Supplier/ Contractor in whose favour payment is to be made	
2.	Address with PIN Code and State	Registered Office: Branch Office: Correspondence Address:
3.	Status – Company/others [Declaration of Micro/ Small/ Medium Enterprise under Micro/ Small & Medium Enterprises Development Act 2006, if applicable]	
4.	Permanent Account (PAN) No.	
5.	GSTIN Numbers	
I.	GSTIN in the States/UT from where the supply of goods take place	
	Name of States/UT	GSTIN Number
i)		
ii)		
II.	GSTIN in the States/UT where the supply for services take place(state where the site under the subject cited package is located	GSTIN Number

6.	PF Registration No. of the Company	
7.	PF Regional Office covered (with Address)	
8.	Name of Contact Person and Designation	
9.	Contact Details	Landline(s): Mobile(s): Email ID :
10.	Bank Details for Electronic Payment	Name of the Bank: Address of Branch: Account No. Type of Account: [] Saving [] Current
11.	9 digit MICR code printed at bottom in middle, next to cheque no.	
12.	IFSC (for RTGS)/NEFT Code (<i>to be obtained from the Bank</i>) <i>Sample Cancelled Cheque to be enclosed</i>	

We hereby declare that the above information are true and correct and we agree that the payment on account of this Contract, in the event of award, be made in the above account maintained in the above mentioned Bank.

Date:.....

(Signature).....

Place:.....

(Printed Name).....

(Designation).....

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System.

(Additional Information)

Bidder's Name and Address:

To:

Punjab State Transmission Corporation Ltd.
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

In support of the additional information required as per ITB Sub-Clause 9.3 (p) of the Bidding Documents, we furnish herewith our data/details/documents etc., alongwith other information, as follows (the stipulations have been reproduced in italics for ready reference):

1.0 The Bidder shall furnish

A certificate from their Banker(s) (as per prescribed formats in Form 16, Section-V: Sample Forms and Procedures) indicating various fund based/non fund based limits sanctioned to the Bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the date of bid opening. Wherever necessary the Employer may make queries with the Bidders' Bankers.[Reference ITB clause 9.3(p)(i)]

1.1 In accordance with 1.0, certificate(s) from banker as per requisite format, indicating various fund based/non fund based limits sanctioned to the bidder or each member of the joint venture and the extent of utilization as on date is/are enclosed, as per the following details:

Name of the Bidder/partner of Joint Venture	
Name of the Banker by whom certificate issued	
Date of certificate (should not be earlier than 3 months prior to date of bid opening)	
Whether fund based/non fund based limits are indicated in the certificate	
Whether extent of utilization is indicated in the certificate	

1.2 The Bidder should accordingly also provide the following information/documents:

(i) Details of Banker:

Name of Banker	
----------------	--

Address of Banker	_____

Telephone No.	_____
Contact Name and Title	_____
Fax No.	_____
E-mail ID	_____

- (ii) As per para 1.0, Authorization Letter(s) from the bidder (in case of JV bidder, from all the partners) addressed to the Banker(s), authorizing PSTCL to seek queries about the bidder with the Banker(s) and advising the Banker(s) to reply the same promptly, is/are enclosed as per following details:

Sl. No.	Letter Ref.	Date	Addressed to (name of the Bank)

2.0 Litigation History

The bidder should provide detailed information on any litigation or arbitration arising out of contracts completed or under execution by it over the last five years. A consistent history of awards involving litigation against the Bidder or any partner of JV may result in rejection of Bid.
[Reference ITB clause 9.3(p)(ii)]

- 2.1 Details of litigation history resulting from Contracts completed or under execution by the bidder over the last five years

Year	Name of client, cause of litigation/arbitration and matter in dispute	Details of Contract and date	Award for or against the bidder	Disputed amount

- 3.0 Bidder shall furnish information/documentation in support that the Bidder have adequate sub-station design infrastructure and erection facilities and capacity and procedures including quality control.

3.1 In support of above, the following documents are enclosed with our Bid (Annexure/Attachment No. to be indicated)

4.0 The details of project manager is furnished in the following table:

Name of the Bidder / Partner of a Joint Venture	
--------------------------------------------------------	--

Candidate Summary:

1(i)	Title or position	Project Manager
(ii)	Name of Candidate	
(iii)	Professional Qualification	
2	Present Employment	
(i)	Name of the Employer	
(ii)	Address of the Employer with e-mail ID, Fax & Telephone Nos.	
(iii)	Job Title of Candidate	
(iv)	Years with present Employer as on date of Bid opening	

Summarised professional experience of the above Candidate over the last 15 (fifteen) years in reverse chronological order (Indicate particular technical and managerial experience relevant to the project)

From	To	Company	Relevant experience in executing such contracts of comparable nature (In years)	Relevant experience in as Manager executing such contracts of comparable nature (In years)

5.0 OTHER INFORMATION

5.1 Current Contract Commitments of works in progress

Bidders (individual firms or each partners of JV) should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

Details of Contract	Value of outstanding work (Rs.)	Estimated completion date

5.2 Financial Data :

(In Rs. Millions)

	Actual (previous five years)					Projection for next five years				
1. Total Assets										
2. Current Assets										
3. Total Liability										
4. Current Liability										
5. Profit before taxes										
6. Profit after taxes										

Date:.....

(Signature)

.....

Place:.....

(Printed

Name)

.....

(Designation)

(Common Seal)

Attachment-15

Page 1 of 1

**Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines& sub-stations of PSTCL System.
(Declaration for tax exemptions, reductions, allowances or benefits)**

Bidder's Name and Address: To: Punjab State Transmission Corporation Ltd
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

1. We confirm that we are solely responsible for obtaining following tax exemptions, reductions, allowances or benefits in respect of supplies under the subject package, in case of award. We further confirm that we have considered the same in our bid thereby passing on the benefit to PSTCL while quoting our prices. In case of our failure to receive such benefits, partly or fully, for any reason whatsoever, the Employer will not compensate us.
2. We are furnishing the following information required by the Employer for issue of requisite certificate if and as permitted in terms of the applicable Govt. of India policies/procedures(in case of award).

Applicable Act, Notification No. and Clause Ref. No.	S.No.	Description of item on which applicable	Country of origin	Remarks, if any

(The requirements listed above are as per current Notification of Govt. of India indicated above. These may be modified, if necessary, in terms of the Notifications.

Date:.....

(Signature).....

Place:.....

(Printed Name).....

(Designation).....

(Common Seal).....

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines& sub-stations of PSTCL System.

(Declaration)

Bidder's Name and Address:

To: Punjab State Transmission Corporation Ltd
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

We confirm that Bid Form have been filled up and price schedule have been filled up and uploaded by us as per the provisions of the Instruction to Bidders. Further, we have noted that the same shall be evaluated as per the provisions of the Bidding Documents.

Date:.....

(Signature).....

Place:.....

(Printed Name).....

(Designation).....

(Common Seal).....

**Declaration of Key Managerial Person and Power of Attorney holder
(Declaration)**

Bidder's Name and Address: To: Punjab State Transmission Corporation Ltd
Shakti Sadan,
Patiala (Punjab) -147001

Dear Sir,

1. We confirm that the declarations made in our bid, particularly Attachment-3 (QR) regarding eligibility/qualification data and documents submitted in our bid in support of the declarations, are true and correct to the best of our knowledge.
2. We further confirm that we have filled up Attachment-3(QR). We also confirm that in support of meeting the Technical experience requirement as per Annexure-A (BDS), we have enclosed self-certified copy of Contract/ Award Letter and certificate from the utility for which the contract has been executed.
3. We shall furnish clarification to bid, if any sought by Employer pursuant to ITB clause 21.1. We understand that if we fail to rectify/furnish the requested documents if any, within 7 working days' notice, our bid is liable to be rejected.
4. We understand that any false declaration and/or misrepresentation of facts and/or furnishing of false/forged documents /information may lead to our debarment from participation in Employer tenders and that our Bid Security/ Contract Performance Guarantee may be forfeited besides other actions as deemed to be appropriate as per the provisions of the Bidding Document/Integrity Pact/Employer's policy.
5. Our/Our proposed manufacturer's annual manufacturing capacity as certified by a Chartered Engineer or similar Professional/ Professional body/Govt Agencies is:

-----km of equivalent OPGW Cable / annum

[Certificate from Chartered Engineer or similar Professional/ Professional body/Govt Agencies in the country of the bidder/proposed manufacturer is to be enclosed along with this Attachment. Annual manufacturing capacity of all the manufacturers to be furnished separately]

- 6. Notwithstanding above, we also understand that the Bid Capacity/Manufacturing Capacity as declared hereinabove, shall be subject to assessment, if any, by the Employer, which shall be final and binding. We also confirm that the Employer may verify the supporting documents/ details in connection with above declarations. We further understand that in case of any unethical practices inter-alia including any misrepresentation of facts, submission of false and/or forged details/ documents/ declaration by us, we may be debarred from the participation in Employer’s tenders in future as considered appropriate by Employer and our Bid Security/ Contract Performance Guarantee shall be forfeited besides taking other actions as deemed appropriate.

Date:.....

Place:.....

(Signature of Power of Attorney holder).....
 (Printed Name).....
 (Designation).....
 (Common Seal).....

(Signature of Key Managerial Person).....
 (Printed Name).....
 (Designation).....
 (Common Seal).....

Note:Key Managerial Personnel (KMP) of the company shall include CEO/Managing Director/ Company Secretary/ Director/ CFO/any of the partner in case of partnership firm/any other officer entrusted with substantial powers of the management of the affairs of the company/firm.

PRICE BID

**Package A - Supply, Erection, Testing and
Commissioning of OPGW along with its Terminal
Equipment on 132kV/220kV/400kV Transmission
Lines& sub-stations of PSTCL System**

BID FORM (Price Bid to be uploaded only)

Bid Proposal Ref. No.:.....

Date:

To:

Punjab State Transmission Corporation Ltd. ,

Shakti Sadan,

Patiala (Punjab) -147001

Package A: Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines & sub-stations of PSTCL System
(Specification No.:STQ-8055).

Dear Sir/Madam,

1.0 In continuation of First Envelope of our Bid, we hereby submit that we have uploaded the price bid both of which shall be read together and in conjunction with each other, and shall be construed as an integral part of our Bid. Accordingly, we the undersigned, offer to design, manufacture, test, deliver, install and commission (including carrying out Trial Operation, Performance & Guarantee Test as per provision of Technical Specification) under the above-named package in full conformity with the said Bidding Documents for the sum of (*Specify the currency and the amount in figures & words*) or such other sums as may be determined in accordance with the terms and conditions of the Bidding Documents.

The above amounts are in accordance with the price schedules attached herewith and are made part of this bid.

2.0 Price Schedules

2.1 In line with the requirements of the Bidding documents, we have uploaded the following Price Schedules, duly filled - in as per your proforma:

Schedule 1 Plant and Equipment (including mandatory Spares) to be supplied including Type Test Charges

Schedule 2 Local Transportation, Insurance and other incidental services applicable for supply of Plant & Equipment

Schedule 3 Installation Services

Schedule 4 Charges for Training to be imparted

Schedule 5 Taxes and Duties not included in Schedule 1 to 4

Schedule 6 Grand Summary (Schedule Nos. 1 to 5)

2.2 We are aware that the Price Schedules do not generally give a full description of the Work to be performed under each item and we shall be deemed to have

- read the Technical Specifications and other sections of the Bidding Documents and Drawings to ascertain the full scope of Work included in each item while filling-in the rates and prices. We agree that the entered rates and prices shall be deemed to include for the full scope as aforesaid, including overheads and profit.
- 2.3 We declare that as specified in Clause 11.5, Section –II:ITB, Vol.-I of the Bidding Documents, prices quoted by us in the Price Schedules shall be subject to Price Adjustment during the execution of Contract in accordance with Appendix-2 (Price Adjustment) to the Contract Agreement.
- 2.4 We understand that in the price schedules, where there are errors between the total of the amounts given under the column for the price Breakdown and the amount given under the Total Price, the former shall prevail and the latter will be corrected accordingly. We further understand that where there are discrepancies between amounts stated in figures and amounts stated in words, the amount stated in words shall prevail. Similarly, any discrepancy in the total bid price and that of the summation of Schedule price (price indicated in a Schedule indicating the total of that schedule), the total bid price shall be corrected to reflect the actual summation of the Schedule prices.
- 2.5 We declare that items left blank in the Schedules will be deemed to have been included in other items. The TOTAL for each Schedule and the TOTAL of Grand Summary shall be deemed to be the total price for executing the Facilities and sections thereof in complete accordance with the Contract, whether or not each individual item has been priced.
- 3.0 Deleted
- 3.1 100% of applicable Taxes and Duties, which are payable by the Employer under the Contract, shall be reimbursed by the Employer after despatch of equipment on production of satisfactory documentary evidence by the Contractor in accordance with the provisions of the Bidding Documents.
- 3.2 We further understand that notwithstanding 3.0 above, in case of award on us, you shall also bear and pay/reimburse to us, GST in respect of supplies by us to you, imposed on the Plant & Equipment including Mandatory Spare Parts specified in Schedule No. 1, 2, 3 & 5, Training charges specified in Schedule 4, Erection, Testing and Commissioning charges in Schedule 6 & 7 of the Price Schedule in Second Envelope, by Indian Laws.
- 3.3 We confirm that we have also registered/we shall also get registered in the GST Network with GSTIN, in all the states where the project is located and the states from which we shall make supply of goods.
- 4.0 We, hereby, declare that only the persons or firms interested in this proposal as principals are named here and that no other persons or firms other than those

mentioned herein have any interest in this proposal or in the Contract to be entered into, if the award is made on us, that this proposal is made without any connection with any other person, firm or party likewise submitting a proposal is in all respects for and in good faith, without collusion or fraud.

Dated this ____ day of _____ 20__

Thanking you, we remain,

Yours faithfully,

For and on behalf of the [Name of the Bidder#]

(Signature).....

(Printed Name).....

(Designation).....

(Common Seal).....

Date:

Place:

Business Address:

Country of Incorporation:

(State or Province to be indicated)

Name of the Principal Officer:

Address of the Principal Officer:

*Applicable in case of a bid from Joint Venture of firms.

#In case the bid is submitted by a Joint Venture, the name of the Joint Venture should be indicated

(I)	Base Equipment (Common cards, Cross-connect/control cards, Optical base card, Power supply cards, power cabling, other hardware & accessories including sub-racks, patch cords, DDF etc. fully equipped excluding (II) and (III) below)	No.	21				Included	Included
(II)	Optical Interface/SFP* for:							
(a)	S4.1	No.	80		0		Included	Included
(b)	L4.1	No.	20		0		Included	Included
(III)	Tributary Cards							
(a)	E1 Interface card (Minimum 16 interfaces per card)	No.	42		0		Included	Included
(b)	Ethernet interfaces 10/100 Mbps with Layer-2 switching (Minimum 4 interfaces per card.)	No.	42		0		Included	Included
2	Termination Equipment							
A-1	Drop & Insert Multiplexer							
	Base Equipment (Common cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, etc. fully equipped excluding subscriber line interface cards).	No.	21		0		Included	Included
A-2	Subscriber Line Interface Cards							
(i)	2 wire (sub/sub)voice channel cards (min 8 channels per card)	No.	21		0		Included	Included
(ii)	4 wire (E&M) voice channel cards (min 8 channel per card)	No.	21		0		Included	Included
3	Equipment Cabinets							
a	For SDH Equipment, Drop/Insert MUX Equipments Equipment including accessories.	No.	21		0		Included	Included
	Sub Total B				0.00		0.00	0.00
	Part C - Auxiliary Power Supply							
A	Main Equipments							
(i)	48V DC Power Supply (DCPS) system based on SMPS (for 15A rating)	Nos.	21				Included	Included
(ii)	Battery bank for above DCPS (VRLA Type-200 AH)	Nos.	21		0		Included	Included
	Sub Total C				0.00		0.00	0.00
	Total Part A + Part B + Part C +				10600.00		1541.40	12141.40

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132KV/220 KV/400 KV Transmission Lines of PSTCL System

Bidder's Name & Address

(Schedule of Rates and Prices)

Schedule -2

Port handling and custom clearance for Plant and Equipment to be supplied from abroad (if any) and Local transportation, In-transit Insurance, Loading and unloading Charges

All prices in Indian Rupees

Sr. No.	Item Description	Unit	Quantity	Local transportation, In-transit Insurance, Loading and unloading Charges	
				Unit charges	Total charges
1	2	4	5	6	7=5*6
Part A - OPGW					
A OPGW cable & Accessories					
1	24 Fibre (DWWSM) OPGW fibre optic cable	Km.	226		Included
2	Installation Hardware set for 24 Fibre OPGW Fibre Optic cabling including all cable fittings & accessories except joint box.	Set	226		Included
3	Joint box (24 Fibres)	No.	185		Included
4	48 Fibre (DWWSM) OPGW fibre optic cable	Km.	141		Included
5	Installation Hardware set for 48 Fibre OPGW Fibre Optic cabling including all cable fittings & accessories except joint box	Set	141		Included
6	Joint box (48 Fibre)	No.	30		Included
B FODP					
1	FODP 48F : Indoor Type, wall mounted with FCPC coupling and pig tails	No.	29		Included
2	FODP 96 F : Indoor Type, wall mounted with FCPC coupling and pig tails	No.	3		Included
C Fibre Optic approach cable					
1	24 Fibre (DWWSM)	Km	14		Included
2	Installation hardware set for above 24 Fibre, Fibre Optic Approach Cable	Set	14		Included
3	48 Fibre (DWWSM)	Km	5		Included
4	Installation hardware set for above 48 Fibre, Fibre Optic Approach Cable	Set	5		Included
Sub Total A					0
Part B - 1. Terminal Equipment					

A	SDH Equipment (STM - 4 MADM, at least Five protected directions)				
(I)	Base Equipment (Common cards, Cross-connect/control cards, Optical base card, Power supply cards, power cabling, other hardware & accessories including sub-racks, patch cords, DDF etc. fully equipped excluding (II) and (III) below)	No.	21		Included
(II)	Optical Interface/SFP* for:				
(a)	S4.1	No.	80		Included
(b)	L4.1	No.	20		Included
(III)	Tributary Cards				
(a)	E1 Interface card (Minimum 16 interfaces per card)	No.	42		Included
(b)	Ethernet interfaces 10/100 Mbps with Layer-2 switching (Minimum 4 interfaces per card.)	No.	42		Included
2	Termination Equipment				
A	Drop & Insert Multiplexer				
(i)	Base Equipment (Common cards, Power supply cards,, power cabling, other hardware & accessories including sub-racks, etc. fully equipped excluding subscriber line interface cards).	No.	21		Included
B	Subscriber Line Interface Cards				
(i)	2 wire (sub/sub)voice channel cards (min 8 channels per card)	No.	21		
(ii)	4 wire (E&M) voice channel cards (min 8 channel per card)	No.	21		Included
3	Equipment Cabinets				
a	For SDH Equipment, Drop/Insert MUX Equipments and DACS Equipment including accessories.	No.	21		Included
	Sub Total C				
A	Part E - Auxiliary Power Supply				
	Main Equipments				
(i)	48V DC Power Supply (DCPS) system based on SMPS (for 15A rating)	Nos.	21		Included
(ii)	Battery bank for above DCPS (VRLA Type-200 AH)	Nos.	21		Included
	Sub Total C				0.0
	Total Part A + Part B + Part C				0.0

Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on 132kV/220kV/400kV Transmission Lines of PSTCL System

Bidder's Name & Address

(Schedule of Rates and Prices)

Schedule -3

Erection, Testing and Commissioning charges

All prices in Indian Rupees

Sr. No.	Item Description	SAC code	Rate of GST Applicable (in %)	Unit	Quantity	Unit ETC charges Excluding GST	Total ETC charges Excluding GST	GST amount as confirm by bidder (in Rs)
1	2	3	4	5	6	7	8	9
Part A - OPGW								
A	OPGW cable & Accessories							
1	24 Fibre (DWSSM) OPGW fibre optic cable			Km.	226		0	0
2	Installation Hardware set for 24 Fibre OPGW Fibre Optic cabling including all cable fittings & accessories except joint box.			Set	226		0	0
3	Joint box (24 Fibres)			No.	185		0	0
4	48 Fibre (DWSSM) OPGW fibre optic cable			Km.	141		0	0
5	Installation Hardware set for 48 Fibre OPGW Fibre Optic cabling including all cable fittings & accessories except joint box			Set	141		0	0
6	Joint box (48 Fibre)			No.	30		0	0
7	Supervision of stringing of OPGW during installation on lines			Man days			0	0
B								
FODP								
1	FODP 48F : Indoor Type, wall mounted with FCPC coupling and pig tails			No.	29		0	0
2	FODP 96 F : Indoor Type, wall mounted with FCPC coupling and pig tails			No.	3		0	0
C								
Fibre Optic approach cable								
1	24 Fibre (DWSSM)			Km	14		0	0

(i)	48V DC Power Supply (DCPS) system based on SMPS (for 15A rating)		Nos.	21	0	0
(ii)	Battery bank for above DCPS (VRLA Type-200 AH)		Nos.	21	0	0
Sub Total C					0.0	0.0
Total Part A + Part B + Part C					0.0	0.0

**Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on
132KV/220KV/400KV Transmission Lines of PSTCL System**

(Schedule of Rates and Prices)

Bidder's Name & Address

Schedule -4b

Price break-down of charges for training to be imparted within india

All prices in Indian Rupees

Sr. No.	Item Description	SAC Code	Rate of GST applicable	Unit	Quantity	Unit charges	Total charges Excluded GST	GST amount as confirm by bidder (in Rs)
1	2	3	4	5	6	7	8	9
1	Training for Communication			MH**	240		0.00	0.00
	Total training charges for training to imparted within india						0.00	0.00

*Note:1. In case the bidder leaves the cell for confirmation of SAC Code and or GST "Blank", the SAC Code and the corresponding GST rate indicated by the Employer shall be deemed to be the one confirmed by the bidder.
2. **MH denotes Man Hours

**Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on
132kV/220kV/400kV Transmission Lines of PSTCL System**

(Summary of Taxes and Duties)

Bidder's Name & Address

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Schedule -5

All prices in Indian Rupees

Sr No.	Item No.	Total prices (In
1	Total GST on Goods to be supplied from within India	
	Total GST for supply of Plant & Equipment (inter -alia including Type Test Charges) from India between the Contractor and the employer (identified in Schedule 1b') and not included in the Ex-works price, as per the provisions of the Bidding Documents.	
2	Total GST on Services to be supplied from within India	
	Total GST on Installation Charges (identified in Schedule 3') and Training Charges (identified in Schedule 4b') and annual Maintenance Charges respectively per the provisions of the Bidding Documents	
	Grand TOTAL (1+2)	0.00

**Supply, Erection, Testing and Commissioning of OPGW along with its Terminal Equipment on
132kV/220kV/400kV Transmission Lines of PSTCL System**

(Schedule of Rates and Prices)

Bidder's Name & Address

(Grand Summary)

Schedule -6

Sr. No.	Description	Total Price (in Rs.)
1	TOTAL SCHEDULE NO . 1(b)	
	Plant & Equipment to be supplied from within India including Type Test Charges for test to be conducted in India	0.00
2	TOTAL SCHEDULE NO . 2	
	Local transportation , In- transit Insurance , loading & Unloading Charges	0.00
3	TOTAL SCHEDULE NO .3	
	Installation Charges	0.00
4	TOTAL SCHEDULE NO. 4(b)	
	Training charges for Training to be imparted in India	0.00
5	TOTAL SCHEDULE NO.4 (c)	
	Annual Maintenance charges	#VALUE!
6	TOTAL SCHEDULE NO. 5	
	Taxes and Duties	0.00
	GRAND TOTAL (1+2+3+4+5+6)	#VALUE!

Note:- All the aforementioned price schedules are open to Reverse bidding and subsequently L-1