CHHATTISGARH STATE POWER TRANSMISSION CO. LTD.

(A Govt. of Chhattisgarh undertaking) (A successor company of CSEB)

OFFICE OF CHIEF ENGINEER (PLANNING & PROJECTS)

Third Floor, SLDC Building, CSEB Campus
Dangania, Raipur (C.G.)-492013

CIN- U40108CT2003SGC015820 GSTIN-22AADCC5773E1ZX

TENDER SPECIFICATIONS

TR-20/14

REPLACEMENT OF EXISTING G.I. EARTHWIRE (7/3.66mm) OF VARIOUS EHV TRANSMISSION LINES (4700 km) OF CSPTCL BY OPGW (24 & 48 FIBER)

(E-bidding)

(RFX No.8100020773)

DATE & TIME OF PRE-BID CONFERENCE : 16/04/2021.

LAST DATE & TIME OF SUBMISSION OF TENDER
DATE: 28/04/2021 (TIME 15.00 HRS)

DUE DATE & TIME OF OPENING OF TENDER
DATE: 28/04/2021 (TIME 15.30 HRS)

Website: - www.cspc.co.in/csptcl

PRICE Rs.11,200/- (Printed)
Rs.11,800/- (Downloaded)

OFFICE OF CHIEF ENGINEER (PLANNING & PROJECTS)

CHHATTISGARH STATE POWER TRANSMISISON CO. LTD. DAGANIYA, RAIPUR (C.G.)

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CHHATTISGARH STATE POWER TRANSMISSION CO. LTD.

(A Govt. of Chhattisgarh undertaking) (A successor company of CSEB)

TENDER FORM

TENDER SPECIFICATION TR-20/14

REPLACEMENT OF EXISTING G.I. EARTHWIRE (7/3.66mm) OF VARIOUS EHV TRANSMISSION LINES (4700 km) OF CSPTCL BY OPGW (24 & 48 FIBER)

Tender document SL.No…….*

Issued to M/s…… *

Cost of Tender documents Rs…….

D.D.No……..Dtd……..

Name of Bank ……

** Not required in case tender document is downloaded*

Signature & Seal of Issuing Authority
CSPTCL; Raipur

The undersigned hereby tender and offer (subject to CSPTCL's conditions of tendering), the Chhattisgarh State Power Transmission Company to test and supply, plant, machinery, materials, deliver and execute and do the several works and things which are described or referred to in the enclosures & Annexures to the specification **TR-20/14** copies of which are annexed hereto and which under the terms thereof are to be supplied, executed and done by the contractor in a thoroughly good and workman like manner, and to perform and observe the provisions and agreements or the part of the contract contained in or reasonably to the inferred from the said tender documents for the sum and at the rates set out in schedules annexed hereto.

It is confirmed that:

(I) Questionnaire for Commercial terms and conditions.

(II) Questionnaire for Technical specifications of the Equipments, and

(III) All other conditions wherever described in the tender documents have been replied in full giving clear details. It has been noted that in case any reply is not given or any reply is incomplete/ambiguous the Company will have right to take the same to be advantageous for the Company. Company's decision in this regard will be final. The bidder will have no right to furnish any technical or commercial clarification after opening of the bid which may in any way alter the offered prices.

Dated, this …… day of …….

Bidder's Signature

Bidder's Address.

CHHATTISGARH STATE POWER TRANSMISSION CO. LTD
(A Government of Chhattisgarh Undertaking)
O/o Chief Engineer (Planning & Projects)
Address : Third floor, SLDC Building, Danganiya Raipur-492013.
Website : www.cspc.co.in Phone 0771-2574238/12/09 Fax:0771-2574246

No.02-04/NIT/ TR-20/14/2329/ Raipur/dtd.19/03/2021

E-NOTICE INVITING TENDER

(E-bidding)

Sealed tenders are invited from experienced Bidders for taking up the following project on turnkey basis-

Sl. No.	Tender No.	Particulars	Cost of Tender Documents (Non-refundable)	Earnest money	Due date of opening of tender
1	TR-20/14 (RFx No. 8100020773)	Replacement of existing G.I. Earthwire (7/3.66mm) of various EHV transmission lines (4700 km) of CSPTCL by OPGW (24 & 48 Fibre)	Rs.11,200/- (Printed) Rs.11,800/- (Downloaded)	Rs.5.00 lacs	**28/04/2021** & **Pre-bid** conference on **16/04/2021**

Last date of sale of tender document: One day prior to due date of opening of tender.

NOTE:-

i) In case any of the above date is declared as holiday, then the particular date will automatically get shifted to next working day.

ii) Any notice for extension of due date of tender opening shall not be published in newspapers. It will be displayed only on official website of the company.

iii) **Pre bid conference shall be held at the Conference Hall of CSPTCL at Raipur on dtd.16/04/2021 at 12.00 hrs.**

TERMS AND CONDITIONS:-

(i) The tender documents can be obtained from the office of the CE (Planning & Project) in person on payment of cost of tender documents in the form of D.D. only made out in the name of MANAGER (RAO : HQ), CSPTCL, Raipur accompanied with firm's application on its letter head. If tender document is required by post, Rs.280/-(i.e., Rs.250/- + 12% GST) shall be paid by D.D. additionally along with the cost of tender document. If more than one tender document is required, separate DDs should be furnished for each tender. CSPTCL shall not be responsible for any postal delay in receipt/ non-receipt of tender documents. No receipt of tender shall be issued in any case.

(ii) The tender document can also be downloaded from official website of CSPTCL "**www.cspc.co.in**'' (go through Chhattisgarh State Power Transmission Co. Ltd. - Tender Notice) and required tender fee Rs. 11,200/- {(i.e. Rs 10,000 /- + 12 % GST) if purchased} or Rs.11,800/- {(i.e. Rs 10,000 /- + 18 % GST) if downloaded} in form of DD in favour of Manager (RAO: HQ), CSPTCL, Raipur payable at Raipur should be submitted along with EMD in envelope containing DD of EMD. The envelope containing DDs of cost of tender document & EMD should be suitably super scribed "DDs containing cost of tender document and EMD". The details of DDs should be mentioned on the outer side of the

envelope also. Please note carefully that in absence of aforesaid requisite tender fee, further bid shall not be considered for opening.

(iii) Tender documents and the detailed specification can be obtained on any working day one day prior to the due date. The tenders duly filled in shall be dropped/get dropped in the specified tender box up to 15:00 Hrs. on the due date. Any other means of delivery shall not be accepted. No receipt of tender shall be issued in any case. The tender box shall be locked/sealed **at 15:00 Hrs.** on the due date and shall be opened at **15:30 Hrs.** on the same date.

(iv) After publication of NIT & before the date of opening of TC Bid, corrigendum/ other information (if any) shall be displayed on our official web only. The bidders are requested to remain in contact with this office or visit our web-site for any development/ clarification/ amendment issued subsequently.

(v) CSPTCL reserves the right to accept or reject any or all the offers, in part or full without assigning any reason whatsoever.

Website:- www.cspc.co.in/csptcl

Chief Engineer (Planning & Projects)
CSPTCL: Raipur

SCOPE OF THE SPECIFICATIONS

GENERAL:-

1) The CSPTCL intends to install OPGW based fiber optic transmission network on it's EHV lines in place of existing G.I. Earthwire in 03 (three) **Packages – I (Approx. 1911 km), Packages – II (Approx. 1084.349 km), Packages – III (Approx. 1246 km)** under the jurisdiction of EHT:C&M Circles Bilaspur, Raipur and Bhilai respectively in Chhattisgarh State. The OPGW shall be installed on 220KV& 132KV transmission lines and the optical node shall be made at involved 132KV and 220KV Sub-stations. The instant project includes installation of 4700 km (24 & 48 fiber) OPGW along with its accessories. The details of work and technical specifications are given in various sections of this specification.

   The fibre optic cables shall be installed on transmission lines under live line conditions, i.e. with all the circuits of the transmission line charged to their rated voltage. The OPGW cable shall be installed at the top of the tower by replacing the existing ground wire. The Contractor shall carry out re-tensioning of the existing earth wire wherever required to maintain the adequate clearances for live line stringing of fibre optic cables.

   The broad scope of this tender specification includes the survey, planning, design, engineering, manufacturing, supply, transportation, insurance, delivery at site, unloading, handling, storage, testing, training and demonstration for acceptance, commissioning, maintenance and documentation for OPGW cable along with associated hardware and transportation of dismantled materials to site store of CSPTCL. The scope of work includes following sub systems:-

   i) **OPGW** :- Supply, dismantling of existing G.I. earthwire, Erection & installation , testing and commissioning of 24 & 48 fiber OPGW along with associated hardware, suitable joint boxes etc. The Optical Power Ground Wire shall be installed on existing 220 KV& 132 KV lines connecting to several sub-stations of CSPTCL (List of lines given in Section-IV-(B), by replacing the existing G.I. Earthwire.

   ii) **Storage**: - Storage space for OPGW, its hardware & other accessories, tools & plants etc. required will be arranged by the bidder. Also construction of various site offices for execution of the work will be in the scope of the bidder.

   iii) **Return of the dismantled G.I. earthwire :-** The work involves recoiling of dismantled Earthwire in empty Drums of OPGW, stacking and transportation of existing Earthwire & its associated accessories i.e. Hardwares, Vibration Damper, Nuts & Bolts etc. to the site Store of CSPTCL as decided by OIC of the work. The contractor shall arrange their own vehicle for transportation, loading & unloading of dismantled Earthwire to the site store of CSPTCL.

2) Some items/ works which are intended to be got done as per scope of work and not specifically brought out in bill of quantities shall have to be done by turnkey contractor at their own cost as per approved drawing, specifications & as per direction of Engineer I/C of CSPTCL.
3) Bidders are required to quote rates for all materials and works as detailed in the specification. They shall furnish full particulars as called for in addition to filling and completing the Annexure of this specification.

4) **Tower Schedule** :- The Tower Schedules of EHV lines shall be issued to the contractor after placement of work order.

5) **Completion Period:** - The work for Replacement of existing G.I. Earthwire (7/3.66mm) of various EHV transmission lines (4700 km) of CSPTCL by OPGW (24 & 48 Fibre) covered under this specification should be completed in **24 (Twenty four) calendar months** including rainy season from the date of order. The contractor shall ensure to complete the work of replacement of G.I. Earthwire with OPGW in all the three packages within aforesaid stipulated period.

Separate gangs with sufficient men & materials shall be deployed by the contractor to carry-out the work of each package simultaneously so the work of all three packages can be completed within stipulated completion period.

PRE - QUALIFYING REQUIREMENTS

The minimum qualification required for the bidders will be as given below:-

A) Only Indian bidders shall be eligible to participate in the tender.

B) Sole bidder or joint venture / consortium (not more than 2 firms) shall be eligible to participate in the tender.

C) The sole bidder or the partners of JV/consortium should comply all the provisions of Ministry of Finance, Government Of India's order no. F.No.6/18/2019-PPD Dtd. 23.07.2020 (Annexure-31-a) read with amended order No.18/37/2020-PPD Dtd.08.02.2021 (Annexure-31-b) and any subsequent amendments issued upto date of issue of N.I.T. (Tender doc. page 230-242).

D) FINANCIAL CRITERIA OF PQR :-

i) **Net Worth:-** Net Worth of the sole bidder/each partner of joint venture (JV)/ consortium for each of the last three Financial Years (2017-18, 2018-19 & 2019-20) should be positive.

Net worth means the sum total of the paid up capital and free reserves (excluding reserves created out of revaluation) reduced by aggregate value of accumulated losses (including debit balance in profit and loss account for current year) and intangible assets.
A certificate issued by Chartered Accountant (in original) showing networth for last 3 financial years (2017-18, 2018-19 & 2019-20) should be submitted.

ii) **MAAT :-** The sole bidder/partners of joint venture (JV)/consortium collectively must have minimum average annual turnover (MAAT) for best 3 years out of last 5 financial years **(FY 2015-16, 2016-17 , 2017-18, 2018-19 & 2019-20)** equal to **Rs.118.32 crore** Self-attested copies (i.e., copies attested by authorised signatory of the tender) of the audited Balance Sheets and profit & loss accounts for last 5 years of sole bidder/each of the partners of the joint venture should be furnished in support, duly certified by chartered accountants of the firm. For calculation of turnover, other income indicated in balance sheet shall not be taken into account.

In case of joint venture/consortium, the lead partner should meet not less than **Rs.70.99 crore** of minimum financial criteria regarding turn over requirement. The other partner should meet not less than **Rs.29.58 crore** of minimum financial criteria regarding turn over requirement. Both the partners of joint venture/consortium shall collectively meet the minimum financial criteria.

iii) **Liquid Assets:-** The bidders (sole bidder/ members of joint venture collectively) shall currently have liquid assets (LA) or/and evidence of access to or availability of credit facilities of not less than **Rs.19.72 crore.**

A certificate of Chartered Accountant (in original) indicating details (break up) of available liquid assets should be furnished in support of this. **Such certificate should have been issued not earlier than 3 months prior to the date of bid opening.**

Liquid assets would include cash (and equivalents), bank deposits, securities that can be freely traded and receivables which has general certainty of getting received.

As regards certificate pertaining to evidence of access to or availability of credit facilities, a certificate (in original) should be furnished from their banker(s) {as per Annexure-21} indicating various fund based / non fund based limits sanctioned to the bidder/ JV Partners and the extent of utilisation as on date. **Such certificate should have been issued not earlier than 3 months prior to the date of bid opening.** Wherever necessary, CSPTCL may make queries with the bidder's banker.

In case bidder is a holding company, the Financial Position criteria referred above (i.e., Net-worth, MAAT & LA), shall be that of holding company only (i.e. excluding its subsidiary/group companies).

In case bidder is a subsidiary of a holding company, the Financial Position criteria referred above, shall be that of subsidiary company only (i.e. excluding its holding company).

Note:-**For the instant tender, the turnover of last 5 financial years i.e. 2015-16, 2016-17, 2017-18, 2018-19 & 2019-20 shall be considered for calculation.**

iv) The sole bidder/partners of joint venture (JV)/consortium (each partner of JV) shall submit certificates (in original as per prescribed Annexure A-29) issued by Chartered Accountant, confirming fulfilment of following criteria :-

a) The sole bidder/partners of joint venture (JV)/consortium (each partner of JV) should have discharged all its payment obligations (principal/interest) on outstanding debentures (i.e. debentures which have not yet been redeemed), if any and no such payments as on **31.12.2020** should be outstanding / overdue.

b) The sole bidder/partners of joint venture (JV)/consortium(each partner of JV) should not be presently in default in payment of any bank loan or interest thereon for more than three months or any loan account of the bidder should not have been classified as NPA (Non performing assets) by the creditor/ lending bank, as on date of issue of NIT.

c) The sole bidder/partners of joint venture (JV)/consortium(each partner of JV) should not be under process of insolvency or liquidation as on the date of issue of NIT. Even at the later date up to opening of price bids against the instant tender, if it comes to the notice of CSPTCL that the sole bidder/ any partner of JV has been going through the process of insolvency or liquidation, their bid will be rejected.

v) The sole bidder/partners of joint venture (JV)/consortium should not be debarred/ blacklisted by Bank/State Govt/Central Govt./State PSU/CPSU/SEB/public utility as on date of issue of NIT. A declaration in this regard shall be furnished by the bidder **(Annexure 28).**

However, the bid may not be considered for further processing in following cases also:-

i) If sole bidder/partners of joint venture (JV)/consortium is debarred/ blacklisted by Bank/State Govt./Central Govt./State PSU/CPSU/SEB/public utility up to date of opening of price bid of the instant tender.

ii) If a case comes to notice regarding submission of forged/fake document in any other tender under process in CSPTCL up to date of opening of price bid of the instant tender.

vi) All the documents / statements / attachments / information submitted by the sole bidder/partners of joint venture (JV)/consortiumin proof of the qualifying requirements must be authentic / genuine /correct and in case, any of the said documents / statements / attachments / information are found to be false / fake / misleading, the bidder will be disqualified and action will be taken against the bidder as per relevant provisions of the tender. A declaration in this regard (as per prescribed **Annexure A-28**) shall be furnished by the sole bidder/ each partner of JV (separately).

E) TECHNICAL EXPERIENCE CRITERIA OF PQR :-

(I) Technical Experience for Sole bidder or Joint Venture(JV)/consortium bidder**: -**

a) Sole bidder or Joint Venture(JV)/consortium bidder should have executed project(s) for supply, erection, testing and commissioning of OPGW (24 Fiber or higher capacity) alongwith the hardwares and accessories on 110 KV or above voltage class transmission lines for at-least **2000 Kms** (cumulatively) route length on turn-key basis during last **5 years** i.e. FY 2015-16 to FY 2019-20 (between 1st Apl'2015 & 31st March'2020) against order(s) issued by any of the following **Indian entities** :-

i. Power utilities owned and controlled by Central or State Govt., **Or**
ii. PSUs, **Or**
iii. Govt. organizations'

The above experience should be either for replacement of earth wire with OPGW on existing line or laying of OPGW (24 Fiber or higher capacity) cable during construction of new 110 KV or higher voltage transmission line against the order(s) issued by above entities. The date of the order(s) in support of the above experience should not be older than 10 years as on the date of issue of NIT.

Out of the above 2000 km of OPGW, minimum 200 km should be in successful operation for a period of minimum one year as on the date of issue of NIT.

b) Sole bidder or Joint Venture(JV)/consortium bidder should have the experience of at least **200 km** (cumulatively) **of Live Line** installation of OPGW on 110 KV or higher voltage transmission line **during 5 (five) years as on date of N.I.T.** in project(s) at (a) above or as a standalone activity in other project(s) against order(s) issued by any of the entities mentioned in(a) (i), (ii) or (iii) above .

Note:-

i. In case of Sole bidder, the experience of the bidder shall be that of "Sole bidder" or "any one of the partner of the Joint Venture/ consortium" in the projects executed by them earlier.

ii. In case the bid is submitted by JV / consortium, either of the JV i.e., the "Lead partner" or the "Other partner" *or both partners jointly* should meet the requirement as required for sole bidder.

The experience of any one of the partners of the joint ventures / consortium (lead partner or other partner) meeting the above 'Project Capability' criteria shall either be as "Sole bidder" or "any one of the partner" of the Joint Venture/ consortium" in the projects executed by them earlier.

(II) **Type Test Reports**:- The sole bidder or JV/Consortium bidder shall furnish the type test reports not older than 5 years as on the date of issue of N.I.T. for 24 fiber or higher capacity of the offered make OPGW cable as per relevant Indian standard/International standards which has successfully passed relevant type tests at CPRI/ERDA/NPL/ERTL laboratory /any other NABL accredited laboratories.

(III) The sole bidder or any other partners of JV/consortium should be either an **Installation Agency** *OR* a **Manufacturer of OPGW** and should fulfill following requirements :-

(i) ***In case of bidder is an Installation Agency:-*** The bidder should fulfil the criterion mentioned at (I)(a),(b) & (II) above and such bidders shall offer OPGW from a manufacturer who have manufacturing unit & testing facility in India established minimum three (03) years prior to date of issue of NIT and shall have capacity to produce minimum 2500 km OPGW (24 Fiber or higher capacity) per annum in India.

The bidder shall furnish self-attested valid NSIC/DIC (applicable for CG State SSI Unit) certificate in respect of OPGW manufacturing company from whom they are procuring OPGW. In case manufacturing firm is not registered with NSIC/DIC, bidder should submit self-attested copy of valid factory registration certificate issued by industries department of state/central government to OPGW manufacturer. The bidder shall also submit the certificate issued by the Chartered Engineer / Chartered Accountant or Industries Department (in original) certifying the year of start of manufacturing of OPGW and annual manufacturing capacity of the OPGW manufacturer.

The Installation Agency as well as OPGW Manufacturer (from whom OPGW is to be supplied) should comply all the provisions stipulated in the order of Ministry Of Finance, Government Of India mentioned above at clause-C and also submit separate certificates (one by installation agency & one by OPGW manufacturer) as per annexure-3 of this tender.

OR

ii) ***In case of bidder is a Manufacturer of OPGW:-*** The sole bidder or one of the partner of JV bidder should have manufacturing unit & testing facility of OPGW in India established minimum three (03) years prior to date of issue of NIT and

shall have the capacity to produce minimum 2500 KM OPGW (24 Fiber or higher capacity) per annum. In addition to this, the bidder should fulfil criterion mentioned at (I)(a),(b) & (II) above.

The bidder shall furnish self-attested valid NSIC/DIC (applicable for CG State SSI Unit) certificate. In case manufacturing firm is not registered with NSIC/DIC, bidder should submit self-attested copy of valid factory registration certificate issued by industries department of state/central government to OPGW manufacturer. The bidder shall also submit the certificate issued by the Chartered Engineer / Chartered Accountant or Industries Department (in original) certifying the year of start of manufacturing of OPGW and annual manufacturing capacity of the OPGW manufacturer.

The sole bidder/ each partner of JV should comply all the provisions stipulated in the order of Ministry Of Finance, Government Of India mentioned above at clause-C and shall submit Certificate as per annexure-3 of this tender

(IV) In support of PQR regarding manufacturing & technical experience criterion, the following documents should be submitted :-

(i) The sole bidder / both partners of JV bidder should submit Certificate as per annexure-3 of this tender without fail. In case, the sole bidder /any partner of Joint Venture/consortium is from a country which shares a land border with India, they will be eligible to bid in this tender only if the bidder is registered with the competent authority as defined in Ministry of Finance, Government Of India's order no. F.No.6/18/2019-PPD Dtd. 23.07.2020 (Annexure-31-a) read with amended order No.18/37/2020-PPD Dtd.08.02.2021 (Annexure-31-b) and any subsequent amendments issued upto date of issue of N.I.T. and a self-attested copy of the registration certificate issued by competent authority should be furnished with the Bid. In case of non-submission of the required certificate, bid shall be rejected.

(ii) In case the sole bidder / JV bidder is participating as the installer & procuring OPGW from a manufacturer fulfilling requirement as per clause E-(III)(i) the bidder should furnish certificates as per Annexure-3 in respect of bidder himself (for both partners in case of JV) & also from the manufacturer of OPGW from whom they are procuring OPGW.

(iii) In case the sole bidder / JV bidder is participating as an installer & procuring OPGW from a manufacturer fulfilling requirement as per clause E-(III)(i), the bidder shall submit manufacturer's authorization in prescribed **annexure-32** from whom they are procuring OPGW.

(iv) For sole bidder or both partner of JV/Consortium (as the case may be) the following self-attested documents should be furnished:-

a) Annual return filed to the Ministry of Corporate Affairs (Applicable in case of Company only).

b) Latest share holding pattern as on date of issue of NIT duly certified by the Director.

c) Latest certificate of incorporation of the bidder.
d) Self-attested copy of partnership deed in case of partnership firm.

(v) Sole bidder or one partner of JV/Consortium who is having manufacturing unit of OPGW in India should furnish self-attested valid NSIC/DIC (applicable for CG State SSI Unit) certificate. In case firm is not registered with NSIC/DIC, bidder should submit self-attested copy of valid factory registration certificate issued by industries department of state/central government for OPGW.
The bidder who is an Installation Agency shall furnish self-attested valid NSIC/DIC (applicable for CG State SSI Unit) certificate in respect of OPGW manufacturing company from whom they are procuring OPGW. In case manufacturing firm is not registered with NSIC/DIC, bidder should submit self-attested copy of valid factory registration certificate issued by industries department of state/central government to OPGW manufacturer.

(vi) The Sole bidder or joint venture / consortium bidder having OPGW manufacturing unit in India shall have the capacity to produce minimum 2500 KM per annum of OPGW cable. The bidder shall submit the certificate issued by the Chartered Engineer / Chartered Accountant or Industries Department (in original) certifying the year of start of manufacturing of OPGW and annual manufacturing capacity of the bidder.

The bidder who is an Installation Agency shall furnish certificate issued by the Chartered Engineer / Chartered Accountant or Industries Department (in original) certifying the year of start of manufacturing of OPGW and annual manufacturing capacity in respect of OPGW manufacturing company from whom the bidder is procuring OPGW.

(vii) Self-attested copies of turnkey contract order for supply, erection & commissioning of OPGW cable on 110 KV or higher voltage transmission line of minimum route length of 2000 kms (cumulatively) against order(s) issued by any entity(ies) mentioned in clause (E-I-a) i.e. “Technical Experience criteria for PQR” above. The date of order(s) should not be older than 10 years from date of issue of NIT. The orders should be either for replacement of earth wire with OPGW on existing line or laying of OPGW cable during construction of new 110 KV or higher voltage transmission line against the order(s) issued by entities mentioned in clause I(a) above.

(viii) Self-attested documentary proof regarding completion of work of providing OPGW on 110 KV or higher voltage transmission line of minimum route length of 2000 Km (cumulative) against orders as mentioned in (vii) above.

(ix) Self-attested copy of performance certificate for at least 200 Km of OPGW cable of 24 fiber(or higher) for successful operation laid on 110 KV (or higher) voltage line(cumulatively)against order(s) issued by entities as mentioned in clause (E) –I (a) above for minimum 1 (one) year from the date of its commissioning as on date of issue of NIT of the instant tender.

(x) Certificate issued by any entity(ies) mentioned in clause(E)-I(b) above for successful completion of at least **200 km** (cumulatively) **of Live Line** installation of OPGW on 110 KV or higher voltage transmission line in project(s) at (a) above or as a standalone activity in other project(s).

Bidders may note that evaluation of various pre-qualifying experience criteria shall be done on the basis of documents / certificates submitted by the bidder, for which responsibility to furnish essential authentic, genuine & correct documentary proof / statements / attachments / information etc., entirely rests on the participating bidder(s). CSPTCL will not be responsible if the bid is considered non-responsive and rejected in the absence of such documentary proof.

(xi) The CSPTCL may asses 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) bidders work/manufacturing facilities ; (iii) manufacturing capacity, details of works executed, (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.

(F) In case the bidder is JV/consortium of two partners, the qualifying requirement should be fulfilled by both the partners jointly.

(G) In case the JV bidder, both partners of JV/ consortium should comply all the provisions stipulated in the order of Ministry Of Finance, Government Of India mentioned above at clause-C and shall submit certificate as per annexure-3 of this tender (separate for both the partners).

(H) **PRE-CONTRACT INTEGRITY PACT:** - The sole bidder / lead partner of JV/consortium bidder shall have to submit pre contract integrity pact in the format enclosed as **Annexure A-23** on non judicial stamp paper worth Rs.300/- duly signed by the bidder for the project along with techno commercial bid. The validity of this integrity pact shall be from the date of its signing and extended up to 2 years or the complete execution of the contract to the satisfaction of both the Buyer and the Bidder/Seller, whichever is later. In case Bidder is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

(I) OTHER ELIGIBILITY CRITERIA:-

a) The sole bidder / lead partner of the joint venture / consortium should submit a certified copy of 'A' class electrical contractor license issued by **C.G. Anugyapan Mandal /CG State licensing Board** along with his offer and the license should be valid as on the date of opening of tender **OR** the bidder shall furnish an Undertaking to submit 'A' class electrical contractor license issued by C.G. Anugyapan Mandal / CG State licensing Board within 30 days after issue of Letter of Award (LOA).

b) The sole bidder/lead partner of the joint venture/consortium should have EPF code number allotted by EPF Commissioner and copy of same should be submitted with the TC Bid.

c) The sole bidder/joint venture or consortium partners should collectively have adequate tools & plants, financial and technical resources and infrastructure backed with qualified agencies to execute the work **in live line/hotline technique** properly and expeditiously within the specified time frame. A declaration in this regard shall be submitted in the **Annexure-12.**

d) Power of attorney issued to legally authorized signatory of this tender should be submitted in the TC bid.

e) Those bidders who are not registered under GST shall not be allowed to participate in the tender.

f) Detailed information on any litigation or arbitration arising out of contracts completed or under execution by it over the last five years (counted from the date of bid submission) shall be provided in **Annexure-15**. A consistent history of awards involving litigation against the bidder or any partner of JV may result in rejection of bid.

(J) <u>In case of Joint Venture (JV)/Consortium, the following conditions shall also apply</u>:-

1. **No bidder/member of a JV/consortium can participate in more than one bid.**

2. One of the partners shall be nominated as lead partner and the joint venture/consortium shall be represented by Lead Partner. An agreement for authorizing one partner to act as "Lead partner" in **proforma 27** (Form of Power of attorney for Joint Venture) signed by legally authorized signatories of both the partners on judicial stamp paper duly attested by Public Notary with seal and revenue stamp affixed thereon should be submitted with the technical bid. The "Lead Partner" shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the Joint Venture/Consortium. The "lead partner" shall be responsible for timely execution & completion of all the activities. Entire execution of the contract shall be done by the "Lead Partner" and payment under the contract shall be received by the "Lead Partner" on behalf of the Joint Venture/Consortium as per power conferred to him in the Power of Attorney. All the correspondences etc. shall be done exclusively with the "lead partner". The bid document should have been purchased and submitted by the "Lead Partner**"** only.

3. The partners of the Joint Venture/Consortium shall be liable jointly and severally for the execution of the Contract in accordance with the Contract terms, and a statement to this effect shall be included in the authorization mentioned under (2) above as well as in the Bid Form and in the Contract Form (in case of a successful bid). The lead

partner shall be authorized to incur liabilities and receive instructions for and on behalf of all the members.

4. The agreement entered into, signed by the Joint Venture/Consortium partners, shall be submitted with the bid. Original copy of JV Undertaking in **proforma-26** (form of undertaking by the Joint Venture Partners) on judicial stamp paper duly attested by Public Notary with seal and revenue stamp affixed thereon indicating joint and several liabilities among the parties to the Joint Venture should be provided with the bid. No joint venture will be accepted after submission of the tender bid. The joint venture/consortium shall remain valid for entire contractual period and the same shall be mentioned in the agreement. In case of any breach of contract by any of the joint venture/consortium partners during execution of the contract, the same shall be deemed to be default by both the partners. It will be the sole discretion of CSPTCL to allow the other partner to complete the work or to terminate the total contract.

5. The bid shall be signed so as to be legally binding upon both the partners of the joint venture/consortium. The non-judicial stamp paper shall be purchased in the name of joint venture and the date of purchase should not be later than six months of date of execution of the undertaking/ agreement shall be signed on all the pages by authorized representatives of each of the partners and should invariably witnessed.

(K) "**EXTREMELY IMPORTANT "**

Bidder to note this to avoid bid rejection':-

It will be the sole responsibility of the sole bidder/partners of joint venture (JV)/consortium bidder to make sure that all the documents required as per tender are submitted along with bid on or before due date of tender. The bid submission date is cut- off date of submission of all the documents required as per tender and every bidder must adhere to this dead line.

However, if any short comings is observed during scrutiny of TC bid, CSPTCL reserves the right to seek required clarifications/ documents from bidder by giving them only one chance to submit required documents/ clarifications/ confirmations within specified time limit."

(L) If a bidder has quoted "NIL" deviations in **Annexure-8** (deviation from technical specifications/ conditions) and **Annexure-14** (deviation from commercial conditions) this will have an overriding effect on any other conditions noted as deviations elsewhere in the bid.

Although details presented in this tender specification have been compiled with all reasonable care, it is the responsibility of the bidder to satisfy himself that the information given in each section are adequate and there are no conflicts between various clauses/sections/specifications. The clarification/ decision of the Executive Director / Chief Engineer (Planning & Projects) shall be final and conclusive.

……..End of PQR…..

SECTION – I

Special Instructions to bidders for submission of bid through SAP- SRM module(E-bidding)

The price bid against tender specification no. **TR-20/14** is to be processed through e-bidding. For participation in E-bidding ,it is mandatory for prospective bidders to get registered online through our website & portal **http://www.cspc.co.in & https:// ebidding.cspcl.co.in:50724/irj/portal**., on registration the bidders will get User ID and Password for participating in the tender.

The techno commercial bid is to be submitted in hard copy whereas the price bid is to be submitted online (E-Bidding portal). Details of NIT & Tender Documents are available on our website and portal as indicated above.

The bidder may download the same from the above site. In e-bidding portal, tender documents will be displayed in online tender display at Technical RFx section.

For bidders, it is recommended to open the e-bidding portal by the following the path www.cspc.co.in->e-Bidding->"click **here for e-Bidding Web portal".**

Last date & time of submission of TC bid in hard copy and price bid in softcopy is **28/04/2021 upto 03:00 pm** and due date & time of opening of the tender is **28/04/2021 upto 03:30 pm.**

Important Instructions :-

1. Please note that this tender shall be processed online as well as offline. The bidder has to submit all the documents in hard copy as per tender specifications in four envelopes..
2. **The abstract(total) amount of Annexure A-1, A-2 & A-3 are to be filled in the item tab in e-bid in SAP SRM System (online e-tender). Amount should be quoted online & in specified fields only. It is required to upload scanned copy of ONLY price bid SCHEDULES DULY FILLED IN AND SIGNED WITH SEAL OF FIRM IN THE specified FOLDER along with the duly filled excel sheets of price schedules. It may be noted that the bid will not be considered for evaluation in case the bidder has not uploaded the scanned copies of duly filled price Bid annexure with seal & signature of bidder even he submit the summary in E-bidding portal.**

   Discount (if any) offered by the bidder should be filled in the respective field in the SAP SRM system (E-bidding Portal)) only. Discount for each of the schedules i.e. A-1, A-2 & A-3 is to be indicated separately in the respective fields. No discount offer shall be considered which is indicated elsewhere for the purpose of evaluation and comparative statement. Once the rates are filled, the bidders may change their rates upto the due date and time of submission of tender. After due date and time, no change on any ground whatsoever will be accepted.
3. After scrutiny of techno-commercial bid, the price bid will be opened in e-bidding system only of eligible bidders for which suitable intimation will be given to the bidders offline & through email.
4. Please note that e-mail is always system generated, hence bidders are advised to regularly check their inbox/junk mail box.

5. CSPTCL shall not assume any responsibility for non-supporting of system, internet, line & associated hardware & software for bidding their tender. No extension in time shall be granted on such grounds. The bidder should submit their bid well before submission dead line to avoid any system related problem. It is strongly recommended not to wait for submission of bid in last minutes as internet/technical problem may disrupt their works.

6. Reference time for submission dead line shall be the time displayed in the portal and shall be treated as final.

7. After end of submission dead line, no alteration in the tender will be allowed by the system. However, in case of extension of due date of opening of tender, the bidders will be allowed to submit revised bid in the system.

8. CSPTCL will not accept incomplete bid.

9. The bidder must have a valid Digital Signature(class –III digital certificate) to establish the identity of the bidder & SAP SRM User ID. User ID & Password from CSPTCL and Digital Signing Certificate and Digital Encryption Certificate from any recognized digital signature issuing authority are required for participation in any Tender. The bidder shall intimate in advance regarding details of digital signature issuing authority for ensuring the reliability of the same. ***It may please be noted that the tender shall be submitted with valid digital signature of Lead partner only in case of joint venture/consortium else the same will not be considered for evaluation***.

10 The e-bidding vendor user manual displayed on website- https://ebidding.cspcl.co.in:50724/irj/portal for the help of the bidders. For any further queries the bidder may contact at Helpline no. 0771-2576672/73 (EITC, CSPDCL, Raipur)

11. Tender shall be opened in the scheduled time as notified. If the due date of opening/submission of tender documents is declared a holiday by the Govt. or local administration, it will be automatically shifted to next working day for which no prior intimation shall be given. Tender opening shall be continued on subsequent days, in case the opening of all tenders is not completed on due date because of the technical constraints of system on the day of opening. It may be noted that the due date of opening/time may be altered/ extended if desired by CSPTCL without assigning any reason. However, intimation shall be available on company‘s tender portal/bidders email (if participation shown). The bidders are requested to keep track of the same.

12. Amendment in tender specification will be published on our website as well as in SRM system and the intimation regarding amendment in date extension will be conveyed through system generated e-mail to registered bidders only.

13. Before participating the bidder shall carefully read all the instructions and processes.

14. Tender duly completed in all respects will be accepted online up to due date & time and will be opened on the due date at specified time in the presence of tenderers or their authorized representatives. In case of authorized representative(s) they shall bring the original authorization letter with their signature attested by the bidder.

INSTRUCTIONS TO BIDDERS

1.01 Sealed Tenders in duplicate on two part basis (each complete with all details in the manner specified together with drawings, test reports, descriptive literature if any) and declaration form duly signed by bidder are to be dropped in tender box placed in the office of the Chief Engineer (Planning & Projects), Chhattisgarh State Power Transmission Co. Ltd., Dangania Raipur, for this particular tender No. **TR-20/14** in double sealed cover & super scribed on each of the covers the relevant tender specification number and due date of opening as indicated in the "Notice Inviting Tenders".

In case, the tender is sent through post / courier, it will be responsibility of the bidder to drop/ get dropped the tender in the tender box. Receipt of tenders shall not be given in any case. The tender should be dropped before or up to 3.00 pm on due date of submission. Tender box shall be sealed at 03.00 pm and in no case tenders shall be allowed to be dropped in the tender box after 03.00 pm.

1.02 The Specification is divided into five Sections: -

Part-I Techno Commercial

(i)	Section - I	Instruction to Bidders,
(ii)	Section-II	General Conditions of Contract,
(iii)	Section- III	Commercial Conditions
(iv)	Section-IV	Technical Conditions
(v)	Section-V	Annexures & Formats

Part II Price bid formats.

1.03 Tenders will be opened in the office of C.E. (Planning & Projects), **CSPTCL**, Dangania, Raipur (CG) 492013, in the presence of bidders or their authorized representatives (limited to two persons only with a valid authorization from their employer). At the time of opening, the techno-commercial bid and other relevant details will be read out. Price bid of successful Techno commercial; bidder would be opened at a later date with due information to the successful bidders.

1.04 The bidder may deviate from the specification while quoting if in his opinion such deviation is in line with the manufacturer's standard practice and conducive to a better and more economical offer. All such deviations should however be clearly indicated giving full justifications for such deviation in separate sheet(s) under "Deviations" title in annexure.

1.05 Only those who have purchased the copy of relevant Specification No. **TR-20/14** or downloaded from CSPTCL's official website (Along with cost of document) can submit their tender. Tenders submitted by others will be rejected.

1.06 The **CSPTCL** reserves the right to reject the lowest or any other tenders or all tenders without assigning any reason whatsoever, if it is considered expedient in the overall interest of **CSPTCL**.

1.07 The tender should be in two parts, Part – I for techno-commercial details in DUPLICATE and Part – II for prices in DUPLICATE. The tenders shall be submitted in two parts and should be enclosed in sealed cover both addressed to the Chief Engineer (Planning & Projects), **CSPTCL**, Dangania, Raipur (CG) 492013. Covers should be sealed and super scribed with tender specification No. **TR-20/14** and date of opening. Tenders being submitted must be signed by a person holding a power of attorney authorizing him to do so. The notarized copy of power of attorney should be furnished. Tenders submitted on behalf of company registered under Indian Companies Act shall be signed by person duly authorized to sign the tender on behalf of the company and shall be accompanied by notarized copy of resolution / abstract of Article of Association/ special or general power of attorney.

1.08 The bidders are required to submit tenders in the following manner. All documents / information of tender as described below shall be placed in a sealed cover containing four separate sealed covers as mentioned below :-

In certain cases confusion takes place regarding furnishing of earnest money since the Envelopes are not properly super-scribed and sealed by the tenderer. It is therefore intimated that FIVE envelopes as under are to be submitted.

a) Envelope - I:-This envelope should contain a covering letter with earnest money along with tender form in original. The cover of envelope should be suitably super-scribed with "**Earnest Money and cost of tender document" should contain the Banker's cheque / demand draft and Goods & Service Tax (GST) Registration Certificate**. The envelope should be sealed properly.
In case, the tender has been download from CSPTCL's official website, the required cost of tender document in the form of MICR DD drawn in favour of Manager (RAO:HQ), CSPTCL, Raipur (C.G.) should also be kept inside this envelope. Please note that in case the cost of tender document & Goods & Service Tax (GST) Registration Certificate is not furnished with the tender, further bids shall not be opened.
b) Envelope - II: - This envelope should contain the Pre Qualification requirements in DUPLICATE with detailed order copy of work executed and their completion certificate.
c) Envelope - III:- This envelope should contain the Technical Bid and Commercial Bid complete in all respects, Pre-contract integrity pact **(Annexure-23)** and copy of unpriced / unfilled price bid schedule (Schedule A-1, A-2, A-3 & A-4 of tender) in DUPLICATE. In case of difference in original and duplicate bid, the contents of original bid will be taken in to account.
d) Envelope-IV:- This large envelope should contain all the above four envelopes.

Any envelope apart from the above mentioned envelopes shall not be entertained.

Any envelope apart from the above mentioned envelopes shall not be entertained.

(i) All the envelopes shall be addressed as under:-
Chief Engineer (Planning& Project),
Chhattisgarh State Power Transmission Company Limited,
(A Successor Company of CSEB), DANGANIA – RAIPUR 492013

(ii) The outer main envelope containing the above envelopes shall bear the following identification:-

"Tender No.**TR-20/14** for Replacement of existing G.I. Earthwire (7/3.66mm) of various EHV transmission lines (4700km) of CSPTCL by OPGW (24 & 48 Fibre) on turnkey basis. The words "**DO NOT OPEN BEFORE ----------"**(date of Bid opening) should also appear on it.

(iii) The outer and inner envelopes shall also indicate the name and full mailing address of the Bidder to enable the Bid to be returned unopened in case it is declared "Late" or otherwise not acceptable.

In case the above instructions are not followed properly and any of their envelope is not available for inspection and opening, no representation at due time of tender opening shall be accepted and such offers shall not be opened.

1.09 Tenders received after due date and time shall not be opened.

1.10 Telegraphic or FAX tenders shall not be accepted under any circumstances.

1.11 **EARNEST MONEY DEPOSIT:-**

The tender shall be accompanied by Earnest Money deposit of Rs.5,00,000/- (Rupees Five Lac only).
The Earnest money Deposit shall be offered in one of the following forms subject to the conditions mentioned below:-

i. Bank Draft to be drawn in favour of "Manager, (RAO:HQ), CSPTCL, Raipur (C.G.)"
ii. No interest shall be paid on Earnest Money Deposit.
iii. No adjustment towards Earnest Money Deposit shall be permitted against any outstanding amount with CSPTCL.
iv. In the case of unsuccessful bidder, the Earnest Money will be refunded after finalization of tender. In case of successful bidder Earnest Money will be refunded only after furnishing security deposit 10% of order value.

v. Earnest money/ security deposit will be forfeited if the bidder fails to accept the letter of intent or purchase order(s) issued in his favour.
vi. Tenders not accompanied by Earnest Money shall be disqualified.
vii. Cost of tender document is non refundable.

1.12 **FORFEITURE OF EARNEST MONEY:-**

The Bid security is required to protect the **CSPTCL** against the risk of Bidder's conduct, which would warrant the Earnest Money's forfeiture, due to following reasons:

a) If a Bidder withdraws his Bid during the period of Bid validity specified.
b) In the event of refusal to accept the Letter of Intent placed by the Purchaser within the validity period.
c) In the case of a successful Bidder if he fails to sign the various Agreements and fails to furnish Security Deposit as specified in the Tender Specification.
The successful Bidder's Earnest Money will be discharged only after the execution of various Agreements and Security deposit by the Bidder (as specified in this tender Specification).

1.13 VALIDITY:-The tenders should be kept valid for a period of 180 days from the date of opening of the tenders as notified in the tender notice and subsequently amendment thereof failing which the tenders will be rejected.

1.14 The contractors are advised to visit the proposed / likely routes of the lines to acquaint himself about topography of the line routes and other details before submitting the bids.

1.15 The successful bidder are required to submit the Project License Certificate from Chief Electrical Inspector & Safety / Industrial Relations Officer of Government of C.G. within one month from the date of acceptance of LOI in respect of the said work; otherwise the same is liable for rejection without notice.

1.16 <u>PRICE-BID & ITS EVALUATION :-</u>

Bidders must quote their price in accordance with the specifications and conditions. Any deviation from the above shall be considered as an alternate bid. The bids will be evaluated based on the main offer only.
Price Part of only those Bidders shall be opened on-line who are determined as having submitted substantially responsive bids and are ascertained to be qualified to satisfactorily perform the Contract. Such Bidders shall be intimated about the date and time for opening of Price Part by the Employer.

The Employer will on-line open Price Bid 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 price bid. The bidders' representatives who are present shall sign a register evidencing their attendance.

The bidders' names, the Bid Prices 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 evaluation criteria.
The Employer shall prepare minutes of the bid opening, including the information disclosed to those present who present at the time of opening.
Bids not opened and read out at bid opening shall not be considered further for evaluation, irrespective of the circumstances.

i. In the event of noticing arithmetical errors viz. multiplication of price & quantity, grand total of total amount etc. these shall be corrected and computation shall be done accordingly.

ii. **The quoted price should be kept valid for the contractual period/ completion of the project. However the provision of price variation shall be applicable as per the relevant clause of the tender.**

iii. All columns shall be completely filled up properly.

iv. No conditional prices should be quoted.

v. The evaluation of price bids shall be done by comparing the Grand total (i.e. Total of all the price bid annexures) quoted by the bidder in price schedule Annex- A-1, A-2, A-3 & A-4 of all the items including GST & levies. Based on the comparative evaluation, LOA shall be placed on the L-1 bidder (lowest quoted price for entire project) on the final accepted price.

vi. **The loading of the items for which the prices are not being quoted by bidder: - In such cases, loading will be done at highest prices quoted amongst the participating bidder. But, while ordering, lowest price amongst the bidders will be considered.**

vii. If the quantity quoted is less than B.O.Q. /or required for turnkey completion of the job, loading will be done on the pro-rata basis.

viii. In case the bidder makes contradictory statement in the Technical & Commercial Bid or for items for which the prices are not being quoted by bidders, loading will be done at highest prices quoted among the participated tenderers. But, while ordering, lowest price among the bidders will be offered.

ix. All the equipments/material, accessories, including charges for erection & commissioning etc. required for replacement of G.I. Earthwire with OPGW have been included in the price schedule i.e. A-1, A-2, A-3 & A-4.

x. If there is discrepancy between the Unit Price and the total price that is obtained by multiplying the unit price & Quantity, the Unit Price shall prevail and total price shall be corrected accordingly. Further, in case there is discrepancy observed in the abstract of rate submitted in E-bidding portal, Excel sheets of price bid annexure uploaded in portal and Scanned copies of price bid annexure duly signed by bidders , the unit rates offered in the scanned copies of price bid annexures shall be prevailing.

xi. The prices for supply of material and installation, testing & commissioning charges of line should be quoted as per the break up mentioned here under:-

a) **Supply of OPGW and its associated accessories:**

The breakup of unit rate, freight and GST should be given in the price bid. Applicable BOCWW cess @ 1% of the cost shall be borne by the contractor and shall be deducted from each bill for remittance to the concerned government department.

(b) **Charges of Installation, Testing & Commissioning of OPGW :-**

The rates for Installation, Testing & Commissioning charges should clearly indicate the unit rate and GST. Applicable cess @ 1% of the cost shall be borne by the contractor and shall be deducted from each bill for remittance to the concerned government department.

The breakup of taxes should be clearly mentioned. In case of any such ambiguous statement, it will be presumed that rates are inclusive of taxes and no claim for such taxes shall be entertained.

Three packages have been formed in order to facilitate simultaneous execution of the work in three EHT circles of CSPTCL. However, the comparative prices shall be arrived at on a single package basis consisting the total work under scope of the tender. The order shall be placed to the lowest qualified bidder for all the three packages.

i) The amount of ex-works price, taxes etc. quoted in the price bids shall be rounded-off upto 2 (two) digits of paise and accordingly the calculation shall be done while evaluation.

ii) CSPTCL's decision in such cases shall be final.

Although details presented in this tender specification have been compiled with all reasonable care, it is the responsibility of the bidder to satisfy himself that the information given in each section are adequate and there are no conflicts between various clauses/sections/specifications. The clarification/ decision of the Executive Director / Chief Engineer (Planning & Projects) shall be final and conclusive.

1.17 **NEGOTIATION OF PRICES:-** CSPTCL reserves the right to hold negotiation with L-1 bidder as deemed necessary. Procedure adopted by CSPTCL for holding negotiation shall be final and binding on all bidders.

1.18 **TIME SCHEDULE & CLARIFICATIONS:-**

In view of the urgency, the date of opening of this tender will not be extended. It is therefore necessary that the tender documents are read by bidders carefully and clarifications, if any, required before furnishing of tenders is promptly obtained. For any delay in this regard, **CSPTCL** will not be responsible and any request for extension of due date will not be entertained.

1.19 **INCOME TAX CLEARANCE CERTIFICATE:**

Income Tax clearance Certificate may be submitted.

1.20 **CLAIMS FOR ITEMS NOT ENTERED IN THE SCHEDULE OF ITEMS:**

Items shown in the schedule of items are purely for the purpose of indicating the type of work to be carried out and no claim shall be entertained for any item or work executed being not mentioned in the aforesaid schedule.

1.21 **SCHEDULES AND ANNEXURES**:

Annexures giving details of various items are enclosed at the end of the specifications **(section V).** Bidder should consult these annexures before filling the tender.

Forms of schedules are also enclosed in the specifications. Bidders are required to go through the complete specification and consult explanatory notes, before filling in various schedules / annexures.

All the points mentioned in schedules and annexures shall be filled in by the bidders and complete information shall be supplied. Incomplete schedules may make his tender liable for rejection.

1.22 **COMPLETENESS OF TENDER:**

Each section of the tender should be complete and include all associated works not specifically mentioned in the schedule / specification etc. but essential for the completeness of the work. The contractor shall not be eligible for any extra charges in respect of such minor works though not specifically included in the tender or contract schedule.

1.23 **DEPARTURE FROM SPECIFICATION:**

If the bidder wishes to depart from the specification in any respect, he shall draw attention to such points of departure, explaining fully the reasons thereof, so that the relative merits of the proposal may be considered. Unless this is done, the requirement of this specification will hold good. Such departures from specification shall be indicated in respective schedules.

1.24 **QUESTIONNAIRE:**

The questionnaire enclosed herewith (Annexure-9) contain a set of questions, and bidder is requested to answer each and every question clearly and without ambiguity.

1.25 **CHECK-LIST:**

The check list **(Annexure-30)** in respect of various schedules etc is required to be submitted by the bidder without which the tender will be considered incomplete and liable for rejection. The bidder should submit all schedules duly filled in along with this offer.

1.26 **NATURE OF CONTRACT :-**

It will be composite in nature, which shall consist of survey, planning, design, engineering, manufacturing, supply, transportation, insurance, delivery at site, unloading, handling, storage, testing, training and demonstration for acceptance, commissioning and documentation for OPGW cable along with associated hardware & all other materials, required for turn-key project.

1.27 **CONFLICTING PROVISIONS:-** Although details presented in this Tender Specification have been compiled with all reasonable care, it is the responsibility of the Bidder to satisfy

himself that the information's given in each section are adequate and that there are no conflicts between various clauses/ sections/ Specifications. In case of any variation, the same may be referred to C.E. (Planning & Projects) For clarification / decision before due date of submission. The clarification/ decision of C.E. (Planning & Projects) shall be final and conclusive.

1.28 **NON RESPONSIVE BID**

CSPTCL reserves the right to reject any Bid, which is:

(a) Not accompanied by the Earnest Money as specified above.
(b) Not received by the due date and time specified.
(c) In variance with specified terms and conditions.
(d) If any time, it is found that a material misrepresentation of facts is made or uncovered.
(e) The Bidder does not respond promptly and thoroughly to the request for supplementary information required for the evaluation of his Bid.
(f) If the Bidder fails to super scribe on the envelope containing the Bid, the details of Earnest Money deposited by him, the Purchaser shall not accept any responsibility and the offers received shall be rejected and shall be returned to the Bidders.

1.29 **TERMINATION**:-

In the event of any breach of the terms of the order, the CSPTCL reserves the right to:-

(i) Cancel the order for part or whole of the materials yet to be supplied or work to be executed on the risk & cost of contractor without any liability on CSPTCL.
(ii) To purchase elsewhere or to execute the work with other agency on the risk & cost of the contractor, part or whole of the materials so affected or work to be executed without any liability on CSPTCL.

1.30 **INTEGRITY PACT**: - The bidder shall have to submit pre-contract integrity pact in the format enclosed as **Annexure-23** on non-judicial stamp paper worth Rs.300/- duly signed by the bidder along with the Techno-Commercial bid. The validity of this integrity pact shall be from the date of its signing and extended up to 2 years or the complete execution of the contract to the satisfaction of both the Buyer and the Bidder/Seller, whichever is later. In case Bidder is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

Although details presented in this tender specification have been compiled with all reasonable care, it is the responsibility of the bidder to satisfy himself that the information given in each section are adequate and there are no conflicts between various clauses/sections/specifications. The clarification/decision of the ED/CE (Planning& Projects) shall be final and conclusive.

1.31. **UNSATISFACTORY PERFORMANCE (Debarred/ blacklisted):-**

The bidder(s) who have been debarred/ blacklisted for future business with CSPTCL/ or any other successor power companies of erstwhile CSEB, or found to be violate any provision(s) contained in the tender document during any stage of bid or during pre contract stage, their bid shall not be considered for further evaluation and the bidder can be disqualified from tender process or the contract, if already awarded, can be terminated for such reason.

1.32 PRE BID CONFERENCE:- A pre bid conference of all the prospective bidders shall be conducted at 12.00 hrs. on dtd.16/04/2021 at CSPTCL's conference hall at Dangania, Raipur, The bidder may depute maximum two authorized representatives alongwith authority letter on Company's letter head. The bidders are requested to go through the tender specification immediately after purchasing the tender specifications and send their queries to the Chief Engineer (P&P) through fax message on Fax No.0771-2574246 / email address (**cepnp.csptcl@cspc.co.in).** The query letters should positively reach the office of the CE/ED (P&P) a day before the date of Pre Bid Conference. Any shortcomings or items which in the opinion of the bidder are essential for completion of work but have not been mentioned in the tender specification should also be pointed out in the queries and the same shall be discussed during the pre bid conference. The queries raised and the same shall be discussed during the pre bid conference and based on the discussions, amendments, if any, in the tender specification shall be intimated to the bidders through letters and same shall be published in CSPTCL's website also.

SECTION- II

GENERAL CONDITIONS OF CONTRACT

2.01 DEFINITION OF TERMS:-

In writing these General Condition of Contract, the specification and bill of quantity, the following words shall have the meaning hereby indicated, unless there is something in the subject matter content inconsistent with the subject.

- "**CSPTCL**." shall mean the CHHATTISGARH STATE POWER TRANSMISSION CO. LTD. represented through the Chief Engineer (P&P), Raipur.
- The purchaser/owner shall mean the CHHATTISGARH STATE POWER TRANSMISSION CO. LTD. (**CSPTCL**).
- "The Engineer In Charge" shall mean the Engineer or Engineers authorized by the Chief Engineer (P&P) for the purpose of this contract.
- "**CSPTCL** Engineer" shall mean an Engineering person or personnel authorized by the **CSPTCL** to supervise and inspect the material and construction of the Line.
- "The Contractor" shall mean the successful bidder awarded with the contract or their successors and permitted assigns.
- "Contract Price" shall mean the sum named in or calculated in accordance with the provisions of the contract as the contract price.
- "General Conditions" shall mean these General Conditions of Contract.
- "Specification" shall mean the specification annexed to these General Conditions of Contract and shall include the Schedules and drawings attached thereto or issued to the contractor as well as all samples and patterns, if any.

2.02 CONTRACT DOCUMENT:-

The term "Contract" shall mean and include the General Conditions, specifications, Annexures, drawings, work orders issued against the contract Annexures of price or the final general conditions, any special conditions applying to the particular contract specification and drawings and agreement to be entered into. Terms and conditions not here in defined shall have the same meaning as assigned to them in the Indian Contract Act falling that in the C.G. Act.

2.03 MANNER OF EXECUTION: -

a) The manner of execution shall be such that the supply of materials reach the site in a phased manner as per the site progress after due approval from this office. The work for Replacement of existing G.I. Earthwire (7/3.66mm) of various 132KV and 220KV transmission lines (4700 km) of CSPTCL by OPGW (24 & 48 Fibre) shall be carried out in an approved manner as outlined in the technical specification or where not outlined, in accordance with latest relevant Indian Standard Specification, to the reasonable satisfaction of the Engineer.

b) The contractor shall within 15 days after the date of acceptance of letter of intent submit to the Engineer, a detail program for the execution of work for his consent. The contractor shall whenever required by the Engineer also provide in writing for his information if general description of the arrangements and methods which the contractor proposes to adopt for the execution of the work.

c) If at any time it should appear to the Engineer that the actual progress of works does not conform to the program to which consent has been given under **clause 3.05 & 3.09**, the contractor shall produce at the request of the Engineer a revised program showing the modifications to such program necessary to ensure completion of the works within the time of completion.

2.04 **VARIATION, ADDITIONS & OMISSIONS:-**

The **CSPTCL** shall have the right to alter, amend, omit, or otherwise vary the quantum of supply / erection work, by notice in writing to the contractor. The contractor shall carry out such variation in accordance with the rates specified in the contract so far as they may apply and where such rates are not available; those will be mutually agreed between the **CSPTCL** and the contractor.

2.05 **INSPECTION DURING ERECTION:**

The Engineer In Charge or his authorized representative(s) shall be entitled at all reasonable times to inspect and supervise and test the materials / works of Lines. Such inspection will not relieve the contractor from their obligations under this contract.

2.06 **CONTRACTORS DEFAULT LIABILITY:**

The CSPTCL may upon written notice of default to the contractor terminate the contract in circumstances detailed here under:-

(I) If, in the judgment of CSPTCL, the contractor fails to

(i) Complete the contractual formalities within the time specified in the contract agreement or within the period for which extension has been granted by CSPTCL to the contractor

and / or

(ii)Comply with any of the provisions of this contract.

CSPTCL under the provisions of this contract shall take one or more of the following penal actions:-

(a) Terminate the contract

(b) Forfeiture of security deposit, if available or EMD.

(c) Debar the firm for future business with CSPTCL for a period of two years from the date of issue of letter to this effect.

(d) This debarring may be applicable in respect of other Chhattisgarh State Power Companies also as may be decided by their management.

(II) In case the contractor fails to commence the work within the reasonable period as decided by CSPTCL or fails to complete the works within the contractual completion period or the progress is not commensurate with the time period provided for completion of entire project or within a period for which extension has been granted by CSPTCL, one or more of following penal actions may be taken by CSPTCL against the contractor:-

(a) Terminate the contract.

(b) Forfeiture of security deposit, if available or EMD.
(c) Debar the firm for future business with CSPTCL for a period of two years from the date of issue of letter to this effect.
(d) This debarring may be applicable in respect of other Chhattisgarh State Power Companies also as may be decided by their management.
(e) The payment of pending RA bills of the instant contract shall be withheld.
(f) The payment of pending RA bills of the other running contracts shall also be withheld.

(III) In case the work of construction of line is not completed in accordance to relevant clause of the tender "completion of work" and CSPTCL does not terminate the contract, the contractor shall continue to execute the work, in which case he shall liable to CSPTCL for deduction of liquidated damages for delay as per relevant clause of this contract until the line is completed.

2.07 FORCE MAJEURE:

The contractor shall not be liable for any penalty for delay or for failure to perform the contract for reasons of FORCE MAJEURE such as acts of God, acts of public enmity, act of Government, cyclones, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes provided that the contractor shall within 10 (ten) days from the beginning of such delay notify the CSPTCL in writing of the cause of delay and shall also submit evidences in this regard. The CSPTCL shall verify the facts and grant such time extension as facts justify.

If progress is delayed at any time during the term or extended term of this contract by strikes, lockouts, fire accident, delay in approval of drawings, ROW issues, force majeure conditions or any cause whatsoever beyond the control of the contractor, a reasonable extension of time shall be granted.

2.08 REJECTION OF WORKS:

In the event of any of the material supplied/work done by the contractor is found defective in material or workmanship or otherwise not in conformity with the requirement of this contract specification, the CSPTCL shall either reject the material and/or work and request the contractor to rectify the same. The contractor on receipt of such notices rectify or replace the defective material and rectifies the work, free of cost. If the contractor fails to do so the CSPTCL may:

a) As its option replace or rectify such defective materials and/or works and recover the extra cost so involved from the contractor plus fifteen percent from the contractor and/or terminate the contract for balance work/supplies with enforcement of penalty as per contract.

b) Defective materials/workmanship will not be accepted under any conditions and shall be rejected outright without compensation. The contractor shall be liable for any loss / damage sustained by CSPTCL.

2.09 JURISDICTION OF THE HIGH COURT OF CHHATTISGARH:

Suits, if any, arising out of this contract shall be filed by either party in a Court of Law to which the jurisdiction of the High Court of Chhattisgarh extends.

2.10 CONTRACTORS RESPONSIBILITY:

Notwithstanding anything mentioned in the specification or subsequent approval or acceptance of the work done by CSPTCL, the ultimate responsibility for satisfactory performance of the material supplied and work done shall rest with the contractor.

2.11 NON-ASSIGNMENTS:

The contractor shall not assign or transfer the work orders issued as per this contract or any part thereof without the prior approval of CSPTCL.

2.12 CERTIFICATES NOT TO AFFECT RIGHTS OF CSPTCL:

The issuance of any certificate by CSPTCL or any extension of time granted by CSPTCL shall not prejudice the rights of CSPTCL in terms of the contract not shall this relieve the contractor of his obligations for due performance of the contract.

2.13 SETTLEMENT OF DISPUTES:

a) Except as otherwise specifically provided in the contract, all disputes concerning question of fact arising under the contract shall be decided by CSPTCL provided a written appeal by the contractor is made to CSPTCL. The decision of CSPTCL shall be final to the parties hereto.
b) Any disputes or difference including those considered as such by only one of the parties arising out of or in connection with this contract shall be to the extent possible be settled amicably between parties. If amicable settlement cannot be reached then all disputes issues shall be settled by Arbitration as provided in this contract.

2.14 ARBITRATION:-

i) No dispute or difference arising between the contractor and the Owner under or relating to or in connection with the Contract shall be referred to Arbitration unless an attempt has first been made to settle the same amicably.

ii) Where any dispute is not resolved amicably then such disputes shall be referred to & settled by Arbitration under and in accordance with the provisions of the Arbitration and Conciliation Act 1996 and any statutory modification thereof, by three Arbitrators. One to be appointed by each party and the third to be appointed by the two Arbitrators appointed by the parties at the commencement of Arbitration proceedings and falling agreement between them, in accordance with said Act, the third Arbitrator so appointed shall act as the presiding Arbitrator. The award shall be final and binding upon the parties. The venue of Arbitration shall be Raipur.

iii) The language of the arbitration proceedings and of all documents and communications between the parties shall be English. Arbitration award shall be speaking, final and binding.

iv) Notwithstanding anything to the contrary contained herein the work under the Contract shall continue during the pendency of any disputes or differences in Arbitration proceedings and no payment due from the Owner shall be withheld on account of such proceedings except to the extent which

may be in dispute and the Owner shall be entitled to make recoveries of amounts, if any, due from the Contractor, as per the provisions of the Contract.

2.15 LAWS GOVERNING CONTRACT:

The contact shall be constructed according to and subject to the Laws of India and jurisdiction of the High Court of Chhattisgarh.

2.16 LANGUAGE AND MEASURES:

All documents pertaining to the Contract including specifications, Annexures / schedules, notice correspondence, operating and maintenance instructions, drawings or any other writings shall be written in English language. The metric system of measurement shall be used exclusively in this contract.

2.17 CORRESPONDENCE:

a) Any notice to the contractor under the terms of the contract shall be served by registered mail or by hand to the authorised local representative of the contractor and copy by post to the contractor's place of business.

b) Any notice to CSPTCL shall be served to the ED/CE (Planning & Projects), CSPTCL, Dangania, Raipur (CG) 492013 in same manner.

2.18 SECRECY:

The contractor shall treat the details of the specification and other documents as private and confidential and they shall not be reproduced without written authorization from CSPTCL.

2.19 SAFETY PRECAUTIONS:

The contractor shall strictly follow, the stipulations contained in the latest editions of IS-7205 "Indian Standard Safety code for erection of structural steel work".

2.20 ENGAGEMENT OF WORKERS BY CONTRACTOR:-

a) The contractor shall at his own expense provide or arrange for the provision of footwear for labour doing cement mixing work which the contractor has undertaken to execute under this contract to the satisfaction of Engineer-in-charge.

b) Whenever demanded by the Engineer-in-charge the contractor shall submit a true statement showing :-

i. Number of Labours employed by him on the work
ii. Their working hours
iii. The wages paid to them, and
iv. The accidents that occurred during the working period of which information required stating the circumstances under which they occurred and the extent of damage and injury caused to them. The contractor should intimate all concerned about any accident & take immediate actions as governed by Rules.

Failure to supply such information or supplying materially incorrect statements may amount to breach of contract. The decision of the Engineer-in-charge shall be determining whether a breach has taken place.

c) In respect of all labours directly employed in the works of the performance of the contractors part of this agreement the contractor shall comply with or cause to be complied with all the rules framed by the Government from time to time for the protection of Health and Sanitary arrangement of the workers employed by the contractors.

2.21 CONTRACTOR TO INFORM HIMSELF FULLY

The contractor shall be deemed to have carefully examined the general conditions of specification, schedules and drawings. If he shall have any doubt as to the meaning of any portion of these general conditions or of the specification, he shall before signing the contract set forth the particulars thereof, and submit them to the Engineer in writing, so that doubt may be removed.

2.22 PATENT RIGHTS:-In event of any claim or demand being made or action being brought against the purchaser for infringement or alleged infringement of any patent in respect of any material, work, drawing/design or thing used or supplied by the contractor under this contract or in respect of any method using or working by the purchaser on such machine, work, material, drawing/design or thing, the contractor will indemnify the CSPTCL against all costs and expenses arising from or incurred by reason of any such claim. The CSPTCL shall notify the contractor immediately if, any claim is made and that the contractor shall be at liberty if he so desires with the assistance of the CSPTCL, if required, but at the contractors expense, to conduct all negotiations for the settlement of the same or any litigation that may arise there from.

2.23 SUBLETTING OF CONTRACT:-

The contractor shall not without the consent in writing of the Engineer or CSPTCL, assign or sublet his contract, or any substantial part thereof, other than for raw materials, for minor details for any part of the work of which the makers are named in the contract, provided that any such consent shall not relieve the contractor from any obligation, duty or responsibility under the contract.

2.24 QUALITY OF MATERIALS:-The work shall be completed in the best and the most substantial and the most workmen like manner and with materials of the best or of approved qualities for their respective uses.

2.25 (A) PACKING:-The contractor shall include and provide for securely protecting and packing the material so as to avoid damage in transit under proper conditions, and he shall be responsible for all losses or damage caused or occasioned by the any defect in packing. All materials shall be packed in accordance with packing specifications prescribed by the carriers. Packing or transporting methods not following to these specifications must be got approved by the Engineer or his authorised representative before transportation is made.

All bright parts shall be thoroughly protected from rust during transit. The purchaser will take no responsibility for any damage done to the material en-route to the 'site of work' or 'place of delivery' whichever may be specified.

(B) Transportation :- The successful bidder shall ensure that all the required material for project is dispatched to site through vehicles within their permissible load carrying capacity sanctioned by Transport Department of State where vehicle is registered.

2.26 DELIVERY:-The contractor shall quote price for the supply and erection of the material, equipment, and machinery covered by the purchaser specification.

2.27 FENCING, LIGHTING AND APPROACH ROAD:-The contractor shall be responsible for the proper fencing, guarding, lighting and watching of all works comprised in the contract and for the proper provision of temporary roadways, foot-ways, guards and fences as far as the same may rendered necessary by reason of the work for the accommodation and protection of foot passengers or other traffic and of the owners and occupiers of adjacent property and of the public.

2.28 POWER TO VARY OR OMIT WORKS:-

No alteration, amendments, omission, additions, suspensions, or variations of the work(hereinafter referred to as 'Variation') under the contract as shown by the contract drawings or the specification shall be made by the contractor except as directed in writing by the Engineer, but the Engineer shall have full power, subject to the provision, hereinafter contained, from time to time during the execution of the contract by notice in writing to instruct the contractor to make such variation without prejudice to the contract and the contractor shall carry out such variations and be bound by the same conditions, as far as applicable as though the said variations occurred in the specification. If any suggested variations would, in the opinion of the contractor, if carried out prevent him fulfilling any of his obligations or guarantees under the contract, he shall notify the Engineer thereof in writing, and the Engineer shall decide forthwith whether or not the same shall be carried out and if the Engineer confirms his instructions, the contractor's obligations and guarantees shall be modified to such an extent as may be justified. The difference of cost if any, occasioned by any such variation shall be added to or deducted from the contract price as the case requires. The amount of such difference, if any, shall be ascertained and determined in accordance with the rates specified in the schedule of prices, so far as the same may be applicable, and where the rates are not contained in the said schedules, or are not possible, the same may be settled by the Engineer and contractor jointly. But the purchaser shall not become liable for payment of any change in respect of any of the variations, unless the instructions for the performance of the same shall have been given in writing by the Engineer.

In the event of the Engineer requiring any variations, such reasonable and proper notice shall be given to the contractor as will enable him to make his arrangements accordingly and in case where goods or materials are already prepared, or any designs, drawings or patterns made or work done that required to be altered, a reasonable sum in respect thereof shall be allowed by the Engineer.

Provided however, that no variation which involves an increase or decrease of the total price payable hereunder be more than 15 percent shall be made without the previous consent in writing of the contractor. In case in which the contractor has received instructions from the Engineer as to carrying out the work which either then or later will, in the opinion of the contractor, involve a claim for additional payment, the contractor shall, as soon as reasonably possible after the receipt of the instructions aforesaid, advise the Engineer to that effect.

2.29 NEGLIGENCE:-

If the contractor shall neglect to execute the work with due diligence and expedition, or shall refuse or neglect to comply with any reasonable orders given to him in writing by the Engineer in connection with the work , or shall contravene the provisions of the contract, the CSPTCL may give seven days notice, in writing, to the contractor, to make good the failure, neglect, or contravention complained of. Should the contractor fail to comply with the notice within a reasonable time from the date of service thereof in the case of a failure, neglect, or contravention capable of being made good within that time, or otherwise within such time as may be reasonably necessary for making it good, then and in such case the CSPTCL shall be at liberty to employ other workman, and forthwith perform such work as the contractor may have neglected to, or if the CSPTCL shall think fit, it shall be lawful for him to take the work wholly, or in part, out of the contractor's hands and re-contract at a reasonable price with any other persons, or provide any other materials, tools, tackles or labour for the purpose of completing the work or any part thereof. In that event the CSPTCL shall, without being responsible to the contractor for fair wear and tear of the same, have the free use of all the materials, tools, tackles, construction plant or other things which may be on the site, for use at any time in connection with the work, to the exclusion of any right of the contractor over the same, and the CSPTCL shall be entitled to retain and apply any balance which may be otherwise due on the contract by him to the contractor or such part thereof as may be necessary to the payment of the cost of executing such work as aforesaid.

If the cost of executing the work as aforesaid shall exceed the balance due to the contractor, and the contractor fails to make good the deficit, the said materials, tools, tackle, construction plant or other things, the property of the contractor may be sold by the CSPTCL, and the proceeds applied towards the payment of such difference and the cost of and incidental to such sale. Any outstanding balance existing after crediting the proceeds of such sale shall be paid by the contractor on the certificate of the Engineer, but when all expenses costs and charges incurred in the completion of the work are paid by the contractor all such materials, tools, construction plant or other things remaining unsold shall be removed by the contractor.

2.30 DEATH BANKRUPTCY ETC.

If the contractor die or commit any act of bankruptcy, or being corporation, commence to be wound up except for reconstruction purposes or carry out its business under receiver, the executors, successors, or other representative in law of the estate of the contractor or any such receiver, liquidator or any person in whom the contractor may become vested, shall forthwith give notice thereof in writing to the CSPTCL for one month, during which he shall take all reasonable steps to prevent a stoppage of works and shall have the option of carrying out the contract subject to his or their providing such guarantee as may be required by the CSPTCL but not exceeding the value of the work for time being remaining-unexecuted. In the event of stoppage of the works, the period of option under this clause shall be fourteen days only. Provided that, should be above option not be exercised, the contract may be terminated by the CSPTCL by notice in writing to the contractor, and the same power and provisions reserved to the CSPTCL in the last proceeding clause on taking of the work out of the contractor’s hands shall immediately become operative.

2.31 INSPECTION & TESTING:-

(a) The Engineer and his duly authorized representative, shall have, at all reasonable times, access to the contractor's premises or works, and shall have the power at all reasonable times, to inspect and examine the materials and workmanship of the plant/Line during its manufacture, construction or erection thereof for which all the reasonable necessary assistance shall be rendered by the contractor without any extra commitment and if part of the material is being manufactured or erected on other premises or works, the contractor shall obtain permission for the Engineer and for his duly authorized representative to inspect as if the materials were manufactured or erected on the contractor's own premises or works.

The Engineer shall on giving seven day's notice in writing to the contractor setting out any grounds of objection which he may have in respect of the work, be at liberty to reject all or any materials or workmanship the subject of any of the said grounds of objection, which in his opinion are not in accordance with the contractor or are in his opinion defective for any reason whatsoever. Such notice shall be sent to the contractor within reasonable time after the ground upon which such notice us based have come to the knowledge of the Engineer. Unless specifically provided otherwise, all tests as per relevant ISS shall be made at the contractor's works before transportation.

The contractor shall give the Engineer 15 (Fifteen) days clear notice of any material being ready for testing and the Engineer or his said representative shall, attend at the contractor's premises or works within a reasonable time. **The contractor should ensure that the material is delivered at site stores within 21 days of clearance. In case material is not received within 21 days from date of issue of Dispatch instructions, the material is liable for re-inspection at the cost of contractor.**

(b) **<u>Fake inspection call:</u> In case, the material is not offered for inspection on the date of inspection offered by the firm, due to any reason the firm shall be required to remit a sum of Rs.25,000/- or actual expenditure incurred in the visit of the inspector, whichever is more.**

2.32 TEST AT CONTRACTOR'S PREMISES:- In all cases where the contract provides for tests, whether at the premises or works of the contractor or of any sub-contractor, the contractor except where otherwise specified shall provide, free of charge, such labour, materials, electricity, fuel, water, stores, apparatus and instruments as may reasonably be demanded necessary to carry out efficiently such tests of the material in accordance with the contract, and shall give facilities to the Engineer or his authorized representative to accomplish such testing.

If specific tests other than those specified in the relevant ISS/contract are required by the CSPTCL, the charges for such tests shall be borne by bidder.

When the tests have been satisfactorily completed at the contractor's or sub-contractor's premises or works, the Engineer or his authorized representative shall issue a test certificate to that effect. However, no material shall be transported before such test certificate has been approved and dispatch instructions issued by this office. The satisfactory completion of these tests or the issue of this certificate shall not abide the CSPTCL to accept the material so passed for transportation, if on further tests after erection it is found not to comply with the specification.

2.33 DELIVERY OF MATERIALS AND DISPATCH INSTRUCTIONS:-

Materials may be supplied based on the field requirement so as to avoid blocking of inventory. On receipt and verification of test certificates, CSPTCL will issue a clearance for dispatch of inspected material. No material shall be dispatched before receipt of such despatch instruction in writing.

2.34 ACCESS TO SITE AND WORK ON SITE:-

Suitable access to the site shall be afforded to the contractor by the CSPTCL in reasonable time. The day to day minor problem like free access to the site and other local problems would be solved by the contractor at his own cost. However, the CSPTCL would extend necessary cooperation/assistance in this respect. The necessary road permits required for transportation of men/material would be arranged by the contractor at his own cost.

In the execution of the work no persons other than the contractor, or his duly appointed representative, subcontractors and workman shall be allowed to do work on the site, except by the Special permission, in writing of the Engineer or his representative, but access to the works at all times shall be accorded to the Engineer and his representative, and other authorized official or representatives of the purchaser.

Nevertheless, the contractor shall permit the execution of the work by other contractors of tradesman whose name shall have been previously communicated in writing to the contractor by the Engineer, and afford them every facility for the execution of their several works simultaneously with his own. The contractor shall provide all the skilled and unskilled labour necessary for the erection of work included in the contract.

2.35 ENGINEER'S SUPERVISION:-

All the works shall be carried out under the direction and to the reasonable satisfaction of the Engineer. If supervision of erection or complete erection be included, the contractor shall be responsible for the correctness of the position, levels, and dimensions of the works according to the drawings, notwithstanding that he may have been assisted by the Engineer in setting out the same.

2.36 ENGINEER'S DECISIONS:-

In respect of all matters which are left to the decision of the Engineer, including the granting of or withholding of certificates, the Engineer shall, if required so to do by the contractor, give in writing a decision thereon, and his reasons for such decision.

2.37 CONTRACTOR'S REPRESENTATIVE AND WORKMEN:-

The contractor shall employ at least one competent representative, whose name or names shall have previously been communicated in writing to the Engineer by the contractor, to supervise the work. The said representative, of if more than one shall be employed, then one of such representatives, shall be present on the site during working hours, and any written orders or instructions which the Engineer or his duly authorized representative whose name shall have been communicated in writing to the contractor shall be deemed to have been given to the contractor.

The Engineer shall be at liberty to object to any representative or person employed by the contractor in the execution of or otherwise about the works who shall misconduct himself or be incompetent or negligent, and the contractor shall remove the person so objected to upon the receipt from the Engineer of notice in writing requiring him so to do and shall provide in his place a competent representative at the contractor's expense.

2.38 LIABILITY FOR ACCIDENTS AND DAMAGE:-

The contractor shall be entirely responsible for all loss, damage, or depreciation of the line until the line is 'taken over' in accordance with relevant clause of specification.

The contractor shall during the progress of the work, properly cover up and protect the line from injury by expose to the weather, and shall take every reasonable, proper, timely and useful precaution against accident or injury to the same from any cause and shall remain answerable and liable for all accidents or injuries thereto which until the same be, or be deemed to be taken over as per relevant clause of this specification, may arise or be occasioned by the acts or omissions of the contractor or his workman or sub-contractor and all losses and damages to the materials arising from such accidents and injuries as aforesaid shall be made good in the most complete and substantial manner by and at the sole cost of the contractor and to the reasonable satisfaction of the Engineer.

Until the line shall be or be deemed to be taken over as aforesaid, the contractor shall also be liable to indemnify the purchaser in respect of all damage or injury to defective design, work, or material, but not otherwise.

Provided that the contractor shall not be liable under the contract for any loss or profit or loss of contract for any claims made against the CSPTCL not already provided for in the contract, nor for any damage or injury caused by or arising from the acts of the purchaser or of others, of (safe as to damage by fire as hereinafter provided) due to circumstances over which the contractor has no control, nor shall his total liability for loss, damage or injury exceed the total value of the contract.

The contractor shall be deemed to have indemnified and saved harmless the purchaser against all actions suits, claims, demands, cost of expense arising in connection with injuries, suffered prior to the date when the line shall have been taken over as per relevant clause of this specification, herein by person employed by the contractor or his sub-contractor on the works whether under the General Law or under the Workman's Compensation Act, 1923, or any other statute in force at the statute of the contract dealing with the question of the liability of employers for injuries suffered by employees for injuries suffered by employees and to have taken steps properly to insure against any claim there under.

On the occurrence of an accident which results in the death of any of the workmen employed by the contractor or which is so serious as to be likely to result in the death of any such workman, the contractor shall, within 24 hours of the happening of such accident, intimate in writing to the concerned legal competent authorities as per rules & act enforce under intimation to Engineer in-charge the fact of such accident. The contractor shall indemnify the **CSPTCL** against all loss or damage sustained by the **CSPTCL** resulting against all loss or damage sustained by the **CSPTCL** directly or indirectly including the penalties or fines if any payable by

the **CSPTCL** as a consequence of **CSPTCL**'s failure to give notice to the provisions of said Act in regard to such accidents.

In the event any claims being made or action brought against the purchaser involving the contractor and arising out of the matters referred to and in respect of which the contractor is liable, under this clause, the contractor shall be immediately notified thereof and he shall with the assistance if he so require, of the purchaser, but at the sole expense of the contractor, conduct all negotiations for the settlement of the same or of any litigation that may arise there from. In such case the purchaser shall, at the expense of the contractor, afford all available assistance for any such purpose.

2.39 Clearance of dues of Sub-vendor and observance of Industrial/Labour Law :-

(i) The main contractor shall furnish list of various agencies/sub-vendors proposed to be engaged for execution of different type of works under scope of this work order to the ED/CE (C&LM) CSPTCL, Raipur and concerned Engineer-In-Charge.

(ii) Wages and fringe benefits according to the Labour Law / Industrial Law and fixed by concerned District Collectorate as in force during the execution of the work shall have to be paid by contractor or his appointed sub-vendor. It shall be the sole responsibility of the main contractor for observing the prevailing laws and contractor shall be abided for such statutory requirements absolving CSPTCL fully in case of any dispute, if so arises. Notwithstanding above, CSPTCL reserves the right to make direct payment to the sub-vendor / sub-contractor in case of failure of the main contractor to do so within a reasonable time period on whatever ground and deduct from the bills due to the contractor under this contract or any other contract with CSPTCL including his amount of performance / security for adjusting the aforesaid payment.

(iii) The termination/completion of the sub-vendor's job shall be informed to CSPTCL promptly. The contractor shall furnish a certificate jointly signed by sub-vendor and himself having settled all the dues and liabilities accrued due to sub-vendor's engagement for the execution of tendered work. The B.G. shall be released only after submission of the aforesaid clearance certificate received from all such sub-vendors engaged on execution of tendered work under the scope of this order. The B.G./ final payment shall be released only after submission of aforesaid clearance certificate to the concerned field Division.

(iv) The contractor shall observe Labour Law/Industrial Law and Wages Law strictly with regard to payment and fringe benefits to be delivered to the labors/ workers engaged by the Contractor or his sub-vendor. It shall be the sole responsibility of main contractor for arranging due insurance of personnel / materials to meet out any exigencies. It shall be the sole responsibility of main contractor for observing all the prevailing Laws and CSPTCL shall not be held responsible for any liability / disputes or claim in any way if arises due to non-observance of such Laws. However, the decision of Honorable District Court / appropriate court of law shall be final and binding on CSPTCL, Contractor and sub-vendor in case of any dispute.

2.40 REPLACEMENT OF DEFECTIVE WORK OR MATERIAL:-

If during the progress of the work the Engineer shall decide and notify in writing to the contractor that the contractor has executed any unsound or imperfect work, or has supplied any materials inferior in quality or quantity to those specified, the contractor on receiving details of such defects or deficiency shall at his own expenses, within seven days of his receiving the notice, or otherwise within such time as may be

reasonably necessary for making it good, proceed to alter, reconstruct, or remove such work or supply fresh materials up to the standard of the specification, and in case the contractor shall fail to do so, the purchaser may, on giving the contractor, seven days notice in writing of his intension to do so, proceed to remove the work or materials complained of, and at the cost of the contractor, perform all such work or supply all such materials provided that nothing in this clause shall be deemed to deprive the purchaser or affect any rights under the contract which he may otherwise have in respect of such defects of deficiencies.

2.41 DEDUCTIONS FROM CONTRACT PRICE:-

(i) All costs, damages or expenses which the purchaser may have paid, for which under the contract the Contractor is liable, may be deducted by the purchaser from any money due or become due by him to the Contractor under the contract or may be recovered by suit or otherwise from the Contractor as an arrear of land revenue.

(ii) Recoveries For Liabilities Against Other Contract/Order:
Any amount recoverable from the successful Bidder against earlier contracts/orders placed by the CSPTCL on the Bidders shall be adjusted from payment(s) due against this contract that may be awarded against this specification.

2.42 CERTIFICATE:-

(i) CERTIFICATE OF ENGINEER:-

Every application to the Engineer for a certificate must be accompanied by a detailed invoice (in duplicate), setting forth in the order of the schedule of prices, particulars of the work executed and/or material ready for dispatch on the date of claim, and the certificate that such material and work is in accordance with the contract, shall be issued by the Engineer within a reasonable time.

The Engineer may, by any certificate make any correction or modification in any previous certificate which shall have been issued by him and payments shall be regulated and adjusted accordingly.

(ii) **CERTIFICATE NOT TO AFFECT THE RIGHTS OF THE CSPTCL OR CONTRACTOR:-**

No certificate of the Engineer on account nor any sum paid on account by the CSPTCL, nor any extension of time for the execution of the works by the contractor under the powers granted by **clause 2.49** shall affect or prejudice the rights of purchaser against the contractor, or relieve the contractor of his obligations for the due performance of contract, or be interpreted as approval of the work done or of the materials supplied and no certificate shall create liability in to the CSPTCL to pay for alterations, amendments, variations or additional work not ordered in writing by the Engineer, or discharge the liability of the contractor for the payment of damages whether due, ascertained, or certified or not or of any sum against the payment of which he is bound to indemnify the CSPTCL, not shall any such certificate nor the acceptance by him of any sum paid on account or otherwise affect or prejudice the rights of the contractor against the CSPTCL.

2.43 S**USPENSION OF WORKS**:- The CSPTCL shall not pay to the contractor any expenses, arising from suspension of the works for any reason whatsoever.

2.44 **RESPONSIBILITY OF CONTRACTOR:-**

The contractor shall be responsible for carrying out the works covered under the scope of the contract according to the specification, order. Deviations, if any, from the approved/specified conditions shall be brought to the notice of C E (Planning & Projects) CSPTCL, Dangania, Raipur (CG) 492013 through the site Engineer, before taking up the work and his decision shall be final and communicated through site Engineer. If at a later date, it is found that the contractor has carried out some work, not according to the specifications, and without taking specific approval, then in that case, all the payments made to the contractor for carrying out such works shall be recovered and the contractor will have to rectify the same at the rate indicated in the order for carrying out such works without extension of time.

2.45 LIQUIDATED DAMAGE FOR DELAY IN COMPLETION:-

a. If the contractor fails to perform the work within the specified period given in the order or extension granted thereof, with respect to successful completion of testing & commissioning of OPGW, the Contractor shall pay to CSPTCL as liquidated damages, a sum of half percent (0.5%) of the contract price (supply and installation, testing & commissioning) for each calendar week or part thereof. However, the amount of liquidated damages for the Contract shall be limited to a maximum of five percent (5%) of the total contract price (supply & erection) for completed and uncompleted portion of the line.

b. The payment or deduction of such damages shall not relieve the contractor from obligations to complete the works, or from any of other obligations and liability under the contract.

2.46 RECOVERY FOR SHORTAGE OF DISMANTLED MATERIAL:- The contractor shall maintain a register for each & every materials to be erected and dismantled duly verified by the OIC of the work. The contractor shall ensure collection and transportation of all the dismantled materials i.e. Earthwire, Hardwares, Vibration dampers, Nut-Bolts etc. to the site store of CSPTCL as decided by OIC of the work. If any discrepancies is found in the dismantled quantities of material, the recovery for the same shall be made from the contractor's running bill @ rates received from the recent auction of steel scrap of materials in CSPTCL.

2.47 REJECTION OF DEFECTIVE WORK:-

If the complete line, or any portion thereof, before it is taken over as per relevant clause of this specification, be defective, or fails to fulfill the requirements of the contract, the Engineer shall give the contractor notice setting forth particulars of such defects or failure, and the contractor shall forthwith make the defective material good, or alter the same to make it comply with the requirements of the contract. Should he fail to do so within a reasonable time, the purchaser may reject and replace at the cost of the contractor, the whole or any portion of the material, as the case may be which is defective or fails to fulfill the requirements of the contract. Such replacement shall be carried out by purchaser within a reasonable time and at a reasonable price and where reasonably possible, to the same specification and under competitive conditions. The contractor's full and extreme liability under this clause shall be satisfied by the payment to the purchaser of the extra cost, if any, of such replacement

delivered and or erected as provided for in the original contract. Such extra cost being the ascertained difference between the prices paid by the purchaser, under the provisions above mentioned, for such replacement and the contract price for the material so replaced including the repayment of any sum paid by the purchaser to the contractor in respect of such defective material. Should the purchaser not so replace the rejected material within reasonable time, the contractor's full and extreme liability under this clause shall be satisfied by the repayment of all moneys paid by the purchaser to him in respect of such material, in the event of such rejection, the purchaser shall be entitled to the use, of the material in a reasonable and proper manner for a time reasonably sufficient to enable him to obtain other replacement material, during the period the rejected material is used commercially the contractor shall be entitled to a reasonable sum as payment for such use.

2.48 TAKING OVER :- When all performance tests called for by the specification have been successfully carried out before transportation, the material shall be accepted and taken over when it has been satisfactorily commissioned on site. The Engineer shall forthwith issue a taking over certificate.

The Engineer shall not delay the issue of any taking over certificate contemplated by this clause on account of minor defects in the material which do not materially affect the commercial use thereof provided that the contractor shall undertake to make good the same in due course.

2.49 REGULATION OF LOCAL AUTHORITIES:-

The purchaser shall, throughout the continuance of the contract and in respect of all matters arising in the performance thereof, serve all notices and obtain consents, way leaves, approvals and permission required in connection with the regulations and bye-laws of the local or other authority which shall be applicable to the works, However, the contractor shall obtain all the necessary licenses/permissions as per central/state/local statutory bodies at his cost.

All works shall be executed in accordance with the Indian Electricity Rules, 1956, and any statutory modifications thereof, wherever they are applicable, unless otherwise agreed to in writing by the Engineer.

2.50 CONSTRUCTION AS PER CONTRACT ACT:-

The contract shall be in all respects be construed and operate as a contract as defined in Indian Contracts Act, 1872, and all payments there under shall be made in Indian rupee unless otherwise specified.

2.51 HEADINGS:-

The subject headings of any clause thereof shall not, in any manner whatsoever, affect the interpretation of such clause.

2.52 CONTRADICTORY STATEMENT IN THE TECHNICAL & COMMERCIAL BID :-

In case the bidder makes contradictory statement in the Technical & Commercial Bid, CSPTCL will have full right to interpret / take that statement into consideration which will be in the interest of CSPTCL.

SECTION – III

GENERAL CONDITIONS OF CONTRACT (COMMERCIAL)

3.01 COMPLETION OF WORK:

a) Time being the essence of contract, the work for Replacement of existing G.I. Earthwire (7/3.66mm) of various EHV transmission lines (4700 km) of CSPTCL by OPGW (24 & 48 Fibre) covered under this specification should be completed in **24 (Twenty four) calendar months** including rainy season from the date of order. The contractor shall ensure to complete the work of replacement of G.I. Earthwire in all 03 (three) packages within aforesaid stipulated period.

Separate gangs with sufficient men & materials shall be deployed by the contractor to carry-out the work of each package simultaneously so the work of all three packages can be completed within stipulated completion period.

b) **Taking over (Operational Acceptance)**:- Upon receipt of intimation about completion of erection, installation & commissioning of OPGW on the specified EHV lines of CSPTCL as whole. CSPTCL Engineer- in-charge shall issue a taking over certificate in which he shall certify the date on which the system has been so taken over. This certificate shall be issued within 30 days of the intimation from the contractor.

The issuance of taking over certificate shall in no way relieve the contractor of his responsibility for the satisfactory operation of the system as per specifications.

3.02 MATERIAL TO BE SUPPLIED BY CONTRACTOR:

All the materials like 24 & 48 Fiber OPGW & its associated accessories etc. shall be supplied by the Contractor to site stores without any extra cost to the CSPTCL.

3.03 TERMS OF PAYMENT:-

3.03.1 The payment on running bills will be allowed in the following manner to relieve the contractor from financial hardship if any, so as to facilitate him for timely completion of the work :-

a) **SUPPLY** :- The contractor shall present at the end of each calendar month a bill for the materials supplied duly certified by CSPTCL Engineer in charge, during the month at the charges/rates accepted. 90% value of the material supplied every month shall be paid within a period of thirty (30) days from the date of receipt of bills in Dn. office. Balance 10% shall be retained by the CSPTCL and shall be released after six months on satisfactory completion and handing over of the completed work by the contractor.

b) **CONSTRUCTION :-**The contractor shall present at the end of each calendar month a bill for the works completed, inspected and duly certified by CSPTCL Engineer in charge, during the month at the charges/rates accepted. 90% value of the work done every month shall be paid within a period of thirty (30) days from the date of receipt of bills in Dn. office. Balance 10% shall be retained by the

CSPTCL and shall be released after six months on satisfactory completion and handing over of the completed work in all respect by the contractor.

3.3.2 (i) ADVANCE PAYMENT: - If requested by the contractor, CSPTCL may at its option grant an advance payment of maximum 10% of contract value after obtaining approval of competent authority. "The advance shall attract interest at the rate notified by PFC for capital projects of STU's in category under which CSPTCL falls plus a margin of 2%. The interest shall be charged monthly outstanding advance. Presently, CSPTCL is rated as "A^{+}" and rate notified by PFC for capital works of "A" category STUS is 11.25% p.a. which implies that **applicable interest rate at present would be 13.25%** to be charged on monthly basis". Separate order shall be issued to this effect. The contractor will furnish an unconditional and irrevocable Bank Guarantee from a Nationalized / Scheduled Bank in favour of CSPTCL for an amount equal to the advance granted plus interest up to the completion period calculated on it. The bank guarantee shall be initially valid till six months (180 days) after expiry of completion period and shall be extended from time to time 180 days as required. This BG may be reduced on pro-rata on quarterly basis based on contractor's request. The advance, if granted, shall be recovered from the running bills along with accrued interest as per CSPTCL's terms and conditions which shall be brought in the order for advance payment. The bank guarantee shall be released on recovery of entire amount of advance granted plus interest.

(ii) **Procedure for reduction in the Advance Payment Security guarantee.** The BG furnished towards advance payment may be considered to be reduced in every three months in case the validity of bank guarantee is more than one year. It should be clearly under stood that reduction in value of advance Bank Guarantee shall not in any way dilute the contractor's responsibilities under the contract including in respect of the facilities for which reduction in the value of securities is allowed.

(iii) **DEDUCTION OF ADVANCE PAYMENT**:- The advance payment with interest accrued on the advance made to the contractor will be adjusted against their running bills. The adjustment of advance will be done from the running bills of the contract proportionately to the extent of 20% in supply of materials and 20% on erection charges only till the total advance plus interest gets adjusted.

3.04 SOURCES OF MATERIALS / ASSOCIATION WITH OTHER FIRMS:

As the specification covers the arrangement of material for **24/48 Fiber OPGW & its associated accessories** etc. and complete replacement of existing Earthwire by OPGW indicated in the relevant section (part 1 of this specification) by the bidder, the source of procurement of various materials must be indicated by the bidder in the relevant **Annexure-13**. In case if the CSPTCL wants any change in the source of supply of above material, then the bidder will change the source accordingly. Further if the bidder desires to change the source of procurement of diligence any item, then he will have to take prior approval of the CSPTCL.

3.05 PROGRAMME CHART AND PROGRESS REPORT: The detailed programme chart and progress report have been described in **Technical Section-IV-F** in this tender document.

3.06 QUALITY ASSURANCE:- The detailed programme for Quality Assurance has been described in **Technical Section-IV-F** in this tender document.

3.07 TEST AND TEST CERTIFICATES:

The tests to be conducted by the contractor as mentioned in **technical section - IV** of this tender specification.

3.08 COMMENCEMENT OF ACTIVITIES:-

The details of Commencement of Activities has been described in **Technical Section-IV-F** in this tender document.

3.09 PROJECT MONITORING:

The details of Project Monitoring has been described in **Technical Section-IV-F** in this tender document.

3.10 SPECIAL WORKS:

The rates for special works not included in the schedules will be decided upon, when any such necessity arises during the execution of the work, by negotiations between the CSPTCL and the contractor. The contractor shall perform the work on the terms and conditions as mutually agreed upon.

3.11 SCOPE (COMMERCIAL TERMS AND CONDITIONS):-

This section of the specification covers supply delivery ex-contractor's stores, unloading of required materials. The work shall be carried out as per the details laid down in the specification. The price for works and material covered under scope of this specification shall be furnished by the bidders in prescribed price schedule appended with this specification. The bidder shall quote for complete work of replacement of Earthwire by 24/48 fiber OPGW, delivery etc. on turn-key basis.

3.12 RATES:

F.O.R. Destination rates must be quoted as under clearly giving break-up of prices in following three elements, otherwise the offers may run the risk of rejection:

i) Ex-factory / Ex-go down prices inclusive of packing and forwarding.

ii) All the taxes shall be applicable as per provision of GST Act 2017 relevant for CSPTCL.

iii) Freight charges for any destination in Chhattisgarh State. The offered freight charges should be on "FIRM" basis only, and should be valid for either road transport or rail transport.

3.13 PRICES:-

The price quoted for all the materials for Replacement of existing G.I. Earthwire (7/3.66mm) of various EHV transmission lines (4700 km) of CSPTCL by OPGW (24 & 48 Fibre) on turn key should be offered on FIRM basis till tendered work is completed and handed over to CSPTCL. The prices quoted in the Price Bid are to be

unconditional which is to be noted carefully by the bidder. The conditional price bids shall not be evaluated by CSPTCL in any case. Bidders are requested to quote their prices in prescribed formats only.

3.14 TAXES :-

The bidder shall quote his GST Registration number in **Annexure A-9.**

(i) GST and other levies in respect of supplies and services under the Contract, should be indicated separately in respective columns in the Price Bid Proposal Sheets. The ITC (Input tax credit) available to bidder should be duly considered while quoting the rate. **Any variation in tax rate during scheduled completion period will be on CSPTCL"s account.**

(ii) **Cess under "Building and other Construction Workers Welfare cess Act, 1996:-** The contractor for carrying out any construction work in Chhattisgarh State must get themselves registered under section 7 (1) of the "Building and Other Construction Workers Welfare Cess Act, 1996" and rules made thereunder by the Chhattisgarh Govt. and submit Certificate of Registration issued by the Registering Officer of the Chhattisgarh Government (Labour Department) for enforcement of the Act. The cess @ 1% on cost of supply of materials and construction charges shall be borne by the contractor and same shall be deducted from each bill. **Any variation in this respect within scheduled completion period shall be to the account of CSPTCL.**
If the rate of applicable cess beyond contractual completion period undergoes upward revision, the payment will continue to be made only on the basis of rates prevailing during completion period. In case the rate of cess undergoes downward revision then the delayed works beyond contractual completion period will attract reduced rate of cess.

(iii) **Payment of other taxes/charges which are not described above**:-The bidder should be aware of the various taxes, duties, levies imposed by the Central Government, State Government or Local Bodies applicable in this contract as on the date of TC bid opening. Further, in the price bid, it should be specifically stated regarding each tax whether it is inclusive or exclusive. However, if there is no specific mention of any duties/levies as exclusive in the price bid, it will be presumed to be inclusive if it is applicable as on the date of TC bid opening and will not be paid extra.

(iv**)**Any variation in statutory taxes, including due to amalgamation or restructuring of existing taxes whether upward or downward within stipulated completion period shall be in the account of CSPTCL.

Tax Beyond contractual completion period:- If the rate of applicable taxes / duties beyond contractual completion period undergoes upward revision, the payment will continue to be made only on the basis of rates prevailing during scheduled completion period. In case the rate of statutory levies/ taxes undergoes downward revision then the delayed supplies/ work performed beyond contractual completion period will attract reduced rate of taxes/duties.

(v) **Any other new tax:** - *But if any new tax/ duty/ levy is imposed either by central Government or by Stat Govt. / local authorities after the date of opening of T.C. Bid, the same shall be payable by CSPTCL extra within stipulated completion period on production*

of documentary evidence. However, tax due to increase of Turnover or withdrawal of tax exemption earlier available to the vendor etc. will not be reimbursed.

vi) The contractor shall be solely responsible for payment of all taxes, duties, license fee etc. if any, for all materials covered under this contract to the concerned authority as may be applicable from time to time.

3.15 EXTENSION OF TIME:-

If the completion of work is delayed due to reason beyond the control of the contractor the contractor shall without delay give notice to the CSPTCL in writing of his claim for an extension of time. The CSPTCL on receipt of such notice may agree to extend the contract date of the work as may be reasonable but without prejudice to other terms and conditions of the contract.

3.16 AGREEMENT:

The successful contractor shall have to enter into an agreement with the Engineer in the approved contract agreement form within 15 days of the receipt of the individual work orders failing which the contract may be cancelled **(Annexure-17).**

3.17 SECURITY DEPOSIT:-

(a) The contractor shall furnish a bank guarantee **(Annexure-18)** from a nationalized / scheduled bank for an amount of 10% (ten percent) of the cost of the contract including GST as a contract security. This bank guarantee shall be submitted within 15 days of receipt of individual orders and shall be kept valid for period exceeding the scheduled completion date by two months or two years from the date of signing of integrity pact whichever is later with additional claim period of six months.

(b) In case, project is delayed (running beyond schedule) on any account the contractor will be required to extend the validity of BG **(Annexure-22)** well in advance at least for six months or period of expected delay plus six months claim period, whichever is more. Charges for extension of BG shall be borne by the contractor. The validity of the bank guarantee shall be extended on stamp paper worth Rs. 300/- or as per the prevailing legal requirements. The BG towards any other amount as per the C.G. State Stamp Duty Act shall be from a Nationalized/ Scheduled Bank in the prescribed form of CSPTCL. No interest shall be paid by CSPTCL on the security deposit. In case of non-fulfillment of contractual obligations by the contractor, the security deposit shall be forfeited.

(c) The security deposit will be released only after completion of entire works, issue of No dues/liability certificate from the Executive Engineer in charge of work and after submission of performance B.G.

3.18 GUARANTEE PERIOD:

The work done, material supplied by the contractor as per the contract specification should be guaranteed for satisfactory operation and against any defect in material and workmanship for a period of **36 (Thirty six)** months from the date

on which OPGW is successfully commissioned on a particular line. The contractor's liability shall be limited to the replacement (supply and re-erection) of any defective parts that may develop in OPGW and its associated accessories in transmission line of his own manufacture or those of his sub-contractors approved under **clause 2.06** (Contractor's default liability) under the conditions provided for by the contract under proper use and arising solely from faulty design, materials, or workmanship.. The "Commissioning here means successful acceptance testing of OPGW between two stations(FODP to FODP). The acceptance test on a particular line shall be witnessed by OIC & concerned EE(Comm. & TM) & a certificate to stating that the acceptance test has been successfully performed on the line shall be issued to the contractor. The above guarantee certificate shall be furnished in triplicate to the CSPTCL for approval. Any defect noticed during this period should be rectified by the contractor free of cost to CSPTCL upon written notice.

If it becomes necessary for the contractor to replace or renew any defective portions of the material under this clause, the provisions of this clause shall apply to the portions of the material so replaced or renewed until the expiration of six months from the date of such replacement or renewal or until the end of the above mentioned period of **36 (thirty six) months** which ever may be later. If any defects be not remedied within a reasonable time, the purchaser may proceed to do the work at the contractor's risk and expense, but without prejudice to any other rights which the purchaser may have against the contractor in respect of such defects.

The contractor shall bear reasonable cost of minor repairs carried out on his behalf at site.

At the end of the maintenance period, the contractor's liability ceases. In respect of goods not covered by this clause, the purchaser shall be entitled to the benefit of any guarantee given to the contractor by the original supplier or manufacturer of such goods.

3.19 PERFORMANCE GUARANTEE :-

(a) After completion of work in all respect (final commissioning etc.) and before issue of final taking over certificate by the Engineer in charge of CSPTCL, the contractor shall provide CSPTCL a Performance Bank Guarantee **(Annexure-19)** from a Nationalized/ Scheduled Bank for an amount of 5% (FIVE PERCENT) of the contract price in the approved B.G. Proforma of the CSPTCL. This Bank guarantee shall be executed on stamp paper worth Rs.300/- or any other amount as per the C.G. state stamp duty Act and shall be kept valid till completion of the guarantee period mentioned in the foregoing Clause plus six month claim period.

(b) No interest shall be paid by CSPTCL for the aforesaid bank guarantee. In case of non-performance of the system (OPGW) as per the contract specification, the performance Bank Guarantee shall be forfeited.

3.20 PAYMENT DUE FROM THE CONTRACTOR:

All costs of damages for which the contractor is liable to the CSPTCL will be deducted by the CSPTCL from any money due to the contractor under the contract.

3.21 RESPONSIBILITY TO RECTIFY THE LOSS AND DAMAGE:

If any loss or damage happens to the work or any part thereof or materials/ plant/equipments for incorporation therein during the period for which the contractor is responsible for the case thereof or from any cause for whatsoever, the contractor shall at his own cost rectify/replace such loss or damage, so that the permanent work conforms in every respect with the provision of the contract to the work/ equipment occasioned by him in course of any operation carried out by him during performing the contract **(Annexure 25).**

3.22 EXTENSION ORDER:- The extension order up to 50% of the total quantity/value may be placed on the same price, rates, terms & conditions.

3.23 **CONTRACT AGREEMENT SECURITY DEPOSIT:-**

A formal agreement, shall be entered into between the contractor and the purchaser for the due performance and observance of the terms and conditions of the contract

On acceptance of offer the successful tenderer will have to deposit as security an amount of 10% of the total value of order in the form of cash/DD or Bank Guarantee.

The proforma for contract agreement, Bank Guarantee for security deposit & Bank Guarantee towards performance are enclosed as **Annexure 17, 18 & 19.**

3.24 INSURANCE:

(A) The contractor will supply the OPGW & its associated accessories to CSPTCL's / their site stores and therefore he will be responsible for the transit risks. It shall be contractor's responsibility to ensure proper packing and safe delivery of the material at the site stores. Any loss or damage caused to the materials during transit due to negligence on contractor's part shall be made good by the contractor free of all charges within one month from the date of consignee's notification, which will be issued within 30 (Thirty) days of receipt of materials at site. Transit insurance is not covered under the scope of this contract.

i) The Contractor shall arrange, secure and maintain insurance as may be necessary for all such amounts to protect his interests and the interests of the Purchaser, against all risks as detailed herein. The Contractor's failure in this regard shall not relieve him of any of his contractual responsibilities and obligations.

ii) Any loss or damage to the materials during handling, transporting, storage and erection, till such time the material/line is taken over by the Purchaser shall be to the account of the Contractor. The Contractor shall be responsible for preferring of all claims and make good the damage or loss by way of repairs and/or replacement of the portion of the works damaged or lost. The transfer of title

shall not in any way relieve the Contractor from the above responsibilities during the period of the contract. The Contractor shall provide the Purchaser with a copy of all insurance policies and Specifications taken out by him in pursuance of the contract. Such copies of Specifications shall be submitted to the Purchaser immediately after such insurance coverage is obtained. The Contractor shall also inform the purchaser in writing at least sixty (60) days in advance, regarding the expiry, cancellation and/or change in any of such Specifications and ensure revalidation/renewal etc. as may be necessary, well in time.

iii) All costs on account of insurance liabilities covered under the contract will be on Contractor's account and will be deemed to be included in Contract price. The Contractor shall cover insurance with Indian Insurance Companies only.

iv) The contractor will indicate in questionnaire the cost element of such insurance cover, which he has assumed while quoting the rates. The above cost of material is inclusive of all materials to be supplied by the contractor. The contractor shall take up proper insurance to cover all the materials required for completion of the work, to be supplied by the contractor against storage, handling, transportation and erection risks.

v) The contractor shall arrange above insurance for the total completion period of transmission line (period in months) as quoted by him in the completion schedule. For delay in the completion of the transmission line, up to 3 (three) months, due to any reason whatsoever, the contractor shall bear the charges of extension of insurance policy. For delay beyond 3 (three) months due to the reasons not attributable to the contractor, the CSPTCL shall reimburse the charges of extension of insurance policy to the contractor on presentation of evidence of having paid such amount to insurance company.

vi) Any other insurance including the insurance of erection personnel employed by the Contractor/ his subcontractor shall also be the responsibility of the contractor and shall be arranged, if required, at his own cost.

(B) The bidder shall ensure following insurances also:-

i) Workmen Compensation Insurance:- This shall protect against claims applicable against workmen's Compensation Act 1948 (Govt. of India). This liability shall not be less than

Workmen's Compensation	As per Statutory Provisions
Employees Liability	As per Statutory Provisions

ii) Comprehensive Automobile Insurance :- This insurance shall be in such a form to protect the contractor against all claims for injuries, disability, disease and death of members of public including purchasers men and damage to property of others arising from use of motor vehicle during on or off the site operation irrespective of ownership of such vehicles.

iii) Comprehensive General liability insurance: It shall protect contractor against all claims arising from injury disability, disease or death of public or damage to property due to act of contractor or his representative.

3.25 PRICES AND QUANTITIES

Prices for various items of the work of replacement of existing G.I. earth wire with OPGW are to be quoted in the manner specified in schedules appended with this specification. The prices will include the cost of labour, all tools and plants except otherwise specifically mentioned in this specification and other incidental charges in connection with the erection work, pertaining to each items as indicated in the schedules, unless otherwise indicated in the specification.

The quantities of OPGW & its accessories indicated in the price schedule are only provisional and are for comparison purpose. The final quantities will be known after completion of work. Thus these are only provisional quantities and may vary during actual execution of work. It may be noted that if during the execution of works, at any point of time, it is noticed that there is wide variation in quantity of material / quantum of work viz a viz provision in the contract, the contractor shall intimate the same to the OIC of the work. The OIC of the work in turn shall submit the proposal to the order placing authority for obtaining competent approval. The supply of material/execution of works (in excess of provision in the contract) shall only be carried out after the approval by the order placing authority.

In the event of revision of quantity on completion of works, total value of supply of materials and installation, testing & commissioning charges shall be worked out with the unit rates of other bidders. In case the total value when calculated with unit rate of other bidder (viz L-2 or so on) is found lower than the revised value of order value, the total payment shall be limited to the lower of the two. This condition may be kept in view while quoting the rates.

3.26 COMPLIANCE WITH REGULATIONS

Unless otherwise specified, all works shall be carried out in accordance with the Indian Electricity Act, 1910; Indian Electricity Rules, 1956 with any amendments or revisions thereof which may be issued during the currency of the contract and the requirement of any other Regulations and Acts as applicable in India (including local statutory bodies) which the CSPTCL may be subjected to. Contractor shall also compliance with the Minimum Wages Act 1948 and the payment of Wages Act and the rules made their under in respect of any employee are workman employed are engaged by him or his sub contractor.

All railway tracks, power / communication line, or other important road crossings etc. or routing the line through air field region shall conform to the relevant rules and procedure laid down by railway, communication, aviation or other concerned authorities.

Suitable arrangements for aviation signal shall be provided at the top of the towers in the vicinity of civil / military aerodromes of air field regions, if any. Similar arrangements will also be provided on the special river crossing towers, if used.

3.27 "A" CLASS ELECTRICAL CONTRACTOR LICENSE:-

Contractor will have to submit a certified copy of "A" Class electrical contractor's license issued by C.G. Anugyapan Mandal, Raipur at the time of placement of order. The annual validation of the license shall be obtained by the contractor at his own cost and submitted to the purchaser during the currency of the contract.

3.28 RESPONSIBILITY FOR OBTAINING INFORMATION AND TAKING ACTION IN TIME.

Whenever any information or clarification in respect of construction of line have to be obtained from various authorities, the contractor shall be responsible for taking action well in time so that there are no delays on this account. The completion period offered in the tender shall be deemed to include the time taken for such incidental works. Request for extension of the completion date on such ground will not be entertained.

3.29 PERMITS AND PRIORITIES: Necessary permits, if any, required for the execution of the contract shall be arranged by the contractor himself. The contractor shall obtain the necessary license / permission as per central /state / local statutory bodies at his cost. The CSPTCL may, however, furnish to the contractor such certificates as may be required for the necessary permits / priorities for the execution of the work, if CSPTCL considers demand justified. The CSPTCL will, however, not be responsible for the delay in execution of the contract, if permits / priorities are not granted in time.

3.30 WAY LEAVE:

(a) **Statutory Payments :-**

All statutory payments to all government agencies shall be borne by the CSPTCL. Any payment which becomes due on account of introduction of new policy of Govt. of India / Govt. of CG announced after issue of N.I.T., shall be paid by CSPTCL.

(b) **Payment of damages for access of site :-**

Any payments / charges required for access of site and damage of crops on way to the site shall be to the contractor's account.

(c) **Railway crossing :-**

The Railway track crossing cases with drawing, questionnaire etc. will be prepared by the CSPTCL and CSPTCL will arrange the approval. All statutory payment like supervision charges, approval fee etc. will be paid by the CSPTCL directly to the Railway Department. The Railway Block charges if any will be paid by the CSPTCL for maximum of one hour per crossing. The Railway block charges beyond one hour per crossing will be borne by the contractor.

3.31 USE OF PRIVATE ROAD/ APPROACH ROAD TO SITE:

The CSPTCL will help in getting necessary permission for use of private/ forest/ canals for transport of materials and construction personnel, wherever possible

under the rules. Any charge levied by the concerned authorities for use of such roads etc. shall be borne by the contractor.

During the erection work, if approach roads are required to be constructed for reaching the construction sites for transportation of men/materials, the cost of construction of such approach roads and any other expenses incurred in obtaining clearance/ permission shall be borne by the contractor.

3.32 (A) MATERIALS TO BE ARRANGE BY THE CONTRACTOR AND PERMITTED EXTRA CONSUMPTION:

(a) The quantity of OPGW to be incorporated in the line shall be worked as per the following norms:

Quantity of OPGW : Line length as per detailed survey x 1 + approx.. 6% for Looping, Splicing, Wastage, Sag etc.

(b) However, the contractor shall make every effort to minimise breakage, losses and wastage of the line materials during erection.

EMPTY OPGW WOODEN/STEEL DRUM ETC: Empty OPGW drums are to be utilized for recoiling of dismantled Earthwire.

(B) **PERMITTED VARIATION IN QUANTITY OF OPGW AND DISMANTLED MATERIALS** :- The quantity of dismantled G.I. Earthwire, Hardwares, Vibration damper, Nut-bolts etc. to be returned to the OIC should be quantity of OPGW & its associated accessories used with a permissible variation upto 3% .

3.33 MATERIALS TO BE ARRANGE BY THE CONTRACTOR FOR ERECTION WORK: All tools, equipments and materials, Electricity to carry out the work is to be arranged by the contractor at his own cost. Also, storage space for equipments and contractor's site office will be arranged by contractor.

3.34 TOOLS AND PLANTS TO BE ARRANGED BY THE CONTRACTOR:

The contractor shall be required to provide at his own expenses all necessary erection tools and plants for carrying out complete erection of the OPGW. The contractor will have to arrange at his cost all tools and equipments such as surveying instrument, winches, ropes, hotline tools & equipments for stringing of OPGW. The contractor will furnish in the relevant schedule, the list of all tools and plants as indicated above, which are available with him. Similarly, contractor will arrange at his cost all machinery and light and heavy vehicles such as jeeps, tractor, cranes for OPGW drum handling, truck etc.

3.35 FORTNIGHTLY PROGRESS :-

The contractor will also have to submit a copy of the fortnightly progress reports along with each erection bill in support of the work done. Thus the progress reports will be prepared by the contractor strictly for the duration from 1^{st} to 15^{th} of the month and 16^{th} to $30^{th}/31^{st}$ (last date) of the month throughout the construction period so that the quantum of work claimed in the bills matches with the completed activity of the works indicated in the progress report.

3.36 STORES FOR SUPPLY OF MATERIAL:-

i. The Contractor shall be required to set up Store along the route of the transmission line.

ii. The materials (to be supplied by the contractor) shall also be arranged in above stores as per the sequence of the work.

iii. The Contractor shall make arrangements to take delivery of all the materials and stock them properly.

iv. Yards and stores for stocking provided by the Contractor shall be opened for inspection by the Purchaser's representative as and when desired.

v. The cost of handling and storage shall be deemed to be included in the quoted erection prices and no extra charges towards, loading, transportation, unloading, stacking and storage etc. shall be payable.

vi. In case of materials to be supplied by the Contractor himself, all the above provisions shall also apply. However, shortage and/or damage of the materials shall be made good within a reasonable time and without any extra charge to the Purchaser and without delaying the construction of transmission line.

3.37 PAYMENT PROCEDURE FOR ERECTION WORK:

Payment will be made against monthly erection bills for works completed during the month as certified by OIC of the work. Each category of the work shall be completed for purpose of payment. Part payment will not be made even if break up rates are available for particular category of work. Hence bill shall be preferred for completed portion of works as certified by OIC of the work.

3.38 IDLE / MOBILIZATION / DEMOBILIZATION CHARGES:- No idle / mobilization / demobilization charges will be payable by the CSPTCL for any reason whatsoever to the contractor for stoppage of work. This may please be noted.

SECTION – IV

(Pages 60 to 183)

TECHNICAL SPECIFICATION

FOR

SURVEY, SUPPLY, INSTALLATION (LIVE LINE), TESTING AND COMMISSIONING OF 24/48 FIBRE OPGW, ADSS CABLE AND APPROACH CABLE ALONG WITH SUITABLE HARDWARE ACCESSORIES BY REPLACING EXISTING EARTH WIRE OF 132KV AND 220 KV EHV LINES OF CSPTCL

SECTION – IV-A

GENERAL REQUIREMENTS FOR SUPPLY, ERECTION, TESTING AND COMMISSIONING OF OPGW CABLE

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GENERAL REQUIREMENTS FOR SUPPLY,ERECTION, TESTING AND COMMISSIONING OF OPGW CABLE

1. General Requirements:-

The Contractor should offer standard products and designs. The Contractor should confirm the requirements of the project. However, the contractor may also offer any special proposal necessary to meet the requirements stated herein.

It should be noted that design information and bill of quantity provided in the document are tentative only. The Contractor shall carry out site surveys, detail engineering and design and submit the report to CSPTCL. The tentative section-wise link schedule shall be provided by CSPTCL to the successful bidder. However, based on final section-wise schedule shall be submitted by the contractor and approved by CSPTCL.

The Bidder's proposal should be self speaking in respect of all functional and performance requirements provided with this specification and shall include sufficient information and supporting documentation in order to determine compliance without further necessity for enquiries.

The contractor shall be bounded to provide the material / equipments as per specifications provided and material / equipments should comply/ fulfil all the desired features and requirements of the project.

At present in CSPTCL, SCADA system is operational which is communicating & collecting the data from RTUs installed at various sub-stations of CSPTCL. Further, data from all the peripheral RTUs is being communicated over PLCC network to nearest OFC node & then onwards over OPGW network up to SLDC SCADA system.

The bidders are advised to visit preferably sites / routes **(at their own expense),** prior to the submission of bid proposal, and make surveys and assessments as deemed necessary for proposal submission.

2. General Responsibilities and Obligations

This sub-section describes the general responsibilities and obligations of the Contractor.

2.1 Responsibilities for the Implementation Plan

The Bidder's technical proposal shall include a project implementation plan and schedule which is consistent / in line with the implementation plan detailed in this specification.

2.1.1 Contractor’s Responsibilities and Obligations

OPGW, Approach OFC, ADSS & associated hardware & fittings: -

The Contractor shall be responsible for implementation of overhead FO Cables System. The Contractor's obligations include, but are not limited to, the following:

i. Provide a working system that meets the functional and performance requirements of this specification.
ii. Engineering and design specific to each location including review of, and conformance with local environmental and earthing requirements.
iii. Development of installation guidelines and procedures for the stringing, mechanical installation, and splicing of all Overhead Fibre Optic Cable, including testing and documentation.
iv. Project management, project scheduling, including monthly project reports documenting progress during the contract period.
v. Engineering and technical assistance during the contract and warranty period.
vi. Site visits, path surveys, and studies necessary to identify and provide all equipment needed to implement the overhead FO cables installation.
vii. For any renovation, expansion or construction of facilities required to be carried out by Employer, the Contractor shall provide in the survey report the details necessary to enable such work to be carried out.
viii. Assessment of suitability for live line installation of overhead FO cable (OPGW) on the present infrastructure, towers etc.
ix. Design and Installation of the mechanical assemblies and accessories, including vibration dampers required for installation of all overhead fibre cable. To conduct structural analysis and submit report to CSPTCL if additional steel work / modification is required to carry out the work.
x. Dismantling the existing earth wire & hardware wherever overhead FO cables (OPGW) is to be installed on existing lines, and for the preservation and transportation of the dismantled earthwire & hardware to designated Area Stores of CSPTCL.
xi. Factory and Site acceptance testing of all equipment provided.
xii. Provide a Quality Assurance Plan ensuring the Employer access to the manufacturing process.
xiii. Shipment of all equipment and documentation to the Employer designated locations and/or staging areas.
xiv. Staging, maintenance and security of staging area including full responsibility for protection from theft and fire.
xv. All documentation and drawings as specified.
xvi. Training of the Employer personnel.
xvii. All Fibre Optic Distribution frame patch facilities.
xviii. Due diligence in properly planning and executing the work so as to minimise any crop, forestry or vegetation damage.

Detailed descriptions of the Contractor's obligations, in relation to individual items of hardware, and services, are delineated in other sections of this specification.

3. General Bidding Requirements :-

The Bidder shall be responsive to the Employer's technical requirements as set forth in this specification. To be considered responsive, the Bidder's proposal shall include the following:

(i) The Technical Proposal including the documents Annexed at Annexure-30 in the tender: Bid Documents Checklist shall be provided in the bid, failing which the bids may not be liable for consideration for technical evaluation.

(ii) A detailed project implementation plan and schedule that is consistent with the scope of the project and Employer's specified objectives. The plan shall include the activities of the Contractor, showing all key milestones, and clearly identifying the nature of all information and project support to be provided by Employer. Manpower resources proposed to be deployed by the Contractor during the execution phase shall be clearly indicated.

(iii) A commitment and a clearly defined plan to develop a system support in India which should be capable of providing a full range of local services (including software and hardware maintenance and upgrade support) for the life of the delivered telecommunications systems.

4. APPLICABLE STANDARDS: -

The following standards and codes shall be generally applicable to the equipment and works supplied under this Contract:

A. American Society for Testing and Materials ASTM-B415, ASTM-D1248, ASTM D 3349.
B. ITU-T/CCITT Recommendations G.650, G.652, G.653, G.655.
C. Institute of Electrical and Electronics Engineers IEEE-812, 1138-1994, IEEE-524, IEEE-828 & 830.
D. Electronic Industries Association, EIA-455-3, 455-31B, 455-32, 455-91, 455-78, 455-59, 455-80, 455-169, 455-81, EIA RS 598.
E. International Electro-technical Commission standards, IEC -1396 and IEC - 1089.
F. International Electro-technical Commission standards, IEC 793-1, 793-2, 794-1, 794-2, IEC-529, IEC 60794-1-2, IEC 60794-4-10.

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.

6. REFERENCES: -

1. CIGRE Guide for Planning of Power Utility Digital Communications Networks.
2. CIGRE Optical Fibre Planning Guide for Power Utilities.
3. CIGRE New Opportunities For Optical Fibre Technology in Electricity Utilities.
4. CIGRE guide to fittings for Optical Cables on Transmission Lines.

SECTION – IV – B

(OPTICAL GROUND WIRE)

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1.8.5	Operating conditions
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1.16	Installation of Approach Cable
1.17	Vendors

1. SCOPE

The scope of this specification includes Design, engineering, manufacturing, testing, demonstration for acceptance, documentation, supply of 24/48 Fibre (DWSM) OPGW and associated hardware, Armoured (DWSM) fibre optic approach cable & fittings and In-line Splices, loading, transportation, unloading, transit insurance and delivery at site and erection of the same on the following transmission lines of CSPTCL:-

(A) Line Length under EHT (C&M) Circle CSPTCL, Bilaspur (Package-I)

S.N.	Name of Line	Route Length (Km)
1	220 KV Raigarh - Saraipali line	111.80
2	220 KV Gerwani - Raigarh line	38.91
3	Raigarh 220 KV - Korba East 220 KV line	109.324
4	IC- DSPM PS 132 KV - Korba East 200 KV	3.031
5	220 KV Kotmikala - Chhuri line	77.172
6	220KV Bishrampur - Chhuri line	133.388
7	IC-II&II Korba East 220 - Korba West 400 Line	5.423
8	Korba West 400- Chhuri 220 KV line	10.076
9	Chhuri 220- Mopka 220 line	94.469
10	220 KV KORBA -SUHELA	106.968
11	220 KV LILO Banari line	0.825
12	132 KV Kotmikala - Manendragarh line	68.2
13	132 KV BANGO-BISHRAMPUR LINE	158.988
14	132 KV MANENDRAGARH LILO LINE	9.213
15	132 KV BAIKUNTHPUR LILO LINE	2.363
16	132 KV S/s Vishrampur - 220 KV S/s Bishrampur line (I/C line)	1.128
17	132 KV DCDS KORBA -JAMNIPALI LINE	9.869
18	132 KV JAMNIPALI- BANGO LINE	29.796
19	132 KV CHHURI LILO LINE	1.43
20	132 KV CHHURIKHURD LILO LINE	0.636
21	132 KV Bishrampur - Ambikapur line	25.871
22	132 KV BISHRAMPUR -BALRAMPUR LINE	117.774
23	132KV WADRAFNAGAR LILO LINE	27.653
24	132 KV PRATAPPUR LILO LINE	1.378
25	132KV RAJPUR LILO LINE	28.84
26	132 KV AMBIKAPUR-PATHALGAON LINE	91.328
27	132 KV BATOLI LILO LINE	0.608
28	132 KV Raigarh - Pathalgaon line	91.883
29	132 KV LILO Gharghoda line	0.504
30	132 KV LILO Gerwani line	1.772
31	I/C 132 KV Raigarh S/s to 220 KV S/s Raigarh line	0.356
32	132 KV Raigarh - Sarangarh line	50.085

33	132 KV LILO Baramkela line	20.85
34	132 KV LILO Kondatarai line	7.985
35	132 KV Saragarh - Saraipali line	57.222
36	132 KV Chaple (Kharsia) - Monnet	7.262
37	132 KV Champa - Raigarh line	79.353
38	132 KV LILO Jaijaipur line	22.92
39	132 KV LILO Adhabar line	0.05
40	132 KV Kondatarai - Dabhara	29.219
41	132 KV Akaltara - Aresmeta line	13.735
42	132 KV Aresmeta - Bhatapara line	32.796
43	132 KV Banari - Akaltara line	11.966
44	132 KV Champa - Banari line	18.14
45	132 KV DCDS KORBA - MOPKA-BILASPUR (up to Bhilai)	85.711
46	132 KV SWASTIK POWER LILO	0.05
47	132 KV RENKI LILO LINE	5.379
48	132 KV LILO at Koni	15.237
49	132 KV LILO Silpahari line	4.623
50	132 KV Navagarh - Mungeli line	20.952
51	132 KV - 220 KV I/C Mungeli line	13.833
52	132 KV Mungeli - Pandariya line	38.54
53	220 KV Marwa - Banari line	14.485
Total RL of lines in EHT:C&M Bilaspur Circle (km)		**1911.37**

(B) LINE LENGTH UNDER EHT: C&M CIRCLE, RAIPUR (Package-II)

S.N.	Name of Line	Route Length (KM)
1	220 KV DCDS PGCIL (Kumhari) - Doma Line	21.475
2	220 KV DCDS Suhela - Paraswani Line	62.176
3	220 KV Suhela - Bemetra Line	31.88
4	220 KV Urla - Raita Line	23.976
5	220 KV LILO Line from Loc. No.27 of 220 KV Urla - Raita Line to 220 KV SS Siltara	2.27
6	132 KV Saraipali - Jhalap Line	79.736
7	132 KV LILO line from Loc. No.146 of 132 KV Saraipali - Jhalap line to Sankara	2.963
8	132 KV LILO line from Loc. No.85 of 132 KV Saraipali - Jhalap line to Basana	1.801
9	132 KV Jhalap - Bagbahara Line	17.21
10	132 KV Paraswani - Bagbahara Line	44.749
11	132 KV Mahasamund - Rajim Line	28.632
12	132 KKV LILO line from Loc. No.22 of of CKT 2 of 132 KV Mahasamund - Rajim to Paraswani	13.375
13	132 KV Bhatapara - Baloda Bajar Line	21.051

14	132 KV Baloda - Bajar Kasdol Line	47.731
15	132 KV DCDS Bhatapara - Simga Line	29.792
16	132 KV Suhela - Baloda Bajar	18.445
17	132 KV DCDS Doma - Mana Line	13.52
18	132 KV DCSS Urla - Sector C Line	2.427
19	132 KV Bhilai - Raipur (Gudiyari) - Birgaon Line	
20	132 KV Bhilai - Raipur (Gudiyari) Line	23.88
21	132 KV Tap Line From Loc. No. 71 of 132 KV Bhilai - Raipur Line to Sarona	3.314
22	132 KV Extn. Line from Loc. No. 71 to 132 KV SS Birgaon	5.907
23	LILO of 132 KV Extn. Line from Loc. No. 71 to Birgaon from Loc. No. 6 to 220/132 KV SS Borjhara	2.144
24	LILO of 132 KV Extn. Line from Loc. No. 71 to Birgaon from Loc. No. 12 to 132 KV SS Sector - C	1.73
25	132 KV Simga - Tulsi Line	17.387
26	132 KV Kurud - Rajim Line	30.499
27	132 KV LILO line from Loc. No.12 of 132 KV Kurud - Rajim line to Magarload	16.867
28	132 KV Magarload - Gariyaband Line	34.516
29	132 KV Gurur - Kanker Line	59.787
30	132 KV LILO Line from Loc. No.137 of 132 KV Gurur - Kanker Line to 132 KV SS Charama	3.347
31	132 KV LILO Line from Loc. No.156 of 132 KV Gurur - Kanker Line to 132 KV SS Bhanupratappur	40.174
32	132 KV DCSS Bhanupratappur - Pakhanjur Line	62.135
33	132 KV DCSS Kanker - Kondagaon Line	94.468
34	132 KV DCSS Kondagaon -Narayanpur Line	48.602
35	132 KV DCSS Kanker - Nagri Line	63.17
36	132 KV DCDS Barsoor - Jagdalpur (132 KV SS) Line	73.485
37	132 KV Parchanpal - Jagdalpur (132 KV SS) Line	16.225
38	132 KV Barsoor - Kirandul Line	56.545
39	132 KV Barsoor - Sukma Line	98.95
40	132 KV Barsoor - Bijapur Line	88.413
	Total RL of lines in EHT:C&M Raipur Circle (km)	**1084.349**

(C) LINE LENGTH UNDER EHT: C&M CIRCLE, BHILAI (Package-III)

S.N.	Particulars	Route Length(KM)
1	132KV Bhilai-Balaghat (up to 139) Main line	46.189
2	132KV Tap line to Kurud	2.84
3	132KV LILO to Pulagon	9.34
4	132KV LILO to Rasmada	3.47
5	132KV LILO to Dhamdha	33.45
6	132KV LILO to Rajnandgaon	13.61

7	132KV LILO to Thelkadih	3.316
8	132KV Bhilai-Dallirajhara Main line	90.677
9	132KV LILO to Ruabandha line	9.785
10	132KV LILO to Gunderdehi line	0.487
11	132KV LILO to Balod line	1.553
12	132KV Gurur-Kurud line	41.728
13	132KV LILO to Dhamtari	1.277
14	220KV Korba-Bhilai Main line	198.52
15	220KV LILO to Mopka	13.468
16	220KV LILO to Dhardehi	31.199
17	220KV LILO to Bhatapara	1.425
18	220KV LILO to Siltara	7.093
19	220KV LILO to PGCIL	5.097
20	220KV Mungeli -Bemetara line	39.609
21	220KV Bemetara -Khedamara line	50.782
22	220KV Thelkadih -Khedamara line	49.822
23	132KV Pandariya-Kwardha line	32.075
24	132KV Bemetara-Saja line	27.35
25	132KV Saja-Dhamdha line	20.505
26	132KV Saja-Gandai line	23.324
27	132KV Rajnadgaon -Dongargaon line	26.583
28	132KV Balod-Gurur line	30.88
29	132KV Doma-Patan line	16.126
30	132KV Bhanupratappur-Pakhanjur line	62.135
31	132KV Dongargaon-Mohla line	60.365
32	132KV Kawardha-Bemetara line	54.021
33	132KV Thelkadih-Dongargarh line	32.087
34	220KV Bhilai-Gurur line	68.487
35	Bhilai 220/132-Bhilai 132 Interconnetor)	0.6
36	Bilaspur-Simga-Bhilai line	126.945
37	132KV LILO to Chakarbhata line	0.308
38	132 KV LILO to Pathariya line	9.85
Total RL of lines in EHT:C&M Bhilai Circle (km)		**1246.378**

DATA SHEET FOR EXISTING EARTHWIRE		
Line Voltage	**132KV**	**220KV**
Nominal Span (E/W & Conductors in mtrs.)	335	350
Wind Zone	IV	IV
Design Tension at Every Day Temp (32º C) and full wind condition – Earthwire) (in kg)	3382	3318
Wind Pressure (kg/Sq-m) (including gust factor)	186.5	192
Max Sag – Ground Wire at 53ºC (in mtrs)	5.598	6.904
UTS – Earthwire (Kg)	6972	6972
Weight – Earth wire (Kg/km)	583	583

1.1 General

The Contractor shall supply & install 24 & 48 fibre (DWSM) OPGW fibre optic cable & (DWSM) armoured fibre optic approach cable. The estimated cable length requirements are indicated in the annexures.

All optical fibre cabling including fibre itself and all associated installation hardware shall have a minimum guaranteed design life span of 25 years.

1.2 Required Optical Fibre Characteristics

The characteristics of optical fibre to be provided under this specification are as follows: -

1.2.1 Physical Characteristics

Dual-Window Single mode (DWSM), G.652 telecommunication grade optical fibres shall be provided in fibre optic cables. DWSM optical fibres shall meet the requirements defined in Table 1-1(a).

1.2.2 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.

Table 1-1(a)

DWSM Optical Fibre Characteristics

Fibre Description:	Dual-Window Single-Mode
Mode Field Diameter:	8.6 to 9.5 µm (± 10% of the nominal value)
Cladding Diameter:	125.0 µm ± 2 µm
Mode field concentricity error	≤ 1.0 µm at 1310 nm
Cladding non-circularity	≤ 2%
Cable Cut-off Wavelength λ_{cc}	≤ 1260 nm

1550 nm loss performance		As per G.652	
Proof Test Level		≥100 kpsi	
Attenuation Coefficient:		@ 1310 nm	≤ 0.35 dB/km
		@ 1550 nm	≤ 0.23dB/km
Chromatic	Dispersion;	20 ps/(nm x km)	1550 nm
	Maximum:	3.5 ps/(nm x km) 1288-1339nm	
		5.3 ps/(nm x km) 1271-1360nm	
Zero Dispersion Wavelength:		1300 to 1324nm	
Zero Dispersion Slope:		-0.093 ps/(nm^{2}xkm) maximum	
Polarization mode	dispersion	≤ 0.5 ps/km^½	
coefficient			
Temperature Dependence:		Induced attenuation ≤ 0.05 dB (-60ºC - +85 ºC)	
Bend Performance:		@ 1310 nm (75±2 mm dia Mandrel), 100 turns;	
		Attenuation Rise ≤ 0.05 dB/km	
		@ 1550 nm (75±2 mm dia Mandrel), 100 turns;	
		Attenuation Rise ≤ 0.10 dB/km	
		@ 1550 nm (32±0.5 mm dia Mandrel, 1 turn;	
		Attenuation Rise ≤ 0.50 dB/km	

1.3 Fibre Optic Cable Construction

Overhead Fibre Optic Cable shall be OPGW (Optical Power Ground Wire). The design of cable shall account for the varying operating and environmental conditions that the cable shall experience while in service.

1.4 EHV Transmission Line Details

Annexed schedules identify the maximum spans, voltage levels and the relevant characteristics of the transmission line where optical fibre cable installations are required.

1.4.1 Optical Fibre Cable Link Lengths

The estimated optical fibre link lengths (from Gantry at one terminating station to the Gantry in the other terminating station) are provided for each required link in Annexure. 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 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.

1.5 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.

1.5.1 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. Buffer tubes shall be filled with a water-blocking gel.

1.5.2 Optical Fibre Strain

The fibre optic cable shall be designed and installed such that the optical fibres experience no strain under all loading conditions defined in IS 802. No fibre strain condition shall apply even after a 25 year cable creep.

For the purpose of these specifications, 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 techniques.
- 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 as defined in IS 802.
- The cable *max strain* is defined as the maximum strain experienced by the Cable under the worst case loading condition as defined in IS 802
- The cable *Every Day Tension (EDT)* is defined as the maximum cable tension on any span under normal conditions viz at 32 °C and no wind.
- 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 of OPGW. However, Max Allowable Tension up to 0.5 times the UTS of OPGW may be accepted, subject to no fibre strain.
- 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 indicating the maximum tension, cable strain and sag shall be calculated and submitted by the contractor for the following conditions as specified in IS 802:1977/1995:

a. 53 ^{o}C, no wind, no ice
b. 32 ^{o}C, no wind, no ice
c. 0 ^{o}C, no wind, no ice
d. 32 ^{o}C, full wind, no ice
e. 0 ^{o}C, 2/3rd / 36% of full wind (IS 802:1977/1995)

The above cases shall be considered for the spans from 100 m to max span length in the range of 50 m spans. 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 for all the transmission lines.

1.5.3 Cable Materials

The materials used for optical fibre cable construction, shall meet the following requirements:

1.5.3.1 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 filling compound shall remain stable for ambient temp. between -20°C and +65°C and shall not drip, flow or leak with age or at high temperatures during short duration lightning strikes and short circuit currents The filling compound shall meet the requirements of "Seepage of Filling Compound test" as per EIA/TIA 455-81.

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.

1.5.3.2 Metallic Members

When the fibre optic cable design incorporates metallic elements in its construction, all metallic elements shall be electrically continuous.

1.6 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 a minimum of 1 cm high white lettering with the vendors' address, the Employer'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.

1.7 OPGW cable Installation Requirement

The fibre optic cables shall be installed on transmission lines under live line conditions, i.e. with all the circuits of the transmission line charged to their rated voltage.

The OPGW cable shall be installed at the top of the tower by replacing the existing ground wire. The Contractor shall carry out re-tensioning of the existing earth wire wherever required to maintain the adequate clearances for live line stringing of fibre optic cables.

In exceptional cases only where replacement work on live line is not possible due to heavy induction of nearby lines or other unforeseen problems, shutdown may be permitted by CSPTCL. In such cases contractor shall submit a letter to OIC to arrange the shutdown. The reasons for not carrying out work on live line should be brought out in the request letter. However, CSPTCL's decision in the matter shall be final & binding on contractor.

1.8 Optical Power Ground Wire (OPGW)

OPGW cable construction shall comply with IEEE-P1138 and IEC publication 1396. 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 composite fibre optic overhead ground wire shall be made up of buffered optical fibre units embedded in a water tight aluminium/aluminium alloy/stainless steel protective central fibre optic unit surrounded by concentric-lay stranded metallic wires in single or multiple layers. However, other material may be accepted subject to meeting the cable type-testing requirement as specified in the technical specifications. 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.

1.8.1 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 central fibre optic unit may include an aluminium tube and/or channelled aluminium rod.

1.8.2 Basic Construction

The cable construction shall conform to the applicable requirements of Technical Specification, applicable clauses of IEC 1089 related to stranded conductors and Table 2.2(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.

1.8.3 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.

1.8.4 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 earth wire 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 Contractor shall shall submit sag-tension charts for the above cases prior to the execution of work.

Table 1-2 (a)

OPGW Electrical and Mechanical Requirements

(1)	**Everyday Tension at 32ºC, no wind:**	≤ 20% of UTS of OPGW
(2)	**D.C. Resistance at 20ºC:**	< 1.0 ohm/Km
(3)	**Short Circuit Current:**	≥6.32 kA for 1.0 second

1.8.5 Operating conditions

Since OPGW shall be located at the top of the EHV 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 the same or similar as those required of conventional ground conductors.

1.8.6 Installation

OPGW installed under live line condition, i.e. with all circuits charged to the rated line voltage as specified in this section 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 Contractor shall be responsible for collecting the tower & the transmission line details for the proposed fibre optic links required for cable designing & tower structural analysis. However, the available details are enclosed in appendices. The Contractor shall ensure that with the replacement of existing earth wire with the OPGW cable, the tower members remain within the statutory safety limits as per Indian Electricity rules. The OPGW cable sections shall normally be terminated & spliced only on tension towers. In exceptional circumstances, and on CSPTCL's 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, Contractor shall submit design details with required strengthening & the work shall be carried out by CSPTCL.**"**

1.8.7 Installation Hardware

The scope of supply of the optical cable includes the assessment, supply and installation of all required fittings and hardware. The Contractor shall determine the exact requirements of all accessories required to install and secure the OPGW.

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 Contractor shall provide the OPGW hardware & accessories drawing & Data Requirement Sheets (DRS) document for all the assemblies & components. However, DRS format of assemblies has been enclosed in the appendices. 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 in accordance with type test procedures specified in Appendix –C.

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).

(b) **Dead End Clamp Assemblies**: All dead end clamp assemblies shall preferably be of the 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, 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 appendices. Vibration damper clamps shall be made of aluminium or aluminium alloy, shall support the dampers during installation and shall maintain the dampers in position without damage to the OPGW and without causing fatigue. Armour or patch rods made of aluminium or aluminium alloy shall be provided as required to reduce clamping stress on the OPGW. The vibration damper body shall be hot-dip galvanised mild steel/cast iron or shall be permanent mould cast zinc alloy.

1.9 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 annexures. 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.

1.9.1 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.

1.9.2 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.

1.9.3 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.

1.10 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 pigtails and to accommodate connectorised termination and coupling of the fibre cables. The Contractor shall provide rack mounted Fibre Optic Distribution Panels (FODPs) sized as indicated in the appendices and shall terminate the fibre optic cabling up to the FODPs.

1.11 Fibre Optic Distribution Panels

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 pre-connectorised pigtails and fitted to the "Back-side" of the provided fibre optic couplings.

(b) FODPs shall accommodate pass-through splicing and fibre terminations. FODPs for indoor use shall be supplied in slim line or ETSI 19" racks.

(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.

1.12 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.

1.13 In-Line Fibre Optic Splice Enclosures

All in-line splices shall be encased in In-Line Fibre Optic Splice Enclosures. Suitable splice enclosures shall be provided to encase the optical cable splices in a protective, moisture and dust free environment. In line splice enclosures shall comply to ingress protection class IP 66 or better. The splice enclosures shall be designed for the storage and protection of a minimum of 24 optical fibre splices and equipped with sufficient number of splice trays for splicing all fibres in the cable. In-line 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 EHV transmission line towers above anti-climb guard levels at about 10 metres from the ground level and shall accommodate pass-through splicing.

1.13.1 Optical Fibre Splices

There shall be no mid-span splices allowed. 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) 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.

1.14 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.

The maximum allowable stringing tension, maximum allowable torsional shear stress, crush strength and other physical parameters of the cable shall not be exceeded.

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, 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 transmission line towers shall also be carried out by the Contractor. The Contractor shall supply all tools & accessories required for installation.

1.15 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 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**: Connectorized pigtails spliced to bare fibres shall provide at least 0.5 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.

1.16 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 lay and installation of approach cables shall be supplied and installed by the Contractor.

1.17 VENDORS:-

The vendors for all the materials except OPGW cables required for the work i.e. OPGW associated accessories and hardwares & fittings shall be subject to approval by CSPTCL after award of contract. The approval of vendors for various materials shall be done as detailed below:-

S. N.	Item(s)	Sub-vendor
1	OPGW Associated Accessories and Hardware & fittings.	Sub-vendor shall be manufacturer of **OPGW associated accessories and hardware & fittings** who has been manufacturing OPGW associated accessories and hardware & fittings for the last three (3) years. Vender should have supplied similar OPGW associated accessories and hardware & fittings to Indian entities i.e. Power utilities owned and controlled by Central or State Govt., Or PSUs Or Govt. organizations' and the same should be in satisfactory operation on 110 kV or higher voltage EHV transmission lines for at least one (1) year as on the date of opening of bids. The bidders are required to submit the GTP / Drawings and valid type test reports etc. from the vendor for approval. The type test report should not be older than 7 years as on the date of opening of bids. Proof of supply & performance certificate for successful operation from last one year should be submitted along with the drawing. The vendor approval shall be given along with the drawing approval.

SECTION – IV - C

INSPECTION & TESTING REQUIREMENTS

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INSPECTION & TESTING REQUIREMENTS

This section describes the specific requirements for inspection & testing requirement for supply of OPGW cable & its associated hardware & fittings.

2.1 General

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.

The entire cost of testing for factory acceptance test, routine tests, 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/CSPTCL representative. **In case tests & inspection are carried out outside India, all expenses of Inspector / Employer's representative shall be bear by the contractor.**

If 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 CSPTCL. After correction of a deficiency, all necessary retests shall be performed to verify the effectiveness of the corrective action.

The test shall be considered complete when (a) all variances have been resolved (b) all the test records have been submitted (c) CSPTCL acknowledges in writing the successful completion of the test.

2.2 Inspection

Access to the Contractor's facilities while manufacturing and testing are taking place, and to any facility where systems / equipment are being produced / tested for CSPTCL shall be available to CSPTCL's representatives. The Contractor shall provide to CSPTCL's representatives sufficient 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. Inspection rights shall apply to the Contractor's facilities and to subcontractor facilities where equipment is being manufactured.

Inspections will be performed by CSPTCL, which will include visual examination of hardware, enclosure cable dressings, and equipment and cable labeling. Contractor documentation will also be examined to verify that it adequately identifies and describes all wiring, hardware and spare parts. Access to inspect the Contractor's hardware quality assurance standards, procedures, and records that are applicable to the facilities shall be provided to CSPTCL.

2.2.1 Inspection Certificate

The Contractor shall give the CSPTCL two weeks written notice of any material being ready for testing. Such tests shall be to the Contractor's account except for the expenses of the Inspector. The Employer, unless witnessing of the tests is waived, will attend such tests on the scheduled date for which Employer has been so notified or on a mutually agreed alternative d.

The CSPTCL shall give notice in writing to the Contractor of any objection to any

drawings and all or any equipment and workmanship which in his opinion is not in accordance with the Contract. The Contractor shall give due consideration to such objections and shall make the modifications that may be necessary to meet said objections. When the factory tests have been completed successfully at the Contractor's or Sub-contractor's works, the CSPTCL shall issue a certificate to this effect after completion of tests. if the tests are not waived off, the certificate shall be issued after receipt of the Contractor's Test Certificate by the Employer. The completion of these tests or the issue of the certificates shall not bind the Employer to accept the equipment, if it does not comply specification of the tender.

In cases where the Contract provides for tests, whether at the premises or works of the Contractor or of any Sub-contractor, the Contractor except where otherwise specified shall provide free of charge items such as labour, materials, electricity, fuel, water stores, apparatus and instruments, as may be reasonably demanded by the Employer or his authorized representative to carry out effectively such tests of the equipment in accordance with the Contract and shall provide facilities to the CSPTCL or his authorized representative to accomplish testing.

The inspection by CSPTCL and issue of Inspection Certificate thereon, shall in no way limit the liabilities and responsibilities of the Contractor in respect of the agreed Quality Assurance Program forming a part of the Contract.

The Contractor shall keep the CSPTCL informed in advance of the time of starting of the progress of manufacture of material in its various stages so that arrangements can be made for inspection.

Record of routine test reports shall be maintained by the Contractor at his works for periodic inspection by the CSPTCL's representative.

Certificates of manufacturing tests shall be maintained by the Contractor and produced for verification as and when desired by the CSPTCL. No material shall be dispatched from its point of manufacture until it has been satisfactorily inspected and tested. Testing shall always be carried out while the inspection may be waived off by the CSPTCL in writing only.

However, such inspection by the Employer's representative(s) shall not relieve the Contractor from the responsibility for furnishing material, software, and equipment to conform to the requirements of the Contract; nor invalidate any claim which the CSPTCL may make because of defective or unsatisfactory material, software or equipment.

2.2.2 Reporting of Variance

A variance report shall be prepared by either CSPTCL or Contractor personnel each time a deviation from specification requirements is detected during inspection or testing. All such variances shall be closed in mutually agreed manner.

However, at any stage if CSPTCL feels that quality of variances calls for suspension of the testing, the testing shall be halted till satisfactory resolution of variances, which may involve retesting also.

2.2.3 Test Plans and Procedures

Test plans for factory acceptance tests shall be provided by the Contractor to ensure that each test is comprehensive and verifies all the features of the equipment are tested. The test plans for factory tests shall be submitted for Employer approval before the start of testing.

The contractor shall prepare detail testing procedure in line to specification and submit for Employer's approval. The procedure shall be modular to the extent possible, which shall facilitate the completion of the testing in the least possible time.

2.2.4 Test Records

The complete record of all factory acceptance tests results shall be maintained by the Contractor. The records shall be maintained in a logical form and shall contain all the relevant information. The test reports shall be signed by the testing engineer and the engineer witnessing the tests.

2.3 Testing Requirements

The terminology used in bidding documents and their correlation with the tests requirements for supply of OPGW Cable described within this section is as follows:

a. Pre-Commissioning & Commissioning Period -

1. i. Type Testing
2. ii. Factory Acceptance Testing (FAT)
3. iii. Site Acceptance Test (SAT)

b. Operational Acceptance - Successful completion of SAT

2.3.1 Type Test Reports :- The sole bidder or JV/Consortium bidder shall furnish the type test reports not older than 5 years as on the date of issue of N.I.T. for 24 fiber or higher capacity of OPGW cable as per relevant Indian standard/International standards which has successfully passed relevant type tests at CPRI/ERDA/NPL/ERTL laboratory /any other NABL accredited laboratories.

List of Type Tests :- The list of required type tests is given in Appendix - C

2.3.2 Factory Acceptance Tests

Factory acceptance tests shall be conducted on randomly selected final assemblies of a Fibre Optic Cable & associated hardware & accessories to be supplied. Factory acceptance testing shall be carried out on overhead fibre optic cable (OPGW) & FO cable hardware fittings & accessories, splice enclosures 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 unless waival 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 in this Section by the Employer.

The factory acceptance test shall demonstrate the technical characteristics of the Fibre Optic cable & associated accessories in relation to this specifications and approved drawings and documents. List of factory acceptance tests for OPGW and FO cable hardware fittings & accessories are given in Appendix - C. This list of factory acceptance

tests shall be supplemented by the Contractor's standard FAT testing program. The factory acceptance tests for the splice enclosures shall be proposed by the Contractor in accordance with technical specifications and Contractor's (including Sub-Contractor's / supplier's) standard FAT testing program.

2.3.3 Sampling for Factory Acceptance Test :-

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. 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. Physical inspection shall be carried out on 100% basis for all the equipment / items offered.

For the FO cable hardware fittings & accessories, the minimum sampling rate, and batch acceptance criteria shall be as defined in IS 2486.

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.

2.3.4 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), along with information such as sampling frequency, applicable standards, acceptance criteria etc.

The production tests would normally not be witnessed by the Employer. However, the Employer reserves the right to do so or inspect the production testing records in accordance with Inspection rights specified for this contract.

2.3.5 Site Acceptance Tests

The Contractor shall be responsible for carrying out site tests and inspection for all equipment supplied in this contract as required by the Employer. All equipment shall be tested on site under the conditions in which it will normally operate. Site acceptance testing shall be carried out for all supplied equipment. The tests to be carried during SAT for overhead fibre optic cable have been defined in this section. However, for other items such as FODP and in-line splice enclosures, the SAT shall be carried out as per approved Field quality plan.

The tests shall be exhaustive and shall demonstrate that the overall performance of the contract works satisfies every requirement specified. A minimum Site Acceptance Testing requirement for Optical Fibre Cable 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 Optical Fibre cable installation.

2.3.6 Site Acceptance Testing Requirement for FO Cabling

SAT shall be carried out link by link from FODP to FODP. 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.

"Sag and tension of OPGW shall be as per approved sag-tension chart and during installation, sag and tension of OPGW shall be documented. During the installation, spliced cable segments shall be tested and documented. Upon completion of a continuous cable path (equipment to equipment locations), 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-1 through Table-3.

Table-1

Fibre Optic Cable Pre-Installation Testing

Item	Description
1.	Physical Inspection of the cable assembly for damage
2.	Optical fibre continuity and fibre attenuation with OTDR at 1550 nm

Table-2

Fibre Optic Cable Splice Testing

Item	Description
1.	Per splice average loss with OTDR(optical time domain reflecto meter)
2.	Physical inspection of splice box/enclosure for proper fibre routing techniques
3.	Physical inspection of sealing techniques, weatherproofing, etc.

Table-3

Fibre Optic Cable Commissioning Testing

Item	Description
1.	Fibre continuity and link attenuation (bi-directional) between FODP connectors at two ends for each fibre at 1310/1550 nm by OTDR
2.	Fibre continuity and link attenuation (bi-directional) between FODP connectors at two ends for each fibre at 1310/1550 nm by Power meter and Laser source
3.	Average fibre attenuation and average splice loss
-End of Table-	

SECTION – IV-D (Page 93-108)

ALL DIELECTRIC SELF-SUSTAINED (ADSS) OPTICAL FIBRE CABLE

1.0 **SCOPE OF WORK** - The scope of the entire work contract shall be supply of 10km of 48 Fibre ADSS Optic Fibre Cable along with survey, supply, installation, testing & commissioning of the above cable on 33 KV or 11 KV CSPDCL distribution poles as per the enclosed cable route diagram (Sarona to SLDC, Dangania Raipur). The firm / contractor shall be responsible for termination of ADSS cable at both end locations i.e. SLDC end & in 132 KV Sarona sub-station and end-to-end testing of each fibre of ADSS cable.

The ADSS optical cable shall be of non- metallic Aerial type designed for installation on poles of 33 kV HT transmission lines with average **span lengths of 60 to 80 mts between 2 poles**. The Bidder shall offer ADSS cable containing 48 Nos. of Dual Window Single Mode (DWSM) optical fibers in conformity with ITU-T recommendations **G-652D**. The cable shall be designed to withstand all prevailing environmental conditions including the effects of high electric and magnetic fields produced by the proximity of live power conductors.

1.1 THE ADSS CABLE STRUCTURE SHALL BE BASED ON THE FOLLOWING CHARACTERISTICS:

a. The ADSS cable shall be designed to withstand the Electromagnetic fields when erected on the high voltage towers. The ADSS cable shall have a very low Electrical Conductivity to avoid currents on the surface of the cable in all situations.

b. The mechanical structure of the ADSS cable shall be designed to withstand the wind and other environmental conditions in the routes, which have been specified in this document. The location of the fibers inside the structure shall be such that the application of the ADSS cable in the specified routes is possible .The ADSS cable selected shall tolerate the normal installation procedures. The Bidder shall list themo-mechanical parameters of the ADSS cable and describe the cable structure, including how the fibres are located inside. The maximum permissible tension to which the offered ADSS cable can be subjected shall be indicated in the bid.

c. The cable structure shall be such that the fibres are protected against water, hydrogen, ultraviolet radiation and other environmental hazards encountered in India.

2. **DESIGN:-**

i) The cable shall be constructed from materials which have been technically proven and able to withstand the electrical and environmental conditions.

ii) A non-magnetic strength member shall be incorporated in the cable and this shall provide sufficient strength to WITHSTAND WIND LOAD without being unduly stiff.

iii) The cable shall be smooth and of circular cross-section to avoid aerodynamic instability and shall be of minimum diameter to reduce HT pole loadings to a minimum.

iv) The cable shall be fully filled with jelly so as to prevent WATER CONDENSATION and electrical degradation within the sheath. The sheath of the cable shall be stable to withstand solar ultra-violet radiation.

v) At maximum working tension, the fiber shall not be subjected to a longitudinal strain greater than specified by the manufacturer and longitudinal strain specifications shall conform to IEEE standard P 1222 – 1995 SECTIONS 4.1.1.9 and 5.1.1.9 for ADSS cable and there shall be no detectable increase in fiber attenuation.

2.1 ELECTRICAL AND MECHANICAL REQUIREMENTS:

Table provides ADSS Electrical and Mechanical requirements for the minimum performance characteristics.

2.1.1 ADSS ELECTRICAL AND MECHANICAL REQUIREMENTS

S.NO.	PARAMETERS	UNIT	PARTICULARS / DESCRIPTION
1	No. of Fibres DWSM (Dual Window Single Mode)	No.	48F
2	Buffer Type	-	Loose Tube
3	Buffer Material	-	PBT
4	Buffer Tube Diameter	mm	2.5mm outer ; Inner 1.8mm
5	Strength member	-	Central Glass Reinforced plastic
6	Peripheral strength member	-	Aramid yarn
7	DWSM optical fibres color	-	Blue, orange, green and natural
8	No. of Fibres per Tube	Nos.	in accordance with relevant International / Indian Standards
9	Tube color	-	Color coding shall be in accordance with relevant International / Indian Standards.
10	Tube filling Compound	-	Loose tube is filled with thixotropic jelly

11	Flooding compound	-	Cable core is flooded with water blocking jelly
12	Single layer polyester tape	-	Wrapped over the cable core
13	LLDPE inner sheath	mm	Minimum thickness is 1.5 mm black color
14	Binding yarn tape	-	Longitudinal tape & contra helical binders
15	HDPE (anti tracking outer jacket UV)	mm	Nominal Thickness 2.00 mm., +0.5 mm., -0.3 mm.
16	Overall diameter of the cable	mm	17.0 mm., +/-0.5 mm.
17	Overall weight of the cable	Kg	240 +/- 10 kg/km
18	Minimum bend radius	mm	285 mm during installation 200 mm installed
19	Tensile strength	KN	7.00 kN
20	Span length	Mtrs	Should be suitable for 100 Mtrs span length with 7.00 kN Tensile Strength per 100 Mtrs.
21	Allowable sag		1.0 % of maximum span length
22	Fibre cable drum lengths	Km	2 km of drum length Minimum
23	Wind speed	Km / Hr.	180

2.1.2 Service Conditions

The equipment / materials offered will be entirely satisfactory for operation under the climatic conditions indicated below:

a) Maximum ambient air temperature (in shade) 45 deg.C

b) Maximum ambient air temperature (under sun) 50 deg.C

a) Maximum daily average ambient air temperature 35 deg.C
b) Maximum yearly average ambient air temperature 30 deg.C
e) Maximum humidity 100%

Due consideration will be given to any special devices or attachment put forward by the Bidder which are calculated to enhance the general utility and the safe and efficient operation of the equipment / material.

2.1.3 DETAILS OF FIBRES:

S.No.		Description	Parameters
1		Mode field DIAMETER (um)	9.2
2		Deviation in mode field diameter (m)	0.4
3		Attenuation Coefficient (dB/km)	0.35 max
4		Attenuation Variation (dB/km) with	
	a	At Wavelength (25nm)	0.02 (1525-1575)
	b	At Temperature	0.05
5		Mode Field non-circularity (%)	6
6		Cutoff Wavelength (nm)	1260
7		Chromatic Dispersion (ps/nm^2 km)	
	a	@1310 (1285-1330) nm	3.5
	b	@1310 (1270-1340) nm	6
	c	@1310 (1525-1575) nm	20
8		Zero dispersion wavelength (nm)	1300 –1324
9		Zero dispersion slope (ps/nm^2 km)	0.092
10		Refractive index	1.47
11		Refractive index profile	Step index
12		Cladding design	Matched
13		Numerical aperture	0.1
14		Bandwidth distance product (MHz km)	N/A
15		Bend Performance (37.5 mm radius, 100 turns)	< 0.05 dB

a) The operating wave length shall be 1300 – 1580 nm. (Attenuation shall be as specified in G.652D).

b) The fibres shall be optimized for operation between 1300 – 1595 nm such that the dispersion coefficient is nominally zero but shall not exceed 33.5 ps / km. nm.

c) The Bidder shall state the attenuation and the dispersion coefficients at the wavelength of 1550 nm and 1310 nm.

2.1.4 MIINIMUM BENDING RADIUS:

The Bidder shall specify the minimum allowable radius of bending for ADSS under all temperature conditions for all long term and short term applications.

2.1.5 OPTICAL WAVEGUIDE FIBRES:

Design requirements of the optical wave-guide fibres shall be as specified

The single mode optical wave-guide fibres shall have characteristics in accordance with the International Telegraph and Telephone Consultative Committee (CCITT) - Red Book (1984) – Volume-III. FASCICLE III.2 –International Analogue Carrier System. Transmission Media, Characteristics. Recommendations G.652D (Study Group XV and EMBD):

The offered single mode fibre shall be at dispersion minimized at a wavelength around 1550 nm for use in 1550 nm window. The maximum attenuation coefficient of any individual fibre shall not exceed 0.25 db/km in the 1550 nm region at 20 deg. C. The Bidder shall offer the typical attenuation spectral curves in the 1200 nm to 1600 nm wavelength range. The additional attenuation introduced for 100 turns of uncabled optical fibres (loosely wound) with 37.5 mm radius mandrel and measured at 1550 nm at +20 deg. C shall be less than 0.5 db compared to the initial value measured before winding. The additional temporary attenuation compared to the initial value measured at 20 deg. C due to Temperature cycling (-20 deg. C to + 80 deg. C) shall be less than 0.05 db/km.

Temperature rise on account of short circuit current shall be less than 0.25 db/km. The above increase in attenuation shall be only temporary. There shall be no measurable increase in the fibre attenuation after normalcy is restored. The attenuation of the fibres embedded in the ADSS shall be distributed uniformly throughout its length so that there are no point discontinuities in excess of 0.05 db. The fibre lengths in each reel shall be continuous. No splice of fibre within a reel of ADSS shall be accepted. The optical wave-guide fibres shall be completely protected from water penetration and environmental conditions. The Bidder shall indicate index of refraction of the fibre core and cladding at 1550 nm and the effective group refractive index for use with Optical Time Domain Reflect Meter (OTDR).

2.1.6 FIBRE SPLICE LOSS.

The splicing loss of any two fibres in any case shall not exceed 0.10 db/splice. Ageing shall not cause increase of the nominal optical attenuation at ambient temp. at 1550 nm by more than 0.05 db/km of fibre over a period of 25 years. The bidder shall submit the ageing characteristics of the offered optic fibres. The total additional attenuation above the nominal attenuation due to regular splices, repair

splices, connectors, temperature variation, ageing etc. shall be indicated by the Bidder.

2.1.7 **CHROMATIC DISPERSION.**

A single mode optical fibre cable (ITU-T Rec.G.652D) shall have following dispersion characteristics.

a)	Zero dispersion wave length	1550 nm
b)	Maximum tolerance on the Zero dispersion wavelength	+/- 15 nm
c)	Maximum chromatic dispersion coefficient in operation window from 1525 to 1575 nm wavelength region	<= 3.5 PS/ nm x km

2.1.8 **FIBRE MATERIAL**

The fibre shall be manufactured from high grade silica and doped as necessary to provide required transmission performance. The chemical composition of the fibres shall be specifically designed to minimize the effect of hydrogen on the transmission properties. The fibres shall be heat resistant. The Bidder shall submit a certificate or test data to guarantee the maximum rated temperature of the fibres.

2.1.9 **FIBRE IDENTIFICATION.**

Each optical fibre for identification shall be colour coded corresponding to sequential numbering. The colors and numbering shall be in accordance with relevant International / Indian Standards in vogue. The colour shall be integrated in the fibre coating and shall be homogeneous. The colour shall not be erased when handled during splicing. The original colour shall be dissemble throughout the design life of the ADSS. The colour should not bleed from one fibre to the other and not fade when wiping the fibre with acetone or alcohol. If the fibres are regrouped in bundles or in tubes the later shall be colored according to a determined code.

3. **FIBRE CHARACTERISTICS**:

3.0 Fibre Types:

All fibres shall be of the single mode dual window type. Fibres shall comply with ITU-T Recommendation G.652D (Characteristics of a Dual – Window Single Mode Optical Fibre Cable).

3.1 The fibre shall be entirely suitable for splicing by means of a normal fusion splicing techniques.

2 The fibre shall be manufactured from high grade silica and doped as necessary to provide the required transmission performance.

3 The chemical composition of the fibres shall be specially designed to minimize the effect of hydrogen on the transmission properties.

4 The fibre cable life expectancy shall be at least 30 years.

4.0 **NUMBER OF FIBRES**

The standard number of fibres to be provided in a cable is 48F.

4.1 **FIBRE COLORING**

Fibre coloring shall conform to EIA/TIA-598. The color-coding shall be permanent thus withstanding normal handling; e.g., during termination, testing, or cable relocation. Refer to EIA – 359 for color identification and coding.

5. **FIBRE BUFFERING AND PROTECTION**

5.0 The primary coating shall consist of an inert material, which can be readily removed for splicing purposes without damage to the fibre and without necessitating the use of hazardous chemicals.

5.1 A secondary coating may be applied directly over the primary coating (tight buffering), or alternatively, a loose jacket may be provided (loose buffering). Where a tight fitting secondary coating is provided, it shall consist of an inert material. Where a loose jacket is provided, jell or hydroscopic substance shall be included in the cable structure to prevent moisture from being retained inside the loose jacket.

5.2 The fibre coating shall be translucent such that fibre splicing techniques using optical alignment of cores by means of injection and detection of light through the cladding shall be supported .In addition, the fibre coating shall be optically matched to the cladding to promote cladding mode stripping.

5.3 The composition of the cable shall be specifically designed to reduce the production of hydrogen gas and to prevent the migration of hydrogen into the fibre.

5.4 The Bidder shall describe specific measures taken to reduce the production of hydrogen gases and any installation constraints that should be observed.

6. **TECHNICAL CHARACTERISTICS**

6.0 **Fibre cable drum lengths** shall be such that to avoid joint when used in a 33 kV transmission line of **2 to 5 km length** to reduce losses due to fibre splices.

6.1 The longitudinal strain specifications shall conform to IEEE Standard P1222-1995,sections 4.1.1.9 and 5.1.1.9 for ADSS cable.

6.2 The ADSS cable shall withstand 7.00 KN for average span length of 60 to 80 Mtrs.

7. DRUMS:

7.1 The cables shall be supplied in non-returnable strong wooden (or alternatively steel) drums provided with lagging of adequate strength, constructed to protect the cable against any damage and displacement during transit, storage and subsequent handling and stringing operations in the field. The bidder shall list the information concerning the following: weight, dimensions, material and standards applied.

7.2 All wooden components shall be manufactured out of seasoned soft wood free from defects that may materially weaken the component parts of the drums. Preservative treatment for anti-termite /anti-fungus shall be applied to the entire

drum with preservatives of a quality which is not harmful to the cable. The bidder shall furnish in the bid details of anti-termite / anti fungus treatment given to the drum.

7.3 Before reeling, cardboard or double corrugated or thick bituminous water proof bamboo paper shall be secured to the drum barrel and inside of flanges of the dry drum by means of a suitable commercial adhesive material. The paper should be dried before use After reeling the cable the exposed surface of the outer layer of the cable shall be wrapped with thin polythene sheet across the flanges to protect the cable from dirt, grit and damage during transportation and handling and also to prevent ingress of rain water during storage and transport.

7.4 A minimum space of 75 mm shall be provided between the inner surfaces of the external protective lagging. A few staggered lagging on the outermost layer of cable shall be provided to avoid unreeling of cable during transit. There shall be minimum of two binders consisting of iron/ galvanized steel wire. Each protective lagging shall have two recesses to accommodate the binders.

7.5 The cable ends shall be properly sealed and secured with the use of U-nails or bolts on the side of one of the flanges to avoid loosening of the cables layers in transport and handling.

7.6 **Only one length of cable** shall be wound on each drum. The method of lagging to be employed shall be clearly stated in the tender. Each drum shall be accompanied by the following information.

a. Manufacturer's name and address

b. Contract / Award letter number

c. Type of the cable

d. Gross weight of the cable and drum

e. Weight of empty drum with lagging

f. Net weight of the cable

g. Length of the cable

h. Drum and lot number

i. Name and address of the consignee

j. Month and year of manufacture

k. Rotation of drum

8. REQUIREMENT FOR INSTALLATION AND LAYING OF ADSS AND OTHER CABLES AND ACCESSORIES:

8.1 SURVEY OF ADSS CABLE ROUTE:

The contractor shall at their own expense visit the 33kV & 11 kV overhead line site where the ADSS optical fibre cabling system is to be installed (as per the ADSS cable routing plan provided in the tender document) prior to execution of installation work of ADSS cable. The contractor shall take care following points

in the survey and detailed report shall be submitted to this office for approval prior to staring the work: -

a. List of all spans and total link length.
b. Details of existing poles / towers / structures.
c. Suitability for installation of ADSS cable and associated hardware fittings.
d. Proposed splice locations.

8.2 SPAN LENGTHS AND SAG REQUIREMENTS:

The span lengths are generally considered between 30 to 100 meters. The average span length between poles has been considered as 60 to 80 meters. The maximum allowable sag is 1%. The minimum ground clearance from lowest point of sag of ADSS cable shall confirm to Indian Electricity act, the bidders may adopt other methods provided such methods ensure that the technical requirements for ADSS cable are not jeopardized from the point of view of insulations/static voltage hazard both on the ADSS and the fibre.

8.3 METHODOLOGY FOR INSTALLATION AND TERMINATION:

The ADSS cable stringing, installation, termination, details of personnel and time requirement etc. shall be submitted for approval prior to the installation. The ADSS cable shall be terminated in the available FODP / LIU at both ends i.e. 132kV Sarona end & SLDC Dangania end. The positioning of the ADSS cable on the poles/towers shall ensure that effect of electric field and consequential damage; both long term and short term on the outer most sheath of ADSS cable shall be minimum. The maximum allowable sag, stringing tension, maximum allowable torsion shear stress, crush strength and other physical parameters of the cable shall not be exceeded.

8.4 OPTICAL FIBRE SPLICES:

Splicing of the optical fibre cabling shall be minimized through careful planning. There shall be no mid-span splices allowed. All required splices shall be planned to occur within facilities or on poles/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. No more than six (6) fibres shall be installed in each splice tray.
d. For each link, bi-directional attenuation of single mode fusion splices measured at 1310 nm & 1550 nm shall not average more than 0.05 dB. The bi-directional splice loss of each splices shall not exceed 0.1 dB when measured at 1310 nm & 1550 nm.
e. For in-line splicing, fibre optic cable service loops of adequate length shall be provided so that all splices occurring at pole / tower structures can be performed at ground level.

Optical fibre attenuation shall be measured before and after installation of the ADSS cable. Any increase in attenuation or step discontinuity in attenuation shall not be accepted. Attenuation after splicing shall be measured. Any increase in attenuation beyond technical specification shall not be accepted.

8.5 CABLE RACEWAYS:

To the extent possible, existing cable raceways shall be utilized. 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 finalized during survey.

8.6 OTHER REQUIREMENTS:

The standard set of installation accessories and fixtures required for successful installation of ADSS cable is to be submitted by contractor. However, during installation, if it is found by the contractor that any other accessories or fixtures are required for successful installation of ADSS cable, the same shall be supplied and installed by the contractor at no additional cost.

The contractor shall transport the cable and associated accessories and fixtures from area store to the site. All required transportation and labour shall be supplied by the contractor. The contractor shall be solely responsible for any shortages or damages in transit, handling and/or in storage of the material at site. Any demurrage, warpage and other such charges framed by the transporter shall be to the account of the bidder.

The contractor shall maintain an accurate and exhaustive record detailing the list of all material received by him and keep such record open for the inspection by Consignee. The cable shall be handled very carefully to prevent any damage or loss. In case of damage to the cable or other items, necessary compensation in the form of replacement shall be arranged by the bidder at their cost.

It shall be the contractor’s responsibility to provide adequate communications among all crew members and support staff to ensure safe and successful installations. During installation, proper attention towards safety of men and machines shall be ensured by the contractor. All safety norms and precautions shall be followed to minimize the possibility of accidents, which if happens, will have to be dealt by the contractor alone. The CSPTCL shall not be held responsible in any manner for such accident. CSPTCL shall have no financial implications towards contractor etc. for any claim arising out of accident during installation of cable and other equipments. This shall be the sole responsibility of the contractor.

9. STANDARDS:

The material shall conform to the following Indian / International Standards, specified under and published unless otherwise specified in these specifications.

REFERENCE	NAME & ADDRESSES
ABBREVIATION	
BS	British Standards, British Standards Institution, 101,
	Pentonville Road, N-190-ND, UK
IEC/CISPR	International Electro technical Commission,
	Bureu Central DE la Commission,
	Electro Technique International, 1 Rue de verembe,
	Geneva, Switzerland.
IS	INDIAN STANDARD INSTITUTION, ManakBhavan, 9, Bahadur Shah ZafarMarg, New Delhi – 110 001, INDIA
ISO	International Organization for Standardization, DANISH BOARD of Standardization Danish Standardization Street, aurehoegvej –12 DK – 2900, Heeleprup, Denmark.
NEMA	NATIONAL ELECTRIC MANUFACTURE ASSOCIATION, 155 East 44th Street. New York, NY 10017, USA.
CSA	CANADIAN STANDARD ASSOCIATION
	178, Raxdale Boulevard, Raxdale Ontario, Canada M9W IR
IEEE	IEEE, 347 East 47th Street
	New York, NY 10017A USA
EIA/ TIA	GLOBAL ENGINEERING DOCUMENT
	15, Inverness Way East
	Endlewood, Colorado 80112 –5704 USA.
NEC	NATIONAL FIRE PROTECTION ASSOCIATION
	1 Battery March Park

	Quincy, Massachusetts 02269-0059
	USA.
JIS	JAPANESE STANDARDS INDUSTRIAL
	1024 Akasaka 4- Chome
	Minato – KU
	Tokyo, Japan.

INDIAN / INTERNATIONAL STANDARDS

S. NO.	INDIAN STANDARD	TITLE	INTERNATIONAL STANDARDS
1.		The international telecommunication union (ITU-T) recommendations	G.652D, G.530
2.		International electro technical commission (IEC) vocabulary	IEC:50 – 1975
3.		Optical fibres Part 1: generic specification	IEC: 793-1
4.		Optical fibre cables Part 1: generic specification	IEC: 794-1
5.		Aluminum alloy redraw rods	IEC: 104-1987
6.		Aluminum clad steel wires for electrical purposes	IEC:1232-1993
7.		Fibre optic test Procedure series	EIA-TIA-445 (FOTP.S)
8.	1S: 2121	Specification for conductor and earth wire Accessories for overhead power lines	
9.		IEEE standard construction of composite Fibre optic overhead ground wire (OPGW) For use on electric utility power lines	IEEE: 1138-1994
10.	IS: 398	Standard conductor for overhead lines	IEC: 1089-1993
11.		IEEE standard for all dielectric self-supporting fibre optic cable (ADSS) for use on overhead utility lines.	IEEE: P1222-1995
12.		Standard colors for color identification and coding	IEEE: 359A
13.		Color coding for fibre optic cables	IEEE: 598

14.		ANSI / IEEE Standard For Aerial ADSS Fibre – Optic Cable	ANSI/IEEE: 524
15.		NFPA NATIONAL ELECTRIC CODE OR PLENUM FIBRE – OPTIC CABLE	NEC: 770

10. TYPE TEST STANDARDS:

The firm / contractor shall conform to following Type Test Standards of ADSS cable and the firm / contractor shall give the compliance for the same.

S.No.	**TEST**	**STANDARD (S)**
(I)	**OPTICAL CHARACTERISTICS OF FIBRES**	
1	Attenuation	IEEE Std. 1138
		IEEE STD. P1222
		(EIA/TIA – 455-61,78A)
		(IEC 793-1-C1A,B,C)
2	CUTOFF WAVELENGTH	IEEE STD. 1138
		IEEE STD PI222
		(EIA-455-80, 170)
		(IEC-793-1-C7A,B)
3	FIBER DISPERSION	IEEE STD. 1138
		IEEE STD. P1222
		(EIA/TIA-455-168A,169A,175A)
		(IEC-793-1-C5A,B,C)
4	FREQUENCY RESPONSE	IEC-793-1-C2B
5	MODE FIELD DIAMETER	IEEE STD. 1138
		IEEE STD. P1222
		(EIA/TIA-455-164A,165A,167A)
		(EIA-455-174)
		(IEC 793-1-C9A,B,C,D)

6	TEMPERATURE CYCLING	IEEE STD. 1138
		IEEE STD. P1222
		(EIA/TIA-455-69A)
		(IEC 793-1-D1)
(II)	**MECHANICAL CHARACTERISTICS OF FIBRE**	
1	ABRASION	IEC 793-1-B4
2	CORE CONCENTRICITY	IEC 793-1-A3
3	MACROBENDING	EIA/TIA-455-62A
		(IEC 793-1-C11)
4	MICROBENDING	IEC-793-1-C3
5	PROOF TEST	IEC-793-1-B1
	a. CONSTANT STRESS	
	b. CONSTANT LONGITUDINAL STRAIN	
	c. CONSTANT BENDING STRAIN	
6	STRIPPABILITY	IEC 793-1-B6
7	VISUAL EXAMINATION	EIA/TIA-455-13
		(IEC 793-1-B5)

(III)	**MECHANICAL CHARACTERISTICS O CABLE**	
1	ADSS CABLE FITTINGS	IEEE STD. P1222
2	AEOLIAN VIBRATION	IEEE STD. 1138
		IEEE STD. P1222

		(ANNEX A)
3	CABLE BENDING	IEEE STD. 1138
		IEEE STD P1222
		(IEC 794-1-E11)
		(EIA-455-88)
4	COLOR CODING	EIA-359A,598
		(IEC 304)
5	COMPOUND FLOW	EIA-455-81A
		(IEEE STD. 1138)
		(IEEE STD. P1222)
6	COMPRESSIVE LOADING	EIA/TIA-455-41A
7	CORROSION (SALT SPRAY)	EIA/TIA-455-16A
8	CREEP	IEEE STD. 1138
		IEEE STD. P1222
9	CRUSH RESISTANCE	IEEE STD. 1138
		IEEE STD. P1222
		(EIA-455-26A0 (IEC 794-1-E3)

IV	**Test**	**Standard(s)**
1	Cut Through	IEC 794-1-E12
2	Flexibility/Cyclic Bending	EIA-455-104A
		(IEC 794-1-E6,E11)
3	Fungus Resistance	EIA-455-56A
4	Galloping	IEEE Std. 1138
		IEEE Std. P1222
		9EIA/TIA-455-25A)
5	High –Low Temperature Bending	EIA/TIA-455-37A

6	Humidity	EIA/TIA-455-5B
7	Impact	IEEE Std. 1138
		IEEE Std. P1222
		(IEC 794-1-E1)
8	Sheave	IEEE Std.1138
		IEEE Std. P1222
		(Annex A)
9	Temperature Cycling	IEC 794-1-F1
		(EIA-455-162)
10	Tensile Strength	IEEE Std. 1138
		IEEE Std. P1222
		(IEC 794-1-E1)
		(EIA-455-33A)
11	Torsion, Twist	EIA-455-36A,85A
		(IEC 794-1-E7)
12	Water Blocking	IEEE Std. 1138
13	Penetration	IEEE Std. P1222
		(IEC 794-1-F5)
		(EIA/TIA-455-82B)
14	Water Wicking	EIA/TIA-455-39A
15	Weathering, Heat	EIA-455-17A
	Aging	

In the event of the supply of material conforming to any standard including JIS other than Standards listed above, the salient features of comparison shall be brought out and furnished along with the bid. A copy of each of the standard in English version shall be enclosed with the bid.

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SECTION –IV-E

Documentation and Deliverables

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Documentation and Deliverables

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

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

(a) Detailed list of the deliverables

(b) Description of the products

(c) Technical particulars

(d) Installation manuals

(e) Maintenance manuals

(f) Quality assurance manuals, Manufacturing Quality Plan (MQP) & Field Quality Plan (FQP)

(g) Tests (type test, production, FAT, SAT) documentation

6.1 System Functional Description Document

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

6.2 System Documentation

A detailed documentation plan and document submission schedule shall be prepared and submitted for approval. The guidelines specified in table 6-1 and 6-2 shall be followed.

6.3 Supplementary Documentation

If during the training courses or while performing maintenance on such equipment during the warranty period, the Employer determines that additional information is required to perform the maintenance function, the Contractor and/or its subcontractors shall provide the specific supplemental information necessary to perform the maintenance function. This information shall be documented in a form suitable for incorporation into the appropriate maintenance document.

6.4 Test Documentation

The Contractor shall provide documentation for all factory and field tests.

The test documentation shall include the following:

(a) Test Procedure Document

(b) Type test documents

(c) Factory Acceptance Test Documents

(d) Site Acceptance Test Documents

6.5 Drawings

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

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

6.6 Drawing and Document Approval Procedure

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

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

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

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

Depending upon the category of approval the Contractor shall resubmit the drawings/documents for review by Employer after incorporating all corrections. Further work by the Contractor shall be strictly in accordance with the Cat-I, Cat-II or Cat-IV approved drawings and no deviation shall be permitted without the written approval of the Employer.

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

6.7 Final Documentation

Final documentation shall consist of the documents approved in Cat I and Cat IV listed in table 6-1. The documents will be used by the Employer personnel for operating and maintaining the equipment after acceptance.

Until acceptance of the equipment by the Employer, the Contractor shall be responsible for supplying documentation revisions or changes necessitated by inaccuracies, installation requirements, omissions determined by usage, and design or production alterations to the equipment. All changes shall be issued in the form of replacements for the affected drawings, diagrams, charts, graphs, tables, lists, and pages in the various documentation such that all documentation describes the equipment "as delivered".

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

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

Table 6-1

Documentation Plan for Communication Equipment Package

S. No	Document	Applicable Equipments / Item	Brief Description	Category of Approval
1.	Documentation plan & schedule		This document shall contain the list of all documents to be submitted for approval and their submission/approval schedule.	I
2.	Data Requirement Sheets (DRS) and Guaranteed Technical Parameters & Drawings	For each and every item to be supplied	These document(s) shall describe all the technical parameters of the equipment being offered.	I
3.	Mechanical drawings	As applicable	This document shall fully describe with particular reference to mechanical construction of all materials to be supplied and dimensions, earthing clearances, cable entry details, dust and moisture ingress protection provisions etc.	I
4.	Previous type test reports	For all items for which type testing is envisaged as per specifications.	Shall be complete in all respect including all test graphs, curves, calculations, photographs etc.	IV
5.	Type test procedures	For all items for which type testing is required.	Shall be formatted as per the technical specifications	I

Table 6-1

Documentation Plan for Communication Equipment Package

S. No	Document	Applicable Equipments / Item	Brief Description	Category of Approval
6.	Manufacturing Quality Plan	For all items to be supplied		I
7.	Type test report	For all items for which type testing is required.		I
8.	Link and site survey reports & engineering analysis	For each Fibre Optic link and site	Link wise survey reports as per specifications, link calculations etc.	I
9.	Numbering, Marking, labelling Document	As applicable.	Must include numbering, marking, labeling and naming conventions for channels, cabels, connectors, etc	I
10.	Physical planning/site preparation manuals	As applicable.	Must contain data gathered during the site survey, including test results, if any. The document shall also contain floor plan, cable trenching/raceway drawings, station block diagrams, rack/cabinet elevation drawings, earthing system details.	I
11.	Factory Acceptance tests: test plan,	For all items to be supplied	This document shall include the list of Site acceptance tests, the administrative &	I

Table 6-1

Documentation Plan for Communication Equipment Package

S. No	Document	Applicable Equipments / Item	Brief Description	Category of Approval
	procedures and report format		functional test plans, test procedures and formats for recording & reporting factory acceptance test results.	
12.	Factory acceptance test report	For all Factory acceptance tests		Acceptance letter by Employer
13.	Transportation & Handling Procedures	For all materials	This document shall describe the procedures & precautions to be observed during overseas & inland transportation, equipment handling during transport, storage & pre-installation. It shall also include packing details and package labelling details.	IV
14.	Site Acceptance tests (SAT) test plan, procedures and report format	System document	This document shall include the list of Site acceptance tests, the administrative & functional test plans, test procedures and formats for recording & reporting site acceptance test results. This document shall be restricted to describing the acceptance tests listed in this technical specification, and other similar tests which shall be conducted in Employer presence for Site acceptance.	I

Table 6-1

Documentation Plan for Communication Equipment Package

S. No	Document	Applicable Equipments / Item	Brief Description	Category of Approval
15.	Field Quality Plan	One Document with multiple subdocuments if required	Field Quality Plan shall describe the quality control to be exercised during the field activities. This document can include the following information: (a.) The list of performance & safety checks applied to installation equipment, tools & tackles, checks, check on physical health & training records of installation crew etc. (b.) The list of Site Acceptance tests (including statement of acceptance criteria). The inclusion of list of site acceptance tests in FQP is analogous to the inclusion of list of FAT in the MQP. The formats for recording & reporting Site acceptance tests can also be reproduced	I
16	Training Manuals	System document	An advance copy of all training material.	IV
17.	Maintenance Philosophy & Procedures	System document	Shall cover breakdown maintenance procedures, preventive maintenance schedules and procedures	IV
18.	SAT reports	Per Link and per location		*

Note*: To be reviewed & approved by site.

Table 6-2

Expected Contents & Structure of Equipment Installation Manual

1.	Installation procedure	Description of activities of installation gangs: Preparation & Setting up, Precautions for preventing damage etc shall be highlighted.
2.	Safety Instructions	Instructions & procedures related to ensuring installation crew safety: personnel grounding & safety, installation equipment safety, Safety for power system & environment
3.	Description of Installation Equipment	Sketches, drawings, photographs, safe working ratings of installation equipment, tools & tackles etc., handling instructions & precautions.
4.	Cable routing	Illustrations of the various possible cable routing
5.	References	References to other related documents covering the installation, jointing & testing, such as . SAT administrative & functional test plans & test procedures . Field Quality Plan & Field Quality Audit . Storage & Handling Instructions . Drawings, technical parameters, DRS etc . Employer & Statutory safety rules, safety manuals, standards, codes of practices etc.

----------End of this Section----------

SECTION- IV-F

(Page 118 to 130)

PROJECT MANAGEMENT, SCHEDULE AND IMPLEMENTATION PLAN

Index

Project Management, Schedule and Implementation Plan

This sub-section describes the project management, schedule, quality assurance, and implementation plan requirements for the Fibre Optic Communication System in CSPTCL.

7.1 Project Management

The Contractor shall assign a project manager with the authority to make commitments and decisions that are binding on the Contractor. The project manager's responsibility shall include interface and coordination with the Project contractor(s). The Employer will designate a project manager to coordinate all the Employer project activities. All Project correspondence and communications between the Employer and the Contractor shall be coordinated through the project managers.

The project shall be staffed from the list of project management and engineering personnel presented in the proposal. Principal participants shall have previous experience in a similar position on at least two other projects of similar scope to this project. The assignment and reassignment of the Contractor's principal participants in the project shall be subject to the Employer's approval.

7.1.1 Reporting Period

The Project Manager shall provide updated project schedules and complete progress reports on monthly basis for the duration of the project. All references to the reporting period throughout this Specification shall refer to this monthly period.

7.1.2 Progress Meetings

The Project Manager shall schedule and attend Progress Meetings as deemed necessary but no less than once every two months.

7.1.3 Transmittals

Every document, letter, progress report, change order, and any other written or electronic media transmissions exchanged between Contractors and Discussions and phone calls where project related information is exchanged shall be documented in a transmittal. The Contractor shall maintain a correspondence index and assign transmittal numbers consecutively for all Contractor documents. The Employer will maintain a similar correspondence numbering scheme identifying documents and correspondence that the Employer initiates.

7.1.4 Quality Assurance

7.1.4.1 General

The Contractor shall adhere to a Quality Assurance (QA) program for the preparation of all Contract deliverables, including documentation. The program shall provide for early detection of actual or potential deficiencies, timely and effective corrective action, and a method of traceability of all such deficiencies.

The contractor's proposal shall include the relevant ISO 9000 certificates from the main contractor and from all subcontractors which have a major part (over 10%) of the delivery.

The relevant ISO 9000 standards to be provided are the following:

- ISO 9001: model for quality assurance in design, development, production, installation and servicing

- ISO 9002: model for quality assurance in production and installation

- ISO 9003: model for quality assurance in final inspection and testing

The Quality Assurance procedures, documentation standards which were included with the Bidder's proposal will be incorporated into the Contract.

7.1.4.2 Quality Assurance System and Requirements

The ISO 9001 Certificate and the assessment and visit reports shall be available to the Employer throughout the duration of the contract.

The Quality Assurance program shall be outlined by the Contractor and shall be finally accepted by the Employer after discussions before the award of contract. A Quality Assurance program of the Contractor shall generally cover but not limited to the following:

a. Organization structure for the management and implementation of the proposed quality assurance program.

b. Documentation control system.

c. Qualification data for Contractor's key personnel

d. The procedure for purchases of materials, parts/components and selection of sub-Contractor's services including vendor analysis, source inspection, incoming raw material inspection, verification of material purchases etc.

e. System for shop manufacturing including process controls and fabrication and assembly controls.

f. Control of non-conforming items and system for corrective action.

g. Control of calibration and testing of measuring and testing equipments.

h. Inspection and test procedure for manufacture.

i. System for indication and appraisal of inspection status.

j. System for quality audits

k. System for authorizing release of manufactured product to the Employer.

l. System for maintenance for records.

m. System for handling storage and delivery

n. A quality plan detailing out the specific quality control procedure adopted for controlling the quality characteristics of the product.

The Quality Assurance Plan shall be mutually discussed and approved by the Employer after incorporating necessary corrections by the Contractor as may be required.

This Quality Assurance plan shall then form part of the contractual documentation and shall not be changed without prior agreement with the Employer. The Contractor shall be required to submit all the Quality Assurance Documents as stipulated in the Quality Assurance Plan at the time of the Employer's inspection of equipment/material.

The Employer or his duly authorised representatives reserve the right to carry out Quality Audit and Quality Surveillance of the systems and procedures of the Contractor/his vendor's Quality Management and Control Activities.

7.1.4.3 Variance Reporting and Processing

An automated variance recording and tracking system shall be placed in service at least one month before the initially scheduled beginning of the FAT. This system shall be designed to record and track variances for documentation deficiencies, functional deficiencies, performance deficiencies, procedural deficiencies (as when deviations from contractually required QA procedures are observed), and test deficiencies (as when the System cannot satisfactorily pass a step within a test procedure).

Variances may be initiated by both Contractor and the Employer personnel and shall be classified as follows:

a. Open (recorded but not necessarily agreed to)

b. Assigned (denoting acceptance by the Contractor)

c. Pending (denoting fixed, in the Contractor's opinion, and awaiting retest or verification)

d. Resolved (denoting the Employer acceptance or verification).

For the tracking of the variances and to support the automatic printout of subset lists, the following information fields shall be stored for each variance:

e. Variance number (automatically assigned)

f. Date initially recorded

g. Status (open/assigned/pending/resolved)

h. Date current status recorded

i. Names of the involved Employer personnel

j. Names of assigned Contractor personnel

k. Subsystem involved

l. Test name (where applicable)

m. Description (up to five lines in a full printout and part of the first line in a one-line-per-variance printout)

n. Urgency description (1, 2, or 3).

The variance recording and tracking system shall allow full printouts of all of the above information, condensed printouts of abbreviations of the above information (one-line-per-variance) and shall produce subsets of the variances based on searches of the fields singly or in combinations. For example, it shall be possible to produce a printout of all the variances (and only those variances) that were at level 1 of 2 urgency, concerning a specific named subsystem, had open or assigned status, and were initiated within a named period.

Depending on its impact, each variance shall be assigned to one of three urgency levels by the Contractor with the Employer having level assignment approval rights.

level 1 Testing will stop for immediate evaluation and correction by the Contractor

level 2 Testing will continue and the variance will be corrected at the end of the current session or day

level 3 Testing will continue and the variance will be corrected and tested at a mutually agreed upon time (e.g., at the end of the test or later in the test period prior to shipment).

A variance status summary shall be included in the monthly project progress reports, and up-to-date variance reports shall be made available to the Employer on demand.

The variance recording and tracking system shall be subject to approval by the Employer.

7.1.4.4 Additional Quality Assurance Requirements

The Employer shall have access to the Contractor's premises at any mutually agreed time and be provided access to inspect and assess the quality system should any specific need arise. The Employer shall also be able to conduct on site reviews as mutually agreed.

The Employer shall have access to any relevant documentation for verification that quality procedures are in accordance with the contract-specific quality plan.

7.1.5 Document Review and Approval Rights

To ensure that the proposed systems conform to the specific provisions and general intent of the Specification, the Contractor shall submit documentation describing the systems to the Employer for review and approval.

The Employer will respond with written comments to the Contractor within thirty (30) calendar days after receipt of the documents. Documents requiring correction must be resubmitted by the Contractor to the Employer within 30 calendar days. The Employer will respond to resubmitted documents within fifteen (15) calendar days after receipt of the document. No implementation schedule relief is to be implied for documents requiring correction and resubmission to the Employer.

The Employer shall have the right to require the Contractor to make any necessary documentation changes at no additional cost to the Employer to achieve conformance with the Specification.

Any purchasing, manufacturing, or programming implementation initiated prior to written the Employer approval of the relevant documents or drawings shall be performed at the Contractor risk. Review and approval by the Employer shall not relieve the Contractor of its overall responsibilities to satisfy system functions and performance requirements in accordance with the Specification.

To help the Employer manage the review and approval of documents during any given period, the Contractor shall stagger the release of documents over the time allocated in the project schedule. The number and size of documents shall be factored into the document release schedule. At any time, no more than five documents shall be submitted to the Employer for review and approval.

7.2 Project Schedule

The project schedule shall consist of an implementation schedule, a documentation schedule, and a training schedule.

7.2.1 Implementation Schedule

The Contractor shall produce and maintain the implementation schedule. A copy of the implementation schedule files on a CD-ROM shall also be provided to the Employer. The overall project plan shall consist of a Milestone Plan and a detailed Schedule Plan.

The Contractor shall provide a critical path analysis report and a manpower resource analysis report. Other standard reports will be defined during the Work statement.

Within four weeks of contract signing, the Contractor shall submit detailed project schedule, as described below. The project schedule shall include all tasks to track overall direction and integration of the project from inception through completion.

The Schedule Plan shall be developed utilizing the concept of Work Breakdown Structures. No task shall be greater than 3 weeks in duration.

The implementation schedule shall include the project milestones defined in this specification, the Contractor activities and the Employer activities defined in this Section. The project schedule shall be an accurate representation of the progress and planned activities of the project.

The actual progress made to date and the scheduled delivery date for the completed systems shall be closely monitored by both the Contractor and the OIC of the work. The following information shall be reported to the Employer in a clear and concise manner using the tabular and graphic capabilities of the project management software:

(a) An overview and general assessment of all the Employer and Contractor activities and any progress or delays in these activities since the last reporting period

(b) Identification of tasks in the critical path together with an analysis indicating any required remedial action

(c) The amount of contingency time (float) remaining in the schedule

(d) Information on each task, including:

(1) Estimated start and finish dates

(2) Any change in the estimated dates since the last reporting period

(3) Estimated total number of calendar-days to complete the task

(4) Percent of task completed

(5) An indication of whether the start date was manually entered or computed.

(e) Total project resources

(f) The tasks to begin in the next two reporting periods

(g) The tasks to be completed in the next two reporting periods

(h) The tasks completed in the last two reporting periods

The content and format of the project schedule shall be subject to the Employer approval. The Contractor shall update and submit the project schedule to the Employer at least one week prior to each progress meeting.

7.2.1.1 Contractor Activities

The implementation schedule shall be compiled by the Contractor summarizing all activities, and shall include but not be limited to the following:

(a) Survey, Design & Engineering

(b) Hardware purchases, development, and integration

(c) Hardware production schedules

(d) Documentation preparation and release

(e) Documentation revision and release following the Employer review

(f) System integration

(g) Type Tests and Factory testing

(h) Shipment

(i) Receipt, forwarding and staging

(j) Installation

(k) Site Acceptance testing

Each scheduled task shall have an estimated duration for completion and predefined relationships with other tasks. Relationships shall be used to enforce the logical progression of work in as much as certain tasks cannot start until others have been completed.

7.2.1.2 The Employer Activities

The implementation schedule shall contain all the Employer activities required in order for the Contractor to complete their systems and integration tasks, including the following:

(a) Document reviews and approvals

(b) Participation in all levels of testing and training

(c) Any site preparations, if required.

7.2.2 Documentation Schedule

The documentation schedule shall include an entry for each document and drawing to be delivered throughout the project. Each documentation schedule entry shall include the document or drawing title, number, revision level, actual or future submittal date for the Employer review or approval, date of completion of review or approval by the Employer, and outcome of review or approval by the Employer. When the Employer requires correction to any document, the documentation schedule shall be updated with a new entry for the next revision of the document. The content and format of the documentation schedule shall be subject to the Employer approval.

The documentation schedule shall allow for at least two submissions of each document requiring review or approval. The time schedule for document review or approval by the Employer shall be as specified in this section.

7.2.3 Training Schedule

The training schedule shall identify the dates of all of the training courses. The Contractor shall work with the Employer to determine the training schedule. The training schedule shall be subject to the Employer approval.

The appendices provide training requirement for this package. The training schedule shall accommodate the availability of CSPTCL personnel in so much as it is possible.

7.3 Progress Reporting

With the intent to assure quality management and project progress as per the implementation schedule, progress reports submitted for each reporting period and Progress Review Meetings shall focus on the following:

7.3.1 Monthly Progress Reports

A Monthly Progress Report shall be prepared by the Project Manager that includes inputs from all its subsystem. The report shall be made available to the Employer as hard copy and soft copy, by the10th working day of each month and shall include but not be limited to:

(a) Updated project schedule highlighting any deviations from the previous issue of the project schedule

(b) Explanation and anticipated effect of each schedule deviation and its implication to the Employer.

(c) Schedule recovery plan for any deviation incurring a delay in delivery date. (All delays shall be factored into the project schedule as soon as they are known to the Contractor.)

(d) A summary of activities performed by the Contractor and the Employer during the previous reporting period

(e) An updated list of all correspondence transmitted and received by the Contractor

(f) Updated documentation schedule

(g) Updated training schedule

(h) List of all Contractor personnel and the Employer personnel resident at the Contractor facility, identifying all activities performed by each person and the activities scheduled for the next two reporting periods

(i) Updated list of Contractor and the Employer action items with status, description of required information, and required resolution dates

(j) Summary of pending and upcoming Contractor and the Employer activities during the next two reporting periods along with required completion dates

(k) Status of unresolved contract questions and change requests

(l) Summary of variances

(m) Log of invoice status

(n) Description of current and anticipated project problems and steps to be taken to resolve each problem.

7.3.2 Quarterly Progress Review Meetings

Progress Review Meetings shall be scheduled by the project managers and attended by the Contractor and the Employer to review progress of the project. Progress meetings shall be used to review the progress reports for the previous reporting periods, written correspondence exchanged since the last meeting, and open action items.

The Contractor shall also attend technical meetings as required to discuss technical aspects of the project and to review the Employer comments on approval documents. When appropriate, these splinter meetings shall be conducted as extensions to the progress meetings.

At least one-half of all meetings shall be held at the Employer's offices. Record the minutes of each meeting shall be prepared and provided as hard copies to all attendees on the same day whenever possible, but not later than within two working days after the meeting. Table 7-1 provides a suggested agenda for Progress Review Meetings.

Table 7-1:

Suggested Progress Review Meeting Agenda

Item:	Title:	Description:
1.	**Meeting Minutes:**	Review minutes from previous meeting, with comments
2.	**Open Action Items:**	Review all outstanding action items
3.	**Progress Review:**	Review with participating Project Managers and Contractor, most recent project schedule. Update schedule and develop Action Items.
4.	**Technical Discussion:**	Discuss Technical Issues.
5.	**Action Items:**	Assign responsibilities for new action items.
6.	**Administrative Matters:**	Discuss administrative matters
7.	**Action Items:**	Assign responsibilities for action items.
8.	**Next Meeting:**	Schedule time and place for next meeting and agree on agenda
9.	**Adjourn:**	Adjourn meeting.

7.4 Implementation Plan

The implementation of integrated wideband telecommunication system network with procurement under multiple Contracts and involvement of multiple agencies requires careful planning and co-ordination. Consequently, this section describes the Employer's phased implementation strategy for the Communication Equipment Package of the project that is consistent with implementation plans of other package(s). The contractor shall propose preliminary implementation plans that will follow the above approach. The Employer and the Contractor shall finalise the detailed implementation plan following the award of the contract.

7.4.1 Implementation Steps

The basic implementation steps pertaining to telecommunication system of the project are:

(a) Conduct site & route surveys, identify equipment locations and required site preparations.

(b) Subsystems design, manufacture, factory & type test (if applicable).

(c) Shipping, installation and field testing for above.

(d) Design, manufacture, factory and type test (if applicable)

(e) Shipping, installation and field testing of above.

Though not detailed, the above steps are intended to encompass all relevant work required to provide the Employer a fully working integrated telecommunication network supporting all Project commitments.

----------End of this Section----------

APPENDIX (Pages 131 to 174)

APPENDIX - A

GENERAL REQUIREMENTS, IMPLEMENTATION SCHEDULE

Table-1

Details of Tower/Earthwire/Conductor

Proforma – 1 - Single Line Tower Schedule Diagram

Proforma – 2 - Details of Tower Schedule.

Above documents shall be provided after finalization of contract.

Table-2

Implementation Schedule for Supply of OPGW

And Associated Hardwares for CSPTCL EHV Transmission System

To be filled by the Contractor: -

S.N.	Description of Work	Commencement	Completion
		(Period in weeks from LOA)	
1	Preparation of Survey format/ Design Document/ DRS approval		
2	Preparation of Functional test procedure, plan & approval		
3	Preparation of Type Test procedure,plan & approval		
4	Preparation of FAT documents & approval		
5	Type & Functional Testing		
6	Preparation of SAT Documents & approval		
7	BOQ Finalisation		
8	Procurement of Raw material, manufacturing, internal testing etc.		
9	FAT & Despatch clearance		
10	Transportation to sites		
11	Site Installation ,Testing & commissioning (SAT1 & SAT2)		
12	**SAT-3 (Fully Functional System for Operational Acceptance)**		

Note: Contractor may also be required to prepone the supply of equipment if desired by the Employer.

APPENDIX-B

CLIMATIC CONDITONS

The materials offered shall be suitable for operation in tropical climate & shall be subject to the sun & inclement weather and shall be able to withstand wide range of temperature variations. The topography & climatic conditions in general are as under:-

1	Location in the state	Chhattisgarh
2	2 Maximum ambient air temperature (^{0}C) 50	50
3	Minimum temperature in shade (^{0}C)	1
4	Maximum relative humidity (%)	95 (sometimes approaches satuaration)
5	Average daily ambient air temperature (^{0}C)	32° Centigrade
6	ISOCERANIC Level (days/year) (Average number of thunder storm days)	50
7	Average rainfall(mm)	1250mm
8	Wind Zone as per IS 802(Part-I)-1995	4
9	9Max. Altitudes above mean sea level (meters)	1000M
10	Seismic level (Horizontal acceleration)(g)	0.3

NOTE:- Moderately hot and humid tropical climate conducive to rust and fungus growth. The climatic conditions are also prone to wide variations in ambient conditions. Stroke is also present in the atmosphere. Heavy lightening also occurs during June to October.

Appendix -C

TYPE TESTING/ FACTORY ACCEPTANCE TESTS REQUIREMENTS

Wherever the referenced test procedures or the technical specifications call for visual inspection for damage, the test report shall include a full description of observed status of the sample. (Visually inspected samples shall also be colour photographed and copies of colour photographs shall be included in type test report)

C-1 Type Tests for Optical Fibres

The type tests listed below in table C-1.1 shall be conducted on DWSM fibres. The tests specific to the cable type are listed in subsequent sections.

Table C-1.1

Type Tests For Optical Fibres

S.No.	Test Name	Acceptance Criteria	Test procedure
1	Attenuation	**AS per Table 2-1 (a) of Section – III (C)**	EIA/TIA 455- 78A
2	Attenuation Variation with Wavelength	**AS per Table 2-1 (a) of Section – III (C)**	EIA/TIA 455- 78A
3	Attenuation at Water Peak	**AS per Table 2-1 (a) of Section – III (C)**	EIA/TIA 455- 78A
4	Temp. Cycling (Temp dependence of Attenuation)		EIA/TIA 455- 3A, 2 cycles
5	Attenuation With Bending (Bend Performance)		EIA/TIA 455- 62A
6	Mode Field dia.		EIA/TIA 455-164A/167A/174
7	Chromatic Dispersion		EIA/TIA 455-168A/169A/175A
8	Cladding Diameter		EIA/TIA 455-176
9	Point Discontinuities of attenuation		EIA/TIA 455-59
10	Core -Clad concentricity error		EIA/TIA 455-176
11	Fibre Tensile Proof Testing		EIA/TIA 455-31B
-End Of table-			

C-2 Type Tests For OPGW Cables

The type tests to be conducted on the OPGW cable are listed in table C-2.1: 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 C-2.1

Type tests for OPGW Cable

S.No.	Test Name	Test Description	Test Procedure	Description
1	Water Ingress Test	IEEE 1138, Section 4.1.1.1	IEEE 1138, Section 5.1.1.1 (IEC 794-1-F5 /EIA/TIA 455-82B)	Test duration : 24 hours
2	Seepage of filling compound	IEEE 1138, Section 4.1.1.2	IEEE 1138, Section 5.1.1.2 (EIA/TIA 455-81B)	Preconditioning period: 72 hours. Test duration: 24 hours.
3	Short Circuit Test	IEEE 1138, Section 4.1.1.3 Or IEC 60794-1-2 (2003) Method H1	IEEE 1138, Section 5.1.1.3	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 monitoring & recording the temperatures between the strands and between optical tube and the strand as required by IEEE 1138. 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. Initial temperature during the test shall be greater than or equal to ambient field temperature. However, maximum

				temperature recorded on any component of OPGW cable shall not exceed the Short Circuit transient peak temperature guaranteed by the Contractor during design.
4	Aeolian Vibration Test	IEEE 1138, Section 4.1.1.4	IEEE 1138, Section 5.1.1.4	Fibre attenuation shall be continuously monitored and recorded through a digital data logging system or equivalent means. 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. 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.
5	Galloping test	IEEE 1138, Section 4.1.1.5	IEEE 1138, Section 5.1.1.5	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:794-1-E11		The short-term and long-term bend tests shall be conducted in accordance with Procedure 2 in IEC:794-1-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, Section 4.1.1.6 Or IEC 60794-1-2 (2003) Method E18B	IEEE 1138, Section 5.1.1.6	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, Section 4.1.1.7	IEEE 1138, (IEC 794-1-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:794-1-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, Section 4.1.1.7	IEEE 1138, Section 5.1.1.7 (IEC 794-1-E4/EIA/TIA 455-25B)	The impact test shall be carried out in accordance with IEC:794-1-E4. Five separate impacts of 0.1-0.3kgm shall be applied. The radius of the intermediate piece shall be the reel drum radius ± 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, Section 4.1.1.8	IEEE 1138, Section 5.1.1.8	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, Section 4.1.1.9	IEEE 1138, Section 5.1.1.9	
12	Strain Margin Test	IEEE 1138, Section 4.1.1.10	IEEE 1138, Section 5.1.1.10	
13	Stress strain Test	IEEE 1138, Section 4.1.1.11	IEEE 1138, Section 5.1.1.11	
14	Cable Cut-off wavelength Test	IEEE 1138, Section 4.1.1.12	IEEE 1138, Section 5.1.1.12	
15	Temperature Cycling Test	IEEE 1138, Section 4.1.1.13	IEEE 1138, Section 5.1.1.13	
16	Corrosion (Salt Spray) Test	EIA/TIA 455-16A		
17	Tensile Performance Test	IEC 794-1-E1 / EIA/TIA 455-33A		The test shall be conducted on a sample of sufficient length in accordance with IEC:794-1-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	Fault Current/ lightning Test	IEEE Std. 4-1978 Or IEC 60794-1-		Tension equal to 20% of the OPGW RTS shall be applied to a sample with minimum length of 15 m of cabled fibres and two separate 4/10 micro

		2(2003)		second current impulses each having a peak value of 150 KA and a negative polarity shall be applied through a 1 cm gap. The attenuation during the tests shall be continuously measured. After the tests the same shall be visually inspected. Any increase in optical waveguide fibres attenuation measured at 1550 nm shall constitute failure. Fibre attenuation shall be continuously monitored and recorded through a digital data logging system or equivalent means. The tensile performance test shall be repeated on the sample subjected to the lightning arc test. The cable construction shall be tested in accordance with Method H2.
19	DC Resistance Test			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 degree C.
-End Of Table-				

C-3 Type Tests for Approach Cable

The type tests to be conducted on the Approach cable are listed in table -C-3.1:Type Tests for 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 C-3.1

Type Tests for Approach Cable

S.NO.	Test Name	Test Procedure
1	Water Ingress Test	(IEC 794-1-F5 / EIA 455-82B) Test duration : 24 hours
2	Seepage of filling compound	(EIA 455-81A), Preconditioning: 72 hours, Test duration : 24 hours.
3	Crush Test	(IEC 794-1-E3/ EIA 455-41)
4	Impact Test	(IEC-794-1-E4/ EIA 455-25A)
5	Stress strain Test	(EIA 455-33A)
6	Cable Cut-off wavelength Test	(EIA 455-170)
7	Temperature Cycling Test	(IEC794-1-F1/EIA-455-3A) – 2 cycles
-End Of Table-		

C-3.1 Impact Test

The Impact test shall be carried out in accordance with IEC:794-1-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 ± 10%. A permanent or temporary increase in optical attenuation value greater than 0.05 dB/km shall constitute failure.

C-4 Type Test on OPGW Cable Fittings

The type tests to be conducted on the OPGW Cable fittings and accessories are listed below:

C-4.1 Mechanical Strength Test for Suspension/Tension Assembly

Applicable Standards : IS : 2486 / 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^{o}. 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 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 removed 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.

C-4.2 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 position 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.

C-4.3 Slip Strength Test of Tension Clamp

Tension clamps shall be fitted on a 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.

C-4.4 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.

C-4.5 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.

C-4.6 Type Test on Vibration Damper

C-4.6.1 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 as determined through vibration analysis of undamped OPGW.. 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.

(a) Force Vs frequency

(b) Phase angle Vs frequency

(c) 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.

The above dynamic characteristics test shall be conducted on five dampers. The variations between the samples tested shall conform to the sample test limits.

C-4.6.2 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.

(a) The analysis shall be done for single fibre optic cable without armour rods. The tension shall be taken as max Permissible Every Day Tension (20% of UTS), for a span ranging from 100 m to 1100 m.

(b) 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.

(c) 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.

(d) 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.

(e) 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-4.7 Vibration Damper Clamp Slip and Fatigue Tests

C-4.7.1 Test Set Up

The clamp slip and 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 15 kN 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.

C-4.7.2 Clamp Slip Test

The vibration damper shall be installed on the test span. The damper clamp, after tightening with the manufacturer's specified tightening torque, when subjected to a longitudinal pull of 2.5 kN parallel to the axis of fibre optic cable for a minimum duration of one minute shall not slip,

i.e., the permanent displacement between fibre optic cable and clamp measured after removal of the load shall not exceed 1.0 mm. The load shall be further increased until the clamp starts slipping. The load at which the clamp slips shall not be more than 5 kN.

C-4.7.3 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 ±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 above 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:

a. There shall not be any frequency shift by more than ±2 Hz for frequencies lower than 15 Hz and ±3 Hz for frequencies higher than 15 Hz.
b. The force response curve shall generally lie within guaranteed % variation in reactance after fatigue test in comparison with that before fatigue test by the Supplier.
c. The power dissipation of the damper shall not be less than guaranteed % variation in power dissipation before fatigue test by the Supplier. However, it shall not be less than minimum power dissipation which shall be governed by lower limits of reactance and phase angle indicated in the envelope.

C-5 Type Tests for In Line Splice Enclosures

Following Type tests shall be demonstrated on the In Line 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 794-1 procedures).

C-5.1 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□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 794-1-C10. The variation in attenuation shall be less than ±0.05dB. The final humidity level, inside the box, shall not exceed the initial level, at the closing of the box.

C-5.2 Humid Heat test

The sealed splice enclosure, with fibres spliced and looped inside, must be subjected to a temperature of $+55^0$C $\pm 2^0$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 ±0.05dB, and the internal humidity rate measured, less than 2%.

C-5.3 Rain Withstand 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 60 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 ±0.05dB.

C-5.4 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 ±0.05dB. 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.

C-5.5 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 ±180º shall be exercised on the cable. Each cycle shall be less than one minute.

b. 3-flexure cycles of the cable, of ±180º with one cycle less than one minute.

The variation in the attenuation, of the fibres, shall be less than ±0.05dB. 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

C-5.6 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.

C-5.7 Drop Test

With 2 lengths of 10 metres of cable fixed to the box, it shall be dropped five times from a

height of 11 metres. There shall be no fissure, at all, of the box, and the connections shall remain tight. The test shall be carried out in accordance with procedure described in IEC-68-2-32.

C-6 Factory Acceptance Tests On Fibre Optic Cables

As specified in technical specifications, the Factory acceptance tests shall be conducted on random sampling of fibre optic cable to be supplied for the present procurement, prior to any shipment.

C-6.1 FAT On Fibre : Optical Acceptance Tests

The Optical acceptance tests listed in table C-6.1 below are applicable for all types of Fibre Optic Cables i.e. OPGW and approach cable to be supplied. The listed tests follow testing requirements set forth in IEEE standard 1138 section 4.2.2.1 and section 5.2.2.1 . 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 - C-6.1

Factory Acceptance Tests for Fibres of all FO cables: Optical Tests

S.No.	Test Name	Acceptance Criteria	Test procedure
1	Attenuation Coefficient	As per relevant stands and approved GTP	EIA/TIA 455- 78A
2	Point Discontinuities of attenuation	As per relevant stands and approved GTP	EIA/TIA 455-59
3	Attenuation at Water Peak	As per relevant stands and approved GTP	EIA/TIA 455- 78A
4	Chromatic Dispersion		EIA/TIA 455-168A/169A/175A
5	Core – Clad Concentricity		EIA/TIA 455-/176

	Error		
6	Cladding diameter		EIA/TIA 455-176
7	Fibre Tensile Proof Testing		EIA/TIA 455-31B
-End Of table-			

The test reports for the above tests for all types of the fibres carried out by the Fibre Manufacturer and used in the OPGW cables and approach cable shall be shown to the inspector during OPGW cable FAT and shall be submitted along with the OPGW cable FAT report.

C-6.2 Factory Acceptance Test On OPGW Cable

The factory acceptance tests for OPGW cable specified below in Table C-6.2 follow the requirements set forth in section 4.1.2 and section 5.1.2 of IEEE standard 1138. 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 C-6.2

Factory Acceptance Tests On OPGW

Applicable standard: IEEE 1138

S. No.	Factory Acceptance Test on Manufactured OPGW
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

C-6.3 Factory Acceptance Test On Approach Cable

The factory acceptance tests for Approach Cable specified below in Table C-6.3:

Table C-6.3

S.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

C-6.4 Factory Acceptance Test On OPGW Fittings

The factory acceptance tests for OPGW Fittings as specified below in Table C-6.3. The sampling plan shall be as per IS 2486:

Table C-6.4

Factory Acceptance Tests On OPGW Fittings

S. 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
Tension Assembly	
1	Clamp Slip Strength test
2	Visual Material verification and dimensional checks as per approved DRS/Drawings
3	Mechanical strength of each component
Vibration Damper	
8	Galvanising test on damper, masses and messenger wires
9	Damper response (resonant frequencies)
10	Clamp Slip test
11	Strength of messenger wires
12	Mass pull off test
13	Visual Material verification and dimensional checks as per approved DRS/Drawings

Structure Mounting Clamp	
1	Clamp fit test
2	Clamp Strength test
3	Visual Material verification and dimensional checks as per approved DRS/Drawings

C-6.5 Factory Acceptance Test on In Line Splice Enclosures

The factory acceptance tests for In Line Splice Enclosures as specified below in Table C-6.5:

Table C-6.5

Factory Acceptance Tests on In Line Splice Enclosures

1	Visual check Kit Quantities and Specific Component Number for each component of In Line Splice Enclosure and dimensional checks against the approved drawings.

C-6.6 Factory Acceptance Test on FODP, Pigtail and other items:

As per technical specification and approved DRS/Drawings.

---------- End of the Appendix----------

APPENDIX-D

OPGW DATA REQUIREMENT SHEETS

The DRS forms have been included for the major items; however, the DRS for each item along with sufficient details shall be submitted. The following sets of Data Requirement Sheets are required to be filled up by the bidders. The response shall be brief and to the point and shall be supported by the printed product description and other literature. The same DRS format duly filled and the relevant drawings shall also be submitted during the detailed engineering along with the relevant technical brochures.

Annexed Below

DATA REQUIREMENT SHEET FOR OPTICAL POWER GROUND WIRE (OPGW)

(To be filled by bidder)

Manufacturer:_____

S.No.		Parameter:	Unit:	Particulars:
1		Fibre Manufacturer		
		Dual Window Single-Mode:		
2		No. of Fibres		
		Dual Window Single-Mode:	each	
3		Buffer Type:		
4		Buffer Tube Diameter:	mm	
5		Buffer Tube material		
6		No. of Buffer Tubes:	each	
7		No. of Fibers per Tube:	each	
8		Identification/numbering of		
		individual tubes:		
9		No. of empty tubes (If any):	each	
10		Filling material:		
11		Filling material compliant with		
		technical specifications?	Yes/No	
12		Strength member(s):		
13		Binding yarn/ tape:		
14		Describe Central Core Design:		
15		20% Aluminum Clad steel wire		
	i	Diameter:	mm	
	ii	Number:	each	

15		Aluminum alloy wires		
	i	Diameter:	mm	
	ii	Number:	each	
16		Aluminum tube inner diameter:	mm	
17		Aluminum tube outside diameter:	mm	
18		Cable Diameter: (nominal ± deviation)	mm	
19		Cable cross-section area (Nominal):	mm^2	
20		Cable cross-section area (Effective):	mm^2	
21		Fully Compliant with IEEE P1138:	Yes/No	

Mechanical Properties of Cable

22		Max. breaking load/ Ultimate	kN	
23		Tensile Strength (UTS):		
24		Fibre strain margin:	%	
25		Zero fibre strain up to load	kN	
26		Weight:	kg/km	
27		Crush strength:	kg/mm	
28		Equivalent Modulus of elasticity:	KN/mm^2	
29		Minimum Bending Radius without microbending:	mm	
30		Maximum Bending Radius:	mm	
	i	Short Term:		
	ii	Long Term (Continuous):		
31		Tensile proof test (Screening) level:	KN/mm^2	
32		Maximum permissible tensile stress:	KN/mm^2	
33		Permissible CTS. tensile stress:	KN/mm^2	
34		Maximum sag at maximum temperature and design span with no wind:	mm	
35		Everyday tension , no wind:	% of UTS	

36		Maximum tension at Every day condition with full wind pressure of .....Kg/m2 on full projected are, 400 meter span:	Kg	

Thermal Properties

37		Coefficient of linear expansion:	per °C	
38		Coefficient of expansion		
	i	Cladding:	per °C	
	ii	Core:	per °C	
39		Nominal operating temperature range:	°C	
40		SC current transient peak temperature:	°C	
41		Maximum allowable temperature for lightning strike:	°C	

Cable Spool & Drum

42		Available length per spool	m	
	i	Maximum:		
	ii	Nominal:		
43		Size of drum:	m	
44		Weight of empty drum:	kg	
45		Weight of drum with cable: spooled	kg	
46		Will drum length scheduling be practiced to match transmission line span lengths?	Yes/No	
47		Describe Drum materials:		
48		Describe cable end capping and protection against abrasion etc.:		

Installation

49		Splice Loss:		

	i	Maximum:	dB	
	ii	Average:	dB	
50		Operating Temperature Range:	°C	
51		Rated Isoceraunic No.		
52		Expected Cable Life:	Years	
53		Installation rate per team:	km/day	
54		No. of persons per team:	no.	
55		Max. possible span for specified operating conditions:	m	
56		Midspan sag at 0°C with no wind loading:	mm	
57		Midspan sag at max temp. with no wind loading:	mm	
58		Midspan sag at max temp. and wind loading	mm	
59		Cable swing angles:		
	i	Worst Case:		
	ii	Everyday:		
60		Describe Installation method(s):		

Sag tension chart parameters like sag and tension at various spans and applicable wind and ice load conditions shall be submitted along with the DRS. The cable parameters like coefficient of liner expansion, modulus of elasticity shall also be indicated.

Optical Parameters

61		Fiber manufacturer(s)/Type:		
62		Fiber production method:		
63		Attenuation Coefficient		
	i	@ 1310 nm	dB/km	
	ii	@ 1550 nm:	dB/km	
64		Attenuation Variation with Wavelength (±25 nm):	dB/km	
65		Attenuation at water peak:	dB/km	
66		Point discontinuity		

	i	@ 1310 nm	dB	
	ii	@ 1550 nm:	dB	
67		Temperature dependence (induced attenuation):	dB	
68		Nominal Mode Field Diameter		
	i	@ 1310 nm:	µm	
	ii	@ 1550 nm:	µm	
69		Mode Field Diameter Deviation		
	i	@ 1310 nm:	µm	
	ii	@ 1550 nm:	µm	
70		Mode field non-circularity:	%	
71		Chromatic DispersionCoefficient	ps/nm.km	
	i	@ 1310 (1288-1339) nm:		
	ii	@ 1310 (1271-1360) nm:		
	iii	@ 1550 nm:		
72		Zero dispersion wavelength:	nm	
73		Zero dispersion Slope:	$ps/nm^2.km$	
74		Cutoff wavelength:	nm	
75		Refractive Index:		
76		Refractive Index profile:		
77		Cladding Design:		
78		Numerical aperture:		

Physical & Mechanical Properties

79		Bend Performance:		
	i	(37.5 mm radius, 100 turns)	dB	
	ii	@1310 nm & @ 1550 nm		
	iii	(16mm radius, 1 turn) @1550 nm	dB	

80		Core Diameter(nominal ± deviation	µm	
81		Core non-circularity:	%	
82		Cladding Diameter (nominal ± deviation):	µm	
83		Core- Clad concentricity Error:	µm	
84		Cladding noncircularity:	%	
85		Fibre cut-off wavelength	µm	
86		Protective Coating type & material		
	i	Primary:		
	ii	Secondary:		
87		Protective Coating Diameter (nominal ± deviation):	µm	
88		Protective Coating removal method:		
89		Coating Concentricity	µm	
90		Polarisation mode dispersion coefficient	ps/km^1/2	
91		Proof test level	kpsi	
92		Colour coding scheme compliant with EIA/TIA 598 or IEC 60304 or Bellore GR-20.	Yes/No	
93		Colouring material compliant with technical specs?	Yes/No	

DATA REQUIREMENTS SHEETS for HARDWARE AND ACCESSORIES

Suspension Clamp Assembly:

94		Minimum vertical Strength	kN	
95		Maximum Slip Strength	kN	
96		Minimum Slip Strength	kN	
97		Length (nominal)	mm	
98		Weight (nominal)	kg	
99		Total Drop (maximum) including shackles	mm	

100		Tightening torque (nominal)	Nm	
101		Details of Armour Rod Set		
	i	No. of rods per clamp		
	ii	Direction of Lay		
	iii	Overall length	mm	
	iv	Diameter of each Rod	mm	
	v	Tolerances		
	vi	Diameter of each rod	±%	
	vii	Length of each rod	±%	
	viii	Material of manufacture		
	ix	UTS of each Rod	kN	
	x	Weight	kg	
102		Details of Protection Splice Set (Reinforcing Rods)		
	i	No. of rods per clamp		
	ii	Direction of Lay		
	iii	Overall length	mm	
	iv	Diameter of each Rod	mm	
	v	Tolerances		
		(a) Diameter of each rod	±%	
		(b) Length of each rod	±%	
	vi	Material of manufacture	±%	
	vii	UTS of each Rod	KN	
	viii	Weight	Kg	

DATA REQUIREMENTS SHEETS for HARDWARE AND ACCESSORIES
Dead End Clamp Assembly:

103		Minimum Slip Load	kN	
104		Length (nominal)		
	i	Reinforcing Rods	mm	
	ii	Dead end	mm	
105		Weight (nominal)		
	i	Reinforcing Rods	kg	
	ii	Dead end	kg	
106		Breaking strength (minimum)	kN	
107		Wire Size		
	i	Reinforcing Rods	mm	
	ii	Dead end	mm	

DATA REQUIREMENTS SHEETS for HARDWARE AND ACCESSORIES
Vibration Damper:

108		Total Weight	Kg	
109		Weight of each Damper	Kg	
110		Material of Damper Weight		
111		Clamp Material		
112		Clamp bolt tightening torque	Nm	
113		Clamp bolt material		
114		Messenger Cable Material		
115		No. of Strands in Messenger Cable		
116		Breaking Strength of Messenger Cable	kN	
117		Resonance Frequencies		
	i	First Frequency	Hz	

	ii	Second Frequency	Hz	
	iii	Third Frequency	Hz	
	iv	Forth Frequency	Hz	
118		Minimum Slip Strength of Damper Clamp		
	i	Before Fatigue Test	kN	
	ii	After fatigue Test	kN	

DATA REQUIREMENTS SHEETS for OPGW HARDWARES and ACCESSORIES

Down Lead Clamp /Fastening Clamp

119		Material:		
120		Suitable for OPGW (range):	mm	
121		Tightening torques	Nm	
122		Vertical load	kN	
123		Filler details:		
	i.	Material		
	ii.	diameter:	mm	
125		Tower attachment arrangement		

DATA REQUIREMENTS SHEETS for In Line Splice Enclosures

126		Dimensions	cm	
127		Weight:	Kg	
128		Colour and Finish:		
129		Cable Glanding & Fixing:		
130		Construction materials & Gauge:		
131		Locking arrangements:		
132		Installation Clearances:		
	i.	Front Access:		
	ii.	Rear Access:	cm	

	iii.	Top * Bottom * Sides:		
133		IP Protection	Class	
134		Total number of optical couplings:	No.	
135		Provision of pass through splicing:	Yes/No	
136		Whether filled with suitable encapsulant	Yes/No	
137		Method(s) for mounting with the tower:		

DATA REQUIREMENTS SHEETS for Optical Fibre Cable Accommodations

138		Cable Glanding:		
139		Maximum number of cables that can be accommodated:	No. of ch	
140		Diameter(s) of cables that can be accommodated:		
141		Describe Cable entries :		
142		Details of Splice Trays:		
	i	Dimension:		
	ii	Material/Gauge:		
	iii	Weight:	kg	
	iv	Colour & Finish:		
	v	Method of mounting:		
143		Maximum number of splice trays:		
144		Number of splices per tray:		
145		Provision of Splice organisors:		
146		Do splice trays require a separate enclosure? If so:	Yes/No	
147		Manufacturer:		
148		Dimensions	cm	
149		Weight:	Kg	
150		Colour and Finish:		
151		Method(s) of Mounting:		

152		Construction materials & Gauge:		
	i	Installation Clearances Front Access:		
	ii	Rear Access:		
	iii	Top * Bottom * Sides:		
153		Excess length of fibre service loops		

DATA REQUIREMENTS SHEETS for In Line Splice Enclosures

Cable Termination Splice Accomodations:

154		Details of Splice Trays:		
	i	Dimension:		
	ii	Material/Gauge:		
	iii	Weight:	Kg	
	iv	Colour & Finish:		
	v	Method of mounting:		
155		Maximum number of splice trays:	No.	
156		Number of splices per tray:	No.	
157		Provision of Splice organisors:		
158		Do splice trays require a separate enclosure? If so:	Yes/No	
159		Manufacturer:		
160		Dimensions - H * W * D:	cm	
161		Weight:	Kg	
162		Colour and Finish:		
163		Method(s) of Mounting:		
164		Construction materials & Gauge:		
	i	Installation Clearances Front Access:		
	ii	Rear Access:		

	iii	Top * Bottom * Sides:		
165		Excess length of fibre service loops		

DATA REQUIREMENTS SHEETS for Fibre Optic Distribution Panels (FODPs)

166		Dimensions H * W * D:	cm	
167		Weight:	Kg	
168		Colour and Finish:		
169		Cable Glanding & Fixing:		
170		Construction materials & Gauge:		
171		Locking arrangements:		
172		Installation Clearances: Front Access:		
173		Rear Access:	cm	
174		Top * Bottom * Sides:		
175		IP Protection	Class	
176		Total number of optical couplings:	ea	
177		Provision of pass through splicing:	Yes/No	
178		Whether filled with suitable encapsulant	Yes/No	
179		Method(s) for mounting		
		Optical Fibre Cable Accommodations		
180		Cable Glanding:		
181		Maximum number of cables that can be accommodated:	each	
182		Diameter(s) of cables that can be accommodated:		
183		Describe Cable entries:		
184		Details of Splice Trays:		
	i	Dimension:		

	ii	Material/Gauge:		
	iii	Weight:	kg	
	iv	Colour & Finish:		
	v	Method of mounting:		
187		Maximum number of splice trays:	No.	
188		Number of splices per tray:	No.	
189		Provision of Splice organisors:		
190		Do splice trays require a separate enclosure? If so:	Yes/No	
191		Manufacturer:		
192		Dimensions H * W * D:	cm	
193		Weight:	Kg	
194		Colour and Finish:		
195		Method(s) of Mounting:		
196		Construction materials & Gauge:		
197		Locking arrangements:		
198		Installation Clearances Front Access:	m	
	i	Rear Access:		
	ii	Top * Bottom * Sides:		
199		Excess length of fibre service loops		

DATA REQUIREMENTS SHEETS for APPROACH CABLE

200		Fibre Manufacturer - Dual Window Single-Mode:		
201		No. of Fibres - Dual Window Single-Mode	each	
202		Buffer Type:		
203		Buffer Tube Diameter:	mm	
204		Buffer Tube material		
205		No. of Buffer Tubes:	each	

206		No. of Fibers per Tube:	each	
207		Identification/numbering of individual tubes:		
208		No. of empty tubes (If any):	each	
209		Filling material:		
210		Filling material compliant with technical specifications?	Yes/No	
211		Strength member(s):		
212		Binding yarn/ tape:		
213		Describe Central Core Design:		

TECHNICAL PARTICULARS OF ADSS CABLE & HARDWARE ACCESSORIES

1		Make & Model		
2		No. of Fibres in ADSS		
3		Mode		
4		Buffer type		
5		Buffer tube diameter		
6		Buffer tube material		
7		No. of buffer tubes		
8		No. of fibres per tube		
9		Identification/numbering of individual tubes		
10		No. of empty tubes(if any)		
11		Filling material		
12		Inner Strength member		
13		Peripheral Strength member		
14		Binding yarn/tape		
15		Approximate outside diameter		
16		Cable diameter		
17		Cable cross section area		

18		Jacket non- circularity		
19		Rip cord provided		
20		Fully compliant with IEEE P1222		
21		Span length		
22		Fibre Cable drum length		
MECHANICAL PROPERTIES OF CABLE				
1		Max. Tensile Strength	kN	
2		Fibre Strain margin		
3		Weight	Kg/km	
4		Crush strength		
5		Modulus of Elasticity	kg/Sq.mm	
6		Minimum bending radius	Mm	
THERMAL PROPERTIES OF CABLE				
1		Coefficient of inner expansion	Per ºC	
2		Coefficient of expansion Cladding Core	Per ºC	
3		Nominal operating temperature range	ºC	
4		SC current transient peak temperature	ºC	
5		Maximum allowable temperature for lightning strike	ºC	
6		Available length per spool Max. & Min.)	Meters	
7		Splice loss (Max. & Min.)	db	
8		Operating Temperature range	ºC	
9		Expected Cable Life	Years	
DUAL - WINDOW SINGLE MODE FIBRES				
1		Fibre manufacturer		
2		Fibre production method		
3		Core diameter	µm	

4		Core non circularity	%	
5		Cladding diameter	µm	
6		Core Clad Concentricity error	µm	
7		Cladding non-circularity		
8		Protective coating type & Material		
		Primary		
		Secondary		
9		Protective coating diameter	µm	
10		Coating concentricity		
11		Colour coding scheme compliant with EIA395A / IEC3047		
12		Attenuation Coefficient		
	a	at 1310 nm	dB/km	
	b	at 1550 nm	dB/km	
13		Attenuation variation with	dB/km	
	a	Wavelength (+/- 25nm)		
	b	Temperature		
14		Nominal Mode field Diameter	µm	
	a	at 1310 nm		
	b	at 1550 nm		
15		Mode field Diameter deviation	µm	
	a	at 1310 nm		
	b	at 1550 nm		
16		Mode field non circularity	%	
17		Chromatic dispersion Coefficient	µm	
	a	at 1310 (1285- 1330) nm		
	b	at 1310 (1270-1340) nm		

	c	at 1550 (1525- 1475) nm		
18		Zero dispersion wavelength	nm	
19		Zero dispersion slope	Ps/nm^2 - km	
20		Cut – off Wavelength		
21		Refractive Index		
22		Refractive Index profile		
23		Cladding design		
24		Numerical aperture		
25		Bandwidth distance product	MHzkm	
26		Bend performance	dB/km	

SIGNATURE OF THE BIDDER

APPENDIX - E

DATA REQUIREMENT SHEET OF ADSS CABLE

(To be filled by Bidder)

S.No.	Description	Units	Parameters
1	Make & Model		
2	No. of Fibres in ADSS		
3	Mode		
4	Buffer type		
5	Buffer tube diameter		
6	Buffer tube material		
7	No. of buffer tubes		
8	No. of fibres per tube		
9	Identification/numbering of individual tubes		
10	No. of empty tubes(if any)		
11	Filling material		
12	Inner Strength member		
13	Peripheral Strength member		
14	Binding yarn/tape		
15	Approximate outside diameter		
16	Cable diameter		
17	Cable cross section area		
18	Jacket non- circularity		
19	Rip cord provided		
20	Fully compliant with IEEE P1222		

21	Span length		
22	Fibre Cable drum length		
MECHANICAL PROPERTIES OF CABLE			
1	Max. Tensile Strength	kN	
2	Fibre Strain margin		
3	Weight	Kg/km	
4	Crush strength		
5	Modulus of Elasticity	kg/Sq.mm	
6	Minimum bending radius	Mm	
THERMAL PROPERTIES OF CABLE			
1	Coefficient of inner expansion	Per ºC	
2	Coefficient of expansion Cladding Core	Per ºC	
3	Nominal operating temperature range	ºC	
4	SC current transient peak temperature	ºC	
5	Maximum allowable temperature for lightning strike	ºC	
6	Available length per spool Max. & Min.)	Meters	
7	Splice loss (Max. & Min.)	db	
8	Operating Temperature range	ºC	
9	Expected Cable Life	Years	
DUAL - WINDOW SINGLE MODE FIBRES			
1	Fibre manufacturer		
2	Fibre production method		
3	Core diameter	µm	
4	Core non circularity	%	
5	Cladding diameter	µm	
6	Core Clad Concentricity error	µm	

7	Cladding non-circularity		
8	Protective coating type & Material		
	Primary		
	Secondary		
9	Protective coating diameter	µm	
10	Coating concentricity		
11	Colour coding scheme compliant with EIA395A / IEC3047		
12	Attenuation Coefficient		
a	at 1310 nm	dB/km	
b	at 1550 nm	dB/km	
13	Attenuation variation with	dB/km	
a	Wavelength (+/- 25nm)		
b	Temperature		
14	Nominal Mode field Diameter	µm	
a	at 1310 nm		
b	at 1550 nm		
15	Mode field Diameter deviation	µm	
a	at 1310 nm		
b	at 1550 nm		
16	Mode field non circularity	%	
17	Chromatic dispersion Coefficient	µm	
a	at 1310 (1285- 1330) nm		
b	at 1310 (1270-1340) nm		
c	at 1550 (1525- 1475) nm		
18	Zero dispersion wavelength	nm	
19	Zero dispersion slope	Ps/nm² -	

		km	
20	Cut – off Wavelength		
21	Refractive Index		
22	Refractive Index profile		
23	Cladding design		
24	Numerical aperture		
25	Bandwidth distance product	MHzkm	
26	Bend performance	dB/km	

SIGNATURE OF THE BIDDER

GUARANTEED TECHNICAL PARTICULARS OF OPGW

S.No.		Parameter	Unit	Particulars
1		Dual Window Single-Mode	Each	G.652D
2		No. of Fibres		24/48
3		Buffer Type		Loose tube
4		Buffer Tube Diameter	mm	2
5		Buffer Tube material		PBT
6		No. of Buffer Tubes	each	04 Nos.
7		No. of Fibers per Tube	each	6 or 12 as per no. of fibres
8		Filling material		Fibre Jelly (non hygroscopic, non conductive)
9		Filling material compliant with		Yes
10		Strength member(s)		FRP and ACS
11		Binding yarn/ tape:		Thermal barrier
12		Fully Compliant with IEEE P1138	Yes/No	Yes

MECHANICAL PROPERTIES OF CABLE

13		Max. breaking load / Ultimate	kN	80 or Better
14		Fibre strain margin:	%	25 or More
15		Zero fibre strain up to load	kN	20 or Better
16		Equivalent Modulus of elasticity:	KN/mm^2	130 or Better
17		Minimum Bending Radius without microbending	mm	380
18		Maximum Bending Radius:	mm	
	i	Short Term:		500
	ii	Long Term (Continuous):		375
19		Maximum sag at maximum temperature and design span with no wind	mm	As approved sag and tension chart by CSPTCL
20		Everyday tension , no wind	% of UTS	As approved sag and tension chart by CSPTCL

THERMAL PROPERTIES

21		Nominal operating temperature range:	°C	-40°C to +80°C
22		SC current transient peak temperature:	°C	200
23		Maximum allowable temperature for lightning strike:	°C	200

CABLE SPOOL & DRUM

24		Length per spool		
	i	Maximum:	mtrs	5000
	ii	Nominal:	mtrs	3000
25		Drum materials		Non-returnable iron-wooden drum for main supply.
26		Cable end capping and protection against abrasion etc.:		Both ends of OPGW shall be securely fastened to drum and sealed with a shrinkable end cap.

INSTALLATION

27		Splice Loss:		
	i	Maximum:	dB	0.1
	ii	Average:	dB	0.05
28		Operating Temperature Range	°C	-40°C to +80°C
29		Rated Isoceraunic No.		50-100
30		Expected Cable Life	Years	25
31		Max. possible span for specified operating conditions	m	As approved sag and tension chart by CSPTCL
32		Midspan sag at 0°C with no wind loading	mm	As approved sag and tension chart by CSPTCL
33		Midspan sag at max temp. with no wind loading	mm	As approved sag and tension chart by CSPTCL
34		Cable swing angles		
	i	Worst Case:		≤50 deg
	ii	Everyday:		0
35		Describe Installation method(s)		The OPGW shall be installed in

				live line conditions

OPTICAL PARAMETERS

36		Attenuation Coefficient		
	i	@ 1310 nm	dB/km	≤ 0.35
	ii	@ 1550 nm:	dB/km	≤ 0.21
37		Attenuation Variation with Wavelength (±25 nm):	dB/km	≤ 0.05 at1310 nm & 1550 nm
38		Attenuation at water peak:	dB/km	≤0.35
39		Point discontinuity		
	i	@ 1310 nm	dB	≤ 0.05
	ii	@ 1550 nm:	dB	≤ 0.05
40		Temperature dependence (induced attenuation):	dB	≤0.05 (-60℃ to +85℃)
41		Chromatic Dispersion Coefficient	ps/nm.km	
	i	@ 1310 (1288-1339) nm:		≤3.5
	ii	@ 1310 (1271-1360) nm:		≤5.3
	iii	@ 1550 nm:		≤18
42		Zero dispersion wavelength:	nm	1300-1324
43		Zero dispersion Slope:	$ps/nm^2.km$	≤0.092
44		Cutoff wavelength:	nm	≤1260
45		Refractive Index:		1.466 at 1310 nm 1.467 at 1550 nm

PHYSICAL & MATERIAL PROPERTIES

46		Bend Performance:		
	i	37.5 mm radius, 100 turns @1310 nm & @ 1550 nm	dB	≤0.05
	ii	16mm radius, 1 turn @1550 nm	dB	≤0.5
47		Protective Coating type & material		
	i	Primary:		DP-1099 / Acrylate

	ii	Secondary:		DS-2150 / Acrylate
48		Colour coding scheme		Compliant with EIA/TIA 598 or IEC 60304 or Bellore GR-20.

SUSPENSION CLAMP ASSEMBLY:

49		Minimum vertical Strength	kN	70 or Better
50		Maximum Slip Strength	kN	17 or Better
51		Minimum Slip Strength	kN	12 or Better
52		Total Drop (maximum) including shackles	mm	150
53		Tightening torque (nominal)	Nm	25 or Better
	viii	Material of manufacture		Aluminum Alloy
	ix	UTS of each Rod	kN	9.6 or Better

DEAD END CLAMP ASSEMBLY

51		Minimum Slip Load	kN	75 or Better
52		Breaking strength (minimum)	kN	80 or Better

VIBRATION DAMPER

53		Material of Damper Weight		Hot-dip Galvanized Cast Iron
54		Clamp Material		Aluminum alloy
55		Clamp bolt tightening torque	Nm	40
56		Clamp bolt material		Galvanized or stainless steel
57		Messenger Cable Material		Gal. high tensile steel
58		Breaking Strength of Messenger Cable	kN	＞42
59		Resonance Frequencies		
	i	First Frequency	Hz	4.5~19.5HZ (27.5~17.5mm)
	ii	Second Frequency	Hz	7~40HZ (17.5~5mm)
	iii	Third Frequency	Hz	40~80HZ (5~2mm)
	iv	Forth Frequency	Hz	55~105HZ (3~0.5mm)
60		Minimum Slip Strength of Damper Clamp		

	i	Before Fatigue Test	kN	2.5KN
	ii	After fatigue Test	kN	2.5KN

DOWN LEAD CLAMP / FASTENING CLAMP

61		Material:		Galvanized steel
62		Suitable for OPGW (range):	mm	9.0~18.0
63		Tightening torques	Nm	40 (clamping tower part) 10 (holding cables part)
64		Vertical load	kN	4
65		Filler details:		
	i.	Material		Steel
	ii.	diameter:	mm	9.0~18.0
66		Tower attachment arrangement		The alternation between two sets is minimum 1.5m

INLINE SPLICE ENCLOSURE

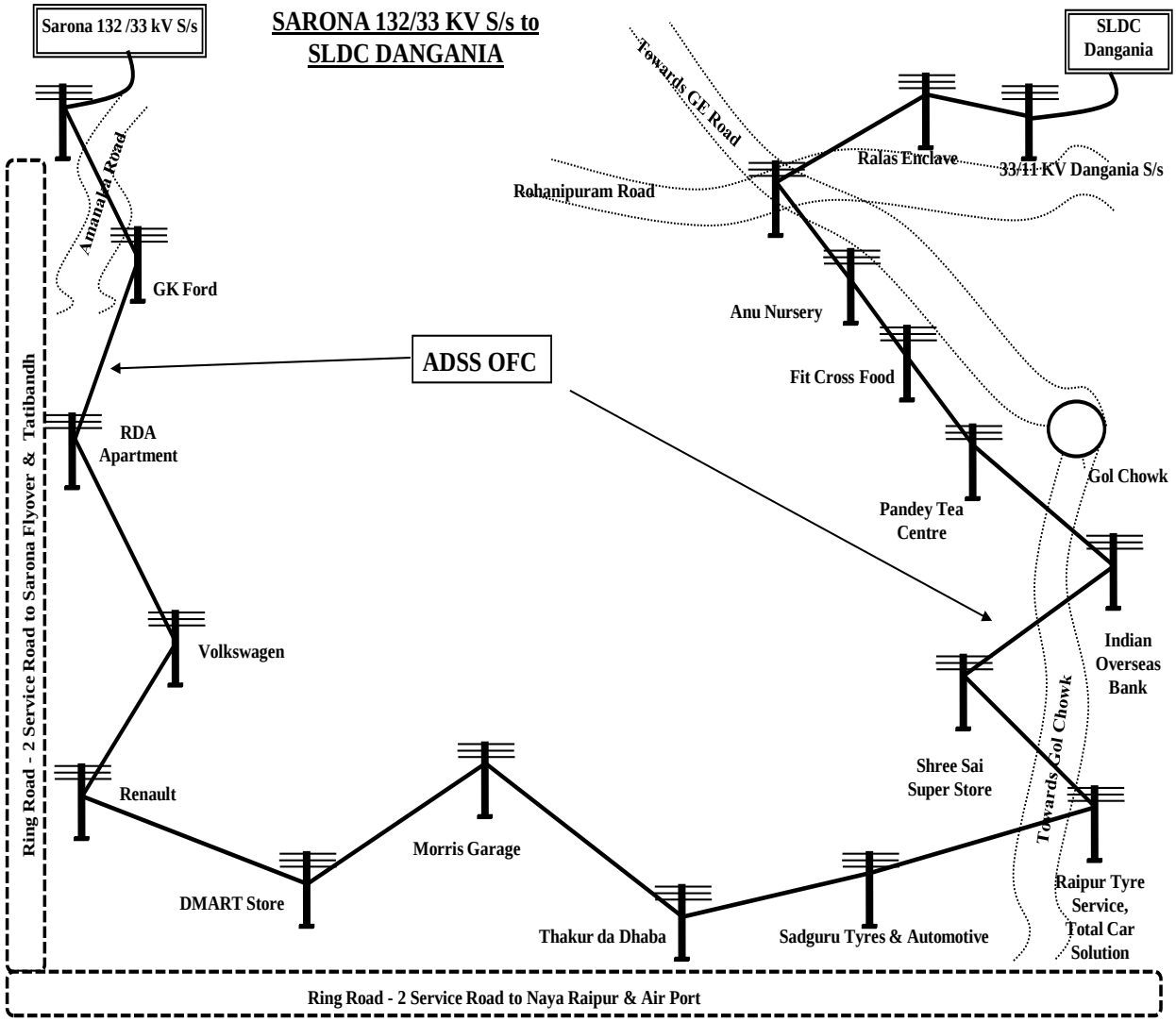
67		Dimensions	cm	45.8±1.0 Height ×20.6±1.0 dia.
68		Weight:	Kg	6.1±0.5
69		Colour and Finish:		Silver White
70		Cable Glanding & Fixing:		Included
71		Construction materials & Gauge:		aluminum alloy and steel, gauge:3.5mm
72		Locking arrangements:		Bolt nut and top lock ribbon
73		Installation Clearances:		
	i.	Front Access:		0.9
	ii.	Rear Access:	cm	0.9
	iii.	Top * Bottom * Sides:		1.8×0×0.9
74		IP Protection	Class	67
75		Provision of pass through splicing:		Required
76		Whether filled with suitable encapsulant		Required
77		Method(s) for mounting with the tower:		Bolt and nut

GUARANTEED TECHNICAL PARTICULARS OF ADSS CABLE

S.No.	PARAMETERS	Unit	Particulars / Description
1	No. of Fibres DWSM (Dual Window Single Mode)	No.	24F
2	Buffer Type	-	Loose Tube
3	Buffer Material	-	PBT
4	Buffer Tube Diameter	mm	2.5 mm outer ; Inner 1.8 mm
5	Strength member	-	Central Glass Reinforced Plastic
6	Peripheral strength member	-	Aramid Yarn
7	DWSM optical fibres color	-	Blue, Orange, Green and Natural
8	No.ofFibres per Tube	Nos.	Loose Tube – 6 Nos. 4 Fibres in each tube (Minimum)
9	Tube color	-	Blue tube as marker, Orange tube as tracer and remaining tubes of natural colors.
10	Tube Filling Compound	-	Loose tube is filled with thixotropic jelly.
11	Flooding Compound	-	Cable core is flooded with water blocking Jelly.
12	Single Layer Polyster Tape	-	Wrapped over the cable core.
13	LLDPE Inner Sheath	mm	Minimum thickness is 1.5 mm black color
14	Binding Yarn Tape	-	Longitudinal Tape and Contra Helical Binders
15	HDPE (anti tracking UV) outer jacket	mm	Nominal thickness 2.00mm,+0.5mm,-0.3mm
16	Overall diameter of the cable	mm	17.0mm, +/-0.5mm
17	Overall weight of the cable	Kg	240 +/- 10 kg/km
18	Minimum bend radius	mm	285 mm during installation 200 mm installed
19	Tensile strength	KN	7.00 KN suitable for 100 Mtrs. span length

20	Span length	Mtrs	Should be suitable for 100 Mtrs. span length with Tensile Strangth of 7.00KN
21	Allowable sag	%	1.0 % of maximum span length
22	Fibre cable drum lengths	km	4 km of drum length minimum
23	Wind speed	Km/Hr	180 Km/Hr

SIGNATURE OF THE BIDDER


SARONA 132/33 KV S/s to
SLDC DANGANIA
Sarona 132 /33 kV S/s
SLDC
Dangania
Towards GE Road
Ralas Enclave
33/11 KV Dangania S/s
Rohanipuram Road
Amanala Road
GK Ford
Anu Nursery
ADSS OFC
Fit Cross Food
RDA
Apartment
Gol Chowk
Pandey Tea
Centre
Volkswagen
Indian
Overseas
Bank
Shree Sai
Super Store
Towards Gol Chowk
Renault
Morris Garage
Raipur Tyre
Service,
Total Car
Solution
DMART Store
Thakur da Dhaba
Sadguru Tyres & Automotive
Ring Road - 2 Service Road to Sarona Flyover & Tatibandh
Ring Road - 2 Service Road to Naya Raipur & Air Port

SITE ACCEPTANCE TEST

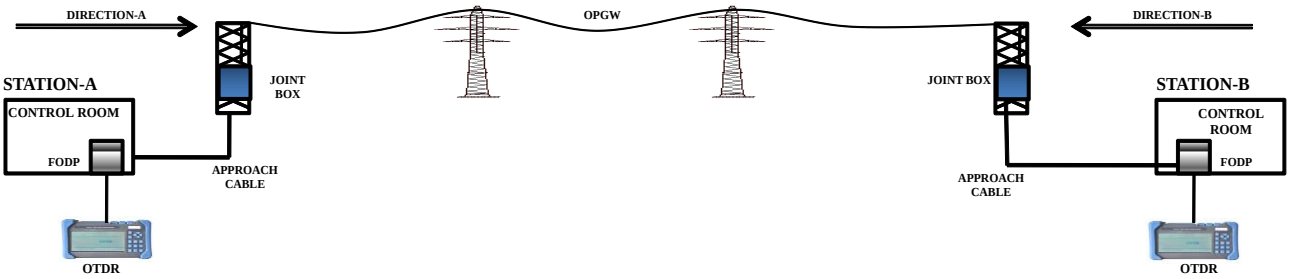
SAT & LINK DETAILS

ORDER No.	ORDER DATE	SAT NO. CSPTCL/Div/No.	SAT DATE	LINK DETAILS				NAME OF ENGINEER-IN-CHARGE & DESIGNATION
				FROM STATION	TO STATION	LINK NAME	LINK TYPE OPGW / ADSS	

SPLICE LOSS CACULATION

MAKE & MODEL OF OTDR	WAVE LENGTH	MAX PERMISSIBLE ATTENUATION OF FIBRE	TOTLA FO LENGTH	PERMISSIBLE LOSS PER SPLICE	TOTAL NO. OF SPLICES	PERMISSIBLE LOSS PER CONNECTOR	NO. OF CONNECTORS	TOTAL LOSS (dB)
A	B	C	D	E	F	G	H	I = C*D + E*F + G*H

TYPICAL OPGW OR ADSS CABLE TESTING LAYOUT



TUBE COLOUR	FIBRE No.	FIBRE COLOUR	LENGTH IN KM.	SPLICE IN Db		ACTUAL LOSS (dB) = (A + B)/2
				DIRECTION-A	DIRECTION-B	
BLUE	1	Blue				
	2	Orange				
	3	Green				
	4	Brown				
	5	Grey				
	6	White				
ORANGE	7	Blue				
	8	Orange				
	9	Green				
	10	Brown				
	11	Grey				
	12	White				
GREEN	13	Blue				
	14	Orange				
	15	Green				
	16	Brown				
	17	Grey				
	18	White				
BROWN	19	Blue				
	20	Orange				
	21	Green				
	22	Brown				
	23	Grey				
	24	White				

NOTE: - **OTDR Trace results attached for all fibres (Yes / No):**

TESTED BY **WITNESSED BY** **APPROVED BY**

Section-V

Financial Schedules, Technical Schedules, Annexures, Formats & Attachments

ANNEXURE-1

FINANCIAL DATA FOR PREVIOUS 5 YEARS (Rs.)				
2015-2016	2016-2017	2017-2018	2018-19	2019-20

Information from Balance Sheet

Particulars	2015-2016	2016-2017	2017-2018	2018-19	2019-20
Total Assets					
Total Liabilities					
Net Worth					
Current Assets					
Current Liabilities					

Note:- Net worth means the sum, total of the paid up capital and free reserves (Excluding reserves created out of revaluation) reduced by aggregate value of accumulated losses (Including debit balance in profit and loss account for current year) and intangible assets.

Information from Income Statement

Particulars	2015-2016	2016-2017	2017-2018	2018-19	2019-20
Total Revenues					
Profits Before Taxes					
Profits After Taxes					

- ❑ Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last five years, as indicated above, complying with the following conditions.
  - All such documents reflect the financial situation of the Bidder.
  - Historic financial statements must be audited by a certified accountant.
  - Historic financial statements must be complete, including all notes to the financial statements.

Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).

Date:

Signature :
Name :
Status :
Seal of the Tendering Co.

ANNEXURE-2

AVERAGE ANNUAL TURNOVER

Annual Turnover Data for the Last 5 Years	
Year	Amount in Rs.
2015-2016	
2016-2017	
2017-2018	
2018-2019	
2019-20	
Average Annual Turnover	

The information supplied should be the Annual Turnover of the Bidder for each year for contracts in progress or completed.

Date: **Signature :**

Name :

Status :

Seal of the Tendering Co. :

ANNEXURE-3

Certification by the Bidder as per order no. F.No.6/18/2019-PPD dated 23/07/2020 read with amended order No.F.No.18/37/2020-PPD Dtd.08.02.2021 and any subsequent amendments issued upto date of issue of N.I.T. issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India (DoE Order)

(In case of a Joint Venture bid, the declaration/ certification shall be given by all partners of the Joint Venture)

Bidder's Name and Address:
Name:…….
Address:…….……

To:
Chief Engineer (Planning & Projects),
Chhattisgarh State Power Transmission Co. Ltd.
Third Floor, SLDC Building, CSEB Campus
Dangania, Raipur (C.G.)-492013

Dear Sir,

We have read and understood the provisions of Order no. F.No.6/18/2019-PPD (Order Public Procurement no.1) dated 23/07/2020 & No.18/37/2020-PPD Dtd.08.02.2021 regarding "Restriction under Rule 144(xi) of General Financial Rules" and F.No.6/18/2019-PPD (Order Public Procurement no.2) dated 23/07/2020 and No.18/37/2020-PPD Dtd.08.02.2021 regarding "Exclusion from Restrictions under Rule 144(xi) of the General Financial Rules" issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India [hereinafter collectively referred as "DoE Order''] and any subsequent modifications/Amendments, if any.

Particularly, we, the Bidder, have read the clause regarding restrictions on procurement from a 'Bidder of a country which shares a land border with India' and on sub-contracting to contractors from such countries.

☐ We certify that we, the bidder is/are not from such a country and will not subcontract any work to a subcontractor/sub vendor from such countries and is eligible to be considered.

Or

☐ We certify that we, the bidder and/or our subcontractor/sub vendor is/are from such a country which shares a land border with India, as brought out in the aforementioned orders. We are registered with the competent authority as defined in the Ministry of Finance, Govt. of India vide order mentioned above & a self-attested copy of registration certificate issued by the competent authority is enclosed along with the bid.

Tick (√) in the box (☐) as applicable

We further declare that any misrepresentation or submission of false/forged document/information in this regard shall be dealt with as per the provisions of Integrity Pact and/or Bidding Documents and/or CSPTCL's policy and procedures.

Date: Name:

Place: Designation

ANNEXURE-4

CURRENT CONTRACT COMMITMENTS

Bidders 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.

Current Contract Commitments					
S. No.	Name of Contract	Employer's Contact Address, Tel, Fax	Value of Outstanding Work [Rs.]	Estimated Completion Date	Average Monthly Invoicing Over Last Six Months [Rs.]
1					
2					
3					
4					
5					

Date:

Signature :

Name :

Status :

Seal of the Tendering Co. :

ANNEXURE-5

DECLARATION FORM
(Offer Validity)

Tender Specification No.TR-20/14

To,

The Chief Engineer (Planning & Projects),
CSPTCL, Raipur

Sir,

Having examined the above specification together with tender conditions referred to therein. I/We the undersigned hereby offer to execute the work contract covered therein complete in all respect as per the specification and general conditions, at the rates entered in the attached contract Annexure of prices in the tender. Our offer is valid up to 180 days from the date of tender opening and the prices, which are on firm basis, will remain valid for (2) two years or date of completion of work from the date of opening of tender whichever is later.

I/We hereby undertake to have the works completed within the time specified in the tender.

I/We certify to have purchased a copy of the specification by remitting cash, demand draft and this has been acknowledged by you in your letter No……. dtd…….

In the event of work order being decided in my/our favour, I/We agree to furnish the Bank Guarantee in the manner acceptable to CSPTCL and for the sum as applicable to me/us as provided in the General conditions of contract (Section-II) of this specification within **15 days** of issue of work order, failing which I/We clearly understand that the said work order will be liable to be withdrawn by CSPTCL.

Signed this_____day of _____

Yours faithfully

Date
Place

SIGNATURE OF TENDERER
NAME
DESIGNATION
(SEAL)

(This form should be duly filled up by the bidder & submitted along with the original copy of tender.)

ANNEXURE-6

LIST OF STRINGING EQUIPMENT AVAILABLE WITH THE CONTRACTOR

(Under this schedule, the list of various stringing tools, plants available with the contractor shall be indicated).

S. No.	DESCRIPTION	MAKE & YEAR OF MANUFACTURE.	QUANTITY TO BE USED PER STRINGING GANG.	TOTAL QUANTITY AVAILABLE WITH THE CONTRACTOR .
1	2	3	4	5

Signature :
Name :
Date
Designation:
Seal of the tendering Co.:

ANNEXURE-7

COMPLETION SCHEDULE

S.No.	DESCRIPTION OF WORK	PERIOD IN MONTHS FROM DATE OF ORDER		DATES CALENDAR MONTHWISE	
		Commencement	Completion	From	To
1.	Establishment Of Site Office & Stores.				
2.	Supply Of OPGW/ ADSS/Approach cable				
3.	Supply of associated Hardwares & accessories of OPGW/ ADSS/ Approach cable				
4.	Stringing				
5.	Testing & Commissioning				

Signature :
Name :
Date
Designation :
Seal of the tendering Co.:

ANNEXURE-8

DEVIATIONS FROM TECHNICAL SPECIFICATIONS /CONDITIONS

S. No.	SUBJECT	CSPTCL's SPECIFICATION CLAUSE REFERENCE AND PAGE NUMBER	PROPOSED DEVIATION BY THE TENDERER	REASONS FOR SUCH DEVIATIONS
1	2	3	4	5

Signature :
Name :
Date :
Designation:
Seal of the tendering Co.:

ANNEXURE-9

QUESTIONNAIRE

Note : The bidders may please note that submission of this questionnaire duly and properly filled in is essential while in entries against the questions given below no reference should be made to comments entered elsewhere in the tender. All quarries should be answered and these answers should be complete in themselves. Please note that none of the column should be left blank and clear reply against all columns should be furnished. In case this is not done the offers will be liable for rejection.

1)	i) Name & Address of the bidder /firm/Company etc. a) Registered office b) Works c) Telex/fax Nos. d) Telephone Nos. (ii) Please mention whether tenderer is a company or proprietorship / partnership firm.	
2)	Bidders to furnish following information :- i) TIN Number ii) PAN iii) Bank details iv) Name of Bank v) A/c No. vi) IFS Code of the bank vii) Copy of cancelled cheque. (attach certified copies of above documents)	
3)	**Goods & Service Tax Registration Number**	
4)	i. Whether you are state or central govt. Undertaking/ unit with 100% government share. ii. If yes whether documentary evidence in support of the above has been enclosed. (in absence of documentary evidence your claim to be State/Central Govt. under-taking shall be ignored.)	
5)	Whether the required earnest money has been furnished by you? If yes, i. In which form. ii. Amount of earnest money furnished.	
6)	Whether agreeable to clause of liquidity damage?	
7)	Please confirm that you are agreeable to payment terms for supply of materials and erection of OPGW on turn key basis as specified in relevant clauses.	

<table>
<tr><td>8)</td><td>(a) whether the rates quoted for OPGW & its associated accessories are :
i. Ex-Works Or Otherwise.
ii. Inclusive Or Exclusive Of Taxes.
(b) Whether following taxes & at what rates are inclusive in the rates offered. If exclusive then at what rate the taxes will be charged extra :-
<table>
<tr><th>S.No</th><th>Name of Tax</th><th>Rate applicable</th><th>Whether inclusive or exclusive</th></tr>
<tr><td>1</td><td>GST</td><td></td><td></td></tr>
<tr><td>1.1</td><td>OPGW</td><td></td><td></td></tr>
<tr><td>1.2</td><td>Other materials</td><td></td><td></td></tr>
<tr><td>2</td><td>Cess under Building and other construction Workers Act 1996.</td><td colspan="2">Should be inclusive</td></tr>
<tr><td>3</td><td>Any other tax</td><td></td><td>Pl. mention</td></tr>
</table></td><td>Remarks</td></tr>
<tr><td>9)</td><td>Whether you are agreeable to payment procedure clause for supply of materials and erection of OPGW of this specification.</td><td></td></tr>
<tr><td>10)</td><td>Whether agreeable to work completion period clause of the tender ?</td><td></td></tr>
<tr><td>11)</td><td>Whether agreeable to guaranteed period clause of the specification.</td><td></td></tr>
<tr><td>12)</td><td>Whether agreeable to furnish a security deposit of an amount of 10% of the order including GST also indicate the form in which security deposit will be furnished i.e. cash, bank guarantee etc.</td><td></td></tr>
<tr><td>13)</td><td>Whether a list of orders executed by you enclosed with full particulars of nature of work done.</td><td></td></tr>
<tr><td>14)</td><td>Whether you agree for inspection by CSPTCL’s representative prior to dispatch and bear the testing charges for all tests as per is to be conducted on samples, drawn by CSPTCL’s representative.</td><td>yes/no</td></tr>
<tr><td>15)</td><td>Whether testing facilities for carrying out the type, acceptance and routine tests as per relevant is specification, ion the materials offered are available with the manufacturer. If so, please furnish the list of testing machines and relevant details.</td><td></td></tr>
<tr><td>16)</td><td>Have you taken into account the element of ‘modvat benefit’ on cost of raw material while offering ex-works prices. Will you pass on such benefit on this account to the CSPTCL?</td><td></td></tr>
<tr><td>17)</td><td>Whether details of departures/ deviation from specification have been furnished in the respective schedule.</td><td></td></tr>
<tr><td>18)</td><td>Whether profit and loss account and balance sheet for the</td><td></td></tr>
</table>

	last 5 years have been furnished.	
19)	Whether details of technical manpower of head office and field organisation furnished in respective schedule.	
20)	Whether agreeable to arrange the transit cum storage insurance of materials as per relevant clause of the specification.	
21)	Whether agreeable to bear the cost of any octroi, duty of levy on materials provided by the contractor such as metal, sand etc.	
22)	Please indicate if use of private/forest/canal service of roads for transport of materials and constructional personnel is required, then the charges, if any, levied by the concerned authorities will be borne by you, without any extra cost to the CSPTCL.	
23)	Have you furnished the power of attorney in respect of the person signing the tender on behalf of the bidder?	
24)	Whether schedule of check list has been enclosed duly filled in.	
25)	Whether :- i) OPGW type test certificates is enclosed. ii) Certificate of sharing land border iii) Latest share holding pattern duly certified by Registrar of Companies enclosed. iv) Certificate of incorporation of the bidder is enclosed. v) Self attested copy of partnership deed in case of partnership firm is enclosed.	

Note : The bidder may use above questionnaire sheets in original for furnishing reply along with this offer. However if separate sheets are used for this questionnaire, it may please be ensured that the serial order and language of questions is maintained.

Date:

Signature :

Name :

Seal of the bidder Co. :

ANNEXURE-10

DETAILS OF HEADQUARTERS & FIELD ORGANISATION OF THE BIDDER

(Under this schedule the strength of technical manpower available with the bidder with their qualification and experience shall be indicated, both in respect of head-quarter and field organisation.)

Date:
Signature :
Name :
Status :
Seal of the bidder Co. :

ANNEXURE-11

DETAILS OF PLANT & MANUFACTURING CAPACITY

S.No.	Particulars	Details of information asked
1.	Name of manufacturer	
2.	Installed Yearly Manufacturing Capacity (km).	
3.	Year Of Installation Of Manufacturing Facility in India.	
4.	OPGW manufactured in Last 3 Years **(i.e. 2017-18, 2018-19 & 2019-20):-** S.No. Period i) ii) iii)	
5.	Total length of OPGW (km) of order under execution.	
6.	Monthly rate at which pending orders to be executed.	
7.	Is spare capacity enough to supply OPGW at the proposed rate against present specification.	

Declaration- I hereby declared that the details furnished above are true & correct to the best of my knowledge.
Date:
Signature:
Name:
Status:
Seal of the bidder Co.:

ANNEXURE-12

LIST OF TOOLS AND PLANTS REQUIRED FOR COMPLETION OF REPLACEMENT WORK OF EXISTING G.I. EARTHWIRE WITH OPGW, TO BE ARRANGED BY THE CONTRACTOR

S.No.	Name Of Activity	List Of Tools And Plants With Quantity.

Date:
Signature :
Name :
Status :
Seal of the bidder Co. :

ANNEXURE-13

SOURCES OF MATERIALS (EXCEPT OPGW & ADSS CABLE) TO BE ARRANGED BY THE CONTRACTOR FOR REPLACEMENT WORK OF EXISTING G.I. EARTHWIRE WITH OPGW (BEING TENDERED).

S. No.	**Particulars**	**Approximate Quantity**	Name Of The Firm From Which The Contractor Proposes To Procure The Material.
1.	Hardware Set for above 24/48 Fibre OPGW Fibre Optic Cabling including all cable fittings and accessories.		
1-a	Suspension Hardware		
1-b	Tension Hardware		
2.	Vibration Dampers for OPGW		
3.	Inline splice enclosure for 24 fibre (Joint Box)		
4.	Inline splice enclosure for 48 fibre (Joint Box)		
5.	Hardware Set for above 24 Fibre (DWSM) Approach Fibre Optic Cable		
6.	Hardware Set for above 24/48 Fibre ADSS Fibre Optic Cabling including all cable fittings and accessories including Vibration Damper & Joint Box		
7.	96 Fibre Indoor type (i.e. 4 sub racks of 24F) rack mounted Fibre Optic Distribution Panel (FODP) including Pigtails and FCPC coupling etc.		
8.	Inline splice enclosure for 24F / 48F fibre (ADSS Cable) (Joint Box)		
9.	Down lead clamp including loop bracket		

Date:
Signature:
Name:
Status:
Seal of the bidder Co.:

ANNEXURE-14

DEVIATION FROM SPECIFICATION (COMMERCIAL)

The bidder shall state under this schedule, how his offer deviates, varies or departs from the **CSPTCL**'s specification (commercial conditions) mentioned in this specification

S.No.	Subject	CSPTCL's specification clause reference & page	Proposed deviation by bidder	Reasons for such deviations
1.	2.	3.	4.	5.

Date:
Signature :
Name :
Status :
Seal of the bidder Co :

ANNEXURE-15

LITIGATION HISTORY OF THE BIDDER

Name of the bidder:

Bidder should provide information on any history of litigation or arbitration resulting from contracts executed in the last five years or currently under execution.

Year	Name of client, cause of litigation/ arbitration and matter in dispute	Details of Contract and Date	Award for or against bidder	Disputed amount (current value in Rs.)

Date
Place

SIGNATURE OF BIDDER
NAME
DESIGNATION
(SEAL)

ANNEXURE-16

QUALITY ASSURANCE PROGRAMME

The Bidder shall submit here complete details of Quality Assurance Programme required as per terms of the Specification.

Date:

Signature :

Name :

Designation :

Seal of tenderer:

Annexure-17

AGREEMENT (PROFORMA)

(To be executed on non judicial stamp paper worth Rs.300/- only with a revenue stamp of Rs. 1/- affixed on it)

This Agreement is made this _____ day of _____ between Shri _____ _____ on behalf of the Contractor_____ _____ _____ (hereinafter called the Contractor which expression shall where the context so admits, be deemed to include his heirs, executors, administrators and representatives) of the one part, and the Chhattisgarh State Power Transmission Company Limited, Raipur being the Company constituted under Companies Act, 1956, (hereinafter called the CSPTCL which expression shall, where the context so admits, be deemed to include its successors in office and permitted assigns) of the other part.

WHEREAS in accordance with a Tender no. _____ dtd. _____ issued by Chief Engineer (P&P) of the CSPTCL, the Contractor submitted his tender dated _____ for construction of ……...

All these works on turnkey basis more particularly described, mentioned, enumerated or referred to in the general conditions, specifications, schedules, drawings etc. forming part of tender, covering letters, schedule of prices and further correspondence, a copy of which is hereto annexed and is for purposes of identification signed by the contractor _____ on behalf of the contractor and Chief Engineer (P&P) of CSPTCL and all of which shall be deemed to form part of this agreement as though separately set out herein and are included in the expression "Contract" herein used (herein after referred to as the said works).

AND WHEREAS the CSPTCL has accepted the tender of the Contractor vide following separate work Orders which have been placed by CSPTCL for aforesaid work on turnkey basis for the total net price of _____ upon the terms and subject to the condition hereinafter mentioned.

NOW THEREFORE THIS AGREEMENT WITNESSES AND IT IS hereby agreed as follows:

1. The contractor shall undertake following works :
   (i) Supply of OPGW and all associated accessories and complete replacement work of G.I. Earthwire with OPGW in transmission lines within the time specified in and in accordance with the terms and conditions specified in the CSPTCL aforesaid Work Orders.
2. The contractor shall commence the works described in the Notice Inviting Tender No. 02-04/NIT/TR-....., dated ....., in all three packages simultaneously and thereafter execute the works in parallel in accordance with the completion schedule submitted in the format set out in Annexure A-8 of the Tender Specifications No. TR-….., read with the PERT Network / Bar Chart submitted in accordance with relevant tender clause. The Works shall be completed by the contractor on turnkey basis not later than **24 (Twenty four) calendar months including rainy season *from the date of order*.** In the event the contractor fails to undertake the Works in accordance with the Schedule, the contractor may be liable for penalty at the discretion of CSPTCL in terms of clause 2.06 of the tender .
3. In the event of a conflict or contradiction between: (a) any provision(s) in this agreement and any provision(s) in the Tender Specifications No. TR-……, i.e. the tender document, the provision(s) of this agreement shall prevail to the extent of such conflict, and (b) two or

more provisions in the tender document, the provision(s) laying down more stringent obligations on the contractor shall prevail."

4. For the work done under the scope of the CSPTCL Work Orders referred above, the CSPTCL shall pay to the Contractor a total sum of Rs. _____ (In words Rupees _____ _____ _____) or such other sum as may become payable in accordance with the said work order.

5. If at any time, any question, dispute or difference whatsoever arises between CSPTCL and the contractor upon, in relation with or in connection with this contract either party may forthwith give the other party a notice in writing of the existence of such question, dispute or difference and same shall be referred to the adjudication of three Arbitrators one to be nominated by CSPTCL, the other by the Contractor and third to be appointed by the two Arbitrators nominated by the parties at the commencement of arbitration proceedings and failing agreement between them, in accordance with the Arbitration and Conciliation Act 1996, the third Arbitrator so appointed shall act as the Presiding Arbitrator. The award so passed shall be binding on both the parties. The place of arbitration shall strictly be RAIPUR CG.
6. In all matters arising under out of or in relation with this agreement, the terms and conditions contained in the aforesaid Work Orders shall apply and all such matters shall be determined accordingly.
7. This agreement shall be deemed to be entered into at Raipur and all disputes and claims, if any, out of or in respect of this Agreement are to be settled at Raipur or be subject to jurisdiction of competent court situated in Chhattisgarh State.

IN WITNESS whereof the parties hereto have signed this agreement on the dates and year mentioned against their respective signature.

Signature of Witness :	Name & Signature for Contractor
1. Signature : _____	Signature
Address : _____	(On behalf of the Contractor)
	Name : _____
Signature : _____	Designation : _____
Address : _____	Seal _____
Signature of Witnesses :	
1. _____	Signature
	(On behalf of CSPTCL)
2. _____	Name _____
	Designation _____

ANNEXURE -18

PROFORMA FOR BANK GUARANTEE TOWARDS SECURITY DEPOSIT

(To be executed on non-judicial stamp paper of Rs. 300/- and Revenue stamp may be affixed on Bank Guarantee)

Bank Guarantee No…… Dtd……

In consideration of the Chhattisgarh State Power Transmission Company Limited, Raipur (A successor company of Chhattisgarh State Electricity Board, Raipur hereinafter referred to as 'CSPTCL') having agreed to accept this Bank Guarantee in lieu of cash deposit by way of Security for due and faithful performance required from M/s. _____ _____ _____ _____ (herein after referred to as "Contractors", the Bank of _____ hereby agrees unequivocally and unconditionally to pay within 48 hours on demand in writing from the Chhattisgarh State Power Transmission Company Limited or any officer authorized by it in this behalf of any amount upto and not exceeding Rs……..……(in words) …… only to the said Chhattisgarh State Power Transmission Company Limited on behalf of the aforesaid M/s …….. who have tendered and contracted for the supply of materials or services to the said the Chhattisgarh State Power Transmission Company Ltd, against order No…….. dtd……. for the order value of Rs…….

The beneficiary of this Bank Guarantee shall be Chhattisgarh State Power Transmission Company Limited, Raipur (A Successor Company of CSEB Raipur). The proceeds / encashment of this Bank Guarantee would go in the name of Chhattisgarh State Power Transmission Company Limited, Raipur (A Successor Company of CSEB Raipur).

This agreement should be valid and binding on this bank up to and including _____ 2001 of for such further period as may hereunder be mutually fixed from time to time in writing by the Chhattisgarh State Power Transmission Company Ltd. and the contractor and shall not be terminable by notice or any change in the constitution of the aforesaid bank or the firm of Contractors or by any others reasons whatsoever and the Banker's liability hereunder shall not be impaired or discharged by any extn. of time or variations or alteration made, given conceded or agreed to with or without the Bank knowledge or consent by or between the Chhattisgarh State Power Transmission Company Ltd. and contractor in the existing and / or further tenders and / or contracts.

It is agreed by the Bank with the CSPTCL that if for any reason a dispute arises concerning the Bank's liability to pay the requisite amount to the CSPTCL under the terms of this guarantee the competent court at Raipur alone shall have the jurisdiction to determine the said dispute and that this shall be without prejudice to the liability of the Bank under the terms of this guarantee being unequivocal and unconditional as mentioned above.

The liability under this guarantee is restricted to Rs…… (In words) …… only. This guarantee shall remain in force until ……. Unless a demand to enforce a claim under the guarantee is made under this Bank Guarantee by the CSPTCL to the Bank within six months from that date the rights of the Chhattisgarh State Power Transmission Company Ltd under this guarantee shall be forfeited and Bank shall be relieved and discharged from all liabilities thereunder.

WITNESSES:- SIGNATURES

Authorized Signatories of Bank

1. …… Signed._ _ _ _ _ _ _

2. …… for _ _ _ _ _ _ _ _ _ _ _ Bank

ANNEXURE -19

PROFORMA FOR BANK GUARANTEE TOWARDS PERFORMANCE

(To be executed on non-judicial stamp paper of Rs. 300/- and Revenue stamp may be affixed on Bank Guarantee)

Bank Guarantee No…… Dtd……

In consideration of the Chhattisgarh State Power Transmission Company Limited, Raipur (A successor company of Chhattisgarh State Electricity Board, Raipur hereinafter referred to as 'CSPTCL') having agreed to accept this Bank Guarantee in lieu of cash deposit by way of Security for due and faithful performance required from M/s. _____ _____ _____ _____ (herein after referred to as "Contractors", the Bank of _____ hereby agrees unequivocally and unconditionally to pay within 48 hours on demand in writing from the Chhattisgarh State Power Transmission Company Limited or any officer authorized by it in this behalf of any amount up to and not exceeding Rs……..……(in words) …… only to the said Chhattisgarh State Power Transmission Company Limited on behalf of the aforesaid M/s …….. who have tendered and contracted for the supply of materials or services to the said the Chhattisgarh State Power Transmission Company Ltd, against order No…….. dtd……. for the order value of Rs…….

The beneficiary of this Bank Guarantee shall be Chhattisgarh State Power Transmission Company Limited, Raipur (A Successor Company of CSEB Raipur). The proceeds / encashment of this Bank Guarantee would go in the name of Chhattisgarh State Power Transmission Company Limited, Raipur (A Successor Company of CSEB Raipur).

This agreement should be valid and binding on this bank up to and including _____ 2001 of for such further period as may hereunder be mutually fixed from time to time in writing by the Chhattisgarh State Transmission Company Ltd. and the contractor and shall not be terminable by notice or any change in the constitution of the aforesaid bank or the firm of Contractors or by any others reasons whatsoever and the Banker's liability hereunder shall not be impaired or discharged by any extn. of time or variations or alteration made, given conceded or agreed to with or without the Bank knowledge or consent by or between the Chhattisgarh State Power Transmission Company Ltd. and contractor in the existing and / or further tenders and / or contracts.

It is agreed by the Bank with the CSPTCL that if for any reason a dispute arises concerning the Bank's liability to pay the requisite amount to the CSPTCL under the terms of this guarantee the competent court at Raipur alone shall have the jurisdiction to determine the said dispute and that this shall be without prejudice to the liability of the Bank under the terms of this guarantee being unequivocal and unconditional as mentioned above.

The liability under this guarantee is restricted to Rs…… (In words)……only. This guarantee shall remain in force until ……. Unless a demand to enforce a claim under the guarantee is made under this Bank Guarantee by the CSPTCL to the Bank within six months from that date the rights of the Chhattisgarh State Power Transmission Company Ltd under this guarantee shall be forfeited and Bank shall be relieved and discharged from all liabilities thereunder.

WITNESSES:- SIGNATURES

Authorized Signatories of Bank

1. …… Signed._ _ _ _ _ _ _

2. …… for _ _ _ _ _ _ _ _ _ _ _ Bank

ANNEXURE -20

Proforma for Indemnity Bond

(To be executed on non-judicial stamp paper worth Rs.300/- with a revenue stamp worth Rs.1/- affixed thereon).

THIS INDEMNITY BOND is made this ……..day of …….20…....By M/s. ……, a company registered under the Companies Act (hereinafter called as 'Contractor' or 'Obligator' which expression shall include its successors and permitted assigns) in favour of Chhattisgarh State Power Transmission Company Limited, Raipur being the Company constituted under Companies Act, 1956, (hereinafter called the CSPTCL) and its project for supply of towers & other line materials and complete erection of ……(hereinafter called "Employer" which expression shall include its successors and assigns):

WHEREAS EMPLOYER has awarded to the 'Contractor' a Contract for supply of towers & other line materials and complete erection of ……transmission line vide Order No…… DTD……. and Amendment No…….(applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which Employer is required to hand over various Material to the 'Contractor' for execution of the Contract.

And WHEREAS by virtue of Clause No…….. of tender specification No……, the 'Contractor' is required to execute an Indemnity Bond in favour of Employer for the Material handed over to it by Employer for the purpose of performance of the Contract/Erection portion of the Contract (hereinafter called the 'Materials').

Now THEREFORE, This Indemnity Bond witnessed as follows:

1. That in consideration of various Material like Galvanised tower parts, Disc Insulators, Stringing Hardware, ACSR Conductor & 7/3.66mm Ground wire as mentioned in the Supply Order No…….. dtd. ……. at clause No……., Valued at (Amount in figures) Rs…….. (amount in words) (Rupees ……..) 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 Employer indemnified for the full value of the Material. The 'Contractor' hereby acknowledges receipt of the initial installment of the Material as per details in the schedule appended hereto. Further, the 'Contractor' agrees to acknowledge receipt of the subsequent installments of the Material as required by 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 of the dispatch title documents in respect of the said Materials duly endorsed by Employer in favour of the 'Contractor' shall be construed as handing over of the Material purposed to be covered by such title documents and the 'Contractor' shall hold such Material in trust as a Trustee for an on behalf of Employer.
2. That the 'Contractor' is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Material at Employer project Site against all risks whatsoever till the Material 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 the Employer. The 'Contractor' undertakes to keep Employer harmless against any loss or damage that may be caused to the Material.
3. The 'Contractor' undertakes that the Material shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions

and no part of the Material shall be utilized 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 Employer is and shall remain the exclusive Purchaser of the Material free from all encumbrances, charges or liens of any kind, whatsoever. The Material shall at all times be open to inspection and checking by the Purchaser's Representative or other employees/Agents authorized in this regard. Further, Employer shall always be free at all times to take possession of the Materials in whatever form the Materials may be, if in its opinion , the Materials are likely to be endangered, misutilized 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 EMPLOYER to return the Material without any demur or reservation.
5. That this Indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Material or the same or any part thereof is misutilized in any manner whatsoever, then the 'Contractor' hereby agrees that the decision of the Purchaser's Representative as to assessment of loss or damage to the Material shall be final and binding on the 'Contractor'. The 'Contractor' binds itself and undertakes to replace the lost and/or damaged Material at its own cost and/or shall pay the amount of loss to Employer without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to 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 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 authorized 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. 1. Signature ……. Signature…….
   2. Name ……. Name ……..
   3. Address ……. Designation ……..

Authorized representative

2. 1. Signature …….
   2. Name …….

(Common Seal)

3. Address …….

(In case of Company)

---

* Indemnity Bonds are to be executed by the authorized person having the Power of Attorney issued under common seal of the company with authority to execute Indemnity Bonds. 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.

ANNEXURE - 21

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 alongwith 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	Utilisaion 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

ANNEXURE - 22

(Proforma for Deed of Extn. of Bank Guarantee)

(To be executed on N.J. Stamp Rs. 300/-+One Revenue Stamp worth Rs. 1/-)

Extn. Deed No.-------
Date----------

B.G. No. ----------Date----------
C.S. Power Transmission Company Ltd.

Sub:-The Extn. of Bank Guarantee No. -----dated----for the Rs.-- ----------
favouring your self expiring on ----------.

1) At the request of our client M/s ----------we hereby extend our Guarantee No.----------dt.----------given on their behalf for the further period from----------to ----------.

2) The Word CSEB wherever referred in the Bank Guarantee shall be replaced by CSPTCL (A Successor Company of CSEB, hereinafter referred to as CSPTCL).The beneficiary of this Bank Guarantee shall be CSPTCL (A Successor Company of CSEB).

3) Our liability under this guarantee is restricted to Rs. ---------- (Rupees ----------). This guarantee shall remain inforce upto ----------. Unless a demand to enforce a claim is made under this Bank Guarantee by the CSPTCL to the Bank within six months from the date i.e. up to ----------the rights of the CSPTCL under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liability there under.

Witness:- Signed for Bank

1)

2)

ANNEXURE-23

PRE-CONTRACT INTEGRITY PACT

1. GENERAL

1.1 This pre-bid contract Agreement (herein called the Integrity Pact) is made on.....day of the month .....20..., between the CSPTCL acting through Shri.....ED/CE (P&P), CSPTCL (hereinafter called the "BUYER", which expression shall mean and include, unless the context otherwise requires, his successors in the office and assigns) and the First Party, proposes to procure (name of the Stores/Equipment/Work/Service) and M/s.....represented by Shri..... Chief Executive Officer (hereinafter called the "BIDDER/Seller", which expression shall mean and include, unless the context otherwise requires, his successors an permitted assigns) and the Second Party, is willing to offer/has offered.

1.2 WHEREAS the BIDDER is a Private Company/Public Company/ Government undertaking / Partnership / Registered Export Agency, constituted in accordance with the relevant law in the matter and the BUYER is a Ministry/Department of the Government, performing its function on behalf of the CSPTCL.

2. OBJECTIVES

NOW, THEREFORE, the BUYER and the BIDDER agree to enter into this pre-contract agreement, hereinafter referred to as Integrity Pact, to avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the Contract to be entered into with a view to:-

2.1. Enabling the BUYER to obtain the desired Stores/Equipment/Work/Service at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and 2.2. Enabling BIDDERs to abstain from bribing or indulging in any corrupt practices in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing any corrupt practices and the BUYER will commit to prevent corruption, in any form, by its official by following transparent procedures.

3. COMMITMENTS OF THE BUYER

The BUYER commits itself to the following:-

3.1 The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves of for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting of implementation process related to contract.

3.2 The BUYER will, during the pre-contract stage, treat BIDDERs alike, and will provide to all BIDDERs the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to the other BIDDERs.

3.3 All the officials of the BUYER will report the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with the full and verifiable facts and the same prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be

debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

4. COMMITMENTS OF BIDDERS

The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:-

4.1. The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material of immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the biding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

4.2. The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage, or inducement to any official of the BUYER or otherwise in procuring the Contract of forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the CSPTCL for showing or forbearing to show favour or disfavour to any person in relation to the contract or any other contract with the CSPTCL.

4.3. The BIDDER further confirms and declares to the BUYER that the BIDDER in the original Manufacture/Integrator/Authorized government sponsored export entity of the stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

4.4. The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payment he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

4.5. The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

4.6. The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

4.7. The BIDDER shall not use improperly, for purpose of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposal and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

4.8. The BIDDER commits to refrain from giving any compliant directly or through any other manner without supporting it with full and verifiable facts.

4.9. The BIDDER shall not instigate or cause to instigate any third person to commit any of the acts mentioned above.

5. PREVIOUS TRANSGRESSION

5.1. The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify BIDDER‟s exclusion from the tender process.

5.2. If the BIDDER makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

6. EARNEST MONEY / SECURITY DEPOSIT

6.1. Every BIDDER while submitting commercial bid, shall deposit an amount as specified in RFP as Earnest Money/Security Deposit, with the BUYER through any of the following instruments:

(i) Bank Draft or a Pay Order in favour of.....

(ii) A confirmed guarantee by an Indian Nationalised Bank, promising payment of the guarantee sum to the .....(BUYER).....on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.

(iii) Any other mode or through any other instrument (to be specified in the RFP).

6.2. The Security Deposit shall be valid up to a period till complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and BUYER, including warranty period.

6.3 In the case of successful BIDDER a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase Contract that the provisions of Sanctions for violation shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

6.4. No interest shall be payable by the BUYER to the BIDDER on Earnest Money/Security Deposit for the period of its currency.

7. SANCTIONS FOR VIOLATIONS

7.1. Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:-

(i) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.

(ii) To forfeit fully or partially the Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed), as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.

(iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

(iv) To recover all sums already paid by the BUYER, and in case of the Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate while in case of a BIDDER from a country other than India with Interest thereon 2% higher than the LIBOR. If

any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER , in order to recover the payments, already made by the BUYER, along with interest.

(vi) To cancel all or any other contracts with the BIDDER and the BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

(vii) To debar the BIDDER from participating in future bidding processes of the CSPTCL for a minimum period of five years, which may be further extended at the discretion of the BUYER.

(viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middlemen or agent or broken with a view to securing the contract.

(ix) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.

(x) If the BIDDER or any employee of the BIDDER or any person action on behalf of the BIDDER, either directly or indirectly, is closely related to any of the officers of the BUYER, or alternatively, if any close relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filling of tender. Any failure to disclose the interest involved shall entitle the BUYER to rescind the contract without payment of any compensation to the BIDDER.

The term "close relative" for this purpose would mean spouse whether residing with the Government servant or not, but not include a spouse separated from the Government servant by a decree or order of a competent court; son or daughter or step son or step daughter and wholly dependent upon Government servant, but does not include a child or step child who is no longer in any way dependent upon the Government servant or of whose custody the Government servant has been deprived of by or under any law; any other person related, whether by blood or marriage, to the Government servant or to the Government servant's wife or husband and wholly dependent upon Government servant.

(xi) The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER, and if he does so, the BUYER shall be entitled forthwith to rescind the contract and all other contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

7.2. The decision of the BUYER to the effect that a breach of the provisions of this pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Monitor(s) appointed for the purpose of this Pact.

8. INDEPENDENT MONITORS

8.1. The BUYER will appoint Independent Monitors (hereinafter referred to as Monitors) for this Pact.

8.2. The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

8.3. The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

8.4. Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

8.5. As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

8.6. The Monitor will be submit a written report to the designated authority of BUYER/Secretary in the department/within 8 to 10 weeks from the date of reference or intimation to him by the BUYER /BIDDER and, should the occasion arise, submit proposal for correcting problematic situation.

09. FACILITATION OF INVESTIGATION

In case of any allegation of violation of any provision of this fact or payment of commission, the BUYER or its agency shall be entitled to examine all the documents including the books of Account of the BIDDER and the BIDDER shall provide necessary information of the relevant documents and shall extend all possible help for the purpose of such examination.

10. LAW AND PLACE OF JURISDICTION

This pact is subject to Indian Law, the place of performance and jurisdiction shall be the seat of the BUYER.

11. OTHER LEGAL ACTIONS

The actions stipulated in this integrity Pact are without prejudice to any other legal action that may following in accordance with the provisions of the any other law in force relating to any civil are criminal proceeding.

12. VALIDITY

12.1 The validity of this integrity Pact shall be from the date of its signing and extend up to 2 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2. If one or several provision of this pact turn out to be invalid; the remainder of this pact shall remain valid. In such case, the parties will strive to come to an agreement to their original intention.

13. The parties hereby sign this integrity Pact at .....on.....

BUYER	BIDDER
ED/CE(P&P)	CHIEF EXECUTIVE OFFICER
CSPTCL, Raipur	Department/PSU

Witness	**Witness**
(i)……	(i)……
……	……
(ii)……	(ii)……
……	……

ANNEXURE-24

(Only for illustration, not to be filled by bidder)

ILLUSTRATION OF CRITERIA FOR PRICE BID EVALUATION
(Tender No.TR-20/14)

REPLACEMENT OF EXISTING G.I. EARTHWIRE (7/3.66mm) OF VARIOUS EHV TRANSMISSION LINES (APPROX.4700 km) OF CSPTCL BY OPGW (24 & 48 FIBRE)

S.No	PARTICULARS	Name of bidder		
		M/s……	M/s……	M/s……
1	Cost of supply of materials as per Schedule A-1 (including all taxes , duties & cess)			
2	Cost of installation, testing & commissioning as per Schedule-A-2 (including all taxes & cess)			
3	Cost of supply of materials (Spare) as per Schedule A-3 (including all taxes , duties & cess)			
4	TOTAL AMOUNT (Sch-A-1, Sch.A-2 & Sch.A-3) (including all taxes) (1+2+3) :-			
5	Rebate / discount offered, if any			
6	Total Project Cost after Rebate (4-5) :-			
7	Position of bidder			

ANNEXURE – 25
PROFORMA FOR BANK GUARANTEE FOR LOSS/DAMAGE TO CSPTCL

NOTE FOR BIDDERS: (Not to be typed in the Bank Guarantee) To be furnished in non-judicial stamp paper of Rs.300/- applicable as per MP/ Chhattisgarh Duty Act from any Nationalised /Scheduled Bank.

In consideration of the Chhattisgarh State Power Transmission Company Limited, (herein after called "CSPTCL") having agreed to exempt Ms. _____ _____ _____ _____ _____ (herein after called "the said Contractors") from the demand under the terms and conditions of an agreement No. _____ Dated _____ made between _____ And _____ for _____ _____ _____ _____ _____ (herein after called "the said agreement") of security deposit for satisfactory performance of materials (as detailed in the said agreement) and for the due fulfilment by the said Contractor(s) of the terms and conditions contained in the said agreement, on production of a Bank Guarantee for Rs. _____ ____ ____ ____ ___ (Rs._____ _____ _____ _____ _____ Only).

1. We_____ _____ _____ Bank (herein after referred to as "the Bank") at the request of _____ _____ contractor(s) do hereby undertake unequivocally and unconditionally to pay to CSPTCL, an amount not exceeding Rs. _____ (Rs. _____ _____ _____ _____ _____ Only) against any loss or damage caused to or suffered or would be caused to or suffered or would be caused to or suffered by CSPTCL by reason of any breach by the said Contractors(s) of any of the terms or conditions contained in the said agreement.
2. We_____ (indicate the name of the bank) Bank do hereby undertake to pay the amounts due and payable under this guarantee without any lemur, merely on a demand from CSPTCL stating that the amount claimed is due by way of loss or damage caused to or would cause to or suffered by CSPTCL by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said agreement or by reasons of the Contractor(s).
3. We, the _____ (indicate the name of the bank) do hereby further undertake unequivocally and unconditionally pay the amount due and payable under this Guarantee without demure, merely on demand from CSPTCL stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by CSPTCL by reason of each breach by the said Contractor(s) of any of the terms or conditions and failure to perform said Bid. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs._____.
4. We, the _____ (indicate the name of the bank) further agree that the guarantee herein contained shall remain in full force and effect during the aforesaid period of _____ days _____ and it shall continue to be so enforceable till all the dues of the CSPTCL under or by virtue of the said Bid have been fully paid and its claims satisfied or discharged or till **Chief Engineer (P&P), CSPTCL** certifies that the terms and conditions of the said Bid have been fully and properly carried out by the said Contractor(s) and accordingly discharge this guarantee. Unless a demand or claim under this discharges from all liability under this guarantee thereafter.

5. We, the _____ (indicate the name of the bank)further agree with the CSPTCL that CSPTCL shall have be fullest liberty without our consent and without affecting in any manner our obligations here under to vary any of the terms and conditions of the said Bid or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time only of the powers exercisable by CSPTCL against the said Contractor(s) and to forebear or enforce any of the terms and conditions relating to the said Bid and we shall not be relieved from our liability by reason of any such variation postpone or extension being granted to the said Contractor or for any forbearance, act or omission on the part of CSPTCL or any indulgence by CSPTCL to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.
6. The beneficiary of this Bank Guarantee shall be Chhattisgarh State Power Transmission Company Limited, Raipur (A Successor Company of erstwhile CSEB Raipur). The proceeds / encashment of this Bank Guarantee would go in the name of Chhattisgarh State Power Transmission Company Limited, Raipur (A Successor company of erstwhile CSEB Raipur).
7. It is agreed to by the Bank with the CSPTCL that if for any reason a dispute arises concerning the Bank Liability to pay the requisite amount to the CSPTCL under the terms of this guarantee the competent court at Raipur alone shall have the jurisdiction to determine the said dispute and that this shall be without prejudice to the liability of the Bank under the terms of this guarantee being unequivocal and unconditional. The beneficiary of this Bank Guarantee shall be Chhattisgarh State Power Transmission Company Limited, Raipur (A Successor Company of erstwhile CSEB Raipur).
8. We, the _____ (indicate the name of the bank) lastly undertake not to revoke this Guarantee during its currency except with the previous consent of CSPTCL in writing.
9.

Dated, the _____ days of _____ _____.

WITNESS (SIGNATURE WITH NAME & ADDRESS)

1.

2.

For _____

(Indicate name of Bank)

ANNEXURE –26

PROFORMA FOR UNDERTAKING BY THE JOINT VENTURE PARTNERS

(To be executed on Non-Judicial Stamp Paper worth Rs. *100.00 &Rs. 1.00 revenue stamps)*

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 "Lead Partner" 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 "Other partner" 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 **TR-___** for …… *(insert name of the project)* of C.S. Power Transmission Co. Ltd, a Company incorporated under the Companies Act of 1956 having its registered office at Dangania, Raipur (hereinafter called the "CSPTCL").

AND WHEREAS CSPTCL invited bids as per the above mentioned Specification for construction of ……stipulated in the bidding documents under Specification No **TR- -** ____*(insert nameof the project)*

AND WHEREAS Qualification Criteria of the specification stipulates that an Undertaking of not more than two firms as partners, meeting the requirements of Qualification Criteria, as applicable may bid, provided, the Joint Venture fulfills all other requirements of Qualification Criteria and in such a case, the Bid Forms shall be signed by both the partners so as to legally bind 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 CSPTCL vide proposal No……..dated ……..... by the "Lead Partner" based on this Undertaking between both parties; under these presents and the bid in accordance with the requirements of Tender specification & Qualification Criteria has been signed by both the parties.

NOW THIS UNDERTAKING WITNESSETH AS UNDER:-

In consideration of the above premises and agreements the parties of this Deed of Undertaking do hereby declare and undertake:

1. In requirement of the award of the Contract by the CSPTCL to the Joint Venture Partners, we, the Parties do hereby undertake that M/s…… 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 CSPTCL for the successful performance of the Contract and shall be fully responsible for the design, supply, erection, testing, commissioning and successful performance of the project in accordance with the Contract.

2. In case of any breach or default of the said Contract by the Lead Partner of the Joint Venture, the other partner 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 CSPTCL suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance of the equipment/ material 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 CSPTCL, on its demand without any demur. It shall not be necessary or obligatory for the CSPTCL to proceed against Lead Partner to these presents before proceeding against or dealing with the other Party(s), CSPTCL can proceed against other partner who shall be jointly and severally liable for the performance and all other liabilities/obligations under the Contract to the CSPTCL.

4. The financial liability of the Parties of this Deed of Undertaking to the CSPTCL, with respect to any of the claims arising 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 Partners of this Deed of Undertaking.

5. It is expressly understood and agreed between the parties to this under taking that the responsibilities and obligations of each of the parties shall be as delineated in the tender to this Deed of Undertaking. It is further undertaken by the parties that the above sharing of responsibilities & 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 CSPTCL 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 CSPTCL 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 authorized representatives executed these presents and affixed Common Seals of their companies, on the day, month and year first mentioned above.

Seal of ……. For "Lead Partner"
has been affixed in my/ our For and on behalf of M/s
presence pursuant to Board of ……..
Director's Resolution dated …….
Name …….. (Signature of the authorized
Designation ……. Representative)
Signature …….

WITNESS :

I.……

II. ……

Seal of ……. For "other Partner"
has been affixed in my/ our For and on behalf of
presence pursuant to Board of M/s……..
Director's Resolution dated …….
Name …….. (Signature of the authorized
Designation ……. representative)
Signature …….

WITNESS :

I.……
II. ……

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 later than six months of date of execution of the Undertaking.
2. The Undertaking shall be signed on all the pages by the authorized representatives of each of the partners and should invariably be witnessed.

ANNEXURE –27

PROFORMA FOR POWER OF ATTORNEY FOR JOINT VENTURE

(To be executed on Non-Judicial Stamp Paper worth Rs. *100.00 &* Rs.*1.00 revenue stamps)*

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 "Lead Partner" 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 "Authorized 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 **TR-**..... the bids for which have been invited by Executive Director (Procurement & Projects), Dangania, Raipur of C.S. Power Transmission Co. Ltd. (CSPTCL) to undertake the following acts :

i) To submit proposal and participate in the aforesaid Bid Specification of the CSPTCL on behalf of the "Joint Venture".
ii) To negotiate with the CSPTCL the terms and conditions for award of the Contract pursuant to the aforesaid Bid and to sign the Contract with the CSPTCL 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 Lead Partner shall ensure timely execution of the Contract. In case of any breach of contract by any of the joint venture/consortium partners during execution of the contract, it will be the sole discretion of CSPTCL to allow the other partner to complete the work or to terminate the total contract.

It is expressly understood that this Power of Attorney shall remain valid binding and irrevocable till completion of the Maintenance Period in terms of the Contract.
The Joint Venture hereby agrees and undertakes to ratify and confirm all the whatsoever the said Attorney/Authorized Representatives/Partner in-charge/Lead Partner quotes in the bid, negotiates and signs the Contract with the CSPTCL 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.....	2. Signature.....
Name .....….....	Name
Designation .....….....	Designation
Occupation .....….....	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 later than six months of date of execution of the Agreement.
2. The Agreement shall be signed on all the pages by the authorized representatives of each of the partners and should invariably be witnessed.

ANNEXURE –28

DECLARATION BY THE BIDDER

(Debarred / Blacklisted)

(*To be furnished the Sole bidder/ Lead partner as well as other partner of the JV Separately*)

(Please ensure the language of the format is maintained to avoid bid rejection)

Name of the bidder (Sole bidder / JV partners) :

1) (Name of the bidder) M/s…… is not debarred/ Blacklisted by Bank / State Govt./ Central Govt. /State PSU/CPSU/SEB/ Public utility as on date of issue of NIT.

2) All the document/ statements/ attachments/ information submitted by (Name of the bidder) M/s ……in proof of qualifying requirements are authentic/ genuine/ correct and in case, any of the said documents/ statements/ attachments/ information is found to be false / fake/ misleading, the bid will be disqualified and action will be taken as per relevant provisions of the tender.

Date …….
place ……

SIGNATURE OF BIDDER
Name ……
Designation……..
(Seal of Company)

ANNEXURE –29

CERTIFICATE ISSUED BY CHARTERED ACCOUNTANT *(To be furnished for Sole bidder/Lead Partner as well as other Partner of JV in original)* ***(Please ensure the language of the format is maintained to avoid bid rejection)***

Name of the bidder (Sole bidder/JV partners) :

a) All payment obligations (principal / Interest) on outstanding debentures (i.e. debentures which have not yet been redeemed) have been discharged and no such payment as on **31.12.2020** is outstanding / overdue.

b) The bidding company is presently not in default in payment of any bank loan or interest thereon for more than three months or any loan account of the bidder has not been classified as NPA (Non performing assets) by the creditor/ lending bank as on date of issue of NIT.

c) The bidding company is not going through the process of insolvency or liquidation as on the date of issue of NIT. Even, if at a later date up to placement of order against the instant tender, it comes to the notice of CSPTCL that the sole bidder/ any partner of JV has been going through the process of insolvency or liquidation, their bid will be rejected.

Date SIGNATURE OF CHARTERED ACCOUNTANT

Place NAME

(SEAL)

ANNEXURE A-30 (a)
CHECK LIST
(To be kept in Envelope-II)

S. No.	Items	Reference	Declaration (Strike-out whichever is not applicable)	Page No.
1.	Duly & properly filled Questionnaire	Annexure A-9	Yes/No	
2.	(a) Declaration regarding sharing of land border with India	Annexure-3	Yes/No	
	(b) Registration certificate issued by competent authority (In case, the sole bidder /any partner of Joint Venture/consortium is from a country which shares a land border with India, as defined in Ministry of Finance, Government Of India's order no. F.No.6/18/2019-PPD Dtd. 23.07.2020 (Annexure-31-a) read with amended order No. F No.18/37/2020-PPD Dtd.08.02.2021 (Annexure-31-b) and any subsequent amendments issued upto date of issue of N.I.T.		Yes/No	
3.	a) Self attested Annual return filed to the Ministry of Corporate Affairs (Applicable in case of Company only).	-	Yes/No	
	b) Self attested Latest share holding pattern as on date of issue of NIT duly certified by the Director.	-	Yes/No	
	c) Self attested Certificate of incorporation of the bidder.	-	Yes/No	
	d) Self attested copy of partnership deed in case of partnership firm	-	Yes/No	
4.	Self attested valid NSIC/DIC (applicable for CG State SSI Unit) certificate.	--	Yes/No	
5.	Self attested copy of valid factory registration certificate issued by industries department of state/central government for OPGW (In case firm is not registered with NSIC/DIC)	--	Yes/No	
6.	Certificate issued by the Chartered Engineer / Chartered Accountant or Industries Department (in original) certifying the year of start of manufacturing unit in India of OPGW and annual manufacturing capacity of the bidder.	--	Yes/No	
7.	Self attested copies of turnkey contract order for supply, erection & commissioning of OPGW cable on 110 KV or higher voltage transmission line of minimum route length of 2000 kms (cumulatively) against order(s) issued by any entity(ies) mentioned in clause i.e. "Technical Experience criteria for PQR".	--	Yes/No	
8.	Self attested documentary proof regarding completion of work of providing OPGW on 110 KV or higher voltage transmission line of minimum route length of 2000 Km (cumulative) against orders.	--	Yes/No	
9.	Self attested copy of performance certificate for at least 200 Km of OPGW cable of 24 fiber(or	--	Yes/No	

	higher) for successful operation laid on 110 KV (or higher) voltage line(cumulatively) for minimum 1 (one) year from the date of its commissioning as on date of issue of NIT of the instant tender.			
10.	Certificate issued by any entity(ies) for successful completion of at least **200 km** (cumulatively) **of Live Line** installation of OPGW on 110 KV or higher voltage transmission line in project(s).	--	Yes/No	
11.	Self-attested copies of audited balance sheets and profit & loss account statement of sole bidder/each partner of JV for last 5 financial years (i.e., FY 2015-16 to FY 2019-20).	--	Yes/No	
12.	A Self-attested certificate issued by chartered accountant showing 'Annual Turnover' for the last five financial years (FY 2015-16, 2016-17, 2017-18, 2018-19 & 2019-20) & 'Net worth' including assets and liability of the sole bidder/each partner of JV for the last three financial years (FY 2017-18, 2018-19 & 2019-20)	--	Yes/No	
13.	A Self-attested certificate of Chartered Accountant (in original) indicating details (break-up) of available 'Liquid assets' (LA) for sole bidder/each partner of JV.	--	Yes/No	
14.	Evidence of access to or availability of credit/facilities. **Such certificate should have been issued not earlier than 3 months prior to the date of bid opening.**	Annexure-A-21	Yes/No	
15.	Declaration by the bidder – Debarred/Blacklisted *(To be furnished for Sole bidder/Lead Partner as well as other Partner of JV **(Separately)**.*	Annexure A-28	Yes/No	
16.	Certificate issued by Chartered Accountant *(To be furnished for Sole bidder/Lead Partner as well as other Partner of JV)*	Annexure A-29	Yes/No	
17.	Copy of Valid 'A' class Electrical Contractor License issued by CG anugyapan Mandal/ CG state licensing board in the name of sole bidder / **lead partner** of the joint venture/ consortium **or** an undertaking to submit 'A' class electrical contractor license issued by C.G. Anugyapan Mandal / CG State licensing Board within 30 days after issue of LOA, by the sole bidder or lead partner of the JV/consortium.	--	Yes/No	
18.	Copy of EPF code number/ EPF registration No. allotted by EPF Commissioner in the name of the sole bidder / **Lead partner** of the JV	--	Yes/No	
19.	Pre-contract Integrity pact in prescribed format	Annexure A-23	Yes/No	
20.	Deviation from technical specification/ conditions	Annexure A-8	Yes/No	
21.	Deviation from the commercial condition of contract	Annexure A-14	Yes/No	
22.	Undertaking by the Joint Venture Partners	Annexure A-26	Yes/No	

23.	Power of Attorney for Joint Venture	Annexure A-27	Yes/No	
24.	Power of attorney issued to legally authorised signatory	--	Yes/No	
25.	Details of headquarters & field organisation of the tenderer	Annexure A-10	Yes/No	
26.	Details of plant & manufacturing capacity	Annexure A-11	Yes/No	
27.	List of tools and plants required for construction of line, to be arranged by the contractor	Annexure A-12	Yes/No	
28.	Litigation History of the Bidder *(To be furnished for Sole bidder/Lead Partner as well as other Partner of JV* ***(Separately)***	Annexure A-15	Yes/No	

Date
Place

SIGNATURE OF BIDDER
NAME
DESIGNATION
(SEAL)

ANNEXURE A-30 (b)
CHECK LIST
(To be submitted with bid)

S.No	ITEMS	REFERENCE	DECLARATION Strike out which ever is not applicable
1	Financial data for previous 5 years	Annexure-1	Yes/No
2	Average annual turnover	Annexure-2	Yes / No
3	Current contract commitments	Annexure-4	Yes / No
4	Declaration form	Annexure-5	Yes / No
5	List of stringing equipment available with the contractor	Annexure-6	Yes / No
6	Completion schedule	Annexure-7	Yes / No
7	Sources of materials to be arranged by the contractor for the transmission line (being tendered).	Annexure-13	Yes / No
8	Quality assurance programme	Annexure-16	Yes/ No.
9	Agreement	Annexure-17	Yes/ No.
10	Bank guarantee proforma for security deposit	Annexure-18	Yes/ No.
11	Proforma for performance bank guarantee	Annexure-19	Yes/ No.
12	Proforma for indemnity bond	Annexure-20	Yes/ No.
13	Proforma for deed of extension of bank guarantee	Annexure-22	Yes/No
14	Illustration of criteria for price bid evaluation	Annexure-24	Yes/ No
15	Proforma for bank guarantee for loss/damage to CSPTCL	Annexure-25	Yes/ No

Annexure-31(a)

F.No.6/18/2019-PPD
Ministry of Finance
Department of Expenditure
Public Procurement Division

161, North Block,
New Delhi
23rd July, 2020

Office Memorandum

Subject: Insertion of Rule 144 (xi) in the General Financial Rules (GFRs), 2017

Rule 144 of the General Financial Rules 2017 entitled 'Fundamental principles of public buying', has been amended by inserting sub-rule (xi) as under:

Notwithstanding anything contained in these Rules, Department of Expenditure may, by order in writing, impose restrictions, including prior registration and/or screening, on procurement from bidders from a country or countries, or a class of countries, on grounds of defence of India, or matters directly or indirectly related thereto including national security; no procurement shall be made in violation of such restrictions.

(Sanjay Prasad)
Joint Secretary (PPD)
Email ID: js.pfc2.doe@gov.in
Telephone: 011-23093882

To,
(1) Secretaries of All Ministries/ Departments of Government of India
(2) Chief Secretaries/ Administrators of Union Territories/ National Capital Territory of Delhi

F.No.6/18/2019-PPD
Ministry of Finance
Department of Expenditure
Public Procurement Division

161, North Block,
New Delhi
23rd July, 2020

Order (Public Procurement No. 1)

Subject: Restrictions under Rule 144 (xi) of the General Financial Rules (GFRs), 2017

Attention is invited to this office OM no. 6/18/2019-PPD dated 23rd July 2020 inserting Rule 144 (xi) in GFRs 2017. In this regard, the following is hereby ordered under Rule 144 (xi) on the grounds stated therein:

Requirement of registration

1. Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the Competent Authority, specified in **Annex I.**

2. This Order shall not apply to (i) cases where orders have been placed or contract has been concluded or letter/notice of award/ acceptance (LoA) has been issued on or before the date of this order; and (ii) cases falling under **Annex II**.

Transitional cases

3. Tenders where no contract has been concluded or no LoA has been issued so far shall be handled in the following manner: -

   a) *In tenders which are yet to be opened, or where evaluation of technical bid or the first exclusionary qualificatory stage (i.e. the first stage at which the qualifications of tenderers are evaluated and unqualified bidders are excluded) has not been completed*: No contracts shall be placed on bidders from such countries. Tenders received from bidders from such countries shall be dealt with as if they are non-compliant with the tender conditions and the tender shall be processed accordingly.

   b) *If the tendering process has crossed the first exclusionary qualificatory stage*: If the qualified bidders include bidders from such countries, the

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entire process shall be scrapped and initiated *de novo*. The *de novo* process shall adhere to the conditions prescribed in this Order.

c) As far as practicable, and in cases of doubt about whether a bidder falls under paragraph 1, a certificate shall be obtained from the bidder whose bid is proposed to be considered or accepted, in terms of paras 8, 9 and 10 read with para 1 of this Order.

Incorporation in tender conditions

4. In tenders to be issued after the date of this order, the provisions of paragraph 1 and of other relevant provisions of this Order shall be incorporated in the tender conditions.

Applicability

5. Apart from Ministries / Departments, attached and subordinate bodies, notwithstanding anything contained in Rule 1 of the GFRs 2017, this Order shall also be applicable
   a. to all Autonomous Bodies:
   b. to public sector banks and public sector financial institutions; and
   c. subject to any orders of the Department of Public Enterprises, to all Central Public Sector Enterprises; and
   d. to procurement in Public Private Partnership projects receiving financial support from the Government or public sector enterprises/ undertakings.
   e. Union Territories, National Capital Territory of Delhi and all agencies/ undertakings thereof

Definitions

6. "Bidder" for the purpose of this Order (including the term 'tenderer', 'consultant' 'vendor' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency, branch or office controlled by such person, participating in a procurement process.

7. 'Tender' for the purpose of this Order will include other forms of procurement, except where the context requires otherwise.

8. "Bidder from a country which shares a land border with India" for the purpose of this Order means

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a) An entity incorporated, established or registered in such a country; or
b) A subsidiary of an entity incorporated, established or registered in such a country; or
c) An entity substantially controlled through entities incorporated, established or registered in such a country; or
d) An entity whose *beneficial owner* is situated in such a country; or
e) An Indian (or other) agent of such an entity; or
f) A natural person who is a citizen of such a country; or
g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

9. "Beneficial owner" for the purpose of paragraph 8 above will be as under:

(i) In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person(s), has a controlling ownership interest or who exercises control through other means.
Explanation—

a. "Controlling ownership interest" means ownership of, or entitlement to, more than twenty-five per cent of shares or capital or profits of the company;

b. "Control" shall include the right to appoint the majority of the directors or to control the management or policy decisions, including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

(ii) In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

(iii) In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;

(iv) Where no natural person is identified under (i) or (ii) or (iii) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

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(v) In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

10. "Agent" for the purpose of this Order is a person employed to do any act for another, or to represent another in dealings with third persons.

Sub-contracting in works contracts

11. In works contracts, including turnkey contracts, contractors shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority. The definition of "contractor from a country which shares a land border with India" shall be as in paragraph 8 above. This shall not apply to sub-contracts already awarded on or before the date of this Order.

Certificate regarding compliance

12. A certificate shall be taken from bidders in the tender documents regarding their compliance with this Order. If such certificate given by a bidder whose bid is accepted is found to be false, this would be a ground for immediate termination and further legal action in accordance with law.

Validity of registration

13. In respect of tenders, registration should be valid at the time of submission of bids and at the time of acceptance of bids. In respect of supply otherwise than by tender, registration should be valid at the time of placement of order. If the bidder was validly registered at the time of acceptance / placement of order, registration shall not be a relevant consideration during contract execution.

Government E-Marketplace

14. The Government E-Marketplace shall, as soon as possible, require all vendors/ bidders registered with GeM to give a certificate regarding compliance with this Order, and after the date fixed by it, shall remove non-compliant entities from GeM unless/ until they are registered in accordance with this Order.

Model Clauses/ Certificates

15. Model Clauses and Model Certificates which may be inserted in tenders / obtained from Bidders are enclosed as **Annex III**. While adhering to the substance of the Order, procuring entities are free to appropriately modify the wording of these clauses based on their past experience, local needs etc. without making any reference to this Department.

(Sanjay Prasad)
Joint Secretary (PPD)
Email ID: js.pfc2.doe@gov.in
Telephone: 011-23093882

To

(1) Secretaries of All Ministries/ Departments of Government of India for information and necessary action. They are also requested to inform these provisions to all procuring entities.

(2) Secretary, Department of Public Enterprises with a request to immediately reiterate these orders in respect of Public Enterprises.

(3) Secretary DPIIT with a request to initiate action as provided under Annex I

(4) Chief Secretaries/ Administrators of Union Territories/ National Capital Territory of Delhi

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Annex I: Competent Authority and Procedure for Registration

A. The Competent Authority for the purpose of registration under this Order shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT)*.

B. The Registration Committee shall have the following members*:

i. An officer, not below the rank of Joint Secretary, designated for this purpose by DPIIT, who shall be the Chairman;
ii. Officers (ordinarily not below the rank of Joint Secretary) representing the Ministry of Home Affairs, Ministry of External Affairs, and of those Departments whose sectors are covered by applications under consideration;
iii. Any other officer whose presence is deemed necessary by the Chairman of the Committee.

C. DPIIT shall lay down the method of application, format etc. for such bidders as stated in para 1 of this Order.

D. On receipt of an application seeking registration from a bidder from a country covered by para 1 of this Order, the Competent Authority shall first seek political and security clearances from the Ministry of External Affairs and Ministry of Home Affairs, as per guidelines issued from time to time. Registration shall not be given unless political and security clearance have both been received.

E. The Ministry of External Affairs and Ministry of Home Affairs may issue guidelines for internal use regarding the procedure for scrutiny of such applications by them.

F. The decision of the Competent Authority, to register such bidder may be for all kinds of tenders or for a specified type(s) of goods or services, and may be for a specified or unspecified duration of time, as deemed fit. The decision of the Competent Authority shall be final.

G. Registration shall not be granted unless the representatives of the Ministries of Home Affairs and External Affairs on the Committee concur*.

H. Registration granted by the Competent Authority of the Government of India shall be valid not only for procurement by Central Government and its agencies/ public enterprises etc. but **also for procurement by State Governments and their agencies/ public enterprises etc. No fresh registration at the State level shall be required**.

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I. The Competent Authority is empowered to cancel the registration already granted if it determines that there is sufficient cause. Such cancellation by itself, however, will not affect the execution of contracts already awarded. Pending cancellation, it may also suspend the registration of a bidder, and the bidder shall not be eligible to bid in any further tenders during the period of suspension.

J. For national security reasons, the Competent Authority shall not be required to give reasons for rejection / cancellation of registration of a bidder.

K. In transitional cases falling under para 3 of this Order, where it is felt that it will not be practicable to exclude bidders from a country which shares a land border with India, a reference seeking permission to consider such bidders shall be made by the procuring entity to the Competent Authority, giving full information and detailed reasons. The Competent Authority shall decide whether such bidders may be considered, and if so shall follow the procedure laid down in the above paras.

L. Periodic reports on the acceptance/ refusal of registration during the preceding period may be required to be sent to the Cabinet Secretariat. Details will be issued separately in due course by DPIIT.

*Note:

i. In respect of application of this Order to procurement by/ under State Governments, all functions assigned to DPIIT shall be carried out by the State Government concerned through a specific department or authority designated by it. The composition of the Registration Committee shall be as decided by the State Government and paragraph G above shall not apply. However, the requirement of **political and security clearance as per para D shall remain and no registration shall be granted without such clearance**.

ii. Registration granted by State Governments shall be valid only for procurement by the State Government and its agencies/ public enterprises etc. and shall not be valid for procurement in other states or by the Government of India and their agencies/ public enterprises etc.]

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Annex II: Special Cases

A. Till 31st December 2020, procurement of medical supplies directly related to containment of the Covid-19 pandemic shall be exempt from the provisions of this Order.

B. *Bona fide* procurements made through GeM without knowing the country of the bidder till the date fixed by GeM for this purpose, shall not be invalidated by this Order.

C. *Bona fide* small procurements, made without knowing the country of the bidder, shall not be invalidated by this Order.

D. In projects which receive international funding with the approval of the Department of Economic Affairs (DEA), Ministry of Finance, the procurement guidelines applicable to the project shall normally be followed, notwithstanding anything contained in this Order and without reference to the Competent Authority. Exceptions to this shall be decided in consultation with DEA.

E. This Order shall not apply to procurement by Indian missions and by offices of government agencies/ undertakings located outside India.

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Annex III

Model Clause /Certificate to be inserted in tenders etc.

(While adhering to the substance of the Order, procuring entities and GeM are free to appropriately modify the wording of the clause/ certificate based on their past experience, local needs etc.)

Model Clauses for Tenders

I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority.

II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

III. "Bidder from a country which shares a land border with India" for the purpose of this Order means: -
   a. An entity incorporated, established or registered in such a country; or
   b. A subsidiary of an entity incorporated, established or registered in such a country; or
   c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
   d. An entity whose *beneficial owner* is situated in such a country; or
   e. An Indian (or other) agent of such an entity; or
   f. A natural person who is a citizen of such a country; or
   g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

IV. The *beneficial owner* for the purpose of (iii) above will be as under:

   1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.
      Explanation—

      a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company;

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b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;

4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

VI. *[To be inserted in tenders for Works contracts, including Turnkey contracts]* The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

Model Certificate for Tenders (for transitional cases as stated in para 3 of this Order)

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I hereby certify that this bidder is not from such a country and is eligible to be considered."

Model Certificate for Tenders

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the

Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Model Certificate for Tenders for Works involving possibility of sub-contracting

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Model Certificate for GeM:

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this vendor/ bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this vendor/ bidder fulfills all requirements in this regard and is eligible to be considered for procurement on GeM. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

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Annexure- 31(b)

No. F.18/37/2020-PPD
Government of India
Ministry of Finance
Department of Expenditure
Procurement Policy Division
***

512, Lok Nayak Bhawan,
New Delhi. Dated the 8th February 2021

OFFICE MEMORANDUM

Subject: Restrictions under Rule 144 (xi) of the General Financial Rules (GFRs), 2017.

Attention is invited to this Department's Order (Public Procurement No.1) issued vide OM F.No.6/18/2019-PPD dated 23.07.2020. As per para 11 of the Order, in case of Works contracts, including turnkey contracts, contractors shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority. However, no such restriction is stipulated in the Order regarding other procurements i.e. procurement of Goods, Services, etc.

2. This office is in receipt of representations seeking clarification whether it is permitted for the bidders to procure raw material or components/ sub-assemblies or the finished goods etc. from the vendors from the countries sharing land borders with India.

3. In this context following is hereby clarified:

i A bidder is permitted to procure raw material, components, sub-assemblies etc. from the vendors from countries which shares a land border with India. Such vendors will not be required to be registered with the Competent Authority, as it is not regarded as "sub-contracting".
ii However, in case a bidder has proposed to supply finished goods procured directly/ indirectly from the vendors from the countries sharing land border with India, such vendor will be required to be registered with the Competent Authority.

4. This is issued with the approval of Secretary (Expenditure).

Kotluru Narayana Reddy
Deputy Secretary to the Govt. of India
Tel.: 24621305
Email: kn.reddy@gov.in

To

(1) Secretaries of All Ministries/ Departments of Government of India,
(2) Chief Secretaries/ Administrators of Union Territories/ National Capital Territory of Delhi.

Annexure-32

UNDERTAKING TO BE SUBMITTED BY BIDDER (INSTALLATION AGENCY) REGARDING OPGW MANUFACTURER

We, M/s (bidder)……. do hereby undertake to offer OPGW (24/48 fiber) Qty. approx. 4700 km as per technical specification of the tender **TR-20/14,** Section-IV, for **'Replacement of existing G.I. Earth-wire (7/3.66mm) of various EHV transmission lines (4700 km) of CSPTCL by OPGW (24&48 Fiber)** of Chhattisgarh State Power Transmission Company Limited.

We, M/s (Manufacturer of OPGW).....are the manufacturer of OPGW, and we do hereby undertake to supply OPGW (24/48 fiber) Qty. approx. 4700 km. to M/s (bidder)……

The supply OPGW (24/48 fiber) Qty. approx. 4700 km will in no way affect the terms and conditions of the order including the completion period, Payment terms & Prices etc.

Date:
Place:

(1) Seal, address & Signature of Bidder

(2) Seal, address & Signature of OPGW Manufacturer

PRICE BID SCHEDULE – A-1
(SCANNED COPY DULY SIGNED BY BIDDERS TO BE UPLOADED)
SUPPLY OF MATERIALS

REPLACEMENT OF EXISTING G.I. EARTHWIRE (7/3.66mm) OF VARIOUS EHV TRANSMISSION LINES (4700 km) OF CSPTCL BY OPGW (24 & 48 FIBER)

(Amount in Rupees)

S. NO.	PARTICULARS	Unit	Qty.	Unit rate (Ex-works price)	GST @ 18% on Sl. No.5	Freight	GST @ 18% on Sl. No.7	**Total Unit Rate (FORD) = 5+6+7+8**	**Total Amount = Sl. No.4 x Sl.No.9**
1	*2*	*3*	***4***	*5*	*6*	*7*	*8*	*9*	*10*
1	24 Fibre (DWSM) OPGW fibre optic cable	**Km**	**4000**						
2	48 Fibre (DWSM) OPGW fibre optic cable	**Km**	**450**						
3-a	24 Fibre Armoured (DWSM) fibre optic approach cable	**Km**	**350**						
3-b	48 Fibre Armoured (DWSM) fibre optic approach cable	**Km**	**200**						
4	48 fibre ADSS optical Fibre Cable	**Km**	**10**						
5	Hardware Set for above 24 & 48 Fibre OPGW Fibre Optic Cabling including all cable fittings and accessories.								
5-a	Suspension Hardware	**No.**	**11036**						

S. NO.	PARTICULARS	Unit	Qty.	Unit rate (Ex-works price)	GST @ 18% on Sl. No.5	Freight	GST @ 18% on Sl. No.7	**Total Unit Rate (FORD) = 5+6+7+8**	**Total Amount = Sl. No.4 x Sl.No.9**
1	*2*	*3*	***4***	*5*	*6*	*7*	*8*	*9*	*10*
5-b	Tension Hardware	**No.**	**8850**						
6	Vibration Dampers for OPGW	**No.**	**61844**						
7	Inline splice enclosure for 24 fibre with 04 cable inlet (Joint Box)	**No.**	**1381**						
8	Inline splice enclosure for 48 fibre with 04 cable inlet (Joint Box)	**No.**	**158**						
9-a	Hardware Set for 24 Fibre Armoured (DWSM) fibre optic approach cable	**Set**	**350**						
9-b	Hardware Set for 48 Fibre Armoured (DWSM) fibre optic approach cable	**Set**	**200**						
10	Hardware Set for above 48 Fibre ADSS Fibre Optic Cabling including all cable fittings and accessories including Vibration Damper & Joint Box	**Set**	**200**						
11	96 Fibre Indoor type (i.e. 4 sub racks of 24F) rack mounted Fibre Optic Distribution Panel (FODP) including Pigtails and FCPC coupling etc.	**No.**	**110**						
12	Inline splice enclosure for 48F fibre (ADSS Cable) (Joint Box)	**Nos**	**08**						
13	Down lead clamp including loop bracket	**Nos.**	**20000**						
	Total (Rs.)								
Amount in words :- Rupees……									

NOTE:-

1. Please be noted, it is obligatory to quote rates in above prescribed format. In case break-up of ex-works & taxes (GST) etc are not given, the tender bid may be rejected**.**
2. The above quantities are provisional & estimated for comparison of bid. The quantities may vary during actual execution of the work.
3. The rate will be FIRM and no any other charges/duties other than mentioned above will be payable by CSPTCL.
4. The rate should be quoted considering the taxes and duties as per tender clause 3.14.
5. Payment of other taxes/duties/levies/charges which are not described above: The bidder should be aware of the various taxes, duties, levies imposed by the Central Government, State Government / local bodies applicable in the present contract as on the date of TC bid opening.
6. The cess under "Building and other Construction Workers Act, 1996 @ 1% of the cost of supply of materials shall be borne by the contractor which shall be deducted from each bill. **Any variation in this respect within scheduled completion period shall be to the account of CSPTCL.**
7. **Any other new tax: -** I*f any new tax/ duty/ levy is imposed either by central Government or by Stat Govt. / local authorities after the date of opening of T.C. Bid, the same shall be payable by CSPTCL extra within stipulated completion period on production of documentary evidence. However, tax due to increase of Turnover or withdrawal of tax exemption earlier available to the vendor etc. will not be reimbursed.*

Signature : Name : Date : Designation :

PRICE BID SCHEDULE – A-2

(SCANNED COPY DULY SIGNED BY BIDDERS TO BE UPLOADED)

INSTLALATION, TESTING & COMMISSONING OF OPGW ALONGWITH HARDWARE ACCESORIES FOR REPLACEMENT OF EXISTING G.I. EARTHWIRE (7/3.66mm) OF VARIOUS EHV TRANSMISSION LINES (4700 km) OF CSPTCL BY OPGW (24 & 48 FIBER)

(Amount in Rupees)

S.N.	PARTICULARS	Unit	Quantity	Unit rate	GST @ 18% on unit rate	Total Unit Rate = 5+6	Total Amount = Sl. No.4 x Sl.No.7
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	Installation of 24 & 48 Fibre (DWSM) OPGW fibre optic cable in **Live Line / Hot Line** alongwith associated Hardware accessories, Vibration dampers, Joint Boxes (OF enclosure) with Splicing etc. complete in all respect, dismantling of existing G.I. Earthwire and its associated hardwares & accessories, transportation of dismantled material to the site store of CSPTCL :-						
1-a	24 Fibre (DWSM) OPGW fibre optic cable	**Km**	**4000**				
1-b	48 Fibre (DWSM) OPGW fibre optic cable	**Km**	**450**				
2	Installation of 48 fibre ADSS optical Fibre Cable alongwith Hardware accessories, Joint Boxes (OF enclosure) with Splicing etc. complete in all respect.	**Km**	**10**				
3-a	Installation of Approach Fibre Optic Cable of 24 Fibre Armoured (DWSM) alongwith Hardware accessories, complete in all respect.	**Km**	**350**				
3-b	Installation of Approach Fibre Optic Cable of 48 Fibre Armoured (DWSM) alongwith Hardware accessories, complete in all respect.	**Km**	**200**				

S.N.	PARTICULARS	Unit	Quantity	Unit rate	GST @ 18% on unit rate	Total Unit Rate = 5+6	Total Amount = Sl. No.4 x Sl.No.7
4	Installation of 96 Fibre Indoor type (i.e. 4 sub racks of 24F) rack mounted Fibre Optic Distribution Panel (FODP) including Pigtails and FCPC coupling etc.	**No.**	**110**				
	Total:-						

(Rupees _____ _____ _____ _____ _____ _____ _____ only.

NOTE:-

1) Please be noted, it is obligatory to quote rates in above prescribed format. In case break-up of ex-works & taxes (GST) etc are not given, the tender bid may be rejected**.**
2) The cess under "Building and other Construction Workers Act, 1996@ 1% of the cost of construction work shall be borne by the contractor which shall be deducted from each bill. **Any variation in this respect within contractual completion period shall be to the account of CSPTCL.**
3) The above quantities are provisional & estimated for comparison of bid. The quantities may vary during actual execution of the work.
4) The rate will be FIRM and no any other charges/duties other than mentioned above will be payable by CSPTCL.
5) Payment of other taxes/duties/levies/charges which are not described above. : The bidder should be aware of the various taxes, duties, levies imposed by the Central Government, State Government / local bodies applicable in the present contract as on the date of TC bid opening.
6) **Any other new tax: -** I*f any new tax/ duty/ levy is imposed either by central Government or by Stat Govt. / local authorities after the date of opening of T.C. Bid, the same shall be payable by CSPTCL extra within stipulated completion period on production of documentary evidence. However, tax due to increase of Turnover or withdrawal of tax exemption earlier available to the vendor etc. will not be reimbursed*.

Signature : Name : Date : Designation :

PRICE BID SCHEDULE – A-3

(SCANNED COPY DULY SIGNED BY BIDDERS TO BE UPLOADED)

SUPPLY OF SPARE MATERIAL

REPLACEMENT OF EXISTING G.I. EARTHWIRE (7/3.66mm) OF VARIOUS EHV TRANSMISSION LINES (4700 km) OF CSPTCL BY OPGW (24 & 48 FIBER)

(Amount in Rupees)

S. NO.	PARTICULARS	Unit	Qty.	Unit rate (Ex-works price)	GST @ 18% on Sl. No.5	Freight	GST @ 18% on Sl. No.7	**Total Unit Rate (FORD) = 5+6+7+8**	**Total Amount = Sl. No.4 x Sl.No.9**
1	*2*	*3*	***4***	*5*	*6*	*7*	*8*	*9*	*10*
1	24 Fibre (DWSM) OPGW fibre optic cable	**Km**	**200**						
2	48 Fibre (DWSM) OPGW fibre optic cable	**Km**	**50**						
3-a	24 Fibre Armoured (DWSM) fibre optic approach cable	**Km**	**10**						
3-b	48 Fibre Armoured (DWSM) fibre optic approach cable	**Km**	**05**						
4	48 fibre ADSS optical Fibre Cable	**Km**	**05**						
5	Hardware Set for above 24 & 48 Fibre OPGW Fibre Optic Cabling including all cable fittings and accessories.								

S. NO.	PARTICULARS	Unit	Qty.	Unit rate (Ex-works price)	GST @ 18% on Sl. No.5	Freight	GST @ 18% on Sl. No.7	**Total Unit Rate (FORD) = 5+6+7+8**	**Total Amount = Sl. No.4 x Sl.No.9**
1	*2*	*3*	***4***	*5*	*6*	*7*	*8*	*9*	*10*
5-a	Suspension Hardware	**No.**	**300**						
5-b	Tension Hardware	**No.**	**300**						
6	Vibration Dampers for OPGW	**No.**	**1200**						
7	Inline splice enclosure for 24 fibre with 04 cable inlet (Joint Box)	**No.**	**50**						
8	Inline splice enclosure for 48 fibre with 04 cable inlet (Joint Box)	**No.**	**10**						
9	Hardware Set for above 48 Fibre ADSS Fibre Optic Cabling including all cable fittings and accessories including Vibration Damper & Joint Box	**Set**	**25**						
10	96 Fibre Indoor type (i.e. 4 sub racks of 24F) rack mounted Fibre Optic Distribution Panel (FODP) including Pigtails and FCPC coupling etc.	**No.**	**10**						
11	Inline splice enclosure for 48F fibre (ADSS Cable) (Joint Box)	**Nos.**	**05**						
12	Down lead clamp including loop bracket	**Nos.**	**200**						
	Total (Rs.)								

NOTE:-

1. Please be noted, it is obligatory to quote rates in above prescribed format. In case break-up of ex-works & taxes (GST) etc are not given, the tender bid may be rejected**.**

2. The rate will be FIRM and no any other charges/duties other than mentioned above will be payable by CSPTCL.
3. The rate should be quoted considering the taxes and duties as per tender clause 3.14.
4. Payment of other taxes/duties/levies/charges which are not described above: The bidder should be aware of the various taxes, duties, levies imposed by the Central Government, State Government / local bodies applicable in the present contract as on the date of TC bid opening.
5. The cess under "Building and other Construction Workers Act, 1996 @ 1% of the cost of supply of materials shall be borne by the contractor which shall be deducted from each bill. **Any variation in this respect within scheduled completion period shall be to the account of CSPTCL.**
6. **Any other new tax: -** I*f any new tax/ duty/ levy is imposed either by central Government or by Stat Govt. / local authorities after the date of opening of T.C. Bid, the same shall be payable by CSPTCL extra within stipulated completion period on production of documentary evidence. However, tax due to increase of Turnover or withdrawal of tax exemption earlier available to the vendor etc. will not be reimbursed*.

Signature : Name : Date : Designation :

SCHEDULE – A-4

PRICE BID SUMMARY

(SCANNED COPY DULY SIGNED BY BIDDERS TO BE UPLOADED)

REPLACEMENT OF EXISTING G.I. EARTHWIRE (7/3.66mm) OF VARIOUS EHV TRANSMISSION LINES (4700 km) OF CSPTCL BY OPGW (24 & 48 FIBER)

S.N.	PARTICULARS	Schedules	Total Amount
1.	SUPPLY OF MATERIAL	Schedule A-1	
2.	INSTLALATION, TESTING & COMMISSONING	Schedule-A-2	
3.	SUPPLY OF SPARE MATERIAL	Schedule A-3	
	TOTAL AMOUNT		

(IN WORDS RUPEES----------)

Signature : **Name :** **Date :** **Designation :**