DELHI TRANSCO LIMITED

WEB NOTIFICATION

Two Part Domestic Competitive Bidding (DCB) Tender is invited through **e-tendering** system of GNCT of Delhi by Dy. General Manager (T), Contract Business Plan (CBP), Delhi Transco Limited, Room No. 13, Ground Floor, Maintenance Block, Old Indraprastha Power House, Near 220kV Indraprastha Substation, New Delhi-110002 (India), from the experienced companies/ contractors, in the relevant business for the following work:

S. No	Tender Enquiry No.	Name of Work	Estimated Amount (in Rs.)	Earnest Money Deposit (Rs)	Work Completion period	Scheduled Date/Time	
1.	T25R220472	**Package-I:** **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan- Kanjhawala, Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**	**62,75,92,937**	**50,00,000**	18 Months	Date and Time of Start of downloading and submission of the bidding document	13.02.2026 at 03:00 PM
		Package-II: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.**	**11,61,20,124**	**23,22,403**	12 Months	Date and Time of Pre-Bid Conference	20.02.2026 at 11:00 AM
		Package-III: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**	**19,75,26,451**	**39,50,530**	18 Months	Date and Time to close the downloading of the bidding documents	30.03.2026 at 01:30 PM
						Date and Time of Close of submission of bids	30.03.2026 at 01:30 PM
		Package-IV: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**	**43,43,04,078**	**50,00,000**	18 Months	Date and Time of Opening of Techno-Commercial part of bids (Part-I)	30.03.2026 at 03:00 PM

Note:

- Complete Tender documents can be downloaded from the website of Delhi Govt. http://www.govtprocurement.delhi.gov.in (Tender ID No. For Package-I: 2026_DTL_286636_1, For Package-II: 2026_DTL_286640_1, For Package-III: 2026_DTL_286645_1, and For Package-IV- 2026_DTL_286650_1. Tender will be submitted and opened at **Tender Opening Cell, Delhi Transco Limited, Room No. 16, Ground Floor, Maintenance Block, Old Indraprastha Power House, Near 220kV Indraprastha Substation, New Delhi-110002 (India)**.
- The Pre-bid Conference will be held at Conference Hall, 4th Floor, Shakti Sadan, Kotla Road, New Delhi-110002

11.02.2026

DGM (T) Contract Business Plan (CBP), Delhi Transco Limited,
Room No. 13, Ground Floor, Maintenance Block, Old Indraprastha Power House,
New Delhi-110002 (India), Email: dgm.cbp@dtl.gov.in

DELHI TRANSCO LTD

(A Government of NCT of Delhi Undertaking)

Bidding Documents

For

Package-I: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Package-II: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.**

Package-III: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Package-IV: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Volume – I, II & III

Tender No: T25R220472

DELHI TRANSCO LTD

(A Government of NCT of Delhi Undertaking)

Bidding Documents

For

Package-I: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

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Package-IV: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Volume – I

Tender No: T25R220472

VOLUME-I

CONDITIONS OF CONTRACT

CONTENTS

Section - I	**Invitation for Bid (IFB)**
Section - II	**Instruction to Bidders (ITB)**
Section - III	**Bid Data Sheet (BDS)**
Section - IV	**Conditions of Contract (CC)**
Section –V	**Special Conditions of Contract (SCC)**
Section - VI	**Forms and Procedures (F&P)**

SECTION – I

INVITATION FOR BID (IFB)

DELHI TRANSCO LIMITED

(A Government of NCT of Delhi Undertaking)

INVITATION FOR BID (IFB)

(DOMESTIC COMPETITIVE BIDDING)

Tender is invited in Two-part Bid system (i.e. Technical bid and Price bid) through e- procurement portal of **Delhi Govt.** by **DGM (T) Contract Business Plan (CBP), Delhi Transco Limited, Room No. 13, Ground Floor, Maintenance Block, Old Indraprastha Power House, Near 220kV Indraprastha Substation, New Delhi-110002 (India),** from eligible bidders who have registered with e- procurement portal of GNCTD and have obtained digital signature.

Tender Name	Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan- Kanjhawala, Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis. Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis. Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis. Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.
Tender Enquiry No.	**Tender No: T25R220472**
Bid Security (BS) in Rs.	Package-I : **50,00,000/-** Package-II : **23,22,403/-/-** Package-III **: 39,50,530/-** Package-IV : **50,00,000/-**
Tender Fee	**Nil**
Bid Validity	180 days from the date of bid opening.

Estimated Amount (in Rs.)	Package-I : **Rs. 62,75,92,937/-** (Rs. Sixty Two Crore Seventy Five Lakh Ninety Two Thousand Nine Hundred Thirty Seven Only) Package-II : **Rs. 11,61,20,124 /-** (Rs. Eleven Crore Sixty One Lakh Twenty Thousand One Hundred Twenty Four Only), Package-III : **Rs. 19,75,26,451/-** (Rs. Nineteen Crore Seventy Five Lakh Twenty Six Thousand Four Hundred and Fifty One Only) Package-IV : **Rs. 43,43,04,078/-** (Rs. Forty Three Crore Forty Three Lakh Four Thousand and Seventy Eight Only)		
Completion Period	Package I: 18 Months Package II: 12 Months Package III: 18 Months Package-IV: 18 Months		
		DATE	TIME
Date and Time of Start of downloading of the bidding document		As per Webnotification	
Date and Time of Close of downloading of the bidding document			
Date and time of Pre-Bid Conference			
Date and time of start of submission of bids			
Date and Time of Close of submission of bids			
Date and Time of Opening of Techno-Commercial part of bids (Part-I)			

For details please visit web site www.dtl.gov.in (unique No.…….) Tender can only be submitted on e-tendering portal of Delhi Govt. website https://govtprocurement.delhi.gov.in or may contact office of **DGM (T) Contract Business Plan (CBP), Delhi Transco Limited, Room No. 13, Ground Floor, Maintenance Block, Old Indraprastha Power House, Near 220kV Indraprastha Substation, New Delhi-110002 (India), Phone: 23230026, Fax No. 011-23232721, Email: dgm.cbp@dtl.gov.in.** The Pre-Bid conference will be held at conference hall, 4th floor, Shakti Sadan, Kotla Road, New Delhi-110002. Date and time of Pre-Bid Conference……

General requirements for invitation of bids are as under:

1.0 **DELHI TRANSCO LIMITED** invites tenders for the aforesaid Package- I,II,III and IV, in Two-part Bid system (i.e. Techno-Commercial and Price bid) through e-procurement portal from eligible bidders who are registered **at e-procurement portal of Delhi Govt. website i.e. http://www.govtprocurement.delhi.gov.in** and have obtained digital signature.

1.1 Bidding Documents are available for downloading date and time mentioned in the web notification.

1.2 No Margn of purchase preference shall be given.

1.3 The submission of bids date and time has been mentioned in the web notification. Bids shall be received up to date and time mentioned in the web notification and Techno- Commercial Bid (Part-I) shall be opened on the same day through e-procurement portal of Delhi Govt. website **i.e. https://govtprocurement.delhi.gov.in** in the presence of Bidder's representative who chose to attend at the address given below:-

Tender Opening Cell,
Delhi Transco Limited,
Room No. 16, Ground Floor,
Maintenance Block, Old Indraprastha Power House,
Near 220kV Indraprastha Substation,
New Delhi-110002 (India),
Email: dgm.cbp@dtl.gov.in

1.4 In case any of the above dates are declared holiday/ closing day, these shall be extended to next working day.

1.5 The complete Bidding Documents including tender drawings are available on DTL website https://www.dtl.gov.in and Delhi Govt. website **http://govtprocurement.delhi.gov.in**

1.6 The Qualifying Requirements are given in the bidding document of the subject Package- I, II, III and IV. In addition to submission of scanned copies of mandatory documents through e-procurement portal, the bidder shall also submit (02) two copies of the bid in Book Bonded form, clearly marking each "Original Bid" and "Copy of bid" including, the signed hard copies of all relevant pre-qualification documents being submitted in support of Bid (all Forms, Annexures etc. Experience certificate, supporting documents copies, type test reports, Guaranteed Technical Particulars and any other documents required as per the bidding document etc.) at least one and half hour before the time of bid opening in the **Tender Opening Cell, Delhi Transco Limited, Room No. 16, Ground Floor, Maintenance Block, Old Indraprastha Power House, Near 220kV Indraprastha Substation, New Delhi-110002 (India).** In the event of any discrepancy between original and copy of the hard bid, the original shall govern. Also in the event of any discrepancy between online bidding documents and the hard copy of the bid, the online bid shall govern. **The Price Bid (Part-II) shall not be submitted in hard copy and shall only be uploaded on e-portal of Delhi Govt. website.**

1.7 All bids must be accompanied by Bid Security amount mentioned in the web notification as per cl. No. 23 of Section ITB, Volume-I of the bidding document. The Scanned copy of Bid Security is to be submitted with online bid; however, the Bid Security in original shall be submitted in the **Tender Opening Cell, Delhi Transco Limited Room No. 16, Ground Floor, Maintenance Block, Old Indraprastha Power House, Near 220kV Indraprastha Substation, New Delhi-110002 (India)**, at least one and half hour before the time of bid opening, failing which the bids shall be rejected.

1.8 The Techno- Commercial Bid (Part-I) so opened shall be evaluated and the date of opening of the Price Bid (Part-II) of the techno-commercially successful bidders shall only be communicated to all techno commercially successful bidders.

1.9 Bidders are permitted to quote for one or all package(s). Multi-package rebate(s) offered if any,

shall be considered in evaluation. Based on such evaluation, award of contracts would be made to one or more bidder(s) for one or all package(s) on the basis of least evaluated cost to the Purchaser.

2.0 Delhi Transco Limited shall not be responsible for any postal delays in respect of request for issuance of bidding documents and/or dispatch of bidding documents and/or submission of bids.

2.1 Delhi Transco limited reserves the right to cancel/withdraw this invitation to bids without assigning any reason and shall bear no liability whatsoever consequent upon such a decision.

2.2 All correspondence/ communication regarding the NIT shall be made to: **DGM (T) Contract Business Plan (CBP), Delhi Transco Limited, Room No. 13, Ground Floor, Maintenance Block, Old Indraprastha Power House, Near 220kV Indraprastha Substation, New Delhi-110002 (India), Phone: 23230026, Fax No. 011-23232721, Email: dgm.cbp@dtl.gov.in**.

2.3 Integrity Pact must be submitted alongwith the bid in physical form at the address given at para 1.7 above.

2.4 Under the Integrity Pact Program (IPP), Shri Umakant Lal & Shri Ashok Kumar Garg shall be the Independent External Monitor for the subject package. Correspondence, if any, to the IEM be addressed to the following:

S.No	Name	Email id
1.	Shri Umakant Lal	Umakantlal@yahoo.co.in
2.	Shri Ashok Kumar Garg	Akgarg1654@gmail.com

DGM (T) CBP

SECTION-II

INSTRUCTION TO BIDDER (ITB)

SECTION- II

INSTRUCTION TO BIDDERS (ITB)

A. INTRODUCTION

1.0 GENERAL INFORMATION

1.1 Delhi Transco Limited (hereinafter called **'DTL'/ 'Owner'/'Employer'**) will receive bids in respect of equipment to be furnished and erected as set-forth in the accompanying Specifications. All bids shall be prepared and submitted in accordance with these instructions.

1.2 **Eligibility of bidders**

Bids can be submitted by firms: -

1.2.1 From within India including company (ies) registered and incorporated in India as per Companies Act, 2013 barring foreign bidders/MNCs not registered and incorporated in India and those bidders with whom business is banned by DTL and

1.2.2 Only 'Class-I local supplier' shall be eligible to bid as per MoP order dt. **16.11.2021** read in conjunction with PPP-MII order dt 16.09.2020 with latest amendment if any

1.2.3 Any bidder from a country which shares a land border with India **and any bidder (including an Indian bidder) who has a Specified Transfer of Technology (ToT) arrangement with an entity from a country which shares a land border with India** will be eligible to bid only if bidder is registered with a competent authority and the registration should be valid at the time of submission of bid and at the time of acceptance of bid as per Ministry of Finance order no- **F.No.7/10/2021-PPD(1) dt 23.02.2023** and their latest amendment thereof.

2.0 QUALIFYING REQUIREMENTS OF BIDDERS

2.1 The Qualifying Requirements for the Bidders are given in **Annexure-A (BDS)** to this Volume-I of the Bidding Documents.

2.2 The above stated requirements are a minimum and the Owner reserves the right to request for any additional information and also reserves the right to reject the Proposal of any Bidder, if in the opinion of the Owner, the qualification data is incomplete or the Bidder is found not qualified to satisfactorily perform the contract.

3.0 COST OF BIDDING

3.1 The bidder shall bear all costs and expenses associated with preparation and submission of its bid including post-bid discussion, technical and other presentations etc., and the Owner will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

B. THE BIDDING DOCUMENTS

4.0 CONTENTS OF BIDDING DOCUMENT

4.1 The goods and services required, bidding procedures and Contract terms are prescribed in the Bidding Document.

In addition to the Invitation For Bids, the Bidding Document is a compilation of the following sections:

Volume - I: Conditions of Contract

i)	Section-I	Invitation For Bid (IFB)
ii)	Section-II	Instructions to Bidders (ITB)
iii)	Section-III	Bid Data Sheets (BDS)
iv)	Section-IV	Conditions of Contract (CC)
v)	Section-V	Special Conditions of Contract (SCC)
vi)	Section-VI	Forms and Procedures (F&P)

Volume -II: Technical Specification

Volume -III: Bid Form, Attachments, GTP & Price Schedules

Section I	Bid Form
Section II	Attachments
Section III	GTP
Section IV	Price Schedules

5.0 UNDERSTANDING OF BID DOCUMENTS

5.1 A prospective Bidder is expected to examine all instructions, forms, terms, specifications and all other information in the Bid documents and fully inform himself as to all the conditions and matters which may in any way affect the scope of work or the cost thereof. Failure to furnish all information required by the Bid document or submission of a Bid not substantially responsive to the Bid document in every respect will be at the Bidder's risk and may result in the rejection of its bid.

6.0 CLARIFICATIONS ON BID DOCUMENTS

6.1 A prospective Bidder finding discrepancies or omissions, in specifications and document or is in doubt as to the true meaning of any part; they shall at once make a request, in writing or by electronic media (hereinafter, the term cable is deemed to include Electronic Data Interchange (EDI) or telefax) at the Employer's mailing address indicated below interpretation/ clarification, to the Owner. The owner, then, will issue interpretation(s) and clarification(s) as he may think fit in writing. After receipt of such interpretation(s) and clarification(s), the Bidder may submit his bid but within the time and date as specified in the invitation for bid. All such interpretations and clarifications shall form a part of the biding document and shall accompany the Bidder's proposal. A prospective Bidder requiring any clarification on bidding document may notify the owner in writing. The Employer will respond in writing to any request for clarification or modification of the bidding documents that it receives within 15 days after appearing in the web site. Written copies of the owner's response (including an explanation of the query but without identifying its source) will be uploaded on the website as the part of bidding documents.

(*Address of Employer, telephone, facsimile numbers & E-mail address: (Refer BDS)*

6.2 Verbal clarification and information given by the owner or his employee(s) or his representative (s) shall not in any way be binding on the owner.

6.3 The Bidder is advised to visit and examine the site, where the facilities are to be installed and its surroundings and obtain for itself on its own responsibility, all information that may be necessary, for preparing the bid and entering into a contract for supply and installation of the facilities. The costs of visiting the site shall be at the Bidder's own expense.

6.4 The Bidder and any of its personnel or designated representative will be granted permission by the facilities incharge to enter upon its premises and lands for the purpose of such inspection, but only upon the express condition that the Bidder, its personnel and designated representative will release and indemnify the facilities incharge and its personnel and designated representative from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of the inspection.

6.5 The Bidder's designated representative(s) is/are invited to attend pre-bid meeting, which, if convened, will take place at the venue and time stipulated in the BDS.

The purpose of the conference will be to clarify any issues regarding the Bidding Documents in general and the Technical Specifications in particular. The bidder is required to submit questions in writing or by cable to reach the Employer at the address indicated in **BDS**, two days before the pre-bid conference i.e. …. (as per web notification and relevant corrigendum)

Any modifications of the Bidding Documents which may become necessary as a result of the pre-bid conference shall be made by the Employer exclusively through an amendment pursuant to **ITB Clause 7.0** and not through the record notes of the pre-bid conference.

Non-attendance at the pre-bid conference will not be a cause for disqualification of a bidder.

7.0 AMENDMENT TO BIDDING DOCUMENT

7.1 At any time prior to the deadline for submission of bids, the owner may, for any reason, whether as its own initiative or in response to a clarification requested by a prospective Bidder, modify the bidding document by amendment(s).

7.2 Each Amendment will be posted on owners as well as on Delhi Govt. website. The owner will not be responsible for checking the website by the bidder for the same in time or otherwise. It will be considered that the information contained therein will have been taken into account by the Bidder in its bid.

7.3 In order to afford prospective Bidders reasonable time in which to take the amendment into account in preparing their bids, the owner may, at its discretion, extend the deadline for the submission of bids.

7.4 Such amendments, clarification, etc, shall be binding on the Bidders and will be given due consideration by the Bidders while they submit their bids and invariably enclose such documents as a part of the bid.

C. PREPARATION OF BIDS

8.0 Language of Bid

8.1 The bid prepared by the bidder and all correspondence and documents relating to the bid, exchanged by the owner and the bidder shall be written in the English language, provided that any printed literature furnished by the Bidder may be written in another language so long as accompanied by an English translation of its pertinent passages. Failure to comply with this may disqualify a bid. For purposes of interpretation of the bid, the English translation shall govern.

9.0 LOCAL CONDITIONS

9.1 It will be imperative on each bidder to fully inform himself of all local conditions and factors which may have any effect on the execution of the contract covered under these documents and specification. The owner shall not entertain any request for clarifications from the Bidders, regarding such local conditions.

9.2 It must be understood and agreed that such factors have properly been investigated and considered while submitting the proposals. No claim for financial adjustment to the contract awarded under these specifications and documents will be entertained by the owner. Neither any change in the time schedule of the contract nor any financial adjustments arising thereof shall be permitted by the owner, which are based on the lack of such clear information or its effect on the cost of the Works to the Bidder.

10.0 DOCUMENTS COMPRISING THE BID

10.1 The bidder shall complete the Bid form inclusive of Price Schedules, Technical Data requirements etc. furnished in the Bidding Documents, indicating for the goods to be supplied and services to be rendered, a brief description of goods and services, quantity and prices.

10.2 The bidder shall also submit documentary evidence to establish that the Bidder meets the Qualification Requirements (QR) as detailed in Bid data sheets (BDS)

10.3 The Bid Security shall be furnished in a separate cover in accordance with clause 23.0 of Section ITB.

Each Bidder shall submit with its bid the following Attachments:

(a) **Attachment 1: Bid Security**

A bid security furnished in accordance with ITB Clause 23.

(b) **Attachment 2: Power of Attorney**

A power of attorney, duly authorized by a Notary Public, indicating that the person(s) signing the bid has the authority to sign the bid and thus that the bid is binding upon the Bidder during the full period of its validity in accordance with ITB Clause 24.

(c) **Attachment 3: Bidder's Eligibility and Qualifications**

In the absence of prequalification, documentary evidence that the Bidder is eligible to bid in accordance with ITB Cl 1.2, Section BDS and is qualified to perform the contract if its bid is accepted.

The documentary evidence of the Bidder's qualifications to perform the contract, if its bid is accepted, shall establish to the Employer's satisfaction that the Bidder has the financial, technical, production, procurement, shipping, installation and other capabilities necessary to perform the contract, and, in particular, meets the experience and other criteria outlined in the Qualification Requirement & ITB.

Bidders to qualify for more than one package, their financial position i.e. MAAT & LA shall not be less than the sum of the requirement of MAAT & LA for the packages they propose to qualify for.

Qualification requirements for bidders are enclosed as Annexure-A, Section BDS

(d) **Attachment 4: Subcontractors Proposed by the Bidder**

The Bidder shall include in its bid details of all major items of supply or services, that it proposes to purchase and shall give details of the name and nationality of the proposed Subcontractor, including vendors, for each of those items. Bidders are free to list more than one Subcontractor against each item of the facilities. Quoted rates and prices will be deemed to apply to whichever Subcontractor is appointed, and no adjustment of the rates and prices will be permitted.

Vendors hired by the erector or the manufacturer or the lead player, shall be selected on considerations of quality and economy and DTL reserves the right to seek information in relation to any such vendor proposed to be hired by the erector or manufacturer or lead player. Subletting of either whole or part of the contract by the contractor, hired by DTL shall not be permissible.

The Employer reserves the right to delete any proposed Subcontractor from the list prior to award of contract, and after discussion between the Employer and the Contractor, attachment-4 to the form of Contract Agreement shall be completed, listing the approved Subcontractors for each item.

(e) **Attachment 5: Commercial Deviations**

In order to facilitate evaluation of bids, deviations, if any, from the Terms & Conditions Commercial Deviations Specifications shall be listed in Attachment 5 for Techno commercial Bid.

(f) **Attachment 6: Deviation on Important condition.**

In order to facilitate evaluation of bids, deviations on Important Condition shall be listed in Attachment 6 for important condition of Bid.

(g) **Attachment 7: Technical Deviation.**

In order to facilitate evaluation of bids, deviations, if any on technical specifications shall be listed in Attachment 7 for Techno commercial Bid.

(h) **Attachment 8: Additional Information**

In order to facilitate evaluation of bids, if any additional Information on technical/commercial specifications shall be listed in Attachment 8 for Techno commercial Bid.

(i) **Attachment 9: Bought-out & Sub-Contracted Item**

(j) **Attachment 10: Work Completion Attachment**

(k) **Attachment 11: List of Special Tools & Tackles**

(l) **Attachment 12: Information regarding ex-employees of Employer in Bidder's firm.**

(m) **Attachment 13: Deleted.**

(n) **Attachment 14: Price Adjustment Data**

(o) **Attachment 15: Guarantee Declaration**

(p) **Attachment 16: Integrity Pact**

Integrity Pact *(submission of Hard Copy in 'Original')*
The Bidder shall complete the accompanying Integrity Pact, which shall be applicable for bidding as well as contract execution, duly signed on each page by the person signing the bid and shall be returned by the Bidder in two (2) originals along with the Techno - Commercial Part in a separate envelope, duly superscripted with 'Integrity Pact'. "The Bidder shall submit the Integrity Pact on a non judicial stamp paper of Rs. 100/-.

The required format for Integrity Pact shall be as per Attachment 16.

If the Bidder is a partnership firm or a consortium, the Integrity Pact shall be signed by all the partners or consortium members.

Integrity Pact must be submitted in physical form at the address given at ITB 25.0 at or before the schedule time and date of opening of Techno-commercial part of the bid.

Bidder's failure to submit the Integrity Pact duly signed in Original alongwith the Bid or subsequently pursuant to ITB Sub-Clause 27.6 shall lead to outright rejection of the Bid.

Bidder shall not approach the court while representing the matters to IEMs and bidder will await their decision in the matter.

(q) **Attachment 17: Deleted**

(r) **Attachment 18: Checklist**

(Bidder shall submit the information regarding documents submitted by them in the offer as per the checklist provided in Attachment)

(s) **Attachment 19:** Affidavit of Self certification regarding Local Content in line with PPP-MII order (submission of Hard Copy in 'Original'), to be submitted on a non-judicial stamp paper of Rs. 100/-.

In line with the MOP order dt. **16.11.2021** read in conjunction with PPP-MII order dt 16.09.2020 & their latest amendments thereof, 'Class-I local supplier' shall be required to indicate percentage of local content and submit self-certification, in original, certifying that the item offered meets the local content requirement for 'Class-I local supplier' and shall also give details of the location(s) at which the local value addition is made, as prescribed in the PPP-MII Order dt 16.09.2020 & their latest amendments thereof, on a non-judicial stamp paper of Rs. 100/-.

Any False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law.

(t) **Attachment 20:** Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with PPP-MII order and MoP Order, as applicable (submission of Hard Copy in 'Original') to be submitted on the letter head of the auditor/ cost accountant.

In line with the MOP order dt. **16.11.2021** read in conjunction with PPP-MII order dated 16.09.2020 & their latest amendments thereof, the 'Class-I local supplier' shall submit certificate on the letter head of the auditor/cost accountant from the statutory auditor or cost auditor of the company giving the percentage of local content.

Any False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law

(u) Attachment 21: Undertaking for not indulging in Corrupt & Fraudulent practice

It shall be the sole responsibility of bidder to provide the information based on the documents submitted by them.

(v) Attachment 22: Certification by the Bidder as per DoE Order no- **F.No.7/10/2021-PPD(1) dt 23.02.2023** in line with ITB Clause 1.2.2 (In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture).

Any false certificate given by a bidder whose bid is accepted will let to immediate termination and further legal action in accordance with law.

(w) Attachment 23: Details of Type test Report as per QR in accordance with latest IEC/NIT

(x) Attachment 24: Indemnity Bond

11.0 SCOPE OF THE PROPOSAL

11.1 The scope of the work covered under this package shall be on the basis of a single Bidder's responsibility, completely covering all the equipment specified under the section Project, Volume-II. It will include the following: -

a. Complete manufacture including shop testing.
b. Providing Engineering drawing, data, operational manual, etc for the Owner's approval.
c. Packing and transportation from the manufacturer's works to the site.
d. Receipt, storage, preservation and conservation of equipment at the site.
e. Pre-assembly, if any, erection, testing and commissioning of all equipment.
f. Reliability tests and performance and guarantee tests on completion of commissioning and
g. Furnishing of spares, if applicable.

The above scope of work is indicative and the complete scope of work is defined in section project, Volume-II of this tender document.

11.2 Bids containing deviations from critical provisions relating to (i) to (xi) below will be considered as non responsive:

(i) Governing Laws, Clause 5, CC
(ii) Settlement of Disputes, Clause 6, CC
(iii) Taxes and Duties, Clause 14, CC

(iv) Appendix 2 to the Form of Contract Agreement (Price Adjustment): Clause No. 15 ITB.
(v) Bid Security: Clause 23.0, Section ITB Volume-I, conditions of contract
(vi) Contract Performance Guarantee: Clause 43.0, Section ITB, Volume-I, Conditions of Contract.
(vii) Liquidated Damages & (Functional Guarantee): Clause 28 & 28.5 CC
(viii) Defect Liability: Clause No. 27 CC
(ix) Price Basis and Payment: Clause No.12 CC and Clause 14 Section ITB
(x) Completion Time : Section F&P Appendix-4
(xi) Patent Indemnity, Clause No.29, CC

However, the Bidders, wishing to propose deviations to any of the above provisions, must provide in the Commercial Deviations Attachment of Bid Form in their bid alongwith the cost of withdrawal of such deviations. If the deviation to any of these provisions is not priced, the bid will be rejected. The evaluated cost of the bid shall include, in addition to the cost described in Price schedule, the cost of withdrawal of the deviations from the above provisions to make the bid fully compliant with these provisions.

Bidders are also required to quote the price for Commercial, contractual and Technical obligations outlined in the bidding document. If a Bidder wishes to make a deviation, such deviation shall be listed in deviation Attachment of Volume-III. The Bidder shall also provide additional price, if any, for withdrawal of the deviations. If the deviation to any of these provisions is not priced, the bid will be rejected.

At the time of Award of Contract, if so desired by the owner, the Bidder shall withdraw these deviations listed in commercial deviation Attachment of Bid Form in their Bid at the cost of withdrawal stated by him in the bid. In case the Bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid, his bid will be rejected and his bid security forfeited.

The owner's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

11.3 Bids not covering the above entire scope of works may be treated as incomplete and hence rejected.

12.0 BID PRICE

12.1 The Bidder shall quote in the appropriate Attachment of Bid form lump-sum price for the entire scope of works (covered under the Bidding document) and also the unit rates of the goods and services.

12.2 The Bid price under the contract shall be on a firm price basis, unless otherwise specified in the conditions of contract.

12.3 The Bidder shall also furnish the price break-up in the appropriate Attachments of bid form to indicate the following:

i. Ex-works price of the equipment/materials (including tools and tackles etc.)
ii. Charges for transportation and insurance for delivery of the equipment/ materials up to their final destinations.

iii. Lump-sum charges towards unloading, storage, insurance, erection, testing & commissioning, exclusive of taxes and duties as per GST.
iv. Price break-up for spares, if applicable, in line with clause 17.0 of this section.
v. Taxes and duties and any other levies legally payable on the transactions between the owner and the Bidder.
vi. Any other charges as per the requirement of conditions of contract/Technical specifications.

12.4 Bidder can effect reductions in the prices already filled up in Price Schedules by way of discounts. Bidder can offer the discount either on lump sum basis or percent basis, which can be made applicable either on the total price or one or more of the price schedule(s).

The Bidder may note that in case they choose to offer multiple discounts, all discounts shall be applicable simultaneously on the base prices of respective items on which the bidder has offered the discount(s) i.e., all the discounts shall be considered together on the Quoted Prices of such items (as quoted by the bidder without discount).

12.5 Examination of the bid shall be in accordance to Clause 34 of Section ITB.

13.0 ALTERNATE PROPOSALS

13.1 Based on their experience, capabilities, patented research, and development works etc., the bidder may, in addition to a base proposal, offer alternate proposal(s), for reasons of economy or better performance. But in all such cases, the base proposal shall be strictly in line with the requirements as stipulated in the bidding documents and only such base proposal shall be considered for the purposes of evaluation of the proposals. Should the bid by the successful bidder contain such alternate proposal then the owner at its discretion may accept the same at the time of award of contract.

14.0 PRICE BASIS AND PAYMENTS

14.1 The bidders shall quote in their proposals lump-sum price for the entire scope of works covered under section Project, Volume-II as required in the Bid Forms on a firm price basis unless otherwise specified in the Conditions of Contract. Bidders quoting a system of pricing other than that specified run the risk of rejection.

14.2 Bidder shall indicate bid prices in Indian Rupees only.

15.0 PRICE ADJUSTMENT: Refer BDS

16.0 TIME SCHEDULE

16.1 The basic consideration and the essence of the contract shall be strict adherence to the time schedule for performing the specified works.

16.2 The Owner's requirements of completion schedule for the works are mentioned in the accompanying conditions of contract.

16.3 The completion schedule as stated in the Conditions of Contract shall be one of the major factors in consideration of the bids.

16.4 The Owner reserves the right to request for a change in the work schedule during pre-award discussions with successful Bidder.

16.5 The Successful Bidder will be required to prepare detailed PERT network and finalize the same with the Owner as per the requirement of Clause 18.0, Section CC, Vol-I.

17.0 SPARE PARTS

17.1 In case where it is mandatory for the bidders to quote for certain identified spare parts, the same are included in the accompanying Technical Specifications. In such cases the item wise price breakdown of such spares on an Ex-works basis shall be indicated in the bid. The Bidder shall further indicate item wise price break-up on FOR site basis. In respect of Taxes, the provisions of Clause 14.0 CC shall be applicable. The above prices shall not be included in the lump-sum price but indicated separately in the Attachments and shall not be subject to escalation. The prices quoted for these spares will be taken into account for evaluation. The owner, however, reserves the right to vary the quantity of any of the spare and/or to delete any items of spares altogether or add new items of spares during award/detailed engineering stage limited to a period of six (6) months from date of contract unless such period is specified otherwise in conditions of contract at the unit rate agreed to in the contract or to be agreed mutually in case unit rates are not identified in the Bid/Contract.

17.2 In addition, the Bidder shall provide in the form of Attachment given in Bid Forms, the complete list of recommended spare parts for three (3) years operation of the equipment covered under the Proposal. In the list of recommended spare parts, the bidder shall identify the unit-wise population of each of the items recommended and anticipated normal life of the spare. Such list will also indicate the prices on FOR destination site basis for each item. No other basis of prices will be quoted. The prices of these spare parts shall be on firm price basis and shall remain valid till 120 days after the date on which the validity of the main bid expires. The prices of the spare parts thus quoted shall not be taken into consideration for the purpose of evaluation. Other relevant terms and conditions of these documents shall also be applicable to such spare parts.

17.3 Spare parts list will be used by the owner to decide about the spares to be procured against his spares requirement for equipment quoted. The quantities of the spares to be procured shall be decided by the owner and the Bidder shall furnish all those spares ordered.

17.4 In case where no mandatory spares are indicated, the Bidder shall comply with the requirement indicated in Clause 17.2 through 17.3 above.

18.0 CONTRACT QUALITY ASSURANCE

18.1 The Bidder shall include in his Proposal the Quality Assurance Programme containing the overall quality management and procedures, which he proposes to follow in the performance of the works during various phases as detailed in relevant clause of the General Technical Conditions.

18.2 At the time of Award of Contract, the detailed Quality Assurance Programme to be followed for the execution of the contract will be mutually discussed and agreed to and such agreed Programme shall form a part of the Contract.

19.0 INSURANCE

19.1 The Bidder's insurance liabilities pertaining to the scope of works are detailed out in Clauses titled 'Insurance' in Conditions of Contract (CC) of this Volume- I. Bidder's attention is specifically invited to these clauses. Bid price shall include all the cost in pursuance of fulfilling all the insurance liabilities under the Contract.

20.0 MAINTENANCE TOOLS AND TACKLES

The Proposal shall include all special tools and tackles required for the operation and maintenance of the equipment in each equipment package. The Bidder shall indicate all the above items in the Proposal sheets in the form of an Attachment given there in and the description and the quantity of each item. The lump sum price to be quoted by the Bidder shall include prices of these tools and tackles. These tools and tackles shall be delivered at site along with the last consignment of equipment and in no case earlier than this, unless otherwise specified in the Conditions of Contract and /or Technical Specifications, Volume-II.

21.0 ERECTION TOOLS & TACKLES

The Bidder, under a separate Attachment, in his Proposal shall include a list of all special equipment, tools & tackles etc. which he proposes to bring to site for the purpose of erection, handling, testing and commissioning including performance & guarantee tests of the equipment. If any such equipment is listed anywhere else in the Proposal and not specially mentioned in the above Attachment, it shall be deemed to have been included in the Bidder's proposed scope of supply.

22.0 BRAND NAMES

22.1 The specific reference in these specifications and documents to any Material / Equipment by brand name, make or catalogue number shall be construed as establishing standards of quality and performance and not as limiting competition. However, Bidders may offer other similar material/equipment provided they meet the specified standard, design and performance requirements. The Bidder shall furnish adequate technical information about such alternative material/equipment to enable the owner to determine its acceptability. The Owner shall be the sole judge on the acceptability or other wise of such alternative material/equipment.

22.2 The Bidder shall note that standards for workmanship, material and equipment and reference to brand names or catalogue numbers designated by the Owner in its Technical Specifications are intended to be descriptive only and not restrictive. The Bidder may substitute alternative standards, brand name and/or catalogue numbers in its bid, provided that it demonstrates to the Owner's satisfaction that the substitutions are substantially equivalent or superior to those designed in the Technical Specifications.

23.0 BID SECURITY

23.1 The Bidder shall furnish, as part of its bid, Bid Security for an amount as specified in the **BDS** Bid security shall be valid for 60 days beyond validity of the bid.

23.2 The Bid Security is required to protect the Owner against the risk of Bidder's conduct, which would warrant the guarantee forfeiture, pursuant to Clause 23.7. The Bid Security shall be made payable to the Owner without any condition whatsoever.

23.3 The Bid Security shall be denominated in Indian Rupees only and shall be in one of the following forms:

(a) DD/Pay Order/FD/Insurance Surety Bonds receipt in favour of Delhi Transco Limited New Delhi, payable at New Delhi, from a Scheduled Commercial Bank.

(b) E-payment from the account of the bidder. The detail of DTL's Bank account is as under:

Name	Delhi Transco Ltd.
Name of Bank with Address	**SBI, Chandni Chowk Delhi.**
Current Account No.	**10820056547**
Codes	**RTGS/IFSC No: SBIN0000631** **MICR No: 110002018**

(c) An irrevocable Bank Guarantee **(including e- Bank Guarantee)** issued by a Scheduled Commercial Bank in favour of Delhi Transco Limited, New Delhi & BG (Bank Guarantee) should be valid for minimum **240 days** from date of opening of tender. Performa for the Bank Guarantee is enclosed as Form-2, Section Forms & Procedure to this Volume-I.

23.4 Any bid not secured in accordance with paras 23.1 and 23.3 above will be rejected by the Owner as non-responsive.

23.5 EMD/Bid Security may be returned to bidders (except L-1 bidder), after opening of price bids and recommendation of L-1 bidder for award/negotiation.

23.6 The successful Bidder's Bid Security will be discharged /returned upon the Bidder's executing the Contract and furnishing the Performance Security/ Guarantee pursuant to Clause 43.0 of ITB. The amount of Bid Security in whole or any part thereof is liable to be forfeited due to its non submission of performance security/guarantee or non-execution of contract.

23.7 The Bid Security may be forfeited:

a) If a Bidder withdraws/modifies his bid after opening during the period of bid validity specified by the Bidder on the Bid Form;

or

In case the Bidder does not withdraw the deviations proposed by him, if any, even after considering the cost of withdrawal stated by him in the bid;

or

If a Bidder does not accept the corrections to its bid price pursuant to Clause 35.0, A and B, Section-ITB;

or

If, as per the Qualifying Requirements the Bidder has to submit a Deed of Joint Undertaking (if any) and bidder fails to submit the same, duly attested by Notary Public of the place(s) of the respective executant (s) or registered with the Indian Embassy/ High Commission in that country, within ten days from the date of intimation of pre-award discussion.

b) In case of a successful Bidder, if the Bidder fails within the specified time limit,

(i) to sign the Contract, in accordance with NIT.

or

(ii) to furnish the Performance Security/ Guarantee, in accordance with NIT.

23.8 The Scanned copy of Bid Security is to be submitted with online bid, however, the Bid Security shall be submitted in separate sealed envelope in one original and two copies in the Tender Opening Cell *[(Refer BDS)]* at least one and half hour before the time of bid opening.

Any bid not accompanied by the required bid security in accordance with provisions of this clause will be rejected by the Owner and bid shall not be opened.

23.9 No interest shall be payable by the Owner on the above Bid Security.

23.10 Bid security is required from all the bidders except Startups, Micro and Small Enterprises (MSEs)/NSIC registered firms as notified by Department of Micro, Small and Medium Enterprises (MSME) and OEM/OES from Govt. organization/PSU.

23.11 Unsuccessful Bidder's Bid Security will be discharged /returned as promptly as possible after a decision with regard to finalization of the tender or after the expiry of the period of bid validity prescribed by the Owner.

24.0 PERIOD OF VALIDITY OF BIDS

24.1 Bids shall remain valid for 180 days after the date of bid opening prescribed by the Owner unless otherwise specified in the accompanying Conditions of Contract. A bid valid for a shorter period will be rejected by the Owner as non-responsive.

24.2 In exceptional circumstances e.g. expiry of bid validity, the Owner may solicit the Bidder's consent to an extension of the period of validity of the bid on same terms and conditions otherwise their bid shall not be considered. The request and the response thereto shall be made in writing (including cable or telex). The bid security provided under Clause 23.0 shall also be extended by the same period as the extension in the validity of the Bid. A bidder may refuse the request without forfeiting his bid security. A Bidder granting the request will not be required or permitted to modify its bid.

D. FORMAT OF BID

25.0 The on line offer complete in all respects will be submitted at e- procurement portal of Delhi Govt. website i.e. www.govtprocurement.delhi.gov.in**.** In addition to submission of scanned copies of mandatory documents through e-procurement portal, the bidder shall also submit (01) One copy of the bid in Book Binded form, clearly marking each "Original Bid" and "Copy of bid" including, the signed hard copies of all relevant pre-qualification documents being submitted in support of Bid (all Forms, Annexures etc. Experience certificate and supporting documents copies, type test reports, Guaranteed Technical Particulars, any other documents required as per the bidding document, etc.) and un priced schedule at least one and half hour before the time of bid opening in the Tender Opening Cell **[*(Refer BDS)*]**.** In the event of any discrepancy between original and copy of the hard bid, the original shall govern. Also in the event of any discrepancy between online bidding documents and the hard copy of the bid, the online bid shall govern. **The Price Bid (Part-II) shall not be submitted in hard copy and shall only be uploaded on e-portal of Delhi Govt. website.**

25.1 The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by the Bidder or a person or persons duly authorized to bind the Bidder to the Contract. The letter of authorization shall be indicated by written Power-of-Attorney accompanying the bid. All pages of the bid, except for un-amended printed literature, shall be initialed by the person or persons signing the bid. **All pages of the bid shall be sequentially numbered.**

All document comprising Power of Attorney, Joint Deed of Undertaking (as applicable), Affidavit of self-certification regarding Minimum Local Content under PPP-MII order dt 15.06.2017, 28.05.2018, 29.05.2019, 04.06.2020& 16.09.2020 & their latest amendments

thereof, read in conjunction with MoP Order dt. 20.12.2018, 04.04.2020, 28.07.2020, 16.11.2021 & their latest amendments thereof, Certificate from statutory auditor/cost auditor/ cost accountant/ chartered accountant, giving the percentage of Local Content, under PPP-MII orders and MoP Orders, if applicable shall be submitted in separate envelop.

25.2 The Bidders must submit the qualifying data in (2) two copies, as required in this Instruction to Bidders in a separate envelop sealed and enclosed in the envelope submitting Proposals, super scribed as under:

QUALIFYING DATA FOR: BID TITLE (Refer BDS)

25.3 The bid shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the persons or persons signing the bid.

25.4 Documents to be uploaded on e-procurement portal of Delhi Government while bidding:

The following scanned copies of documents are required to be uploaded:

a) Bid Security
b) GST Registration No.
c) PAN No.
d) EPF Registration No.
e) Registration Certificate of the Company issued from the Competent Authority.
f) Details of technical experience along with performance certificates as per NIT.
g) Financial details as per NIT
h) Bid form, attachments and annexure's as per NIT
i) Price bid (Only Online)
j) Other documents as per NIT

26.0 SIGNATURE OF BIDS

26.1 The bid must contain the name, residence and place of business of the person or persons making the bid and must be signed and sealed by the Bidder with his usual signature. The names of all persons signing should also be typed or printed below the signature.

26.2 Bid by a partnership must be furnished with full names of all partners and be signed with the partnership name, followed by the signature(s) and designation(s) of the authorized partner(s) or other authorized representative(s).

26.3 Bids by Corporation/Company must be signed with the legal name of the Corporation/company by the President, Managing Director or by the Secretary or other person or persons authorized to bid on behalf of such Corporation/Company in the matter.

26.4 A bid by a person who affixes to his signature the word 'President' Managing Director', 'Secretary', 'Agent' or other designation without disclosing his principal will be rejected.

26.5 Satisfactory evidence of authority of the person signing on behalf of the Bidder shall be furnished with the bid.

26.6 The Bidder's name stated on the Proposal shall be exact legal name of the firm.

26.7 Bids not conforming to the above requirements of signing may be disqualified.

27.0 SEALING AND MARKING OF BIDS

27.1 The Bidders shall seal the original and each copy of the bid in an inner and an outer envelope, duly marking the envelopes as "Original" and "Copy".

27.2 The inner and outer envelopes shall be:

a). Addressed to the Owner at the following address:
Address of Employer, telephone, facsimile numbers & E-mail address: (Refer BDS)

b). bear the name of package, the specification number, Details of Bid Guarantee, Validity of Bid, Name of the Bidder with address and the words "**DO NOT OPEN BEFORE date and time of opening as mentioned in web notification** , to be completed with the time and date specified in the Invitation for Bid, pursuant to ITB Sub-Clause 27.2.Other Annexure's/ Performa's / Attachments shall be enclosed in envelope on which above contents shall be super scribed. **The Price Bid (Part-II) shall not be submitted in hard copy, and shall be submitted online only however un priced schedules shall be submitted along with techno commercial bid Part I.**

27.3 The inner envelope shall indicate the name and address of the Bidder to enable the bid to be returned unopened in case it is declared "late" or "rejected".

27.4 If the outer envelope is not sealed and marked as required by para 27.2 above, the Owner will assume no responsibility for the bid's misplacement or premature opening or its secrecy, but this disclosure will not constitute grounds for bid rejection.

27.5 The Bid Security **(separate for each Package)** must be submitted in a separate sealed envelope on which the contents shall be super scribed.

27.6 The Bidder shall submit the sealed bids in Two Part System i.e. PART-I **(TECHNO-COMMERCIAL BID- ONLINE AND IN HARD COPY)** and PART-II **(PRICE BID-ONLINE ONLY) (separate for each Package).** The Integrity Pact shall be submitted in two (2) originals in separate sealed envelope along with bid having marking as "Integrity Pact" **(separate for each Package)**. The separate envelopes containing original & copies of PART-I (TECHNO-COMMERCIAL BID)", and BID SECURITY and Integrity Pact shall then be sealed in an outer envelope.

PART-I (TECHNO-COMMERCIAL BID) - All supporting documents, Attachments, Annexures, Performa, Un-priced Schedules, Bid Form (un-priced) and Bid document **except price bid**.

PART-II (PRICE BID) - Price Schedules & Bid Form only. **(ONLINE ONLY) (separate for each Package)**

28.0 DEADLINE FOR SUBMISSION OF BIDS

28.1 The Bidders are required to submit the bid through e-procurement portal of Delhi Govt. website **i.e.** **www.govtprocurement.delhi.gov.in** not later than the time & date mentioned in the Invitation for Bid. In addition to submission of scanned copies of mandatory documents through e-procurement portal, the bidder shall also submit (01) one copy of the bid in Book Binded form, clearly marking each "Original Bid" and "Copy of bid" including, the signed hard copies of all relevant pre-qualification documents being submitted in support of Bid (all

Forms, Annexures etc. Experience certificate, supporting documents copies, type test reports, Guaranteed Technical Particulars and any other documents required as per the bidding document, etc.) atleast one and half hour before the time of bid opening in the Tender Opening Cell ***(Refer BDS)]***. In the event of any discrepancy between original and copy of the hard bid, the original shall govern. Also in the event of any discrepancy between online bidding documents and the hard copy of the bid, the online bid shall govern. **The Price Bid (Part-II) shall not be submitted in hard copy and shall only be uploaded on e-portal of Delhi Govt. website.** Bidders have the option of sending the hard copy of the bid by registered post or submitting the bid in person. Bids submitted by telex/telegram will not be accepted. No request from any Bidder to the Owner to collect the Proposals from airlines, cargo agents etc. shall be entertained by the Owner.

28.2 Hard Copy of the bids must be received by the Owner at the address specified under para 27.2, not later than the time & date mentioned in the Invitation for Bid. In the event of the specified date for submission of Bids, being declared a holiday for the Owner, the Bid will be received up to the appointed time on the next working day.

28.3 The Owner may, at its discretion, extend this deadline for the submission of bids by amending the Bidding Documents, in which case all rights and obligations of the Owner and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

29.0 LATE BIDS

29.1 Any bid received by the Owner after the time & date fixed or extended for submission of bids prescribed by the Owner, will be rejected and/or returned unopened to the Bidder.

30.0 MODIFICATION AND WITHDRAWAL OF BIDS

30.1 The Bidder may modify or withdraw its bid after the bid's submission provided that written notice of the modification or withdrawal is received by the Owner prior to the deadline prescribed for submission of bids.

30.2 The Bidder's modification or withdrawal notice shall be sent by fax/e-mail but it should be followed by a signed confirmation copy by post and such signed confirmation should reach the owner/ purchaser not later than the bid submission date and the modified bid prepared, sealed, marked and dispatched in accordance with the provisions of Clause 27.0 clearly identified as such, in two inner envelopes duly marked "Bid Modifications-Original" and "Bid Modifications-Copies." The inner envelopes shall be sealed in an outer envelope, which shall be duly marked "Bid Modifications." The Bidder shall submit one (1) no. original and two (2) no. copies of the same.

Other provisions concerning the marking and dispatch of bid modifications shall be in accordance with ITB Sub-Clauses 27.2, 27.3 and 27.4.

30.3 No bid may be modified or withdrawn after the deadline for submission of bids. Withdrawal of a bid after the deadline for submission of bids will result in forfeiture of bidder's bid security.

30.4 Notice of withdrawal shall

a) be addressed to the Owner named in Clause. No. 27.2(a) of ITB.

b) bear the name of the package, tender/ specification number, and the words " Bid Withdrawal Notice"

Bid withdrawal notices received after the bid submission deadline will be ignored, and the submitted bid will be deemed to be a validly submitted bid.

31.0 INFORMATION REQUIRED WITH THE PROPOSAL

31.1 The bids must clearly indicate the name of the manufacturer, the type of model of each principal item of equipment proposed to be furnished and erected. The bid should also contain drawings and descriptive materials indicating general dimensions, materials from which the parts are manufactured, principles of operation, the extent of pre-assembly involved, major construction equipment proposed to be deployed, method of erection and the proposed erection organizational structure.

31.2 The above information shall be provided by the Bidder in the form of separate sheets, drawings, catalogues, etc. in (02) two copies.

31.3 Any bid not containing sufficient descriptive material to describe accurately the equipment proposed may be treated as incomplete and hence rejected. Such descriptive materials and drawings submitted by the Bidder will be retained by the Owner. Any major departure from these drawings and descriptive material submitted will not be permitted during the execution of the Contract without specific written permission of the Owner.

31.4 Oral statements made by the Bidder at any time regarding quality, quantity or arrangement of the equipment or any other matter will not be considered.

31.5 Standard catalogue pages and other documents of the Bidder may be used in the bid to provide additional information and data as deemed necessary by the Bidder.

31.6 The Bidder, along with his Proposal, shall submit a list of recommended erection equipment and materials which will be required for the purpose of erection of equipment and materials supplied under the Contract.

31.7 In case the 'Proposal' information contradicts specification requirements, the specification requirements will govern, unless otherwise brought out clearly in the Technical Commercial Deviations Attachment.

E. BID OPENING AND EVALUATION

32.0 OPENING OF BIDS BY OWNER

32.1 Two-part bids submitted by the bidders shall be opened in two phases. In the first phase, the techno commercial bid (Part-I) shall be opened and the bids of the bidders found techno commercially successful after detailed evaluation shall be opened in the second phase

In first stage, the Owner will open the Part-I (Techno Commercial Bid) bids in the presence of Bidders' representatives (up to 2 persons) who choose to attend at the date and time for opening of bids in the Invitation to Bid or in case any extension has been given thereto, on the extended bid opening date and time notified to all the Bidders. The Bidders' representatives who are present shall sign in a register as well as proforma evidencing their attendance.

Bid Security will be checked and in case Bid Security is not found of required amount or not in acceptable mode, the offer of that particular bidder shall be considered invalid.

On the due date of opening as notified, Bidders, whose Bid Security will be found in order only their Techno Commercial offer will be opened on the date of opening.

32.2 Envelopes marked **"WITHDRAWAL**" shall be opened first and the name of the Bidder shall be read out. Bids for which an acceptable notice of withdrawal has been submitted pursuant to ITB clause 30.0 shall not be opened.

32.3 The Bidders' names, bid prices, modifications, bid withdrawals and the presence or absence of the requisite Bid Security and such other details as the Owner, at its discretion, may consider appropriate will be announced at the opening. Subsequently, all envelopes marked **"MODIFICATION**" shall be opened and the submissions therein read out in appropriate detail. No bid shall be rejected at bid opening except for late bids pursuant to ITB Clause 30.0.

Any bid not accompanied by an acceptable Bid Security shall be rejected by the Owner as being non responsive, pursuant to ITB clause 34.4. The bid guarantee of a Joint Venture must be in the name of all partners in the Joint Venture submitting the bid.

32.4 No electronic recording devices will be permitted during bid opening.

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

32.6 After Tenders/Bids have been opened no alterations, shall be permitted either in the Tendered/Bid amount or in the specifications or schedule or any altering offer entertained unless and until specifically asked for.

33.0 CLARIFICATION OF BIDS

To assist in the examination, evaluation and comparison of bids the Owner may, at its discretion, ask the Bidder for a clarification of its bid. The request for clarification and the response shall be in writing and no change in the price or substance of the bid shall be sought, offered or permitted.

34.0 PRELIMINARY EXAMINATION

34.1 The Owner will examine the bids to determine whether they are complete, whether required sureties have been furnished, whether the documents have been properly signed and whether the bids are generally in order.

34.2 Prior to the detailed evaluation of PART-I (TECHNO-COMMERCIAL BID)", the Owner/Employer will determine whether each bid is of acceptable quality, is generally complete and is substantially responsive to the bidding documents. For purpose of this Clause, a substantially responsive bid is one, which conforms to all the terms and conditions of the Bidding Document without material deviations, objections, conditions or reservations. A material deviation, objection, conditionality or reservation is one (i) that affects in any substantial way the scope, quality or performance of the contract; (ii) that limits in any substantial way, inconsistent with the bidding documents, the Owner's rights or the successful Bidder's obligations under the contract; or (iii) whose rectification would unfairly affect the competitive position of other Bidders who are presenting substantially responsive bids.

The qualified bidders, whose bids are techno-commercially responsive and, who are considered to have the capacity and capability to perform the Contract based on the assessment, if carried out, price bids shall be opened.

The PART-II (PRICE BID) of only those bidders whose **TECHNO-COMMERCIAL BID** are of acceptable quality shall be opened **ONLINE ONLY**, thereafter. However technically acceptable party shall be informed for the opening of the Price Bid (Part-II).

34.3 A bid determined as not substantially responsive will be rejected by the Owner and may not subsequently be made responsive by the Bidder by correction of the non- conformity. The Owner's determination of a bid's responsiveness is to be based on the contents & compliance of the complete provisions of Techno-Commercial bid itself without recourse to extrinsic evidence.

34.4 The Owner may waive any minor informality or non-conformity or irregularity in a bid, which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any Bidder.

35A Detailed Technical & Commercial Evaluation (Part-I)

35A.1 The Owner will carry out a detailed evaluation of the Techno-Commercial (Part-I) of offer to determine whether the Technical/Commercial aspects are in accordance with the requirements set forth in the bidding documents. In order to reach such a determination, the Owner will examine and compare the technical/commercial aspects of the bids on the basis of the information supplied by the bidders, taking into account the following factors:

(a) Overall completeness and compliance with the Techno-Commercial Specifications and Drawings; deviations from the Technical Specifications as identified in Attachment-7 to the bid; suitability of the facilities offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the bid. The bid that does not meet minimum acceptable standards of completeness, consistency and detail will be rejected for non- responsiveness.

(b) Achievement of specified performance criteria by the facilities & Qualifying Requirements as provided in Annexure-A of BDS. The evaluation will also take into account the Bidder's financial, technical and production capabilities.

(c) Type, quantity and long term availability of mandatory and recommended spare parts and maintenance services.

(d) Any other relevant factors, if any, listed in the Bid, or that the Owner deems necessary or prudent to take into consideration.

(e) The bidder has to quote the complete scope of work for one or all subject package(s) as stated in Section- Technical Specification, Vol.-II of the Bidding Documents. Bids covering partial scope of the work as specified in Technical Specification will be treated as incomplete and shall be rejected.

(f) Conditional discount(s)/ rebate(s), if any, offered by the bidder shall not be taken into consideration for evaluation. It shall however, be considered in case of award.

(g) The cost of withdrawal of deviations shall also be considered for the purpose of evaluation of Bid.

35A.2 When alternative technical proposal have been permitted and offered in Section-ITB to the bid, the Owner will make similar evaluation of the alternatives, which will be treated in the technical and commercial evaluations as if they were base bids. Where alternatives are not permitted, but have been offered in any event, they shall be ignored.

35B Evaluation of Price Bids (Part-II)

35B.1 The Owner will carry out a detailed evaluation of the Price Bids Part (Part-II) of the bidders found techno-commercially successful. The Bid evaluation of Package I, II, III & IV shall be

carried out package-wise. Multi-package rebate(s) offered, if any, shall also be considered in evaluation. Based on such evaluation, Award of Contract(s) would be made to one or more bidder(s) for one or all the package(s) on the basis of least evaluated cost to the Employer. The comparison will be in line with the bidding documents and on the basis of Lumpsum price for the entire scope of work under the package. Based on such evaluation, L1 bidder would be decided on the basis of least evaluated cost to the Employer.

The lump sum price shall include:

i) F.O.R. destination (site) price of equipment/materials, including mandatory spares and special tools & tackles (if any) under the package.

ii) Charges for erection, which shall include unloading, handling, storage, insurance, erection, testing & commissioning of the complete equipment/materials under the package and all associated civil works.

The Owner's comparison will also include the costs resulting from application of the evaluation procedures described in ITB Sub-Clause 35B.3.

DTL's evaluation of a bid, in addition to the lump sum price as above will take into account the applicable taxes, duties & levies payable/reimbursable by the Employer as per provisions of Clause 14.0 of CC, Volume I.

Discount(s)/ rebate(s) offered by the bidder shall be indicated either on lumpsum basis or percent basis. Bidder shall also indicate in his bid, the price component on which the percentage discount is to be applied. In case the price component(s) on which the percentage discount is applicable is not indicated in the bid, then the discount will be adjusted in the total bid price [i.e. proportionately on each price component], **for arriving the price of L1 bidder**. However, if lumpsum discount is offered, the same shall be adjusted in full from the ex-works price component (by proportionately reducing ex-works price of individual items), **for arriving the price of L1 bidder.**

35B.2 The Owner's evaluation of a bid will take into account, in addition to the bid prices indicated in Price Schedules, the following costs and factors that will be added to each Bidder's bid price in the evaluation using pricing information available to the Owner, in the manner and to the extent indicated in ITB Sub-Clause 35.B.3 and in the Technical Specifications:

(a) the cost of all quantifiable deviations and omissions from the contractual and commercial conditions and the Technical Specifications as identified in Attachment-5 to 7 to the bid.

(b) compliance with the time Attachment called for in Attachment-10 of Bid price Attachment and evidenced as needed in a milestone Attachment provided in the bid.

(c) *Performance and Productivity of the equipments offered*

Bidder shall state the guaranteed performance or efficiency in response to Technical Specifications. Equipment offered shall have minimum performance specified in Technical Specifications to be considered responsive. Bids offering Equipments with a performance less that of specified may be rejected.

35B.3 Pursuant to ITB Sub-Clause 35.B.2, the following evaluation methods will be followed:

(a) *Contractual and commercial deviations*

The evaluation shall be based on the evaluated cost of fulfilling the contract in compliance with all commercial, contractual and technical obligations under this bidding document. In

arriving at the evaluated cost, the price of withdrawal of deviations shown in relevant Attachment of the bid, price and other Attachments, will be used. If the deviation to any of the provisions is not priced, the bid will be rejected.
At the time of award of contract, if so desired by the Owner, the bidder will withdraw the deviations listed in relevant deviation Attachments of bid in their bid at the cost of withdrawal stated by him in the bid. In case the bidder does not withdraw the deviations proposed by him in the bid, his bid will be rejected and his Bid Security will be forfeited.

(b) Time Attachment (Program of Performance)

The plant and equipment covered by this bidding are required to be shipped and installed, and the facilities shall have the pre-commissioning completed within the period named in the Bid after the effective date specified in the Contract Agreement. Bidders are required to base their prices on the Time Attachment given in Attachment -10 of Bid Form to the form of Contract Agreement (Time Attachment) or, where no time Attachment is given, on the completion date(s) given in the Bid. No credit will be given for earlier completion. Bid offering completion beyond the named period is liable to be rejected.

(c) If the vendor has quoted higher than the scheduled delivery period the bids will be treated as non-responsive.

Any adjustments in price that result from the above procedures shall be added, for purposes of comparative evaluation only, to arrive at an "Evaluated Bid Price." Bid prices quoted by Bidders shall remain unaltered.

a) Arithmetical/computational errors will be rectified on the following basis.

(i) If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity of item, or between sub-total and the total price, the unit or sub-total price shall prevail, and the total price shall be corrected.

(ii) Further, if there is a discrepancy between the quantity specified by DTL in the bidding document and the indicated by the bidder in his bid, the former shall be taken to arrive at the computed price.

(iii) In case the unit rate of an item is not quoted but the total price of the item is indicated, the same shall be taken to arrive at the computed price.

(iv) If there is a discrepancy between words and figures (of unit price or sub-total price if total price is not quoted), the amount in words will prevail (Not applicable in case of total quoted price, in that case arithmetically corrected computed price shall prevail).

b) Wherever, as per the bidding documents, any shortfall in the rating and performance requirement of equipment/material/systems attracts consideration of differential price factor and the value of differential loss for evaluation, the same shall be worked out as per the methodology given in the bidding documents, for adding the same to the computed price of the bidders.

c) The value of the differential loss will be added to the computed price of each bidder and the price quoted by the bidder for extra scope of work will be deducted, as discussed above, to arrive at the computed bid price.

d) The computed price arrived at, as above, shall be considered for the purpose of further evaluation as well as award.

If the bidder does not accept the methodology of correction as mentioned above, its bid will be rejected and the bid security will be forfeited in accordance with ITB Clause 23.7.

36.0 DEFINITIONS AND MEANINGS

36.1 For the purpose of evaluation and comparison of bids, the following meanings and definitions will apply.

a). **'Bid Price'** shall mean the base price quoted by each Bidder in his Proposal for the completed scope of works.

b). **'Differential Price'** shall mean the summation of the equalizing elements of price for parameter differential or deficiencies in the equipment and services determined from the Bidder's Proposal.

c) 'Cost Compensation for Deviations' shall mean the Rupee value of deviations, which shall be provided by the Bidder with proper justification in his Bid.

d). **'Evaluated Bid Price'** shall be the summation of 'Bid Price', 'Differential Price' and 'Cost Compensation for Deviations'.

36.2 Calculation of Differential Price & Cost Compensation for Deviations, if applicable:

36.2.1 The Differential Price (if applicable) to be added to the Bid Price of each during evaluation and comparison shall be derived as under:

Differential Price (DP) =n1 F1+n2F2…+nnFn where F1, F2…..Fn are the various factors in Indian Rupees per unit of parameter differential or deficiency in the equipment and services offered as stipulated in these specification; n1, n2…..nn are the respective parameter differential or deficiency in the corresponding units to be determined from the Bidder's Proposal. The above factors and corresponding units of parameter differential are brought out in the Technical Specifications and/or Conditions of Contract.

37.0 COMPARISON OF BIDS

37.1 Lump-sum price includes all taxes and levies covering both supply of material as well as erection, installation and commissioning. However, while submitting the invoices/bills/ running bills, for making payments, bifurcation between taxable amount and applicable taxes should be enumerated on each and every invoices/bills/running bills.

37.2 For comparison purposes all the evaluated bid prices shall be in Indian Rupees as under:-

W = M+DP+D

Where,

W = Total Comparison Price
M = Bid price in Indian Rupees (Ex-works value of equipment + Components of erection cost + mandatory spares, taxes and duties and other Components, if any).

DP = Differential price in Indian Rupees calculated according to para 36.2.1.
D = Cost compensation for deviations.

37.3 All evaluated bid prices of all the Bidders shall be compared among themselves to determine the lowest evaluated bid and, as a result of this comparison; the lowest bid **will be term as L1 bidder.**

38.0 Purchase preference, Contacting the employer & Award of Contract

38.1 Purchase Preference:

38.1.1 Deleted.

38.1.2 Deleted.

38.1.3 Verification of local content:

a. The 'Class-I local supplier' at the time of tender, bidding or solicitation in his bid in the given format, shall be required to indicate percentage of local content and provide self-certification that the item offered meets the local content requirement for 'Class-I local supplier' as the case may be. They shall also give details of the location(s) at which the local value addition is made. Further,

b. the 'Class-I local supplier' shall also be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.

38.1.4 Any False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law.

38.1.5 A supplier who has been debarred by any procuring entity for violation of PPP-MII Order, dt 15.06.2017, 28.05.2018, 29.05.2019, 04.06.2020 & 16.09.2020 & there latest amendments thereof, read in conjunction with MoP Order dt. 20.12.2018, 04.04.2020, 28.07.2020 &16.11.2021& their latest amendments thereof (mentioned above) for procurement by any other procuring entity for the duration of the debarment. The debarment for such other procuring entities shall take effect prospectively from the date on which it comes to the notice of other procurement entities.

38.2 CONTACTING THE OWNER

Bid shall be deemed to be under consideration immediately after they are opened and until such time official intimation of award/rejection is made by the Owner to the Bidders. While the bids are under consideration, Bidders and/or their representatives or other interested parties are advised to refrain from contacting by any means, the Owner and/or his employees/representatives on matters related to the bids under consideration. The owner, if necessary, will obtain clarifications on the bids by requesting for such information from any

or all the Bidders, either in writing or through personal contacts as may be necessary. Bidders will not be permitted to change the substance of the bids after the bids have been opened.

38.3 Award of Contract

38.3.1 Post-Qualification

38.3.1 The Employer will determine to its satisfaction whether the Bidder selected as Techno-Commercially qualified & lowest bidders considered for award is qualified to satisfactorily perform the contract in terms of the qualifying requirements stipulated in the ITB 1.2 and 2.0

38.3.2 The determination will take into account the Bidder's financial, technical and production capabilities, in particular its contract, work in hand, future commitments and current litigation. It will be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder in Attachment 3 to the bid, as well as such other information as the Employer deems necessary and appropriate.

38.3.3 An affirmative determination will be a prerequisite for award of the contract to the Bidder. A negative determination will result in rejection of the Bidder's bid, in which event the Employer will proceed to the next bidder to make a similar determination of that Bidder's capabilities to perform satisfactorily.

39.0 AWARD CRITERIA

39.1 The Owner will award the Contract to the successful Bidders whose bids have been determined to be substantially responsive and **lowest bidder considered for award** provided further that the Bidders are determined to be qualified to perform the Contract satisfactorily. The owner shall be the sole judge in this regard.

39.2 The Employer may request the Bidder to withdraw any of the deviations listed in Attachment 05 to 07 of the winning bid, at the price shown for the deviation in Attachment 05 to 07 to the bid. Bidder would be required to comply with all other requirements of the Bidding Documents except for those deviations which are accepted by the Employer.

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

39.4 The mode of contracting with the successful bidder will be as briefly indicated below:
In the case of successful Bidder, the award shall be made as follows:

(i) First Contract: Supply of equipment and materials on the ex-works basis.

(ii) Second Contract: Transportation, storage, insurance, erection, testing and commissioning etc. of equipment/ materials in respect of all the equipments supplied under the "First Contract" and any other services specified in the Contract Documents.

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

40.0 OWNER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS

40.1 The Owner reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to award of contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Owner's action. DELHI TRANSCO LIMITED reserves the right to waive minor deviations if they do not materially affect the capability of the Bidder to perform the contract.

41.0 NOTIFICATION OF AWARD

41.1 Prior to the expiration of the period of bid validity and extended validity period, if any, the Owner will notify the successful Bidder in writing by registered letter or by cable or telex or fax or e-mail, that its bid has been accepted which shall be confirmed in writing by bidder. However if confirmation is not received from the bidder the notification shall be deemed to have been accepted by the bidder after expiry of the period mentioned in the notification.

41.2 The notification of award will constitute the formation of the Contract.

41.3 Upon the successful Bidder's furnishing of Contract performance Guarantee **(CPG)** pursuant to Clause 43.0 the Owner will promptly notify each unsuccessful Bidder and will discharge its bid security, pursuant to Clause 23.0.

42.0 SIGNING OF CONTRACT

42.1 At the same time as the Owner notifies the successful Bidder that its bid has been accepted, the Owner will send the Bidder the detailed Letter of Award, incorporating all agreements between the parties.

42.2 Within seven (07) days of receipt of the detailed Letter of Award, the successful bidder shall sign and date the same and return it to the Owner, failing which all the terms & conditions of the Letter of Award shall be binding upon the successful bidder and it shall be treated as a binding Contract between Delhi Transco Limited and the successful bidder.

42.3 The Bidder will prepare the Contract Agreement as per the Performa enclosed in Section- Forms & Procedure to this Volume-I and the same will be signed within 30 (thirty) days from the date of Notification of Award.

43.0 CONTRACT PERFORMANCE GUARANTEE

43.1 Within Twenty-Eight (28) days from the issuance of the notification of award, the successful Bidder, to whom the work is awarded, shall be required to furnish a Performance Guarantee deposited in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt from a Commercial bank, Bank Guarantee (including e-Bank Guarantee) from a scheduled Commercial bank or any foreign Bank or subsidiary of a foreign Bank having its branch in India with overall international corporate rating or rating of long term debt not less than A- (A minus) or equivalent by reputed rating agency**,** in the form attached in Section- Forms & Procedure to this Volume-I in favour of the Owner or online payment in an acceptable form.

The guarantee amount shall be equal to ten percent (10%) of the total Contract Price and it shall guarantee the faithful performance of the Contract in accordance with the terms and conditions specified in these documents and specifications.

Performance Security shall be valid upto defect liability period but initially for 12 months from the date of taking over/operational acceptance. This Performance guarantee shall be renewed periodically every year upto the end of defect liability period. Every renewal of the Performance guarantee shall be done by the contractor one month prior to the expiry date.

Non submission of performance security within the stipulated period will constitute a sufficient ground for the annulment of the award and forfeiture of the bid security.

44.0 Corrupt or Fraudulent Practices

44.1 DTL requires that Bidders/Suppliers/Contractors, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the DTL:

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

(i) "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and

(ii) "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Employer/Owner, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition;

(b) will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;

(c) will declare a firm ineligible, either indefinitely or for a stated period of time, if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing this contract.

44.2 Furthermore, Bidders shall be aware of the provision stated in sub-clause 42.2 of the Conditions of Contract.

44.3 Bidder shall furnish undertaking for not indulging in corrupt & fraudulent practice as per **Attachment 21.**

45 **GOODS AND SERVICE TAX**

45.1 The bidder shall comply with the provision of section 171 of the GST Act, 2017 and all the benefits accrued to him on account of any reduction in rate of tax on any supply of goods or services will be supplied to DTL under this Tender **No.** ***Refer BDS*** will be passed on to Delhi Transco Limited by way of commensurate reduction in the prices. In future, if anything found contrary, the bidder will be accountable for any contravention of the law and shall indemnify Delhi Transco Limited for the loss suffered on account of not passing the aforesaid benefit.

46. Deleted.

SECTION-III

BID DATA SHEETS (BDS)

SECTION-III

BID DATA SHEETS (BDS)

The following bid specific data for the Plant and Equipment to be procured shall amend and/or supplement the provisions in the Instruction to Bidders (ITB)

S. No.	ITB Clause Ref. No.	Bid Data Details
1.	ITB 23.8, ITB 25.0, ITB 28.1	**Address for submission of Bid Documents and Bid Opening;** Address in Person or by Post: **Tender Opening Cell,** Delhi Transco Limited, Room No. 16, Ground Floor, Maintenance Block, Old Indraprastha Power House, Near 220kV Indraprastha Substation, ***New Delhi-110002 (India),*** Email: dgm.cbp@dtl.gov.in
2.	ITB 6.1, ITB 27.2	**Address for submission of Bid Documents and Bid Opening;** Address in Person or by Post: **Tender Opening Cell,** Delhi Transco Limited, Room No. 16, Ground Floor, Maintenance Block, Old Indraprastha Power House, Near 220kV Indraprastha Substation, ***New Delhi-110002 (India),*** Email: dgm.cbp@dtl.gov.in
3.	ITB 6.1	**Clause 6.1 of ITB stands modified as under:** A prospective Bidder finding discrepancies or omissions, in specifications and document or is in doubt as to the true meaning of any part; they shall at once make a request, in writing or by electronic media (hereinafter, the term cable is deemed to include Electronic Data Interchange (EDI) or telefax) at the Employer's mailing address within ten (10) days after floating of tender. In case of any changes/modification in the bidding documents due to the above, the same shall be uploaded on the website as part of bidding document.
4.	ITB 6.5	**Venue, date and time for Pre-bid Meeting:** The Bidder's designated representative is invited to attend a pre-bid meeting, which will take place at the venue and time as given below: **Delhi Transco Limited ,** Fourth Floor, Conference Room Shakti Sadan,Kotla Road New Delhi – 110002. Date :……. Time: …… hours (IST)
5.	ITB 15.0	**For a Completion Period Equal to or Less than 18 Months Cl. 15.0 to be followed as under:** "Prices as quoted by the bidder shall remain fixed during the Bidder's Performance of the Contract and not subject to variation

S. No.	ITB Clause Ref. No.	Bid Data Details
		on any account. A bid submitted with an adjustable price quotation will be treated as non-responsive and rejected."
6.	ITB 23.1	Amount of Bid Security: Package-I: **50,00,000/-** Package-II: **23,22,403/-/-** Package-III**: 39,50,530/-** Package-IV: **50,00,000/-**
7.	ITB 25.2	**BID TITLE:** Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala, Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis. Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis. Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis. Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.
8.	ITB 33.1	**Clause no. 33.1 of ITB**: "To assist in the examination, evaluation and comparison of bids the Owner may, at its discretion, ask the Bidder for a clarification of its bid. The request for clarification and the response shall be in writing and no change in the price or substance of the bid shall be sought, offered or permitted." **Shall be read as :** "To assist in the examination, evaluation and comparison of bids the

S. No.	ITB Clause Ref. No.	Bid Data Details
		Owner may, at its discretion, ask the Bidder for a clarification of its bid. The request for clarification and the response shall be in writing and no change in the price or substance of the bid shall be sought, offered or permitted. The bidder shall ensure that its original bid will be complete in all respect before submission."
9.	ITB 36, 37	Differential price is applicable on only HTLS Conductor as per technical specification of HTLS Conductor.
10.	ITB 41.3	Upon the successful Bidder's furnishing of Contract performance Guarantee (CPG) pursuant to Clause 43.0 the Owner will discharge its bid security, pursuant to Clause 23.0.
11.	ITB 45.1	**Tender No. T25R220472**
12.	ITB 46.0: New Clause	Bidders must not have been blacklisted or deregistered by any Central/State Government department or public sector undertaking. Also, no work of the bidder must have been rescinded by client after award of contract during last 5 years. The bidder should submit undertaking to this effect.

Annexure-A

Qualifying Requirements of bidders for Re-Conductoring packages of 220kV HTLS Conductors along with accessories.

1.0 General

Qualification of bidder will be based on meeting the minimum pass/fail criteria specified below regarding the Bidder's Technical Experience and Financial Position as demonstrated by the Bidder's responses in the corresponding Bid Schedules.

Technical experience and financial resources of any proposed subcontractor shall not be taken into account in determining the Bidder's compliance with the qualifying criteria. The bid can be submitted by an individual firm as a manufacturer or an Erector or a Collaborator or a Joint Venture (Specific requirements for Joint Ventures are given under Para 4.0 below)

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

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

General Requirements

a) The bidder shall furnish documentary evidence in support of the qualifying requirement stipulated as above along with the bid.

b) All the Bidders shall submit the proof of work executed by them along with the Performance Certificates in support of their qualification.

c) The bidder shall have a project manager with 15 years' experience in executing such contract of comparable nature including not less than five years as manager.

d) The bidder should have adequate after sales support facility and shall ensure availability of technical support in India so as to attend warrantee provisions under this contract.

e) A Bidder shall submit only one bid in the same tendering process, either individually as bidder or as a partner of a Joint Venture. A bidder who submits or participates in more than one bid will cause all of the proposals in which the bidder has participated to be disqualified. No bidder can be a sub-contractor while submitting a bid individually or as a partner of a Joint Venture in the same bidding process.

f) The Bidder shall furnish an undertaking that in the event of award, the bidder shall conduct type tests as detailed in Technical Specification /NIT on offered HTLS conductor at their own cost, if valid type test reports are not available for the tests conducted earlier.

g) As per the terminology used by CEA guidelines, High Performance Conductors (HPC) [High Temperature/High temperature Low Sag Conductor (HTLS)] may be used interchangeably.

1.1 Eligible Bidder

a) Manufacturer of Conductor having experience of manufacturing, supply, stringing, testing & commissioning of EHV transmission line Conductors as per the experience criteria mentioned for Manufacturing and ETC of Conductors as per clause 2.1 & 2.2 respectively.

OR

b) Manufacturer of Conductor having experience of manufacturing, supply of conductor as per criteria mentioned in clause 2.1 and erection is carried out through an erector meeting experience criteria as per clause 2.2. The bid shall include consent letter (as per format Annexure-D1) from the proposed erector.

OR

c) Erectors who have the experience as per the criteria mentioned in 2.2 below and supply HTLS Conductor from such manufacturer(s) who fulfills the criteria mentioned at 2.1 (i) or 2.1 (ii) below. The bid shall include consent letter (as per format Annexure-D2) from the proposed HTLS Conductor manufacturer.

In addition to the Contract Performance Guarantee to be furnished by the bidder, the bid shall also include a confirmation letter from the manufacturer, stating that the manufacturer shall furnish back up performance guarantee in the form of bank guarantee for a period of two (02) years for amount equivalent to 10 % of the Ex-works cost of the HTLS conductor for successful performance of HTLS conductor to be manufactured and supplied under the contract.

OR

(d) Joint venture/Consortium consisting of two or more partners including the lead partner meeting the following conditions:

(i) All the Partners of JV/Consortium shall meet collectively the requirement of Clause 2.1 & 2.2 below.

(ii) Each of the partners of the Joint venture/Consortium must meet the minimum qualifying requirements as mentioned in clause No. 2.1 or 2.2 below.

2.0 Technical Experience;

2.1 Experience of Manufacturer:-

The bidder shall be a manufacturer of conductor for the last seven years. The Manufacturer's experience should include the following:

(i) The Indian Conductor Manufacturer should have manufactured, tested and supplied at least 33% of the estimated quantity (i.e. length of conductor in kms)of High Temperature Low Sag (except GAP type) conductor having a minimum thirty three (33) -number of strands or minimum 150 sq. mm Aluminum cross section area of same technology as that of conductor being offered during last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originallyscheduled date of bid opening.

OR

(ii) Indian Conductor manufacturer not meeting the requirement as stipulated above at clause 2.1(i), it can also participate provided such manufacturers have manufactured, tested and supplied at least one thousand (1000) km of ACSR/ AAAC/ ACAR/ AACSR conductor and ten (10) km of High Temperature Low Sag (HTLS except GAP type) conductor of same technology as that of conductor being offered and having a minimum thirty three (33)-number of strands or minimum 150 sq. mm Aluminum cross section area during last seven (7) years and the same should have been in satisfactory operation for a period of at least 01(one) year as on the originally scheduled date of bid opening.

OR

(iii) In case, the Bidder is an Indian Entity meeting the requirement stipulated in above clause at 2.1 (ii) except HTLS Conductor, but has established manufacturing and testing facilities in India and manufactured HTLS conductor having minimum thirty three (33)-number of strands or minimum 150 sq. mm Aluminum cross section area shall also be considered, provided the bidder meets the following requirements.

The bidder must have manufactured HTLS conductor based on the technological support of the Principal/Parent/Subsidiary/Sister concern[##]company or Collaborator (s) and the bidder should have conducted following type tests on HTLS conductor manufactured in Indian facilityas on the originallyscheduled date of bid opening.

A) On complete Conductor

i) DC resistance test on stranded conductor
ii) UTS test on stranded conductor at ambient & at designed elevated temperature (minimum 150 Deg C design temperature).

……

B) On Conductor Strand/ Core

i) Heat resistance test on Aluminium Alloy strands (not applicable for annealed aluminium).
ii) Torsion and Elongation tests on core strands/ composite core.
iii) Breaking load test on core strands/composite core and Aluminium/ Aluminium Alloy strands
iv) Conductivity test on thermal resistant Aluminium / Aluminium Alloy strands.
v) Glass transition temperature test (For composite core only).
vi) Flexural Strength test (For composite core only).

Note: The tests indicated at B) above should have been carried out by the Bidder/Licensee on their own or by their supplier of aluminium alloy strands, core/core strands.

Provided further, that the Principal/Collaborator(s) Parent/Subsidiary/Sister concern company of the bidder meets the qualifying requirements as per clause 2.1 (i) mentioned above.

However, in case of clause 2.1(iii) ,the warranty obligations for additional period of two (2) years over and above the warranty period as specified in the bidding documents shall be applicable for which an amount of 10% of the Ex-works cost of the HTLS conductor in the form of BG shall be furnished by the bidder. This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the bidder.

Further, for 2.1(iii), the bidder shall also submit the following along with the bid:

(i) A legally enforceable undertaking (jointly with the Collaborator(s)/ parent /principal/subsidiary/sister concern[##]company to guarantee quality, timely supply, performance and warranty obligations as specified for the core/conductor.

(ii) A confirmation letter from the Collaborator(s)/parent/principal/subsidiary/sister concern[##]company stating that it shall furnish performance guarantee for an amount of 10 % (Ten percent) of the Ex-works cost of HTLS conductor to be supplied in this package.

This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the bidder.

(iii) A valid collaboration agreement for technology transfer / license to design, manufacture, test and supply of 220kV or above voltage level HTLS conductor/core of same technology as that of the conductor/core being offered in this package in India.

Note: 1: If Principal/collaborator/sister concern conductor manufacturer company is a foreign entity then it should submit performance certificate from an end user located in a country other than the country where the product has been manufactured during last seven (7**) years and must be in satisfactory operation[#] for at least two (2) years as on the originallyscheduled date of bid opening.

……

Note2: In case bidder is a holding company, the technical experience referred to in clause 2.1 above shall be of that holding company only (i.e. excluding its subsidiary/parent/group/sister concern[##]companies etc.). In case bidder is a subsidiary of a holding company, the technical experience referred to in clause 2.1 above shall be of that subsidiary company only (i.e. excluding its holding company).

2.2 Experience of Erector:-

(i) The erector should have completed stringing of HTLS conductor for transmission line of cumulative circuit kilometres of not less than 50% of the estimated circuit kilometres of 220kV or higher voltage class in India as a prime contractor/sub-contractor or as a partner in a Joint Venture+ within the last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originallyscheduled date of bid opening.

OR

(ii) The erectors who do not have experience for HTLS conductor stringing shall also be considered if stringing have been completed for any type of conductor of 220kV or higher voltage transmission line for cumulative circuit kilometres of not less than 100 km as a prime contractor or as a partner in a Joint Venture+ within the last seven (7) years and the same should have been in satisfactory operation for a period of at least 02yearsas on the originally scheduled date of bid opening.

However,the warranty obligations for additional period of two (2) years over and above the warranty period as specified in the bidding documents shall be applicable for which an amount of 5 % (Five percent) of the cost of the total Project value in the form of BG shall be furnished by the bidder.

This warranty obligation guarantee shall be in addition to the contract performance guarantee to be submitted by the bidder.

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

3.0 Financial Position

3.1 The bidder should have adequate financial capability to meet the following minimum criteria:

a) Net Worth requirement of QR

Net Worth for last three financial years should be positive. (Total assets less total liabilities shall be positive) .

b) Minimum Average Annual Turnover (MAAT) requirement for the last three years of the bidder should not be less than;

MAAT = (Cost Estimate x 1.5/Completion period in years).

Package-I : MAAT = Rs 62,75,92,937/-
Package-II : MAAT = Rs 17,41,80,187/-
Package-III : MAAT = Rs 19,75,26,451/-
Package-IV : MAAT = Rs 43,43,04,078/-

(For the purpose of arriving at MAAT, total income, except non-recurring income e.g. Sale of fixed assets shall be considered).

Further the completion period for calculating MAAT shall be considered as 1 year even if the Contractual Completion period is less than 1 year.

c) Liquid Asset (LA) requirement of

LA = (Cost Estimate x 3/Completion period in months).

Package-I : LA = Rs 10,45,98,823/-
Package-II : LA = Rs 2,90,30,031/-
Package-III : LA = Rs 3,29,21,075/-
Package-IV : LA = Rs 7,23,84,013/-

(For the purpose of arriving at LA, Current Assets less Inventories and prepaid expenses shall be considered i.e. LA=Current Asset-Inventories-Prepaid Expenses)

Further, the Completion Period for calculating LA shall be considered as 12 months even if the Contractual Completion period is less than 12 months. The cost Estimate referred above shall include GST and other taxes & duties.

In case bidder is a holding company, financial position criteria referred to in clause 3.1 above shall be of that holding company only (i.e. excluding its subsidiary/group companies). In case bidder is a subsidiary of a holding company, financial position criteria referred to in clause 3.1 above shall be of that subsidiary company only (i.e. excluding its holding company).

In case bidder has established manufacturing facility in India and yet to complete three (3) financial years, the Net Worth and average of the turnover as per financial statement for completed financial years shall be considered for the purpose of compliance to the specified Net Worth and MAAT requirements.

Relaxation for Start-Ups^/ MSEs:

Start-Ups^/ MSEs, meeting the specified requirements at Para 3.1 (a) above in Financial Position shall also be considered qualified if they meet Eighty (80) % of the requirement specified at Para 3.1(b) & 3.1(c) above in Financial Position.

^ Start-Ups as defined by DIPP, applicable as on the originallyscheduled date of bid opening.

4.0 Techno-Commercial and Legal Arrangement of Joint Venture/Consortium:

The figures for each of the partners of the joint venture/consortium shall be added together to determine the bidder's compliance with the minimum qualifying criteria set out in Clause 3.1 (a), (b) & (c) above. However, in order for a joint venture to qualify, partners of the joint venture/consortium must meet the following minimum criteria:

(a) All the partners of the JV/Consortium shall meet individually the Financial Position criteria given at 3.1 (a) above.

(b) The lead partner shall meet, not less than 40% of the minimum criteria given at Para 3.1 (b) & (c) above.

(c) Each of the other partner(s) shall meet not less than 25% of the criteria given at 3.1(b) & (c) above.

In case of Joint Venture/consortium, the following conditions shall also apply:

i. The bid, and in case of successful bid, the specified Form of Agreement shall be signed so as to be legally binding on all partners (Form enclosed).

ii. Each of the Partners of the Joint Venture/consortium must meet the minimum qualifying requirements given under clause 2.1 or 2.2. However, all the partners of Joint Venture/consortium shall meet collectively, the requirements of Clauses 2.1 and 2.2 above.

iii. One of the partners shall be nominated as Lead Partner, and 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. Thus the lead partner shall be authorized to represent the joint venture/ consortium for the purpose of execution of the Contract. The payment shall be in the name of joint venture/ consortium. The authorization shall be evidenced by submitting a Power of Attorney signed by legally authorized signatory of all the partners as per bidding documents.

iv. All 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 of this effect shall be included in the authorization mentioned under (iii) above as well as in the Bid Form and in the Contract Form (in case of a successful bid).

Agreement entered into by the Joint Venture/consortium partners shall be submitted with the bid.

5.0 Financial & Capacity Requirements

Bidder shall be financially sound.

i) Bidder shall submit a certificate from their Banker(s) as per format indicating various fund based/non fund based limits sanctioned to the bidder and the extent of

……

utilization as on date. Such certificate should have been issued not earlier than three months prior to the originallyscheduled date of bid opening.

ii) Bidder shall submit a monthly cash flow projection for execution of the contract having regard to implementation schedule. Bidder should indicate how funding gap in each month is proposed to be met.

iii) Bidder shall submit the complete Annual reports together with Audited statement of accounts of the company for last five years.

In the event the Bidder (being a company registered/ incorporated outside India or otherwise) is not able to furnish the above information of its own (separate), being a subsidiary company and the accounts are being consolidated with their Group/ Holding/ Parent/sister concern## company, the Bidder should submit the balance sheet, income statement, other information as required, of its own (separate), (not of its Group/ Holding/ Parent/ sister concern## company) duly certified by:

i) Their statutory Auditor; or
ii) A Certified Public Accountant; or
iii) Their Company Secretary certifying that it is based on audited accounts, as the case may be.

Similarly, if the Bidder happens to be a Group / Holding / Parent company, the Bidder should submit the above information of its own (separate), exclusive of its Subsidiaries, duly certified by:

i) Their statutory Auditor; or
ii) A Certified Public Accountant; or
iii) Their Company Secretary certifying that it is based on audited accounts, as the case may be.

(#) Satisfactory operation means certificate issued by the Employer certifying the Operation without any adverse remark.

(##) Sister Concern of bidder means the company which has same parent as that of the bidder.

(**) For the purpose of qualifying requirement, during the last seven years means that commissioning date is to be within a period of seven years ending last day of month previous to the one in which tender is invited.

Annexure-D1

CONSENT LETTER FROM ERECTOR TO BE FURNISHED BY THE HTLS MANUFACTURER

(To be submitted on the letterhead of the company)

To

Dt. …….

Delhi Transco Ltd.
Shakti Sadan, Kotla Road
New Delhi-110002.

IN RESPECT OF TURNKEY PACKAGE (Name of tender)
TENDER NO. …….

Dear Sir,

The undersigned on behalf of M/s…….having its registered office at…… wish to confirm as under:

1. That, we shall carry out erection, testing & commissioning of HTLS conductors for M/s …… meeting the technical specification as specified in Delhi Transco Limited said Tender No …….

2. That, we as an Erector meet the qualifying criteria as specified in clause 2.2 of Annexure A, BDS, Vol-I of the said Tender No. …….

3. That, we shall carry out erection, testing & commissioning of HTLS conductors in line with the agreed Time Schedule between Delhi Transco Limited and M/S……..

4. That, documentation in respect of our qualification and experience is enclosed with this consent letter as per the requirement of Tender Specifications.

That, Undersigned is authorized to submit this consent/confirmation letter on behalf of M/s…….……(Authorization letter enclosed).

For and on behalf of M/s……
Signature:……
Name:…….
Designation:……
Seal:…

Annexure-D2

CONSENT LETTER FROM HTLS MANUFACTURER TO BE FURNISHED BY THE ERECTOR

(To be submitted on the letterhead of the company)

To

Dt. …….

Delhi Transco Ltd.
Shakti Sadan, Kotla Road
New Delhi-110002.

IN RESPECT OF TURNKEY PACKAGE (Name of tender).
TENDER NO. ……..

Dear Sir,

The undersigned on behalf of M/s…….having its manufacturing units at ……. and registered office at…… wish to confirm as under:

1. That, we shall supply HTLS Conductor to M/s …… meeting the technical specification as specified in Delhi Transco Limited said Tender No ……..

2. That, we as a HTLS Conductor Manufacturer meet the qualifying criteria as specified in Clause 2.1 of Annexure A, BDS, Vol-I of the said Tender No. …….

3. That, we shall supply the HTLS Conductor in line with the agreed Time Schedule between Delhi Transco Limited and M/S……..

4. That, we shall undertake supervision of erection, testing & commissioning in case of award of contract to M/s……..(To be submitted by an erector who is not having experience as provided)

5. That, documentation in respect of our qualification and experience is enclosed with this consent letter as per the requirement of Tender Specifications.

That, Undersigned is authorized to submit this consent/confirmation letter on behalf of M/s……(Authorization letter enclosed).

For and on behalf of M/s……
Signature:……
Name:…….
Designation:……
Seal:……

SECTION-IV

CONDITIONS OF CONTRACT (CC)

SECTION-IV

Condition of Contract (CC)

A. Contract and Interpretation:

1.0 Definitions:

1.1 The following words and expressions shall have the meanings hereby assigned to them:

"Contract" means the Contract Agreement entered into between the Employer and the Contractor, together with the Contract Documents referred to therein; they shall constitute the Contract, and the term "the Contract" shall in all such documents be construed accordingly.

"Contract Documents" means the documents listed in Article 1.1(Contract Documents) of the Form of Contract Agreement (including any amendments thereto).
"CC" means the Conditions of Contract hereof.

"Day" means calendar day of the Gregorian Calendar.

"Month" means calendar month of the Gregorian Calendar.

"Employer/Owner" means the person named as below and includes the legal successors or permitted assigns of the Employer/Owner.

Delhi Transco Ltd.
Shakti Sadan
New Delhi-110002
Fax No. – 011-23232721,
Tel. No. -011-23230026

"Project Manager" means the person appointed by the Employer in the manner provided in CC Sub-Clause 17.1 (Project Manager) hereof and named as such in the CC to perform the duties delegated by the Employer.

The Project Manager is: [Name, address, telephone, cable, email-id and facsimile numbers]

"Contractor" means the person(s) whose bid to perform the Contract has been accepted by the Employer and is named as such in the Contract Agreement, and includes the legal successors or permitted assigns of the Contractor.

The Contractor is: [Name, address, telephone, cable and facsimile numbers]

"Contractor's Representative" means any person nominated by the Contractor and named as such in the CC and approved by the Employer in the manner provided in CC Sub-Clause 17.2 (Contractor's Representative and Construction Manager) hereof to perform the duties delegated by the Contractor.

The Contractor's Representative is: [Name, address, telephone, cable and facsimile numbers]

"Subcontractor," including vendors, means any person to whom execution of any part of the Facilities, including preparation of any design or supply of any Plant and Equipment, is sub-contracted directly or indirectly by the Contractor, and includes its legal successors or permitted assigns.

"Contract Price" means the sum specified in Article 2.1 (Contract Price) of the Contract Agreement, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract.

"Facilities" means the Plant and Equipment to be supplied and installed, as well as all the Installation Services to be carried out by the Contractor under the Contract.

"Plant and Equipment" means permanent plant, equipment, machinery, apparatus, articles and things of

all kinds to be provided and incorporated in the Facilities by the Contractor under the Contract (including the spare parts to be supplied by the Contractor under CC Sub-Clause 7.3 hereof), but does not include Contractor's Equipment.

"Installation Services" means all those services ancillary to the supply of the Plant and Equipment for the Facilities, to be provided by the Contractor under the Contract; e.g., transportation and provision of marine or other similar insurance, inspection, expediting, Site preparation works (including the provision and use of Contractor's Equipment and the supply of all construction materials required), installation, testing, Pre-commissioning, commissioning, operations, maintenance, the provision of operations and maintenance manuals, training, etc.

"Contractor's Equipment" means all plant, facilities, equipment, machinery, tools, apparatus, appliances or things of every kind required in or for installation, completion and maintenance of Facilities that are to be provided by the Contractor, but does not include Plant and Equipment, or other things intended to form or forming part of the Facilities.

"Site" means the land and other places upon which the Facilities are to be installed, and such other land or places as may be specified in the Contract as forming part of the Site.

"Effective Date" means the date from which the Time for Completion shall be determined as stated in Article 3 (Effective Date for Determining Time for Completion) of the form of Contract Agreement.

"**Taking Over"** means the Employer's written acceptance of the Facilities under the Contract, after successful Trial – Operation for the specified period in accordance with the Contract.

"Time of completion" means the time within which completion of the Facilities as whole (or of a part of the Facilities where a separate Time for completion of such part has been prescribed) and Taking Over by the employer is to be attained in accordance with the stipulations in the SCC and the relevant provisions of the Contract.

The successful Bidder shall be required to prepare detailed Network(s) and project implementation plans & programmes and finalize the same with the Employer as per requirement specified in Technical Specifications, which shall form a part of the Contract.

Note: No credit will be given for the earlier delivery/ completion and offers with delivery/completion beyond the completion period will be treated as unresponsive.

"Completion" means that the Facilities (or a specific part thereof where specific parts are specified in the CC) have been completed operationally and structurally and put in a tight and clean condition, and that all work in respect of Pre-commissioning of the Facilities or such specific part thereof has been completed and Commissioning has been attained as per Technical Specifications followed by successful Trial – Operation, as provided in CC Clause 24.0 (Completion of Facilities) & 25.0 (Commissioning and Operational Acceptance) hereof.

"Pre-commissioning" means the testing, checking and other requirements specified in the Technical Specifications that are to be carried out by the Contractor in preparation for Commissioning as provided in CC Clause 24 (Completion) hereof.

"Commissioning" means operations of the facilities or any part thereof to be carried out by the Contractor as provided in CC Sub-Clause 25.1 (commissioning) hereof, for the purpose of carrying out Guarantee Test(s).

"Guarantee Test(s)" means the test(s) specified in the Technical Specifications to be carried out to ascertain whether the Facilities or a specified part thereof is able to attain the Functional Guarantees specified in the Technical Specifications in accordance with the provisions of CC Sub-Clause 25.2 (Guarantee Test) hereof.

"Operational Acceptance" means the acceptance by the Employer of the Facilities (or any part of the Facilities where the Contract provides for acceptance of the Facilities in parts), which certifies the Contractor's fulfillment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of CC Clause 28 (Functional Guarantees) hereof and shall include deemed acceptance in accordance with CC Clause 25 (Commissioning and Operational

Acceptance) hereof.

"Defect Liability Period" means the period of validity of the warranties given by the Contractor commencing at Completion of the Facilities or a part thereof, during which the Contractor is responsible for defects with respect to the Facilities (or the relevant part thereof) as provided in CC Clause 27 (Defect Liability) hereof.

'Local content' means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.

'Class-I local supplier' *means a supplier or service provider, whose goods, services or works offered for procurement,* meets the minimum local content as prescribed for 'Class-I local supplier' as defined under PPP-MII Order No.P-45021/2/2017-PP (BE-II) dated 16.09.2020.

'Class-II local supplier' *means a supplier or service provider, whose goods, services or works offered for procurement,* meets the minimum local content as prescribed for 'Class-II local supplier' but less than that prescribed for 'Class-I local supplier' as defined under PPP-MII Order No.P-45021/2/2017-PP (BE-II) dated 16.09.2020.

'Non - Local supplier' *means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than or equal to 20%, as defined above or as defined under PPP-MII* Order No. P-45021/2/2017-PP (BE-II) dated 16.09.2020.

'Minimum local content:' The 'local content' requirement to categorize a supplier as 'Class-I local supplier' is minimum 50%. For 'Class-II local supplier', the 'local content' requirement is minimum 20%. Nodal Ministry/ Department may prescribe only a higher percentage of minimum local content requirement to categorize a supplier as 'Class-I local supplier'/ 'Class-II local supplier'. For the items, for which Nodal Ministry Department has not prescribed higher minimum local content notification under the Order, it shall be 50% and 20% for 'Class-I local supplier'/ 'Class-II local supplier' respectively.

'L1' means the lowest tender or lowest bid or the lowest quotation received in a tender, bidding process or other procurement solicitation as adjudged in the evaluation process as per the tender or other procurement solicitation.

'Margin of purchase preference' means the maximum extent to which the price quoted by a "Class-I local supplier" may be above the L 1 for the purpose of purchase preference.

'Procuring entity' means a Ministry or department or attached or subordinate office of, or autonomous body controlled by, the Government of India and includes Government companies as defined in the Companies Act.

2. Contract Documents

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

3. Interpretation

3.1 Language

3.1.1 All Contract Documents, all correspondence and communications to be given, and all other documentation to be prepared and supplied under the Contract shall be written in English, and the Contract shall be construed and interpreted in accordance with that language.

3.1.2 If any of the Contract Documents, correspondence or communications are prepared in any language other than the governing language under CC Sub Clause 3.1.1 above, the English translation of such documents, correspondence or communications shall prevail in matters of interpretation.

3.2 Singular and Plural

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

3.3 Headings

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

3.4 Persons

Words importing persons or parties shall include firms, corporations and government entities.

3.5 Incoterms

Unless inconsistent with any provision of the Contract, the meaning of any trade term and the rights and obligations of parties there under shall be as prescribed by Incoterms.

Incoterms means international rules for interpreting trade terms published by the International Chamber of Commerce (latest edition), 38 Cours Albert 1er, 75008 Paris, France.

3.6 Entire Agreement

Subject to CC Sub-Clause 16.4 hereof, the Contract constitutes the entire agreement between the Employer and Contractor with respect to the subject matter of Contract and supersedes all communications, negotiations and agreements (whether written or oral) of parties with respect thereto made prior to the date of Contract.

3.7 Amendment

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

3.8 Independent Contractor

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

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

nship between any such employees, representatives or Subcontractors and the Employer.

3.9 Joint Venture or Consortium

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

3.10 Non-Waiver

3.10.1 Subject to CC Sub-Clause 3.10.2 below, no relaxation, forbearance, delay or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect or restrict the rights of that party under the Contract, nor shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

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

3.11 Severability

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

3.12 Country of Origin

"Origin" means the place where the materials, equipment and other supplies for the Facilities are mined, grown, produced or manufactured, and from which the services are provided.

4. Notices

4.1 Unless otherwise stated in the Contract, all notices to be given under the Contract shall be in writing, and shall be sent by personal delivery, airmail post, special courier, cable, telegraph, telex, facsimile, email id or Electronic Data Interchange (EDI) to the address of the relevant party set out in the Special Conditions of Contract, with the following provisions.

Employer's address for notice purposes: [Name, address and telephone, cable, email-id and facsimile numbers]

Contractor's address for notice purposes: [Name, address and telephone, cable, email-id and facsimile numbers]

4.1.1 Any notice sent by cable, telegraph, telex, facsimile, email id or EDI shall be confirmed within two (2) days after despatch by notice sent by airmail post or special courier, except as otherwise specified in the Contract.

4.1.2 Any notice sent by airmail post or special courier shall be deemed (in the absence of evidence of earlier receipt) to have been delivered ten (10) days after dispatch. In proving the fact of despatch, it shall be sufficient to show that the envelope containing such notice was properly addressed, stamped and conveyed to the postal authorities or courier service for transmission by airmail or special courier.

4.1.3 Any notice delivered personally or sent by cable, telegraph, telex, facsimile, email id or EDI shall be deemed to have been delivered on date of its despatch.

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

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

5. Governing Law

5.1 The courts at New Delhi shall have the exclusive jurisdiction on all matters

This Contract/Agreement is governed by and shall be construed in accordance with the laws of India and Indian laws shall govern the validity, enforcement, and interpretation of this Contract/Agreement."

In the contracts concerning International Agreements or contracts involving international parties, the following 'Governing Law' clause shall be considered:

"This Contract/Agreement shall be governed by and construed in accordance with the laws of India and Indian laws shall govern the validity, enforcement, and interpretation of this Contract/Agreement without regard to applicable principles of conflicts of law. Each of the parties hereto irrevocably consents to the exclusive jurisdiction of Courts at New Delhi, in connection with controversy, dispute, or claim of any nature arising out of, in connection with, or in relation to the interpretation, performance, enforcement or breach of this Contract/Agreement (and any closing document executed in connection herewith), including any claim based on contract, tort or statute, which shall be resolved before the commercial courts as per Commercial Courts Act, 2015."

6. Settlement of Disputes

(Note: - Bidder shall not approach the court while representing the matters to IEMs and bidder will await their decision in the matter.)

6.1. Adjudicator

Not applicable.

6.2 Dispute Resolution

6.2.1 Any controversy, dispute, or claim of any nature arising out of, in connection with, or in relation to the interpretation, performance, enforcement or breach of this Contract/Agreement (and any closing document executed in connection herewith), including any claim based on contract, tort or statute, shall be resolved before the Commercial Courts as per Commercial Courts Act, 2015
The Agreement shall be subject to jurisdiction of the courts at New Delhi.

6.2.2 The parties irrevocably submit to the exclusive jurisdiction of Courts at New Delhi for the determination of disputes arising under this contract/agreement."

6.2.3 Deleted

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6.2.9.1 Deleted

6.2.9.2 Deleted

B. Subject Matter of Contract

7. Scope of Facilities

7.1. Unless otherwise expressly limited in the Technical Specifications, the Contractor's obligation cover the provision of all Plant and Equipment and the performance of all Installation Services required for the design, the manufacture (including procurement, quality assurance, construction, installation, associated civil works, Pre-commissioning and delivery) of the Plant and Equipment and the installation, completion, commissioning and performance testing of the facilities in accordance with the plans, procedures, specifications drawings, codes and any other documents as specified in the Technical specifications. Such specifications include, but are not limited to, the provision of supervision and engineering services the supply of labour, materials, equipment, spare parts (as specified in CC sub-clause 7.3 below) and accessories, Contractor's Equipment; construction utilities and supplies, temporary materials, structures and facilities, transportation (including without limitation, unloading and hauling to, from and at the Site); and storage except for those supplies, works and services that will be provided or performed by the Employer, as set forth in Appendix-6 (Scope of Works and Supply by the Employer) to the Contract Agreement.

7.2 The Contractor shall, unless specifically excluded in the Contract, perform all such work and/or supply all such items and materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Completion of the Facilities as if such work and/or items and materials were expressly mentioned in the Contract.

7.3 In addition to the supply of Mandatory Spare Parts included in the Contract, the Contractor agrees to supply spare parts required for the operation and maintenance of the Facilities for the period specified in the CC. However, the identity, specifications and quantities of such spare parts and the terms and conditions relating to the supply thereof are to be agreed between the Employer and the Contractor, and the price of such spare parts shall be that given in Price Schedules, which shall be added to the Contract Price. The price of such spare parts shall include the purchase price thereof and other costs and expenses (including the Contractor's fees) relating to the supply of spare parts.

The Contractor shall ensure the availability of spare parts for the supplied items for a minimum period of fifteen (15) years from operational acceptance by the Employer

7.4 The Contractor shall carry sufficient inventories to ensure an ex-stock supply of consumable spares for the plant and equipment. Other spare parts and components shall be supplied as promptly as possible, but at the most within six (6) months of placing the order and opening the letter of credit.

7.5 In the event of termination of production of spare parts:

(i) The Contractor shall send advance notification to the Employer of the pending termination, with 2 (two) years time to permit the Employer to procure needed requirements, and

(ii) Following such termination, the contractor shall furnish at no cost to the Employer the blueprints, drawings and specifications of the spare parts, if requested.

8. Time for Commencement and Completion

8.1 The Contractor shall commence work on the Facilities within the period specified in the CC and without prejudice to CC Sub-Clause 26.2 hereof, the Contractor shall thereafter proceed with the Facilities in accordance with the time schedule specified in Appendix 4 (Time Schedule) to the Contract Agreement.

The contractor shall commence work on the facilities from the Effective Date of Contract for determining Time for completion as specified in the contract.

8.2. The Contractor shall attain Completion of the Facilities (or of a part where a separate time for Completion of such part is specified in the Contract) within the time stated in the CC or within such extended time to which the Contractor shall be entitled under CC Clause 40 (Extension of Time for Completion) hereof.

9. Contractor's Responsibilities

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

9.2 The Contractor confirms that it has entered into this Contract on the basis of a proper examination of the data relating to the Facilities (including any data as to boring tests) provided by the Employer, and on the basis of information that the Contractor could have obtained from a visual inspection of the Site (if access thereto was available) and of other data readily available to it relating to the Facilities as at the date twenty-eight (28) days prior to bid submission. The Contractor acknowledges that any failure to acquaint itself with all such data and information shall not relieve its responsibility for properly estimating the difficulty or cost of successfully performing the Facilities.

9.3 The Contractor shall acquire in its name all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the Site is located that are necessary for the performance of the Contract, including, without limitation, visas for the Contractor's and Subcontractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals and/or licenses that are not the responsibility of the Employer under CC Sub-Clause 10.3 hereof and that are necessary for the performance of the Contract.

9.4 The Contractor shall comply with all laws in force in the country where the Facilities are installed and where the Installation Services are carried out. The laws will include all national, provincial, municipal or other laws that affect the performance of the Contract and bind upon the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the Subcontractors and their personnel, but without prejudice to CC Sub-Clause 10.1 hereof.

9.5 Any Plant, Material and Services that will be incorporated in or be required for the Facilities and other supplies shall have their origin as specified under CC Sub-Clause 3.12 (Country of Origin).

9.6 The Contractor shall permit the Employer to inspect the Contractor’s accounts and records relating to the performance of the Contractor.

10. Employer's Responsibilities

10.1 The Employer shall ensure the accuracy of all information and/or data to be supplied by the Employer as described in Appendix 6 (Scope of Works and Supply by the Employer) to the Contract, except when otherwise expressly stated in the Contract.

10.2 The Employer shall be responsible for acquiring and providing legal and physical possession of the Site and access thereto, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way, as specified in Appendix 6 (Scope of Works and Supply by the Employer) to the Contract Agreement. The Employer shall give full possession of and accord all rights of access thereto on or before the date(s) specified in Appendix 6.

10.3 The Employer shall acquire and pay for all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the site is located which such authorities or undertakings require the Employer to obtain them in the Employer's name, are necessary for the execution of the Contract (they include those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract), including those specified in Appendix 6 (Scope of works and supply by the Employer) to the Contract Agreement.

10.4 If requested by the Contractor, the Employer shall use its best endeavors to assist the Contractor in obtaining in a timely and expeditious manner all permits, approvals and/or licenses necessary for the execution of the Contract from all local, state or national government authorities or public service undertakings that such authorities or undertakings require the Contractor or Subcontractors or the personnel of the Contractor or Subcontractors, as the case may be, to obtain.

10.5 Unless otherwise specified in the Contract or agreed upon by the Employer and the Contractor, the Employer shall provide sufficient, properly qualified operating and maintenance personnel, shall supply and make available all raw materials utilities, lubricants, chemicals, catalysts, other materials and facilities, and shall perform all works and services of whatsoever nature, to enable the Contractor to properly carry out Pre-commissioning, Commissioning and Guarantee Tests, all in accordance with the provisions of Appendix 6 (Scope of works and supply by the Employer) to the Contract Agreement at or before the time specified in the program furnished by the Contractor under CC Sub-Clause 18.2 (Program of Performance) hereof and in the manner thereupon specified or as otherwise agreed upon by the Employer and the Contractor.

10.6 The Employer shall be responsible for the continued operation of the facilities after Operational Acceptance, in accordance with CC 25.3

10.7 All costs and expenses involved in the performance of the obligations under this CC Clause 10 shall be the responsibility of the Employer, save those to be incurred by the Contractor with respect to the performance of Guarantee Tests, in accordance with CC Sub-Clause 25.2.

C. Payment

11. Contract Price

11.1 The Contract Price shall be as specified in Article 2 (Contract Price and Terms of Payment) of the Form of Contract Agreement.

11.2 The Contract Price shall be on lump sum basis. The Contract price shall be adjusted on account of variation in quantity in accordance with clause 39 CC. Further the CIF/Ex-works price component and installation price component shall also be subject to price adjustment in line with the provisions of Appendix 2 to Form of Contract Agreement

11.3 Subject to CC Sub-Clauses 9.2, 10.1 and 35 (Unforeseen Conditions) hereof, the Contractor shall be deemed to have satisfied itself as to the correctness and sufficiency of the Contract Price, which shall, except as otherwise provided for in the Contract, cover all its obligations under the Contract.

12. Terms of Payment

12.1 The Contract Price shall be paid as specified in Appendix 1 (Terms and Procedures of Payment) to the Contract Agreement. The procedures to be followed in making application for and processing payments shall be those outlined in the same Appendix 1.

12.2 No payment made by the Employer herein shall be deemed to constitute acceptance by the Employer of the Facilities or any part(s) thereof.

12.3 The currency or currencies in which payments are made to the Contractor under this Contract shall be specified in Appendix 1 (Terms and Procedures of Payment) to the Contract Agreement, subject to the general principle that payments will be made in the currency or currencies in which the Contract Price has

been stated in the Contractor's bid.

12.4 All payments shall be made in currency or currencies specified in the corresponding Appendix 1 (Terms and Procedures of Payment) to the Contract Agreement, pursuant to CC 12.3.

13. Securities

13.1 Issuance of Securities

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

13.2 Advance Payment Security

13.2.1 The Contractor shall, within twenty-eight (28) days of the notification of contract award, provide a security in an amount equal to the advance payment calculated in accordance with Appendix 1 (Terms and Procedures of Payment) to the Contract Agreement, and in the same currency or currencies with a validity of up to the date of completion of Facilities in accordance with CC clause 24.0 and it shall be kept alive till the recovery of the full amount of the advance with interest portion.

13.2.2 The Security shall be in the form provided in the bidding documents or in another form acceptable to the Employer. The security shall be discharged after completion of the facilities or relevant party thereof.

Procedure for effective reduction in the Advance Payment Security:

Recovery of the advance amount shall be made from each running bill proportionately. It should be clearly understood that reduction in the value of security for advance shall not in any way dilute the Contractor's responsibility and liabilities under the Contract including in respect of the Facilities for which reduction in the value of security is allowed.

13.3 Performance Security

13.3.1 The Bidder shall submit **performance** ***security*** **@** 10% of the **total** contract ***price for the performance of contact*** within twenty eight days (28 days) ***from the issuance of*** notifications of award. **The Material shall not be accepted without depositing performance security**.

The performance ***security is to be deposited in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt from a commercial Bank, Bank Guarantee*** **(including e- Bank Guarantee)** ***from a commercial Bank*** **or online payment in an acceptable form safeguarding the purchaser's interest in all respect. Performance** ***security shall be*** **valid** up to **defect liability period but initially** for 12 Months from **the date of taking over**/operational acceptance. **This** performance guarantee shall be renewed periodically every year **upto the end of defect liability period**. Every renewal of performance guarantee shall be done by the contractor one month prior to the expiry date.

The bidder will submit an undertaking to the owner with a copy to the banker issuing the performance bank guarantee that the bidder will renew and submit the bank guarantee within thirty days before the expiry of bank guarantee failing which it shall be encashed and credited in favour of DTL automatically by the banker without waiting for any instructions from DTL.

13.3.2 The performance security shall be in the form of unconditional Bank Guarantee attached hereto in the Section IV - Sample Forms and Procedures.

13.3.3 Reduction in the security pro rata to the Contract Price of any part of the Facilities is not admissible since separate time for Completion of part of the facilities is not applicable. However, if the Defects Liability Period has been extended on any part of the Facilities pursuant to CC sub-clause 27.8 hereof, the Contractor shall issue an additional security in an amount proportionate to the Contract Price of that part. The Security shall be returned to the Contractor immediately after its expiration, provided, however, that if the Contractor pursuant to CC Sub-Clause 27.10, is liable for an extended warranty obligation, the performance security shall be extended for the period and up to the amount specified in the CC clause 27.

13.3.4. In case of award of the contract to a Joint Venture, the performance security and the Bank Guarantee for advance payment shall be submitted in the name of the Joint Venture and not in the name of the Lead Partner or any Partner(s) of the Joint Venture alone

13.3.5. No interest on Performance Security Deposit will be payable to the depositors.

13.3.6 Exemption from performance security deposit will not be permitted under any circumstance.

13.4 **Issuing Banks**

The Advance Payment Security and Performance Security are to be provided by the Contractor in the form of 'Bank Guarantee' which should be issued either:

(a) by a reputed bank located in the country of Employer and acceptable to the Employer, or
(b) by a foreign bank confirmed by either its correspondence bank located in the country of Employer which should be reputed and acceptable to the Employer, or
(c) by a Public Sector Bank in the country of Employer.

All banks shall be nationalized and scheduled banks operating in India.

14. Taxes and Duties

14.1 Prices are to be quoted exclusive of GST and GST rate may also be indicated in the price bid and BOQ/ un-priced schedule.

14.2 The Contractor shall be entirely responsible for payment of all taxes, duties, license fees and other such levies legally payable/incurred until delivery of the contracted supplies to the Employer. If it is statutory requirement to make deductions towards such taxes and duties or any other applicable taxes and duties, the same shall be made by the owner and a certificate for the same shall be issued to the Contractor.

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

14.4 In respect of transactions between the Employer and the Contractor, the Base Price is inclusive of all cost as well as duties and tax (custom duties & levies, Taxes and duties as per GST Rules) paid or payable on components, raw materials and any other items used /incorporated or to be incorporated in the Plants & Equipments and other final goods & services to be supplied by the contractor under the proposed contract. No separate claim shall be paid by the Employer for taxes and duties included in respect of these items stated herein.

14.5 Taxes, duties and levies as per GST Rules for the goods & Services under 'transactions' between contractor & Employer for destination site/state shall not be included in the base price. These amounts will be payable (along with subsequent statutory variation if any) on the supplies made by the Contractor, subject to submission of the documentary evidence indicating the said taxes paid by the contractor and GST credit is transferred to the Employer. But the amount of said taxes shall be limited to the tax liability on the transaction between the employer and the Contractor only. However, Employer will not bear any upward variation in GST rate due to change/disputes in classification relating to HSN/SAC code as quoted by the bidder at a later stage. Employer shall, however, deduct such taxes at source as per the rules and issue Tax Deduction at Source (TDS) Certificate to the Contractor as per the said rules. The Input Tax Credit (ITC) available, if any, under GST as per the relevant Government laws wherever applicable has been taken into account by the Contractor. Reimbursement of GST by the Employer shall be at the rate applicable on the HSN/SAC of the goods/ services supplied by the Contractor to the Employer as mutually agreed upon. The payment of GST on advance payment shall be against Invoice/Debit Note containing particulars specified under the GST Act and related Rules, Notifications, etc as notified by the Government in this regard. In the event that the Contractor fails to provide the invoice in the form and manner prescribed under the GST Act and Rules, the Employer shall not be liable to make any payment against such invoice. GST payment against Advance payment shall be against a proforma invoice. Further, the Contractor shall, within 7 days from the date of receipt of Advance, furnish an Advance Receipt Voucher to the Employer, as prescribed under the GST Law.

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

14.7 DELETED

14.8 For payment in respect of dispatches made directly from Contractor's works, Tax invoices raised by the Contractor shall be accepted as documentary evidence and for payment of GST. The amount of GST as stated in Tax invoice will be paid only after the GST credit is transferred to the Employer. However, the employer from time to time may also verify the payment / deposit of various taxes by the contractor, which the later has already claimed and charged in the previous invoices from the employer against the aforesaid transactions between employer and the contractor.

14.9 In Case the Taxes, Duties and Levies as per GST Rules on transaction between Employer and the Contractor is covered under the Reverse Charge provision full Tax has to be stated / mentioned in the quoted prices/ bid. However, where the Reverse Charge Mechanism Provisions are applicable, DTL shall not pay the applicable tax amount to the contractor and will deposit directly to the Government treasury. To facilitate the bidders, Employer has indicated HSN/SAC code and rate of GST against each item in the price schedule. It shall entirely be the responsibility of the bidder to check the HSN/SAC code and rate of GST given against each item. The bidder may either confirm the HSN and rate of GST or if the bidder opts to classify the item in question under a different HSN/ SAC code or opts to indicate a different rate of GST, bidder may indicate the same in the columns provided. The bidder shall solely be responsible for HSN/SAC classification and the rate of GST of each item. Employer's liability for the reimbursement of GST shall be GST applicable at the rate as confirmed/ deemed confirmed in the bid and as accepted by the employer. The Input Tax Credit (ITC) available, if any, under the GST law as per the relevant Govt. policies wherever applicable shall be taken into account by the bidder while quoting bid price.

14.10 For the purpose of the Contract, it is agreed that the Contract Price specified in Article-2 (Contract Price and Terms of Payment) of the Contract Agreement is based on the taxes inclusive of duties, levies and charges prevailing at the date seven (07) days prior to the last date of bid submission. If any rates of Tax including service tax are increased or decreased or, a new Tax is introduced, or/an existing Tax is abolished in the course of the performance of the Contract, which was or will be assessed on the Contractor in connection with performance of the Contract, an equitable adjustment of the Contract price shall be made to take into account any such change by addition to the Contract price or deduction therefrom, as the case may be (changes in law & regulations) hereof. However, these adjustments would be applicable to all transactions between the employer and the Contractor for which the taxes and duties are reimbursable by the Employer as per the Contract. These adjustments shall not be applicable on procurement of raw materials, intermediary components etc by the Contractor.

14.11 In respect of raw materials, intermediary components etc forming part of base price of goods & services supplied under the contract, neither the employer nor the Contractor shall be entitled to any claim arising due to increase or decrease in the rate of Tax, introduction of a new Tax or abolition of an existing Tax in the course of the performance of the Contract. However, Employer will not bear any upward variation in GST rate due to change/disputes in classification relating to HSN/SAC code as quoted by the bidder at a later stage.

D. Intellectual Property

15. Copyright

15.1 The copy right in all drawings, documents and other materials containing data and information furnished to the Employer by the Contractor herein shall remain vested in the Contractor or, if they are furnished to the Employer directly or through the Contactor by any third party, including supplies of materials, the copyright in such materials shall remain vested in such third party.

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

16. Confidential Information

16.1 The Employer and the Contractor shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party any documents, data or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following termination of the Contract. Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this CC Clause.16.

16.2 The Employer shall not use such documents, data and other information received from the Contractor for any purpose other than the operation and maintenance of the Facilities. Similarly, the Contractor shall not use such documents, data and other information received from the Employer for any purpose other than the

design, procurement of Plant and Equipment, construction or such other work and services as are required for the performance of the Contract.

16.3 The obligation of a party under CC Sub-Clauses 16.1 and 16.2 above, however, shall not apply to that information which

(a) now or hereafter enters the public domain through no fault of that party

(b) can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party hereto

(c) otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality

16.4 The above provisions of this CC Clause 16 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Facilities or any part thereof.

16.5 The provisions of this CC Clause 16 shall survive termination, for whatever reason, of the Contract.

E. Execution of the Facilities

17. Representatives

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

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

17.2 Contractor's Representative & Construction Manager

17.2.1 If the Contractor's Representative is not named in the Contract, then within fourteen (14) days of the Effective Date, the Contractor shall appoint the Contractor's Representative and shall request the Employer in writing to approve the person so appointed. If the Employer makes no objection to the appointment within fourteen (14) days, the Contractor's Representative shall be deemed to have been approved. If the Employer objects to the appointment within fourteen (14) days giving the reason therefore, then the Contractor shall appoint a replacement within fourteen (14) days of such objection, and the foregoing provisions of this CC Sub-Clause 17.2.1 shall apply thereto.

17.2.2 The Contractor's Representative shall represent and act for the Contractor at all times during the currency of the Contract and shall give to the Project Manager all the Contractor's notices, instructions, information and all other communications under the Contract.
All notices, instructions, information and all other communications given by the Employer or the Project Manager to the Contractor under the Contract shall be given to the Contractor's Representative or, in its absence, its deputy, except as herein otherwise provided.

The Contractor shall not revoke the appointment of the Contractor's Representative without the Employer's prior written consent, which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor's Representative, pursuant to the procedure set out in CC Sub-Clause 17.2.1.

17.2.3 The Contractor's Representative may, subject to the approval of the Employer (which shall not be unreasonably withheld), at any time delegate to any person any of the powers, functions and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Contractor's Representative, and shall specify the powers, functions and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until a copy thereof has been delivered to the Employer and the Project Manager

Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this CC Sub-Clause 17.2.3 shall be deemed to be an act or exercise by the Contractor's

Representative.

17.2.3.1 Notwithstanding any thing stated in CC sub-Clause 17.1 and 17.2.1 above, for the purpose of execution of Contract, the Employer and the Contractor shall finalize and agree to a Contract Co-ordination Procedure and all the communication under the Contract shall be in accordance with such Contract Coordination Procedure.

17.2.4 From the commencement of installation of the Facilities at the site until Operational Acceptance, the Contractor's Representative shall appoint a suitable person as the construction manager, (hereinafter referred to as "the Construction Manager"). The Construction Manager shall supervise all work done at the site by the Contractor and shall be present at the site through-out normal working, hours, except when on leave, sick or absent for reasons connected with the proper performance of the Contract. Whenever the Construction Manager is absent from the Site, a suitable person shall be appointed to act as his or her deputy.

17.2.5 The Employer may by notice to the Contractor object to any representative or person employed by the Contractor in the execution of the Contract who, in the reasonable opinion of the Employer, may behave inappropriately, may be incompetent or negligent, or may commit a serious breach of the Site regulations provided under CC Sub-Clause 22.3. The Employer shall provide evidence of the same, whereupon the Contractor shall remove such person from the Facilities.

17.2.6 If any representative or person employed by the Contractor is removed in accordance with CC Sub-Clause 17.2.5, the Contractor shall, where required, promptly appoint a replacement.

18. Work Program

18.1 Contractor's Organization

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

18.2 Program of Performance

The form of the program of performance of the Contract shall be in the form of the Critical Path Method (CPM), the PERT network, or other internationally used programs.

Within twenty-eight (28) days after the date of Notification of Award, the Contractor shall prepare and submit to the Project Manager a detailed program of performance of the Contract, made in the form specified in the CC and showing the sequence in which it proposes to design, manufacture, transport, assemble, install and pre-commission the Facilities, as well as the date by which the Contractor reasonably requires that the Employer shall have fulfilled its obligations under the Contract so as to enable the Contractor to execute the Contract in accordance with the program and to achieve completion, commissioning and Acceptance of the Facilities in accordance with the Contract. The program so submitted by the Contractor shall accord with the Time Schedule included in appendix-4 (Time Schedule) to the Contract Agreement and any other dates and periods specified in the Contract. The Contractor shall update and revise the program as and when appropriate or when required by the Project Manager, but without modification in the Times for Completion given in the CC and any extension granted in accordance with CC Clause 40, and shall submit all such revisions to the Project Manager.

18.3 Progress Report

The Contractor shall monitor progress of all the activities specified in the program referred to in CC Sub-Clause 18.2 (Program of Performance) above, and supply a progress report to the Project Manager every month.

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

18.4 Progress of Performance

If at any time the Contractor's actual progress falls behind the program referred to in CC Sub-Clause 18.2

(Program of Performance), or it becomes apparent that it will so fall behind, the Contractor shall, at the request of the Employer or the Project Manager, prepare and submit to the Project Manager a revised program, taking into account the prevailing circumstances, and shall notify the Project Manager of the steps being taken to expedite progress so as to attain Completion of the Facilities within the Time for Completion under CC Sub Clause 8.2 (Time for Commencement and Completion), any extension thereof entitled under CC Sub-Clause 40.1 (Extension of Time for Completion), or any extended period as may otherwise be agreed upon between the Employer and the Contractor.

18.5 Work Procedures

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

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

19. Subcontracting

19.1 Appendix 5 (List of Approved Subcontractors) to the Contract Agreement specifies major items of supply or services and a list of approved Subcontractors against each item, including vendors. Insofar as no Subcontractors are listed against any such item, the Contractor shall prepare a list of Subcontractors for such item for inclusion in such list. The Contractor may from time to time propose any addition to or deletion from any such list. The Contractor shall submit any such list or any modification thereto to the Employer for its approval in sufficient time so as not to impede the progress of work on the Facilities. Such approval by the Employer for any of the Subcontractors shall not relieve the Contractor from any of its obligations, duties or responsibilities under the Contract.

19.2 The Contractor shall select and employ its Subcontractors for such major items from those listed in the lists referred to in CC Sub-Clause 19.1.

19.3 For items or parts of the Facilities not specified in Appendix 5 (List of Approved Subcontractors) to the Contract Agreement, the Contractor may employ such Subcontractors as it may select, at its discretion.

20. Design and Engineering

20.1 Specifications and Drawings

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

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

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

20.2 Codes and Standards

Wherever references are made in the Contract to codes and standards in accordance with which the Contract shall be executed, the edition or the revised version of such codes and standards current at the date twenty-eight (28) days prior to date of bid submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied after approval by the Employer and shall be treated in accordance with CC Clause 39.3 (Changes Originating from Contractor).

20.3 Approval/Review of Technical Documents by Project Manager

20.3.1 The Contractor shall prepare (or cause its subcontractors to prepare) and furnish to the Project Manager the documents listed in Appendix-7(List of Documents for Approval or Review) to the Contract Agreement for its approval or review as specified and as in accordance with the requirements of CC sub-Clause 18.2 (Program of Performance).

Any part of the Facilities covered by or related to the documents to be approved by the Project Manager shall be executed only after the Project Manager's approval thereof.

CC sub-Clause 20.3.2 through 20.3.7 shall apply to those documents requiring the Project Manager's approval, but not to those furnished to the Project Manager for its review only.

20.3.2 Within twenty one (21) days after receipt by the Project Manager of any document requiring the Project Manager's approval in accordance with CC Sub-Clause 20.3.1, the Project Manager shall either return one copy thereof to the Contractor with its approval endorsed thereon or shall notify the Contractor in writing of its disapproval thereof and the reasons therefore and the modifications that the Project Manager proposes.

20.3.3 The Project Manager shall not disapprove any document, except on the grounds that the document does not comply with some specified provision of the Contract or that it is contrary to good engineering practice.

20.3.4 If the Project Manager disapproves the document, the Contractor shall modify the document and resubmit it for the Project Manager's approval in accordance with CC sub-Clause 20.3.2. If the Project Manager approves the documents subject to modification(s), the Contractor shall make the required modifications the document shall be deemed to have been approved.

The procedure, for submission of the documents by the Contractor and their approval by the Project Manager shall be discussed and finalized with the Contractor.

20.3.5 Deleted

20.3.6 The Project Manager's approval, with or without modification of the document furnished by the Contractor, shall not relieve the Contractor of any responsibility or liability imposed upon it by any provisions of the Contract except to the extent that any subsequent failure results from modifications required by the Project Manager.

20.3.7 The Contractor shall not depart from any approved document unless the Contractor has first submitted to the Project Manager an amended document and obtained the Project Manager's approval thereof, pursuant to the provisions of this CC Sub-Clause 20.3. If the Project Manager requests any change in any already approved document and/or in any document based thereon, the provisions of CC Clause 39 (Change in the Facilities) shall apply to such request.

21. Procurement

21.1 Plant and Equipment

Subject to CC Sub-Clause 18.2, the Contractor shall manufacture or procure and transport all the Plant and Equipment in an expeditious and orderly manner to the Site.

21.2 Employer-Supplied Plant, Equipment, and Materials

If Appendix 6 (Scope of Works and Supply by the Employer) to the Contract Agreement provides that the Employer shall furnish any specific items of machinery, equipment or materials to the Contractor, the following provisions shall apply:

21.2.1 The Employer shall, at its own risk and expense, transport each item to the place on or near the Site as agreed upon by the parties and make such item available to the Contractor at the time specified in the program furnished by the Contractor, pursuant to CC Sub-Clause 18.2 (Program of Performance), unless otherwise mutually agreed.

21.2.2 Upon receipt of such item, the Contractor shall inspect the same visually and notify the Project Manager of any detected shortage, defect or default. The Employer shall immediately remedy any shortage, defect or default, or the Contractor shall, if practicable and possible, at the request of the Employer, remedy such shortage, defect or default at the Employer's cost and expense. After inspection, such item shall fall under the care, custody and control of the Contractor. The provision of this CC Sub-21.2.2 shall apply to any item supplied to remedy any such shortage or default or to substitute for any defective item, or shall apply to defective items that have been repaired.

21.2.3 The foregoing responsibilities of the Contractor and its obligations of care, custody and control shall not relieve the Employer of liability for any undetected shortage, defect or default, nor place the Contractor under any liability for any such shortage, defect or default whether under CC Clause 27 (Defect Liability) or under any other provision of Contract.

21.3 Transportation

21.3.1 The Contractor shall at its own risk and expense transport all the Plant and Equipment and the Contractor's Equipment to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances.

21.3.2 Unless otherwise provided in the Contract, the Contractor shall be entitled to select any safe mode of transport operated by any person to carry the Plant and Equipment and the Contractor's Equipment.

21.3.3 Upon despatch of each shipment of the Plant and Equipment and the Contractor's Equipment, the Contractor shall notify the Employer by telex, cable, facsimile or Electronic Data Interchange (EDI) of the description of the Plant and Equipment and of the Contractor's Equipment, the point and means of despatch, and the estimated time and point of arrival in the country where the Site is located, if applicable, and at the Site. The Contractor shall furnish the Employer with relevant shipping documents to be agreed upon between the parties.

21.3.4 The Contractor shall be responsible for obtaining, if necessary, approvals from the authorities for transportation of the Plant and Equipment and the Contractor's Equipment to the Site. The Employer shall use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining such approvals, if requested by the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any claim for damage to roads, bridges or any other traffic facilities that may be caused by the transport of the Plant and Equipment and the Contractor's Equipment to the Site.

21.4 Customs Clearance

The Contractor shall, at its own expense, handle all imported Plant and Equipment and Contractor's Equipment at the point(s) of import and shall handle any formalities for customs clearance including liabilities for port charges if any, subject to the Employer's obligations under CC sub-Clause 14.4, provided that if applicable laws or regulations require any application or act to be made by or in the name of the employer, the employer shall take all necessary steps to comply with such laws or regulations. In the event of delays in customs clearance due to the fault of the employer, the Contractor shall be entitled to an extension in the Time for Completion, pursuant to CC Clause 40.

21.5 Delivery and Documents

21.5.1 For Imported Goods

Upon shipment, the Contractor shall notify the Employer and the Insurance company by cable or telex of the full details of the shipment including Contract number, description of goods, quantity, the vessel, the bill of lading/Airway Bill number and date, port of loading, date of shipment, port of discharge, etc. The Contractor shall mail the following documents to the Employer, with a copy to the Insurance Company:

1) Copies of the Contractor's invoice showing Contract Agreement reference, goods description, quantity, unit price, total amount;

2) Original (3/3) and six copies of the negotiable, clean on-board bill of lading/Air way Bill marked freight prepaid and six copies of non negotiable bill of lading / Airway Bill;

3) Copies of packing list identifying contents of each package(6 copies);

4) Original insurance policy certification (3 copies);

5) Manufacture's / Contractor's guarantee certificate of Quality;

6) Material Inspection & Clearance Certificate (MICC) for dispatch, issued by the Employer's representative and the Contractor's factory inspection report, test certificates(3 copies); and

7) Certificate of origin.

The above documents shall be air mailed/faxed by the Contractor to reach the Employer with in one week from date of shipment to enable the Employer to make progressive payment to the Contractor and also

make necessary arrangement for payment of custom duties etc. The Contractor will be responsible for any consequent expenses due to delay in furnishing the above documentation.

21.5.2 For Domestic Goods

Upon shipment, the Contractor shall notify the employer and the Insurance Company by cable or telex of the full details of the dispatch including Contract number, description of goods, quantity, R/R or L/R number and date, place of loading, date of dispatch etc. The Contractor shall mail the following documents to the Employer, with a copy to Insurance Company:

1) Copies of the Contractor's invoice showing Contract Agreement reference, goods description, quantity, unit price, total amount(6 copies);

2) Copies of packing list identifying contents of each package(6 Copies);

3) Railway receipt / Receipted LR ;

4) Manufacturer's / Contractor's guarantee certificate of Quality.

5) Material Inspection & Clearance Certificate (MICC) for dispatch issued by the Employer's representative and the Contractor's factory inspection report & test certificate (3 copies) and insurance certificate (3 copies); and

6) Certificate of origin.

21.6 **Packing**

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

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

21.7 Indemnity Bond

For the equipment/material to be provided by the Contractor, it will be the responsibility of the Contractor to take delivery, unload and store the material at Site and execute an Indemnity Bond in favour of the Employer against loss, damage and any risks involved for the full value of the material and obtain authorization letter from Employer as per proforma given at Section-IV. This Indemnity Bond shall be furnished by the Contractor before commencement of the supplies and shall be valid till the scheduled date of Operational Acceptance of the equipment by the Employer

22. Installation

22.1 Setting Out/Supervision/Labour

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

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

22.1.2 Contractor's Supervision:

The Contractor shall give or provide all necessary superintendence during the installation of the Facilities, and the Construction Manager or its deputy shall be constantly on the Site to provide full-time superintendence of the installation. The Contractor shall provide and employ only technical personnel who

are skilled and experienced in their respective callings and supervisory staff who are competent to adequately supervise the work at hand.

22.1.3 Labour:

(a) The Contractor shall provide and employ on the Site in the installation of the Facilities such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged to use local labour that has the necessary skills.

(b) Unless otherwise provided in the Contract, the Contractor shall be responsible for the recruitment, transportation, accommodation and catering of all labour, local or expatriate, required for the execution of the Contract and for all payments in connection therewith.

(c) The Contractor shall be responsible for obtaining all necessary permit(s) and/or visa(s) from the appropriate authorities for the entry of all labour and personnel to be employed on the Site into the country where the Site is located.

(d) The Contractor shall at its own expense provide the means of repatriation to all of its and its Subcontractor's personnel employed on the Contract at the Site to their various home countries. It shall also provide suitable temporary maintenance of all such persons from the cessation of their employment on the Contract to the date programmed for their departure. In the event that the Contractor defaults in providing such means of transportation and temporary maintenance, the Employer may provide the same to such personnel and recover the cost of doing so from the Contractor.

(e) The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, riotous or disorderly conduct or behavior by or amongst its employees and the labour of its Subcontractors.

(f) The Contractor shall, in all dealings with its labour and the labour of its Subcontractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious or other customs and all local laws and regulations pertaining to the employment of labour.

22.2 Contractor's Equipment

22.2.1 All Contractors' Equipment brought by the Contractor onto the Site shall be deemed to be intended to be used exclusively for the execution of the Contract. The Contractor shall not remove the same from the Site without the Project Manager's consent that such Contractor's Equipment is no longer required for the execution of the Contract.

22.2.2 Unless otherwise specified in the Contract, upon completion of the Facilities, the Contractor shall remove from the Site all Equipment brought by the Contractor onto the Site and any surplus materials remaining thereon.

22.2.3 The Employer will, if requested, use its best endeavors to assist the Contractor in obtaining any local, state or national government permission required by the Contractor for the export of the Contractor's Equipment imported by the Contractor for use in the execution of the Contract that is no longer required for the execution of the Contract.

22.3 Site Regulations and Safety

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

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

22.3.1 Compliance with Labour Regulations

22.3.1.1 During continuance of the contract, the Contractor and his sub-contractors shall abide at all times by all applicable existing labour enactments and rules made there under, regulations notifications and bye laws of the State or Central Government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law in future

either by the State or the Central Government or the local authority. The employees of the Contractor and the Sub-contractor in no case shall be treated as the employees of the Employer at any point of time.

22.3.1.2 The Contractor shall keep the employer indemnified against any action by the competent authority on account of contravention of any of the provisions of any Act or rules made there under, regulations or notifications including amendments.

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

22.3.1.4 Some major laws along with their latest amendments applicable to establishments engaged in building and other construction works:

a) Workmen Compensation Act 1923: The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

b) Payment of Gratuity Act 1972: Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years service or more or on death the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

c) Employee P.F. and Miscellaneous Provision Act 1952: The Act provides for monthly contribution by the employer plus workers @ 10% or 8.33%. The benefits under the Act are:

1) Pension or family pension on retirement or death, as the case may be.
2) Deposit linked insurance on death in harness of the worker.
3) Payment of P.F. accumulation on retirement/death etc.

d) Maternity Benefit Act 1951: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

e) Contract Labour (Regulation & Abolition) Act 1970: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by law. The Principal Employer is required to take Certification of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more labour contract labour.

f) Minimum Wages Act 1948: The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provision of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employments.

g) Payment of Wages Act 1936: It lays down as to by what date the wages are to paid, when it will be paid and what deductions can be made from the wages of the workers.

h) Equal Remuneration Act 1979: The Act provides for payment of equal wages for work of equal nature to Male and Female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.

i) Payment of Bonus Act 1965: The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs.3500/- per month or less. The bonus is to be paid to employees getting Rs.2500/- per month or above upto Rs.3500/- per month shall be worked out by taking wages as Rs.2500/-per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.

j) Industrial Dispute Act 1947: The Act lays down the machinery the procedure for resolution of Industrial disputes, in what situations a strike or lock out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

k) Industrial Employment (Standing Orders) Act 1946: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.

l) Trade Unions Act 1926: The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.

m) Child Labour (Prohibition & Regulation) Act 1986: The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.

n) Inter-State Migrant workmen's (Regulation of Employment & Conditions of Service) Act 1979: The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state).The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home upto the establishment and back, etc.

o) The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996: All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as Canteens, First-Aid facilities, Ambulance, Housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the government.

p) Factories Act 1948: The Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

22.3.2 Protection of Environment

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

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

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

The Water (Prevention and Control of Pollution) Act, 1974, This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.

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

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

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

22.4 Opportunities for Other Contractors

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

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

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

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

22.5 Emergency Work

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

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

22.6 Site Clearance

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

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

22.7 Watching and Lighting

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

and occupiers of adjacent property and for the safety of the public.

22.8 Work at Night and on Holidays

22.8.1 Unless otherwise provided in the Contract, no work shall be carried out during the night and on public holidays of the country where the Site is located without prior written consent of the Employer, except where work is necessary or required to ensure safety of the Facilities or for the protection of life, or to prevent loss or damage to property, when the Contractor shall immediately advise the Project Manager, provided that provisions of this CC Sub-Clause 22.8.1 shall not apply to any work which is customarily carried out by rotary or double-shifts

22.8.2 Notwithstanding CC Sub-Clauses 22.8.1 or 22.1.3, if and when the Contractor considers it necessary to carry out work at night or on public holidays so as to meet the Time for Completion and requests the Employer's consent thereto, the Employer shall not unreasonably withhold such consent.

23. Test and Inspection

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

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

23.3 Whenever the Contractor is ready to carry out any such test and/or inspection, the Contractor shall give a reasonable advance notice of such test and/or inspection and of the place and time thereof to the Project Manager. The Contractor shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Employer and the Project Manager (or their designated representatives) to attend the test and/or inspection. For notification of testing, four weeks shall be deemed as reasonable advance notice.

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

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

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

23.6 If any Plant and Equipment or any part of the Facilities fails to pass any test and/or inspection, the Contractor shall either rectify or replace such Plant and Equipment or part of the Facilities and shall repeat the test and/or inspection upon giving a notice under CC Sub-Clause 23.3. If the inspection is not materialized due to the reasons attributable to contractor then all the expenses including to & fro airfare and TA, DA shall be to the account of the contractor.

23.7 Deleted

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

23.9 The Contractor agrees that neither the execution of a test and/or inspection of Plant and Equipment or any part of the Facilities, nor the attendance by the Employer or the Project Manager, nor the issue of any test

certificate pursuant to CC Sub-Clause 23.4, shall release the Contractor from any other responsibilities under the Contract.

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

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

If any part of the Facilities or foundations have been covered up at the Site after compliance with the requirement of CC Sub-Clause 23.10 and are found to be executed in accordance with the Contract, the expenses of uncovering, making openings in or through, reinstating, and making good the same shall be borne by the Employer, and the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been delayed or impeded in the performance of any of its obligations under the Contract.

24. Completion of the Facilities

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

24.2 Within seven (7) days after receipt of the notice from the Contractor under CC Sub-Clause 24.1, the Employer shall supply the operating and maintenance personnel specified in Appendix 6 (Scope of Works and Supply by the Employer) to the Contract Agreement for Pre-commissioning of the Facilities or any part thereof.

Pursuant to Appendix 6 (Scope of Works and Supply by the Employer) to the Contract Agreement, the Employer shall also provide, within the said seven (7) day period, the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters required for Pre-commissioning of the Facilities or any part thereof.

24.3 As soon as reasonably practicable after the operating and maintenance personnel have been supplied by the Employer and the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters if so specified in Appendix-6 (scope of works and supply by the Employer) have been provided by the Employer in accordance with CC Sub-Clause 24.2, the Contractor shall commence Pre-commissioning of the Facilities or the relevant part there of in preparation for Commissioning.

24.4 As soon as all works in respect of Pre-commissioning are completed and in the opinion of the Contractor, the facilities or any part thereof is ready for commissioning, the contractor shall commence Commissioning as per procedures stipulated in Technical Specification and as soon as Commissioning is satisfactorily completed, the Contractor shall so notify the Project Manager in writing. (Also refer CC 25.2.3)

24.5 The Project Manager shall, within fourteen (14) days after receipt of the Contractor's notice under CC Sub-Clause 24.4, either issue a Completion Certificate in the form specified in the Forms and Procedures section in the bidding documents, stating that the Facilities or that part thereof have reached Completion as at the date of the Contractor's notice under CC Sub-Clause 24.4, or notify the Contractor in writing of any defects and/or deficiencies.

If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in CC Sub-Clause 24.4.

If the Project Manager is satisfied that the Facilities or that part thereof have reached Completion, the Project Manager shall, within seven (7) days after receipt of the Contractor's repeated notice, issue a Completion Certificate stating that the Facilities or that part thereof have reached Completion as at the date of the Contractor's repeated notice

If the Project Manager is not so satisfied, then it shall notify the Contractor in writing of any defects and/or deficiencies within seven (7) days after receipt of the Contractor's repeated notice, and the above procedure shall be repeated.

24.6 If the Project Manager fails to issue the Completion Certificate and fails to inform the Contractor of any defects and/or deficiencies within fourteen (14) days after receipt of the Contractor's notice under CC Sub-Clause 24.4 or within seven (7) days after receipt of the Contractor's repeated notice under CC Sub-Clause 24.5, or if the Employer makes use of the Facilities or part thereof, then the Facilities or that part thereof shall be deemed to have reached Completion as of the date of the Contractor's notice or repeated notice, or as of the Employer's use of the Facilities, as the case may be.

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

25. Commissioning and Operational Acceptance

25.1 Commissioning

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

If any Plant and Equipment or any part of the Facilities fails during Commissioning, the Contractor shall either rectify (if fault is minor) or replace such Plant and Equipment or part of the Facilities.

25.1.2 The Employer shall unless otherwise specified in Technical Specifications supply the operating and maintenance personnel and all raw material, utilities, lubricants, chemicals, catalysts, facilities, service and other matters required for Commissioning.

25.1.3 Trial – Operation

25.1.3.1 Trial – Operation of the Facilities or any part thereof shall be commenced by the Contractor immediately after the Commissioning is completed pursuant to CC Sub-Clause 25.1.1

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

25.1.3.3 At any time after the events set out in CC Sub-Clause 25.1.3.2 have occurred, the Contractor may give a notice to the Project Manager requesting the issue of an Taking Over Certificate in the form provided in the Bidding Documents or in another form acceptable to the Employer in respect of the Facilities or the part thereof specified in such notice as on the date of such notice.

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

25.1.4 Taking Over

25.1.4.1 Upon successful Trial – Operation of the Facilities or any part thereof, pursuant to CC Sub-Clause 25.1.3, the Project Manager shall issue to the Contractor a Taking Over Certificate as a proof of the acceptance of the Facilities or any part thereof. Such certificate shall not relieve the Contractor of any of his obligations which otherwise survive, by the terms and conditions of Contract after issue of such certificate.

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

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

25.2 Guarantee Test

25.2.1 The Guarantee Test (and repeats thereof) shall be conducted by the Contractor after successful trial-

operation of the Facilities or the relevant part thereof to ascertain whether the Facilities or the relevant part can attain the Functional Guarantees specified in the Contract Documents. The Contractor's and Project Manager's advisory personnel shall attend the Guarantee Test. The Employer shall promptly provide the Contractor with such information as the Contractor may reasonably require in relation to the conduct and results of the Guarantee Test (and any repeats thereof).

25.2.2 If for reasons not attributable to the Contractor, the Guarantee Test of the Facilities or the relevant part thereof cannot be successfully completed within the period from the date of Completion specified in the CC or any other period agreed upon by the Employer and the Contractor, the Contractor shall be deemed to have fulfilled its obligations with respect to the Functional Guarantees, and CC Sub-Clauses 28.2 and 28.3 shall not apply.

The Guarantee Test of the Facilities shall be successfully completed within twenty-six weeks from the date of Completion.

25.2.3 Completion- Guarantee test- acceptance

In the event that the Contractor is unable to proceed with the Pre-commissioning of the Facilities pursuant to Sub-Clause 24.3, or with the Guarantee Test pursuant to Sub-Clause 25.2, for reasons attributable to the Employer either on account of non-availability of other facilities under the responsibilities of other contractor(s), or for reasons beyond the Employer's control, the provisions leading to "deemed" completion of activities such as Completion of the Facilities, pursuant to CC Sub-Clause 24.6, Operational Acceptance, pursuant to CC Sub-Clause 25.3.4, Contractor's obligations regarding Defect Liability Period, pursuant to CC Sub Clause 27.2, Functional Guarantee, pursuant to CC Clause 28, Care of Facilities, pursuant to CC Clause 32, and Suspension, pursuant to CC Sub-Clause 41.1, shall not apply. In this case, the following provisions shall apply.
s obligations regarding Defect Liability Period, pursuant to CC Sub Clause 27.2, Functional Guarantee, pursuant to CC Clause 28, Care of Facilities, pursuant to CC Clause 32, and Suspension, pursuant to CC Sub-Clause 41.1, shall not apply. In this case, the following provisions shall apply.

25.2.3.1 When the Contractor is notified by the Project Manager that he will be unable to proceed with the activities and obligations pursuant to above Sub-Clause CC 25.2.3, the Contractor shall be entitled to the following:

a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to CC Sub-Clause 26.2.

b) payments due to the Contractor in accordance with the provisions specified in Appendix I (terms and Procedures of Payment) to the Contract Agreement, which would have not been payable in normal circumstances due to non-completion of the subject activities, shall be released to the Contractor against submission of a security in the form of a bank guarantee of equivalent amount acceptable to the Employer, and which shall become null and void when the Contractor will have complied with its obligations regarding these payments, subject to the provisions of Sub-Clause CC 25.2.3.2 below.

c) g these payments, subject to the provisions of Sub-Clause CC 25.2.3.2 below.

c) the expenses toward the above security and extension of other securities under the Contract, of which validity need to be extended, shall be reimbursed to the Contractor by the Employer.

d) the additional charges toward the care of the Facilities pursuant to CC Sub-Clause 32.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in Sub-Clause CC 25.2.3.3 below. The provisions of CC sub-Clause 33.2 shall apply to the Facilities during the same period.

25.2.3.2 In the event that the period of suspension under Sub-Clause CC 25.2.3 actually exceeds one hundred eighty (180) days, the Employer and the Contractor shall mutually agree to any additional compensation payable to the Contractor.

25.2.3.3 When the Contractor is notified by the Project Manager that the Facilities are ready for Pre-commissioning, the Contractor shall proceed without delay in performing all activities and obligations under the Contract.

25.3 Operational Acceptance

25.3.1 Subject to CC Sub-Clause 25.4 (Partial Acceptance) below, Operational Acceptance shall occur in respect of the Facilities or any part thereof when

(a) the Guarantee Test has been successfully completed and the Functional Guarantees are met; or

(b) the Guarantee Test has not been successfully completed or has not been carried out for reasons not attributable to the Contractor within the period from the date of Completion specified in the CC or any other agreed upon period as specified in CC Sub-Clause 25.2.2 above but successful completion of the facilities has been achieved; or

(c) the Contractor has paid the liquidated damages specified in CC Sub Clause 28.3 hereof; and

(c) any minor items mentioned in CC Sub-Clause 24.7 hereof relevant to the Facilities or that part thereof have been completed.

(e) as built drawings, and operating and maintenance manuals and CD's etc. as per Technical Specifications of the Bidding Documents are furnished.

25.3.2 At any time after any of the events set out in CC Sub-Clause 25.3.1 have occurred, the Contractor may give a notice to the Project Manager requesting the issue of an Operational Acceptance Certificate in the form provided in the Bidding Documents or in another form acceptable to the Employer in respect of the Facilities or the part thereof specified in such notice as at the date of such notice.

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

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

25.4 Partial Acceptance

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

25.4.2 If a part of the Facilities comprises facilities such as buildings, for which no Commissioning or Guarantee Test is required, then the Project Manager shall issue the Operational Acceptance Certificate for such facility when it attains Completion, provided that the Contractor shall thereafter complete any outstanding minor items that are listed in the Operational Acceptance Certificate.

F. Guarantees and Liabilities

26. Completion Time Guarantee

26.1 The Contractor guarantees that it shall attain Completion of the Facilities (or a part for which a separate time for completion is specified in the CC) within the Time for Completion specified in the CC pursuant to CC Sub-Clause 8.2, or within such extended time to which the Contractor shall be entitled under CC Clause 40 (Extension of Time for Completion) hereof.

26.2 If the Contractor fails to comply with the Time for Completion in accordance with Clause CC 26 for the whole of the facilities, (or a part for which a separate time for completion is agreed) then the Contractor shall pay to the Employer a sum equivalent to 0.05% (zero point zero five percent) of the Contract Price for the whole of the facilities, (or a part for which a separate time for completion is agreed) as liquidated damages for such default and not as a penalty, without prejudice to the Employer's other remedies under the Contract, for each day which shall elapse between the relevant Time for Completion pursuant to Clause 26.1 above and the date stated in **Taking Over Certificate** of the whole of the Works (or a part for which a separate time for completion is agreed) subject to the limit of five percent (5%) of Contract Price for the whole of the facilities, (or a part for which a separate time for completion is agreed).

The parties agree that the sum specified above is not a penalty but a genuine pre-estimate of the loss/damage which will be suffered by the Employer for default on the part of the Contractor and said amount will be payable without proof of actual loss or damage caused by such default.

The Employer may, without prejudice to any other method of recovery, deduct the amount of such damages from any monies due or to become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations and liabilities under the Contract.

Note:-If the supply of any equipment or execution of any work does not affect the Taking Over of the whole of the Works (or a part for which a separate time for completion is agreed or), then the Liquidated Damages (LD) towards such delayed supply or work shall be levied in proportion to their Cost with maximum limit of 05% of their Cost.

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

27. Defect Liability

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

27.2 The Defect Liability Period shall 60 months from the date of Commissioning/Completion of the facilities.

If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the Plant and Equipment supplied or of the work executed by the Contractor, the Contractor shall promptly in consultation and agreement with the Employer regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good (as the Contractor shall, at its discretion, determine) such defect as well as any damage to the Facilities caused by such defect.

27.3 The Contractor's obligations under this CC Clause 27 shall not apply to

(a) any materials that are supplied by the Employer under CC Sub-Clause 21.2 (Employer-Supplied Plant, Equipment and Materials), are normally consumed in operation, or have a normal life shorter than the Defect Liability Period stated herein.

(b)any designs, specifications or other data designed, supplied or specified by or on behalf of the Employer or any matters for which the Contractor has disclaimed responsibility herein.

(c) any other materials supplied or any other work executed by or on behalf of the Employer, except for the work executed by the Employer under CC Sub-Clause 27.7.

27.4 The Employer shall give the Contractor a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. The Employer shall afford all reasonable opportunity for the Contractor to inspect any such defect.

27.5 The Employer shall afford the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its obligations under this CC Clause 27. The Contractor may, with the consent of the Employer, remove from the Site any Plant and Equipment or any part of the Facilities that are defective if the nature of the defect, and/or any damage to the Facilities caused by the defect, is such that repairs cannot be expeditiously carried out at the Site.

27.6 If the repair, replacement or making good is of such a character that it may affect the efficiency of the Facilities or any part thereof, the Employer may give to the Contractor a notice requiring that tests of the defective part of the Facilities shall be made by the Contractor immediately upon completion of such remedial work, whereupon the Contractor shall carry out such tests.

If such part fails the tests, the Contractor shall carry out further repair, replacement or making good (as the case may be) until that part of the Facilities passes such tests.

The tests in character shall in any case be not less than what has already been agreed by the employer and the Contractor for the original equipment/part of the Facilities.

27.7 If the Contractor fails to commence the work necessary to remedy such defect or any damage to the Facilities caused by such defect within a reasonable time (which shall in no event be considered to be less than fifteen (15) days), the Employer may, following notice to the Contractor, proceed to do such work, and the reasonable costs incurred by the Employer in connection therewith shall be paid to the Employer by the Contractor or may be deducted by the Employer from any amount due the Contractor or claimed

under the Performance Security

27.8 If the facilities or any part thereof cannot be used by reason of such defect and/or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Employer because of any of the aforesaid reasons.

Upon correction of the defects in the Facilities or any part thereof by repair/ replacement, such repair/replacement shall have the Defect Liability Period extended by a period of twenty-four (24) months from the time such replacement/repair of the facilities or any part thereof, subject to the condition that the overall period of Defect Liability shall not be less than Sixty (60) months and more than Eighty-four (84) months from the date of issuance of respective Commissioning/Completion.

27.8.1 At the end of Defect Liability Period, the Contractor's liability ceases except for latent defects. The Contractor's liability for latent defects warranty shall be limited to period of five (5) years from the end of Defect Liability Period. For the purpose of this clause, the latent defects shall be the defects inherently lying within the material or arising out of design deficiency, which do not manifest themselves during the Defect Liability Period defined in this CC Clause 27, but later.

27.9 Except as provided in CC Clauses 27 and 33 (Loss of or Damage to Property/ Accident or Injury to Workers/Indemnification), the Contractor shall be under no liability whatsoever and howsoever arising, and whether under the Contract or at law, in respect of defects in the Facilities or any part thereof, the Plant and Equipment, design or engineering or work executed that appear after operational acceptance or any part thereof, except where such defects are the result of the gross negligence, fraud, criminal or willful action of the Contractor.

27.10 In addition, the Contractor shall also provide an extended warranty for any such component of the Facilities and during the period of time as may be specified in the CC. Such obligation shall be in addition to the defect liability specified under CC Sub-Clause 27.2.

28. Functional Guarantee

28.1 The Contractor guarantees that during the Guarantee Test, the Facilities and all parts thereof shall attain the Functional Guarantees specified in Appendix 8 (Functional Guarantees) to the Contract Agreement, subject to and upon the conditions therein specified.

28.2 If, for reasons attributable to the Contractor, the minimum level of the Functional Guarantees specified in Appendix 8 (Functional Guarantees) to the Contract Agreement are not met either in whole or in part, the Contractor shall at its cost and expense make such changes, modifications and/or additions to the Plant or any part thereof as may be necessary to meet at least the minimum level of such Guarantees. The Contractor shall notify the Employer upon completion of the necessary changes, modifications and/or additions, and shall request the Employer to repeat the Guarantee Test until the minimum level of the Guarantees has been met. If the Contractor eventually fails to meet the minimum level of Functional Guarantees, the Employer may consider termination of the Contract pursuant to CC Sub-Clause 42.2 and recover the payments already made to the Contractor.

28.3 If, for reasons attributable to the Contractor, the Functional Guarantees specified in Appendix 8 (Functional Guarantees) to the Contract Agreement are not attained either in whole or in part, but the minimum level of the Functional Guarantees specified in Appendix 8 (Functional Guarantees) to the Contract Agreement is met, the Contractor shall, at the Employer's option, either

(a) make such changes, modifications and/or additions to the Facilities or any part thereof that are necessary to attain the Functional Guarantees at its cost and expense within a mutually agreed time and shall request the Employer to repeat the Guarantee Test, or

(b) pay liquidated damages to the Employer in respect of the failure to meet the Functional Guarantees in accordance with the provisions in Appendix 8 (Functional Guarantees) to the Contract Agreement.

28.4 In case the Employer exercises its option to accept the equipment after levy of liquidated damages, the payment of liquidated damages under CC sub clause 28.3, upto the limitation of liability specified in the

Appendix-8 (Functional Guarantees) to the Contract Agreement, shall completely satisfy the Contractor's guarantees under CC Sub clause 28.3, and the Contractor shall have not further liability whatsoever to the Employer in respect thereof. Upon the payment of such liquidated damages by the Contractor, the Project Manager shall issue the Operational Acceptance Certificate for the Facilities or any part thereof in respect of which the liquidated damages have been so paid.

28.5 Functional Guarantees, Liquidated Damages for Non-Performance

28.5.1 The bidder shall guarantee that the equipment offered shall meet the rating and performance requirements stipulated for various equipment covered in this specification. The bidder shall also furnish a declaration in the manner prescribed and included in the relevant schedule of Bid Form & Price Schedules for guarantees, which shall attract levy of liquidated damages for non-performance.

28.5.2 If the guarantees are not established at factory tests in case of HTLS Conductor as defined in the relevant technical specifications, then the Employer at his discretion may reject or accept the equipment in line with relevant technical specifications.

28.5.3 Differential Price Factors for Evaluation and Liquidated Damages

a) The factors and the respective Indian Rupees value of differential loss (Average Ohmic Loss in KW) is as under:

For Package-I : Average Ohmic loss (KW) = 133488 x R_{ac}

For Package-II : Average Ohmic loss (KW) = 21168 x R_{ac}

For Package-III : Average Ohmic loss (KW) = 34473.6 x R_{ac}

For Package-IV : Average Ohmic loss (KW) = 95472 x R_{ac}

where Rac= AC resistance per km guaranteed by the bidder at corresponding to temperature at continuous operating current of 1200 A under normal condition) for purpose of calculation of differential price for the bid evaluation as specified in 24.6 (e) of ITB and liquidated damages shall be as stipulated below:

Equipment	**Parameter to be taken for applying differential Price factor (F)**	**Value of F in Indian Rupees (applicable for Average Ohmic Loss) of parameter differential per KW**
HTLS Conductor	Differential losses (kW) (i.e. Average Ohmic Loss)	Rs. 1,52,600 /- (Rupees One Lakh Fifty-Two Thousand Six Hundred only)

The amount of liquidated damages so recoverable shall be as per the aforesaid ceiling and shall not prejudice the Contractor's other liabilities under the Contract in any manner. The liquidated damages for shortfall in guaranteed parameters and for delay in completion are independent of each other and shall be levied separately and concurrently.

b) For bid evaluation, the best parameter of loss (lowest ohmic loss for conductor) corresponding to lowest AC resistance quoted among bidders by any technically responsive and qualified bidder shall be taken as basis and that quoted by the particular bidder shall be used to arrive at differential price to be applied for each bid.

29. Patent Indemnity

29.1 The Contractor shall, subject to the Employer's compliance with CC Sub Clause 29.2, indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Employer may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract by reason of: (a) the installation of the Facilities by the Contractor or the use of the Facilities in the country where the Site is located; and (b) the sale of the products produced by the Facilities in any country.

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

29.2 If any proceedings are brought or any claim is made against the Employer arising out of the matters referred to in CC Sub-Clause 29.1, the Employer shall promptly give the Contractor a notice thereof, and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

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

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

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

30. Limitation of Liability

30.1 Except in cases of criminal negligence or willful misconduct,

(a) the Contractor shall not be liable to the Employer, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Contractor to pay liquidated damages to the Employer and

(b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.

G. Risk Distribution

31. Transfer of Ownership

31.1 Ownership of the plant and equipment (including spare parts) to be imported into the country where the site is located shall be transferred to the Employer upon loading on to the mode of transport to be used to convey the Plant and Equipment from the country of origin to that country and upon endorsement of the dispatch documents in favour of Employer.

31.2 Ownership of the Plant and Equipment (including spare parts) procured in the country where the site is located, shall be transferred to the Employer upon loading on to the mode of transport to be used to carry the Plant and Equipment from the works to the site and upon endorsement of the dispatch documents in favour of Employer.

31.3 Ownership of the Contractor's Equipment used by the Contractor and its Subcontractors in connection with the Contract shall remain with the Contractor or its Subcontractors.

31.4 Ownership of any Plant and Equipment in excess of the requirements for the Facilities shall revert to the Contractor upon Completion of the Facilities or at such earlier time when the Employer and the Contractor agree that the Plant and Equipment in question are no longer required for the Facilities provided quantity of any Plant and Equipment specifically stipulated in the Contract shall be the property of the Employer whether or not incorporated in the Facilities.

31.5 Notwithstanding the transfer of ownership of the Plant and Equipment, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor pursuant to CC Clause 32 (Care of Facilities) hereof until Completion of the Facilities or the part thereof in which

such Plant and Equipment are incorporated.

32. Care of Facilities

32.1 The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of Completion of the Facilities pursuant to CC Clause 24 (Completion of the Facilities) or, where the Contract provides for Completion of the Facilities in parts, until the date of Completion of the relevant part, and shall make good at its own cost any loss or damage that may occur to the Facilities or the relevant part thereof from any cause whatsoever during such period. The Contractor shall also be responsible for any loss or damage to the Facilities caused by the Contractor or its Subcontractors in the course of any work carried out, pursuant to CC Clause 27 (Defect Liability). Notwithstanding the foregoing, the Contractor shall not be liable for any loss or damage to the Facilities or that part thereof caused by reason of any of the matters specified or referred to in paragraphs (a), (b) and (c) of CC Sub Clauses 32.2 and 38.1.

32.2 If any loss or damage occurs to the Facilities or any part thereof or to the Contractor's temporary facilities by reason of

(a) (insofar as they relate to the country where the Site is located) nuclear reaction, nuclear radiation, radioactive contamination, pressure wave caused by aircraft or other aerial objects, or any other occurrences that an experienced contractor could not reasonably foresee, or if reasonably foreseeable could not reasonably make provision for or insure against, insofar as such risks are not normally insurable on the insurance market and are mentioned in the general exclusions of the policy of insurance, including War Risks and Political Risks, taken out under CC Clause 34 (Insurance) hereof

(b) any use or occupation by the Employer or any third party (other than a Subcontractor) authorized by the Employer of any part of the Facilities

(c) any use of or reliance upon any design, data or specification provided or designated by or on behalf of the Employer, or any such matter for which the Contractor has disclaimed responsibility herein, The Employer shall pay to the Contractor all sums payable in respect of the Facilities executed, notwithstanding that the same be lost, destroyed or damaged, and will pay to the Contractor the replacement value of all temporary facilities and all parts thereof lost, destroyed or damaged. If the Employer requests the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Contractor shall make good the same at the cost of the Employer in accordance with CC Clause 39 (Change in the Facilities). If the Employer does not request the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Employer shall either request a change in accordance with CC Clause 39 (Change in the Facilities), excluding the performance of that part of the Facilities thereby lost, destroyed or damaged, or, where the loss or damage affects a substantial part of the Facilities, the Employer shall terminate the Contract pursuant to CC Sub-Clause 42.1 (Termination for Employer's Convenience) hereof, except that the Contractor shall have no entitlement to profit under paragraph (e) of CC Sub Clause 42.1.3 in respect of any unexecuted Facilities as at the date of termination.

32.3 The Contractor shall be liable for any loss of or damage to any Contractor's Equipment, or any other property of the Contractor used or intended to be used for purposes of the Facilities, except (i) as mentioned in CC Sub-Clause 32.2 (with respect to the Contractor's temporary facilities), and (ii) where such loss or damage arises by reason of any of the matters specified in CC Sub-Clauses 32.2 (b) and (c) and 38.1.

32.4 With respect to any loss or damage caused to the Facilities or any part thereof or to the Contractor's Equipment by reason of any of the matters specified in CC Sub-Clause 38.1, the provisions of CC Sub-Clause 38.3 shall apply.

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

33.1 Subject to CC Sub-Clause 33.3, the Contractor shall indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, in respect of the death or injury of any person or loss of or damage to any property (other than the Facilities whether accepted or not), arising in connection with the supply and installation of the Facilities and by reason of the negligence of the Contractor or its Subcontractors, or their employees, officers or agents, except any injury, death or property damage caused by the negligence of the Employer, its contractors, employees, officers or agents.

33.2 If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under CC Sub-Clause 33.1, the Employer shall promptly give the Contractor a notice thereof and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

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

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

33.3 The Employer shall indemnify and hold harmless the Contractor and its employees, officers and Subcontractors from any liability for loss of or damage to property of the Employer, other than the Facilities not yet taken over, that is caused by fire, explosion or any other perils, in excess of the amount recoverable from insurances procured under CC Clause 34 (Insurance), provided that such fire, explosion or other perils were not caused by any act or failure of the Contractor.

33.4 The party entitled to the benefit of an indemnity under this CC Clause 33 shall take all reasonable measures to mitigate any loss or damage which has occurred. If the party fails to take such measures, the other party's liabilities shall be correspondingly reduced.

34. Insurance

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

(a) Transit / Marine insurance: During supply of materials for Supply/ Supply portion of Contract

Covering loss or damage occurring while in transit from the manufacturer’s or Contractor's or Subcontractor's works or stores until arrival at the Site, to the Plant and Equipment (including spare parts thereof) and to the Contractor's Equipment. Concerned supplier/Contractor shall take such policy and ensure its validity upto 90days of receipt of Plant and Equipment (including spare parts thereof) at employer’s store or store of the contractor’s as the case may be. Evidence of such policy shall be furnished by contractor along with dispatch documents.

(b) Storage Cum Erection (SCE)/Installation Insurance: All Risks Coverage

Covering physical loss or damage to all the equipment, material and facilities being supplied, under the contract, from point of receipt at site including handling, storage, erection, testing etc till Completion of the Facilities, with an extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the Defect Liability Period while the Contractor is on the Site for the purpose of performing its obligations during the Defect Liability Period. Concerned Erector /Contractor shall take such policy..

(c) Materials/Plants/ Equipments supplied By Employer

Covering physical loss or damage to all the equipment, material and facilities being supplied for erection or use, under the contract, from point of receipt at site including handling, storage, erection, testing etc till Completion of the Facilities.

(d) Third Party Liability Insurance

Covering bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property occurring in connection with the supply and installation of the Facilities.

(e) Automobile Liability Insurance

The contractor shall ensure that all the vehicles deployed by the contractor or its sub-contractors

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

(f) Workers' Compensation

In accordance with the statutory requirements applicable in any country where the Contract or any part thereof is executed.

(g) Contractor' plant and Machinery (CPM) insurance

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

(h) Other Insurances

Such other insurances as may be specifically agreed upon by the parties hereto as listed in the said Appendix 3.

34.2 All the insurance policies pertaining to Storage Cum Erection /Installation & all Risk Coverage except transit insurance shall be taken in the name of DTL unless otherwise specified. All such policy shall indicate DTL as beneficiary and DTL shall be named as co-insured under all other insurance policies taken out by the Contractor pursuant to CC Sub-Clause 34.1, except for the Third Party Liability, Workers' Compensation Insurance, and the Contractor's Subcontractors shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to CC Sub-Clause 34.1 except for the Transit / Marine insurance During Transport, Workers' Compensation Insurance. All insurer's rights of subrogation against such co-insured for losses or claims arising out of the performance of the Contract shall be waived under such policies.

34.3 The Contractor shall, in accordance with the provisions of Appendix 3 (Insurance Requirements) to the Contract Agreement, deliver to the Employer certificates of insurance (or copies of the insurance policies) as evidence that the required policies are in full force and effect. The certificates shall provide that no less than twenty-one (21) days' notice shall be given to the Employer by insurers prior to cancellation or material modification of a policy

34.4 The Contractor shall ensure that, where applicable, its Subcontractor(s) shall take out and maintain in effect adequate insurance policies for their personnel and vehicles and for work executed by them under the Contract, unless such Subcontractors are covered by the policies taken out by the Contractor.

34.5 The Employer shall at its expense take out and maintain in effect during the performance of the Contract those insurances specified in Appendix 3 (Insurance Requirements) to the Contract Agreement, in the sums and with the deductibles and other conditions specified in the said Appendix. The Contractor and the Contractor's Subcontractors shall be named as co-insureds under all such policies. All insurers' rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies. The Employer shall deliver to the Contractor satisfactory evidence that the required insurances are in full force and effect. The policies shall provide that not less than twenty-one (21) days' notice shall be given to the Contractor by all insurers prior to any cancellation or material modification of the policies. If so requested by the Contractor, the Employer shall provide copies of the policies taken out by the Employer under this CC Sub-Clause 34.5.

34.6 If the Contractor fails to take out and/or maintain in effect the insurances referred to in CC Sub-Clause 34.1, the Employer may take out and maintain in effect any such insurances and may from time to time deduct from any amount due to the Contractor under the Contract any premium that the Employer shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Contractor. If the Employer fails to take out and/or maintain in effect the insurances referred to in CC 34.5, the Contractor may take out and maintain in effect any such insurances and may from time to time deduct from any amount due to the Employer under the Contract any premium that the Contractor shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Employer. If the Contractor fails to or is unable to take out and maintain in effect any such insurances, the Contractor shall nevertheless have no liability or responsibility towards the Employer, and the Contractor shall have full recourse against the Employer for any and all liabilities of the Employer herein. .

34.7 Unless otherwise provided in the Contract, the Contractor shall prepare, lodge, pursue and conduct and settle all and any claims made under the policies effected by it pursuant to this CC Clause 34, with the insurance company in case of theft, pilferage, fire etc under information to employer and the monies payable by any insurers under all the insurance except Third Party Liability Insurance, Workers' Compensation Insurance, shall be paid to the joint account of the Employer and the Contractor and such amounts paid shall be apportioned between the Employer and the Contractor in accordance with the respective responsibilities under the Contract. The Employer shall give to the Contractor all such reasonable assistance as may be required by the Contractor. With respect to insurance claims in which the Employer's interest is involved, the Contractor shall not give any release or make any compromise with the insurer without the prior written consent of the Employer. With respect to insurance claims in which the Contractor's interest is involved, the Employer shall not give any release or make any compromise with the insurer without the prior written consent of the Contractor. The Contractor shall replace the lost/ damaged plants/materials/ equipments/ works/ foundations or Employer supplied items promptly irrespective of the settlement of claims by the underwriter.

35. Unforeseen Conditions

35.1 If, during the execution of the Contract, the Contractor shall encounter on the Site any physical conditions (other than climatic conditions) or artificial obstructions that could not have been reasonably foreseen prior to the date of the Contract Agreement by an experienced contractor on the basis of reasonable examination of the data relating to the Facilities (including any data as to boring tests) provided by the Employer, and on the basis of information that it could have obtained from a visual inspection of the Site (if access thereto was available) or other data readily available to it relating to the Facilities, and if the Contractor determines that it will in consequence of such conditions or obstructions incur additional cost and expense or require additional time to perform its obligations under the Contract that would not have been required if such physical conditions or artificial obstructions had not been encountered, the Contractor shall promptly, and before performing additional work or using additional Plant and Equipment or Contractor's Equipment, notify the Project Manager in writing of

(a) the physical conditions or artificial obstructions on the Site that could not have been reasonably foreseen
(b) the additional work and/or Plant and Equipment and/ or Contractor's Equipment required, including the steps which the Contractor will or proposes to take to overcome such conditions or obstructions
(c) the extent of the anticipated delay
(d) the additional cost and expense that the Contractor is likely to incur.

On receiving any notice from the Contractor under this CC Sub-Clause 35.1, the Project Manager shall promptly consult with the Employer and Contractor and decide upon the actions to be taken to overcome the physical conditions or artificial obstructions encountered. Following such consultations, the Project Manager shall instruct the Contractor, with a copy to the Employer, of the actions to be taken.

35.2 Any reasonable additional cost and expense incurred by the Contractor in following the instructions from the Project Manager to overcome such physical conditions or artificial obstructions referred to in CC Sub-Clause 35.1 shall be paid by the Employer to the Contractor as an addition to the Contract Price.

35.3 If the Contractor is delayed or impeded in the performance of the Contract because of any such physical conditions or artificial obstructions referred to in CC Sub-Clause 35.1, the Time for Completion shall be extended in accordance with CC Clause 40 (Extension of Time for Completion).

36. Change in Laws and Regulations

36.1 If, after the date twenty-eight (28) days prior to the date of Bid submission, in the country where the Site is located, any law, regulation, ordinance, order or by-law having the force of law is enacted, promulgated, abrogated or changed (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the costs and expenses of the Contractor and/or the Time for Completion, the Contract Price shall be correspondingly increased or decreased, and/or the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract. However, these adjustments would be restricted to direct transactions between the Employer and the Contractor and not on procurement of raw materials, intermediary components etc. by the Contractor. Further, no adjustment of the Contract Price shall be made on account of variation in deemed export benefits. Notwithstanding the foregoing, such additional or reduced costs shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with the Appendix 2 to the Contract Agreement.

37. Force Majeure

37.1 "Force Majeure" shall mean any event beyond the reasonable control of the Employer or of the Contractor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected, and shall include, without limitation, the following:

(a) war, hostilities or warlike operations (whether a state of war be declared or not), invasion, act of foreign enemy and civil war

(b)rebellion, revolution, insurrection, mutiny, usurpation of civil or military government, conspiracy, riot, civil commotion and terrorist acts

(c) confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government or de jure or de facto authority or ruler or any other act or failure to act of any local state or national government authority

(d) strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, quarantine and plague

(e) earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane, storm, lightning, or other inclement weather condition, nuclear and pressure waves or other natural or physical disaster

(f) shortage of labour, materials or utilities where caused by circumstances that are themselves Force Majeure.

37.2 If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event.

37.3 The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The Time for Completion shall be extended in accordance with CC Clause 40 (Extension of Time for Completion).

37.4 The party or parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect thereof upon its or their performance of the Contract and to fulfill its or their obligations under the Contract, but without prejudice to either party's right to terminate the Contract under CC Sub Clauses 37.6 and 38.5.

37.5 No delay or nonperformance by either party hereto caused by the occurrence of any event of Force Majeure shall

(a) constitute a default or breach of the Contract

(b)(subject to CC Sub-Clauses 32.2, 38.3 and 38.4) give rise to any claim for damages or additional cost or expense occasioned thereby if and to the extent that such delay or nonperformance is caused by the occurrence of an event of Force Majeure.

37.6. If the performance of the Contract is substantially prevented, hindered or delayed for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days on account of one or more events of Force Majeure during the currency of the Contract, the parties will attempt to develop a mutually satisfactory solution, failing which the dispute will be resolved in accordance with CC Clause.6.

37.7. Notwithstanding CC Sub-Clause 37.5, Force Majeure shall not apply to any obligation of the Employer to make payments to the Contractor herein.

38. War Risks

38.1 "War Risks" shall mean any event specified in paragraphs (a) and (b) of CC Sub-Clause 37.1 and any explosion or impact of any mine, bomb, shell, grenade or other projectile, missile, munitions or explosive of war, occurring or existing in or near the country (or countries) where the Site is located.

38.2 Notwithstanding anything contained in the Contract, the Contractor shall have no liability whatsoever for or with respect to

(a) destruction of or damage to Facilities, Plant & Equipment, or any part thereof

(b) destruction of or damage to property of the Employer or any third party

(c) injury or loss of life if such destruction, damage, injury or loss of life is caused by any War Risks, and the Employer shall indemnify and hold the Contractor harmless from and against any and all claims, liabilities, actions, lawsuits, damages, costs, charges or expenses arising in consequence of or in connection with the same.

38.3 If the Facilities or any Plant and Equipment or Contractor's Equipment or any other property of the Contractor used or intended to be used for the purposes of the Facilities shall sustain destruction or damage by reason of any War Risks, the Employer shall pay the Contractor for

(a) any part of the Facilities or the Plant and Equipment so destroyed or damaged (to the extent not already paid for by the Employer)

(b) replacing or making good any Contractor's Equipment or other property of the Contractor so destroyed or damaged,

(c) replacing or making good any such destruction or damage to the Facilities or the Plant and Equipment or any part thereof so far as may be required by the Employer, and as may be necessary for completion of the facilities.

If the Employer does not require the Contractor to replace or make good any such destruction or damage to the Facilities, the Employer shall either request a change in accordance with CC Clause 39 (Change in the Facilities), excluding the performance of that part of the Facilities thereby destroyed or damaged or, where the loss, destruction or damage affects a substantial part of the Facilities, shall terminate the Contract, pursuant to CC Sub-Clause 42.1 (Termination for Employer's Convenience).

38.4 Notwithstanding anything contained in the Contract, the Employer shall pay the Contractor for any increased costs or incidentals to the execution of the Contract that are in any way attributable to, consequent on, resulting from, or in any way connected with any War Risks, provided that the Contractor shall as soon as practicable notify the Employer in writing of any such increased cost.

38.5 If during the performance of the Contract any war risks shall occur that financially or otherwise materially affect the execution of the Contract by the Contractor with due and proper consideration given to the safety of its and its Subcontractors personal engaged in the work on the facilities, provided, however, that if the execution of the work on the facilities becomes impossible or is substantially prevented for a single period of more than sixty (60) days or an aggregate period of more the one hundred and twenty (120) days on account of any war Risks, the parties will attempt to develop a mutually satisfactory solution, failing which the dispatch will be resolved in accordance with CC Clause.6.

38.6 In the event of termination pursuant to CC Sub Clause. 38.3, the rights and obligation of the employer and the Contractor shall be as specified in CC Sub- Clause 42.1.2 and 42.1.3, except that the Contractor shall have no entitlement to profit under paragraph (e) of CC Sub Clause 42.13 in respect of any unexecuted facilities as of the date of termination.

H. Change in Contract Elements

39. Change in the Facilities

39.1 Introducing a Change

39.1.1 Subject to CC Sub-Clauses 39.2.5 and 39.2.7, the Employer shall have the right to propose, and subsequently require, that the Project Manager order the Contractor from time to time during the performance of the Contract to make any change, modification, addition or deletion to, in or from the Facilities (hereinafter called "Change"), provided that such Change falls within the general scope of the Facilities and does not constitute unrelated work and that it is technically practicable, taking into account both the state of advancement of the Facilities and the technical compatibility of the Change envisaged with the nature of the Facilities as specified in the Contract.

39.1.2 The Contractor may from time to time during its performance of the Contract propose to the Employer (with a copy to the Project Manager) any Change that the Contractor considers necessary or desirable to improve the quality, efficiency or safety of the Facilities. The Employer may at its discretion approve or reject any Change proposed by the Contractor, provided that the Employer shall approve any Change proposed by the Contractor to ensure the safety of the Facilities.

39.1.3 Notwithstanding CC Sub-Clauses 39.1.1 and 39.1.2, no change made necessary because of any default of the Contractor in the performance of its obligations under the Contract shall be deemed to be a Change, and such change shall not result in any adjustment of the Contract Price or the Time for Completion.

39.1.4 The procedure on how to proceed with and execute Changes is specified in CC Sub-Clauses 39.2 and 39.3, and further details and sample forms are provided in the Sample Forms and Procedures section in the bidding documents.

39.2 Changes Originating from Employer

39.2.1 If the Employer proposes a Change pursuant to CC Sub-Clause 39.1.1, it shall send to the Contractor a "Request for Change Proposal," requiring the Contractor to prepare and furnish to the Project Manager as soon as reasonably practicable a "Change Proposal," which shall include the following:

(a) brief description of the Change
(b) effect on the Time for Completion
(c) estimated cost of the Change
(d) effect on Functional Guarantees (if any)
(e) effect on any other provisions of the Contract.

39.2.2 Prior to preparing and submitting the "Change Proposal," the Contractor shall submit to the Project Manager an "Estimate for Change Proposal," which shall be an estimate of the cost of preparing and submitting the Change Proposal. Upon receipt of the Contractor's Estimate for Change Proposal, the Employer shall do one of the following:

(a) accept the Contractor's estimate with instructions to the Contractor to proceed with the preparation of the Change Proposal

(b) advise the Contractor of any part of its Estimate for Change Proposal that is unacceptable and request the Contractor to review its estimate

(c) advise the Contractor that the Employer does not intend to proceed with the Change.

39.2.3 Upon receipt of the Employer's instruction to proceed under CC Sub-Clause 39.2.2 (a), the Contractor shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with CC Sub-Clause 39.2.1.

39.2.4 The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices included in the Contract. If such rates and prices are inequitable, the parties thereto shall agree on specific rates for the valuation of the Change.

39.2.5 If before or during the preparation of the change proposal it becomes apparent that the aggregate effect of compliance therewith and with all other change orders that have already become binding upon the contractor under this CC Clause 39 would be to increase or decrease the contractor price as originally set forth in Article- 2 (Contract price and Terms of payment) of the contract agreement by more than fifteen (15) percent, the Contractor may give a written notice of objection there to prior to furnish the change proposal as aforesaid. If the employer accept the contractors objection, the employer and the contractor shall agree on specific rates for valuation of the change.

The Contractor failure to so object shall neither affect its right to object to any subsequent requested change or change orders herein, nor affect its right to taken into account, when making such subsequent objection, the percentage increase or decrease in the contract price that any change not objected to by the contractor represents.

39.2.6 If rates and prices of any change are not available in the contract, the parties thereto shall agree on specific rates for the valuation of the change. Upon receipt of the change proposal, the employer and the contractor

shall mutually agree upon all matters therein contained. With in fourteen (14) days after such agreement, the employer shall, if it intends to proceed with change, issue the contractor with a change order.

If the employer is unable to reach a decision with in fourteen (14) days, it shall notify the contractor with details of when the contractor can expect a decision.

If the employer decides not to proceed with the change for whatever reason, it shall, with in the said period of fourteen (14) days, notify the contractor accordingly. Under such circumstances, the contractor shall be entitled to reimbursement of all costs reasonably incurred by it in the preparation of the change proposal, provided that these do not exceed the amount given by the Contractor in its estimate for change proposal submitted in accordance with CC Sub – Clause 39.2.2.

39.2.7 If the Employer and the Contractor cannot reach agreement on the price for the Change, an equitable adjustment to the Time for Completion, or any other matters identified in the Change Proposal, the Employer may nevertheless instruct the Contractor to proceed with the Change by issue of a "Pending Agreement Change Order."

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

If the parties cannot reach agreement within sixty (60) days from the date of issue of the Pending Agreement Change Order, then the matter may be taken up as per the CC Sub-Clause 6.2.

39.3 Changes Originating from Contractor

39.3.1 If the Contractor proposes a Change pursuant to CC Sub-Clause 39.1.2, the Contractor shall submit to the Project Manager a written "Application for Change Proposal," giving reasons for the proposed Change and including the information specified in CC Sub-Clause 39.2.1.

Upon receipt of the Application for Change Proposal, the parties shall follow the procedures outlined in CC Sub-Clauses 39.2.6 and 39.2.7. However, should the Employer choose not to proceed, the Contractor shall not be entitled to recover the costs of preparing the Application for Change Proposal.

39.4 The scope of work under the package(s) shall be as per the Technical Specification, Vol- II of bidding Documents. The quantity variation applicable for the existing scope shall be generally as per the following.

a) The employer reserves the right to increase or decrease the quantity of different items of the specified good and services to the extent of fifteen percent (15%) of the contract prices, by way of suitable amendment to the contract, without any change in unit rate/price and/ or other terms and conditions of the contract. However, the quantities of individual items of goods and services may vary up to any extent.

b) The contract price for (i) items for which quantities have been indicated as lumpsum / lot/ set (ii) items for which quantities were to be estimated by the bidder, including additional items (falling under (i) and /or (ii) considered necessary by the bidder for successful completion of the works as per TS and indicated by him in his bid, shall remain constant unless there is change made in the scope of work by the employer. The quantities and unit prices (a) subsequently arrived while approving the bill of quantities (BOQ)/ billing breakup of lumpsum/lot/set quantities and/ or (b) quantities estimated by the bidder /contractor shall be for on account payment purpose only. In case additional quantities, over and above the quantities in BOQ/ billing break up and/or estimated by the bidder/contractor are required for the successful completion of the scope of work as per technical specification, the contractor shall execute additional quantities of these items for which no additional payments shall be made over and above the lumpsum contract price.

c) of the scope of work as per technical specification, the contractor shall execute additional quantities of these items for which no additional payments shall be made over and above the lumpsum contract price.

In case quantities of these items supplied at site are in excess of that required for successful completion of scope of work, such additional quantities shall be property of the contractor and contractor shall be allowed to take back the same from the site for which no deduction from the lumpsum contract price shall be made. Further in case actual requirement of quantities for successful completion of scope of work is less than the quantities identified in the approved BOQ/

billing break up and/or estimated by the bidder/ contractor, the lumpsum contract price shall remain unchanged and no deduction shall be made from the lumpsum price due to such reduction of quantities. It shall be the responsibility of the bidder to pay all statutory taxes, duties and levies to the concerned authority's surplus material which would otherwise have been, lawfully payable. The bidder shall submit an indemnity bond to keep the employer harmless from any liability, before release to such martial to the bidder by the employer**.**

c) The quantity variation from the existing scope shall be notified to the contractor within the validity of contract.

40. Extension of Time for Completion

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

(a) any Change in the Facilities as provided in CC Clause 39 (Change in the Facilities)

(b) any occurrence of Force Majeure as provided in CC Clause 37 (Force Majeure), unforeseen conditions as provided in CC Clause 35 (Unforeseen Conditions), or other occurrence of any of the matters specified or referred to in paragraphs (a), (b) and (c) of CC Sub-Clause 32.2

(c) any suspension order given by the Employer under CC Clause 41 (Suspension) hereof or reduction in the rate of progress pursuant to CC Sub-Clause 41.2 or

(d) any changes in laws and regulations as provided in CC Clause 36 (Change in Laws and Regulations) or

(e) any default or breach of the Contract by the Employer, specifically including failure to supply the items listed in Appendix 6 (Scope of Works and Supply by the Employer) to the Contract Agreement, or any activity, act or omission of any other contractors employed by the Employer or

(f) any other matter specifically mentioned in the Contract;

by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Contractor.

40.2 Except where otherwise specifically provided in the Contract, the Contractor shall submit to the Project Manager a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Employer and the Contractor shall agree upon the period of such extension. In the event that the Contractor does not accept the Employer's estimate of a fair and reasonable time extension, the Contractor may take up the matter as per CC Sub-Clause 6.2.

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

41. Suspension

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

If, by virtue of a suspension order given by the Project Manager, other than by reason of the Contractor's default or breach of the Contract, the Contractor's performance of any of its obligations is suspended for an aggregate period of more than ninety (90) days, then at any time thereafter and provided that at that time such performance is still suspended, the Contractor may give a notice to the Project Manager requiring that the Employer shall, within twenty-eight (28) days of receipt of the notice, order the resumption of such performance or request and subsequently order a change in accordance with CC Clause 39 (Change in the Facilities), excluding the performance of the suspended obligations from the Contract.

If the Employer fails to do so within such period, the Contractor may, by a further notice to the Project Manager, elect to treat the suspension, where it affects a part only of the Facilities, as a deletion of such part in accordance with CC Clause 39 (Change in the Facilities) or, where it affects the whole of the Facilities, as termination of the Contract under CC Sub-Clause 42.1 (Termination for Employer's Convenience).

41.2 In case,

(a) the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to Appendix 1 (Terms and Procedures of Payment) to the Contract Agreement, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon as stipulated in CC Sub-Clause 12.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, or fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Contractor's notice or

(b) the Contractor is unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, including but not limited to the Employer's failure to provide possession of or access to the Site or other areas in accordance with CC Sub-Clause 10.2, or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities; then the Contractor may by fourteen (14) days' notice to the Employer suspend performance of all or any of its obligations under the Contract, or reduce the rate of progress.

41.3 If the Contractor's performance of its obligations is suspended or the rate of progress is reduced pursuant to this CC Clause 41, then the Time for Completion shall be extended in accordance with CC Sub-Clause 40.1, and any and all additional costs or expenses incurred by the Contractor as a result of such suspension or reduction shall be paid by the Employer to the Contractor in addition to the Contract Price, except in the case of suspension order or reduction in the rate of progress by reason of the Contractor's default or breach of the Contract.

41.4 During the period of suspension, the Contractor shall not remove from the Site any Plant and Equipment, any part of the Facilities or any Contractor's Equipment, without the prior written consent of the Employer.

42. Termination

42.1 Termination for Employer's Convenience

42.1.1 The Employer may at any time terminate the Contract for any reason by giving the Contractor a notice of termination that refers to this CC Sub-Clause 42.1.

42.1.2 Upon receipt of the notice of termination under CC Sub-Clause 42.1.1, the Contractor shall either immediately or upon the date specified in the notice of termination

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

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

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

(d) In addition, the Contractor, subject to the payment specified in CC Sub Clause 42.1.3, shall

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

(ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to

the Facilities and to the Plant and Equipment as at the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors

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

42.1.3 In the event of termination of the Contract under CC Sub-Clause 42.1.1, the Employer shall pay to the Contractor the following amounts:

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

b. The costs reasonably incurred by the Contractor in the removal of the Contractor's Equipment from the Site and in the repatriation of the Contractor's and its Subcontractors' personnel

c. The amounts to be paid by the Contractor to its Subcontractors in connection with the termination of any subcontracts, including any cancellation charges

d. Costs incurred by the Contractor in protecting the Facilities and leaving the Site in a clean and safe condition pursuant to paragraph (a) of CC Sub-Clause 42.1.2

e. The cost of satisfying all other obligations, commitments and claims that the Contractor may in good faith have undertaken with third parties in connection with the Contract and that are not covered by paragraphs (a) through (d) above.

42.2 Termination for Contractor's Default

42.2.1 The Employer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefore to the Contractor, referring to this CC Sub-Clause 42.2 and Performance security (CPG) will be forfeited:

(a) if the Contractor becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, if the Contractor is a corporation, a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Contractor takes or suffers any other analogous action in consequence of debt.

(b) if the Contractor assigns or transfers the Contract or any right or interest therein in violation of the provision of CC Clause 43 (Assignment).

(c) if the Contractor, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purpose of this sub-clause :

"corrupt practice" means the offering, giving, receiving or soliciting of any thing of value to influence the action of a public official in the procurement process or in contact execution.

"fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Employer, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition".

42.2.2 If the Contractor

(a) has abandoned or repudiated the Contract

(b) has without valid reason failed to commence work on the Facilities promptly or has suspended (other than pursuant to CC Sub-Clause 41.2) the progress of Contract performance for more than

twenty-eight (28) days after receiving a written instruction from the Employer to proceed

(c) persistently fails to execute the Contract in accordance with the Contract or persistently neglects to carry out its obligations under the Contract without just cause

(d) refuses or is unable to provide sufficient materials, services or labour to execute and complete the Facilities in the manner specified in the program furnished under CC Clause 18.2 (Program of Performance) at rates of progress that give reasonable assurance to the Employer that the Contractor can attain Completion of the Facilities by the Time for Completion as extended.

then the Employer may, without prejudice to any other rights it may possess under the Contract, give a notice to the Contractor stating the nature of the default and requiring the Contractor to remedy the same. If the Contractor fails to remedy or to take steps to remedy the same within fourteen (14) days of its receipt of such notice, then the Employer may terminate the Contract forthwith by giving a notice of termination to the Contractor that refers to this CC Sub Clause 42.2

42.2.3 Upon receipt of the notice of termination under CC Sub-Clauses.42.2.1 or 42.2.2, the Contractor shall, either immediately or upon such date as is specified in the notice of termination,

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

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

(c) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination

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

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

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

Upon completion of the Facilities or at such earlier date as the Employer thinks appropriate, the Employer shall give notice to the Contractor that such Contractor's Equipment will be returned to the Contractor at or near the Site and shall return such Contractor's Equipment to the Contractor in accordance with such notice. The Contractor shall thereafter without delay and at its cost remove or arrange removal of the same from the Site.

42.2.5 Subject to CC Sub-Clause 42.2.6, the Contractor shall be entitled to be paid the Contract Price attributable to the Facilities executed as at the date of termination, the value of any unused or partially used Plant and Equipment on the Site, and the costs, if any, incurred in protecting the Facilities and in leaving the Site in a clean and safe condition pursuant to paragraph (a) of CC SubClause 42.2.3. Any sums due to the Employer from the Contractor accruing prior to the date of termination shall be deducted from the amount to be paid to the Contractor under this Contract.

42.2.6 If the Employer completes the Facilities, the cost of completing the Facilities by the Employer shall be determined. If the sum that the Contractor is entitled to be paid, pursuant to CC SubClause 42.2.5, plus the reasonable costs incurred by the Employer in completing the Facilities, exceeds the Contract Price, the Contractor shall be liable for such excess.

If such excess is greater than the sums due to the Contractor under CC SubClause 42.2.5, the Contractor shall pay the balance to the Employer, and if such excess is less than the sums due to the Contractor under

CC Sub-Clause 42.2.5, the Employer shall pay the balance to the Contractor.

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

42.3 Termination by Contractor

42.3.1 If

(a) The Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to Appendix 1 (Terms and Procedures of Payment) of the Contract Agreement, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon as stipulated in CC Sub-Clause 12.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Contractor's notice, or

(b) The contractor is unable to carry out any of its obligations under the contract for any reason attributable to the employer, including but not limited to the employer's failure to provide possession of or access to the site or other areas or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities, which the employer is required to obtain as per provision of the contract as per relevant applicable laws of the country.

then the Contractor may give a notice to the Employer thereof, and if the Employer has failed to pay the outstanding sum, to approve the invoice or supporting documents, to give its reasons for withholding such approval, or to remedy the breach within twenty-eight (28) days of such notice, or if the Contractor is still unable to carry out any of its obligations under the Contract for any reason attributable to the Employer within twenty-eight (28) days of the said notice, the Contractor may by a further notice to the Employer referring to this CC Sub-Clause 42.3.1, forthwith terminate the Contract.

42.3.2 The Contractor may terminate the Contract forthwith by giving a notice to the Employer to that effect, referring to this CC Sub-Clause 42.3.2, if the Employer becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, being a corporation, if a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Employer takes or suffers any other analogous action in consequence of debt.

42.3.3 If the Contract is terminated under CC Sub-Clauses 42.3.1 or 42.3.2, then the Contractor shall immediately

(a) cease all further work, except for such work as may be necessary for the purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition

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

(c) remove all Contractor's Equipment from the Site and repatriate the Contractor's and its Subcontractor's personnel from the Site

(d) In addition, the Contractor, subject to the payment specified in CC Sub-Clause 42.3.4, shall

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

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

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

42.3.4 If the Contract is terminated under CC Sub-Clauses 42.3.1 or 42.3.2, the Employer shall pay to the Contractor all payments specified in CC Sub-Clause 42.1.3, and reasonable compensation for all loss or damage sustained by the Contractor arising out of, in connection with or in consequence of such termination.

42.3.5 Termination by the Contractor pursuant to this CC Sub-Clause 42.3 is without prejudice to any other rights or remedies of the Contractor that may be exercised in lieu of or in addition to rights conferred by CC Sub-Clause 42.3.

42.4 In this CC Clause 42, the expression "Facilities executed" shall include all work executed, Installation Services provided, and Plant and Equipment acquired (or subject to a legally binding obligation to purchase) by the Contractor and used or intended to be used for the purpose of the Facilities, up to and including the date of termination.

42.5 In this CC Clause 42, in calculating any monies due from the Employer to the Contractor, account shall be taken of any sum previously paid by the Employer to the Contractor under the Contract, including any advance payment paid pursuant to Appendix 1 (Terms and Procedures of Payment) to the Contract Agreement.

43. Assignment

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

44 Construction of the contract

44.1 The contracts to be entered into with the successful bidder shall be as under.

For Domestic Bidder:

--- " First contract" for Ex-works supply and CIF supply , if any of all equipment and materials including mandatory spares identifying separately the CIF and Ex-works components of the supply.

---- "Second Contract" for providing all services i.e. inland transportation for delivery at site ,unloading, storage handling at site, installation, testing and commissioning including performance testing in respect of all the equipments supplied under " First contract" and any other services specified in the contract documents.

44.2 The award of two (2) separate contracts shall not in any way dilute the responsibility of the contractor for the successful completion if the facility as per specification and breach in one contract shall automatically be construed as a breach of the other contract which will confer a right on the employer to terminate the other contract also at the risk and the cost of the contractor.

44.3 Deleted

44.4 Deleted

44.5 In case of two contracts entered into as above or where the employer hands over his equipment to the contractor for executing the contract then the contractor shall at the time of taking delivery of equipment through bill of lading or other dispatch documents, furnish trust receipt for plant, equipment and materials and also execute an Indemnity bond in favour of the employer in the form acceptable to the employer for keeping the equipment in safe custody and to utilize the same exclusively for the purpose of the said Contract. Samples of Performa for the Trust receipt and Indemnity bond are enclosed under Section IV (Sample forms and procedures). The employer shall also issue separate authorization letter to the Contractor to enable him to take physical delivery of plant, equipment and materials from the employer as per Performa enclosed under Section IV (sample forms and procedures).

44.6 The Contract will be signed in two original and the contractor shall be provided with one signed original and the other signed original will be retained by the employer.

44.7 The contractor shall provide free of cost to the employer all the engineering data, drawing and descriptive materials submitted with the bid, in at least two (2) copies to form a part of the contract immediately after notification of Award.

44.8 Subsequent to signing of the contract, the contractor at his own cost shall provide the employer with at least fifteen (15) true copies of contract agreement within thirty (30) days after signing of the contract.

45. Specific Requirement

The bidder shall be responsible for safety of human and equipment during the working. It will be the responsibility of the Contractor to co-ordinate and obtain clearance from Electrical Inspector (Govt. of NCT of Delhi) before commissioning. Any additional items, modification due to observation of such statutory authorities shall be provided by the Contractor at no extra cost to the Employer. However the necessary fee of the Inspector shall be reimbursed by DTL.

46. DTL not to be made party in case of dispute between Contactor and Sub contactor Vendor.

47. BLACK-LISTING OF FIRMS/ BANNING OF BUSINESS

DTL may decide to black-list firms or ban business with them, for specified time, based on facts and circumstances of the particular case generally on the following grounds:

i. Corrupt or Fraudulent practices resorted to by Contractor including mis-representation of facts.
ii. Willful indulgence by the Contractor in supplying sub-standard material irrespective of whether pre-dispatch inspection conducted by DTL or not.
iii. Repeated use of delaying tactic in fulfilling contractual obligations willfully.
iv. Established litigant nature of the contractor to derive undue benefit.
v. Poor performance in one or more contracts.

SECTION-V

SPECIAL CONDITIONS OF CONTRACT (SCC)

SECTION-V

SPECIAL CONDITIONS OF CONTRACT (SCC)

The following bid specific data for the Plant and Equipment to be procured shall amend and/or supplement the provisions in the Conditions of Contract (CC)

<table>
<tr><th>Sl. No.</th><th>CC Clause Ref. No.</th><th colspan="2">Amendment/Supplement to CC</th></tr>
<tr><td rowspan="6">1.</td><td rowspan="6">CC 1.1& Appendix -4 of Section-F&P</td><td>Description</td><td>Duration in months from date of notification of Award</td></tr>
<tr><td>Taking over by the Employer upon successful completion of:</td><td></td></tr>
<tr><td>Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan- Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.</td><td>18 Months</td></tr>
<tr><td>Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.</td><td>12 Months</td></tr>
<tr><td>Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.</td><td>18 Months</td></tr>
<tr><td>Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.</td><td>18 Months</td></tr>
</table>

Sl. No.	CC Clause Ref. No.	Amendment/Supplement to CC
2.	CC 42.2.1	"The Employer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefore to the Contractor, referring to this CC Sub-Clause 42.2" may be read as "The Employer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefore to the Contractor, referring to this CC Sub-Clause 42.2 and Performance security (CPG) will be forfeited."
3.	CC Clause 19.1	**Supplementing CC Clause 19.1 with the following: -** Further, the Contractor shall not subcontract any work to a subcontractor/sub vendor from such countries which shares a land border with India unless such subcontractor/sub vendor fulfils all requirement in regard to 'Bidder from a country which shares a land border with India as per ITB clause1.2.2& 1.2.3.
4.	New Clause	**Sub-Vendor/Sub-contractor Approval** (a) For non-QR supply item if the sub-vendor/ sub-contractor was approved in DTL during last 7 years or if the sub-vendor/sub-contractor is the enlisted vendor of PGCIL as per latest compendium, then that sub-vendor/sub-contractor shall be considered as deemed approved and no letter of approval or its project specific extension is required to be issued in such cases. The contractor can submit the valid type test report and engineering drawings of offered equipment/items directly to the D & E Deptt. for its acceptance/approval along with supporting document of earlier approval of sub-vendor/sub-contractor DTL or vendor enlistment of PGCIL. (b) For QR supply item if the sub-vendor/sub-contractor is the enlisted vendor of PGCIL as per latest compendium, then that sub-vendor/sub-contractor shall be required to submit only the documents in support of meeting the QR. (c) For non- QR supply items, if the proposed sub-vendor/sub-contractor is not covered in Cl. No.-04 (a) above, the Contractor shall be required to furnish details/ documents in support of his claim viz. Plant & Machinery, Testing Facilities, Sources of raw material, manpower, type

Sl. No.	CC Clause Ref. No.	Amendment/Supplement to CC
		test reports (an undertaking may be furnished by the contractor to submit the valid type test reports to D&E along with drawing approval) etc. (d) For QR related supply items, if the sub-vendor/sub-contractor proposed is not covered in Cl. No.-04 (b) above, the Contractor shall be required to furnish details/ documents in support of his claim viz. Qualifying requirement (QR), Plant & Machinery, Testing Facilities, Sources of raw material, manpower, type test reports (an undertaking may be furnished by the contractor to submit the valid type test reports to D&E along with drawing approval) etc. (e) For the off-the-shelf items (which are not custom made and are readily available in the market like LED, luminaries, other lighting equipment, AC etc.) no type test will be sought.
5.	New Clause	The performance certificate for satisfactory operation of major equipments (GIS bay, Gas insulated bus duct, AIS bay equipments, Auto/Power transformer, Reactor, NIFPES, Mono Pole/Lattice towers, Power cable of 33kV and above, C&R panel, SAS, Hardware Fitting suitable for HTLS Conductor, composite polymer Insulator) shall also be required like the QR items even if they are supplied as non-QR items.
6.	New Clause	In addition to the routine inspections carried out, DTL shall organize the quality assurance inspection all materials as well as field/site works through a third-party agency or through an officer deputed or this purpose from QA&I department, during the execution of work & at the time of completion of work, for which the contractor shall provide full access and all necessary support. Such third-party inspection shall be part of Material Quality Assurance Plan (MQAP) and Field Quality Plan (FQP), as the case may be.

----- End of Section-V (SCC) ----

SECTION-VI

FORMS AND PROCEDURES (F&P)

1. BID FORM

Please Refer Volume III

2. BANK GUARANTEE FOR BID SECURITY

Ref …

Bank Guarantee No……
Date ...……

To

_____

_____

Dear Sir,

In accordance with your invitation for Bid under your Specification No…….M/s…… ……..having its Registered Office ……..(hereinafter called the "Bidder") wish to participate in the said Bid for ……... and you, as a special favour, have agreed to accept Bank Bid Guarantee for an amount of Rs……(Rupees…….only) valid upto …….. on behalf of the Bidder in lieu of Bid deposit required to be made by the Bidder, as a condition precedent for participation in the said Bid.

We, ……. having our Registered Office at ……. guarantee and undertake to pay immediately on demand by Delhi Transco Limited the amount of Rs……./- (Rupees…….Only) without any reservation, protest, demur and recourse. Any such demand made by said 'Owner' i.e. Delhi Transco Limited or its authorized representative shall be conclusive and binding on us irrespective of any dispute or difference raised by the bidder.

This guarantee shall remain valid upto ……. If any further extension of this guarantee is required, the same shall be extended to such required period on receiving instructions from M/s……..on whose behalf this guarantee is issued.

In witness whereof the Scheduled Bank, through its authorized Officer, has set its hand and stamp on this …… day of ……at…….

Designation with Bank (Scheduled) Stamp

Name: _____
Phone No. _____
Domain e-mail Id _____
Official address _____

	WITNESS 1	WITNESS 2
Signatue		
Name		
Address		

3a. FORM OF NOTIFICATION BY THE EMPLOYER TO THE BIDDER FOR FORFEITURE OF BID GUARANTEE AMOUNT

M/s…….

Ref.: Your proposal against our IFB
No...……
Forfeiture of Bid Guarantee amount.

Dear Sirs,

Whereas you have furnished as a part of your proposal the Bid Guarantee in the form of irrevocable and confirmed Letter of Credit No..... .dated.....…..... opened by ……..for a sum of…… .. (Bank's name) …….....payable to..... .....Name of the Employer) on demand without any reservation, demur or protest, contest and recourse at...……(Name and place of Bank).

In terms of the aforesaid Bid Guarantee, we do hereby forfeit the Guarantee amount.

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

(AUTHORISED SIGNATORY)

N.B. The Letter of Credit should not stipulate any other proforma of notification different from this format. No change whatsoever in the said proforma is acceptable to the Employer.

3b. FORM OF SIGHT DRAFT

Drawn under L.C.
No.....dated…….....of.....
.....…….....
(Name of Bank that opened the L.C.)

At sight promptly pay to ....
(Name of the Bank at which L.C. is negotiable)

or order sum of.....(for payment to the Employer) for value received.
(Amount of L.C.)

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

(AUTHORISED SIGNATORY)

To,

(Name and Address of the Bank which opened L.C.)

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

NOTE: INSTRUCTIONS INDICATED IN ITALICS IN THIS NOTIFICATION OF AWARD ARE TO BE TAKEN CARE OF BY THE ISSUING AUTHORITY.

Ref. No. :

Date :

…..(Contractor's Name & Address)…...

Attn : Mr.....

Sub : Notification of Award of Contract for Supply of.....
(Package Name) ..... as per Specification No……...

Dear Sir,

1.0 This has reference to the following:

(i) Our Invitation for Bids (IFB) No. ……..…..... dated ….....

(ii) Bidding Documents for the subject package issued to you vide our letter no. ……. dated.....comprising the following :

……... **(List out all the Sections/Volumes of the Bidding Documents along with Tender Drawings etc. as issued to the bidder)** .....

Errata/Amendment No..... to..... (Name of Section/Volume of the Bidding Documents to which Errata/Amendment pertains)..... issued to you vide our letter no……..... dated.....

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

(iii) Clarifications furnished to you on the Bidding Documents vide our letter no.....dated ……based on the query raised by you/one of the prospective bidders. (Use as applicable)

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

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

(iv) Your Proposal for the subject package submitted vide your letter No. ....……. dated.....and its modification vide

letter no……dated ..... (Delete if not applicable).

(v) Our Fax message/letter No. ……...dated……..... regarding extension of validity of bid and that of the Bank Guarantee towards Bid Security.

(Applicable only if any extension has been sought subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO OR BY THE BIDDER AFTER BID OPENING)

(vi) Our Fax message/letter No.……dated…….. inviting you for post bid discussions.

(vii) Post bid discussions and meetings we had with you from……to …….. resulting into the following Minutes of Meeting enclosed herein with this Notification of award:

(a) Minutes of Meeting regarding Commercial issues (APPENDIX - ....)

(b) Minutes of Meeting on Technical issues (APPENDIX - ....)

(c) Minutes of Meeting regarding Work Schedule (APPENDIX - ....)

(d) Minutes of Meeting regarding Quality Assurance Aspects (APPENDIX- …...)

2.0 We confirm having accepted your proposal submitted vide letter no. ……. dated .....and its modification vide letter no……..dated (Delete if not applicable) read in conjunction with all the specifications, terms & conditions of the Bidding Documents, Your subsequent letters (Use if relevant) and agreed Minutes of Meeting referred to in para 1.0 above and award on you the Contract for the work of .....……...(Indicate brief Scope of Work).....of ……...(Name of Package) ……... for ……(Name of project) ……..…as per Specification No. : ……..(hereinafter referred to as the 'First Contract').

3.0 We have also notified you vide our Notification of Award No.....……..... dated ..... for award of another Contract on you for the work of ..... (Indicate brief scope of work of the Second Contract) …… of the equipment/materials to be supplied by you under this 'First Contract' including Performance and Guarantee test for complete .....…….(Name of Package)..... for ……(Name of Project)……..... as per Specification No…….(hereinafter referred to as the 'Second Contract').
You shall also be fully responsible for the works to be executed under the 'Second Contract' and it is expressly understood and agreed by you that any breach under the 'Second Contract' shall automatically be deemed as a breach of this 'First Contract' and vice-versa and any such breach or occurrence or default giving us a right to terminate the 'Second Contract' and/or recover damages thereunder, shall give us an absolute right to terminate this Contract and/or recover damages under this 'First Contract' as well and vice-versa. However, such breach or default or occurrence in the 'Second Contract' shall not automatically relieve you of any of your

responsibility/obligations under this 'First Contract'. It is also expressly understood and agreed by you that the equipment/materials to be supplied by you under this 'First Contract' when installed and commissioned under the 'Second Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

4.0 The total Contract Price for the entire scope of work under the Contract shall be …….(Specify the amount and currency)..... as per the following break up:

(i) Ex-manufacturing works/place
……
of dispatch price (both in India)/ CIF/CIP port of entry price
(Use as Applicable)
for Main Equipment

(ii) Ex-manufacturing works/place
……
of dispatch price (both in India)/ CIF/CIP port of entry price
(Use as Applicable)
for Mandatory Spares

(iii) Type test charges
……
(Delete if not applicable)

TOTAL (i + ii + iii)

(..... (Specify the total amount in words)…….)

5.0 You shall prepare and finalize the Contract Documents for signing of the formal Contract Agreement and shall enter into the Contract Agreement with us, as per the proforma enclosed with the Bidding Documents, on non-judicial stamp paper of appropriate value within……...(Specify)…….....days from the date of this Notification of Award.

6.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including all the enclosed Appendices, by the authorized signatory of your company as a proof of your acknowledgement and confirmation.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,
for and on behalf of
(Name of the Employer)

(Authorized Signatory)

Encl. : As above.

4b. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT' FOR INSTALLATION OF PLANT AND EQUIPMENT

NOTE: INSTRUCTIONS INDICATED IN ITALICS IN THIS NOTIFICATION OF AWARD ARE TO BE TAKEN CARE OF BY THE ISSUING AUTHORITY.

Ref. No. :

Date :

…(Contractor's Name & Address)...

Attn : Mr……...

Sub : Notification of Award of Contract for Installation, testing and commissioning of ……. (Package Name) ..... as per Specification No. …….

Dear Sir,

1.0 This has reference to the following:

(i) Our Invitation for Bids (IFB) No. ……... dated .....

(ii) Bidding Documents for the subject package issued to you vide our letter no. ……... dated..... comprising the following:

……...(List out all the Sections/Volumes of the Bidding Documents along with Tender Drawings etc. as issued to the bidder)....……. Errata/Amendment No.....… to..... (Name of Section/Volume of the Bidding Documents to which Errata/Amendment pertains) ……..issued to you vide our letter no. ……..... dated…….

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

(iii) Clarifications furnished to you on the Bidding Documents vide our letter no…..... dated ..... based on the query raised by you/one of the prospective bidders (Use as applicable).

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

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

(iv) Your Proposal for the subject package submitted vide your letter No. ……. dated…… and its modification vide letter no.

…….dated..... (Delete if not applicable).

(v) Our Fax message/letter no. …….. Dated..... regarding extension of validity of bid and that of the Bank Guarantee towards Bid Security.

(Applicable only if any extension has been sought subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO OR BY THE BIDDER AFTER BID OPENING)

(vi) Our Fax message/letter no. …….. Dated ……. inviting you for post bid discussions.

(vii) Post bid discussions and meetings we had with you from .....to ……. resulting into the following Minutes of Meeting enclosed herein with this Notification of Award:

(a) Minutes of Meeting regarding Commercial issues (APPENDIX - ....)

(b) Minutes of Meeting on Technical issues (APPENDIX - ....)

(c) Minutes of Meeting regarding Work Schedule (APPENDIX - ....)

(d) Minutes of Meeting regarding Quality Assurance Aspects (APPENDIX - …..)

2.0 We confirm having accepted your proposal submitted vide letter no. ……..dated..... and its modification vide letter no. ……..……..... dated ……(Delete if not applicable) read in conjunction with all the specifications, terms & conditions of the Bidding Documents, Your subsequent letters (Use if relevant) and agreed Minutes of Meeting referred to in para 1.0 above and award on you the Contract for the work of .....(Indicate brief Scope of Work)..... of ……..….... (Name of Package) ..... for …….(Name of project)....…… as per Specification No.: .....(hereinafter referred to as the 'Second Contract').

3.0 We have also notified you vide our Notification of Award No. ....…….. dated……..... for award of another Contract on you for the work of …….. (Indicate brief scope of work of the First Contract)……... of the equipment/ materials to be supplied by you under the 'First Contract' including Performance and Guarantee Test for complete ……..……....(Name of Package)..... for ……..…....(Name of Project) …...…….as per Specification No…….(hereinafter referred to as the 'First Contract'). You shall also be fully responsible for the works to be executed under the 'First Contract' and it is expressly understood and agreed by you that any breach under the 'First Contract' shall automatically be deemed as a breach of this 'Second Contract' and vice-versa and any such breach or occurrence or default giving us a right to terminate the 'First Contract' and/or recover damages there-under, shall give us an absolute right to terminate this Contract and/or recover damages under this 'Second Contract' as well and vice-versa. However, such breach or default or occurrence in the 'First Contract' shall not automatically relieve you of any of your responsibility/obligations under this 'Second Contract'. It is also expressly understood and agreed by you that the

equipment/materials to be supplied by you under the 'First Contract' when erected and commissioned under this 'Second Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

4.0 The total Contract Price for the entire scope of work under the Contract shall be ……..... (Specify the amount and currency)…… as per the following break up:

(i) Inland transportation and inland transit insurance charges including port clearance, port handling and port charges (Delete if not applicable) for Main Equipment: …….

(ii) Inland transportation and inland transit insurance charges including port clearance, port handling and port charges (Delete if not applicable) for Mandatory Spares: ……..…….

(iii) Unloading and handling at site, storage, erection, testing and commissioning including performance testing and insurance covering all the activities: ……..

TOTAL (i + ii + iii)

.....(Specify the total amount in words)

5.0 You shall prepare and finalize the Contract Documents for signing of the formal Contract Agreement and shall enter into the Contract Agreement with us, as per the proforma enclosed with the Bidding Documents, on non-judicial stamp paper of appropriate value within …….. ... (Specify)…… ...days from the date of this Notification of Award.

6.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including all the enclosed Appendices, by the authorized signatory of your company as a proof of your acknowledgement and confirmation.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,
for and on behalf of

(Name of the Employer)

(Authorized Signatory)

5. FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT is made the ……..... day of ....., 20……..

BETWEEN
(1) .....a corporation incorporated under the laws
(Name of Employer)
of .....and having its principal place of business
(law of country of Employer)
at.....(Address of Employer) (hereinafter called "the Employer")

and

(2) ....., a corporation incorporated under the laws of
(Name of Contractor)
…….. and having its principal place of business
(Country of Contractor)
at ……..… (Address of Contractor) (hereinafter called "the Contractor")

WHEREAS the Employer desires to engage the Contractor to design, manufacture, test, deliver, install, complete and commission certain Facilities, viz.

……..... ("the Facilities") and the
(List of Facilities)
Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

Article 1. Contract Documents

1.1 Contract Documents (Reference CC Clause 2)

The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:

(1) This Contract Agreement and the Appendices hereto

(2) Notification of Award.

(3) Conditions of Contract & SCC

(4) Technical Specifications and Drawings

(5) The Bid and Price Schedules submitted by the Contractor

(6) Procedures (as listed)

(7) Any other documents shall be added here

1.2 Order of Precedence (Reference CC Clause 2)

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions (Reference CC Clause 1)

1.3.1 Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the Conditions of Contract.

Article 2. Contract Price and Terms of Payment

2.1 Contract Price (Reference CC Clause 11)

The Employer hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of:

……..

……... …….
(amount in words)

(.....…….....)
(amount in figures in INR)

or such other sums as may be determined in accordance with the terms and conditions of the Contract.

2.2 Terms of Payment (Reference CC Clause 12)

The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in Appendix 1 (Terms and Procedures of Payment) hereto.

Article 3. Effective Date for Determining Time for Completion

3.1 Effective Date (Reference CC Clause 1)

The Time of Completion of Facilities shall be determined from the date of the Notification of Award provided all of the following conditions have been fulfilled within a period of two (2) months from the date of said Notification of Award:

(a) This Contract Agreement has been duly executed for and on behalf of the Employer and the Contractor;

(b) The Contractor has submitted to the Employer the Performance Security and the Advance Payment Guarantee;

(c) The Employer has paid the Contractor the Advance Payment.

Each party shall use its best efforts to fulfill the above conditions for which it is responsible as soon as practicable.

3.2 If the Conditions listed under 3.1 are not fulfilled within two (2) months from date of Notification of Award because of reasons attributable to the Employer, the contract would become effective only from the date of fulfillment of the above conditions and, the parties shall discuss and agree on an equitable adjustment to the Contract Price and the time for completion and/or other relevant conditions of the Contract. The Contractor shall not however, benefit (in reckoning the Time for Completion) on account of its delay in providing the Performance Security or the Bank Guarantee for advance payment beyond the period provided in the Contract.

Article 4. It is expressly understood and agreed by and between the Contractor and the Employer that the Employer is entering into this Agreement solely on its own behalf and not on behalf of any other person or entity. In particular it is expressly understood and agreed that the Government of India (GoI) is not a party to this Agreement and has no liabilities, obligations or rights hereunder. It is expressly understood and agreed that the Employer is an independent legal entity with power and authority to enter into contracts solely on its own behalf under the applicable laws of India and the general principals of Contract Law.

The Contractor expressly agrees, acknowledges and understands that the Employer is not an Agent, Representative or Delegate of the GoI. It is further understood and agreed that the GoI is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the Contract. Accordingly, the Contractor expressly waives, releases and foregoes any and all actions or claims, including cross claims, impleader claims or counter claims against the GoI arising out of this Contract and covenants not to sue the GoI as to any manner, claim, cause of action or thing whatsoever arising of or under this Agreement.

Article 5. Appendices

The Appendices listed in the attached List of Appendices shall be deemed to form an integral part of this Contract Agreement.

Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

Article 6. Deleted

Article 7. Notwithstanding the award of contract under two separate contracts, any breach under one contract shall be deemed to be a breach of the other contract(s).

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by for and on behalf of the Employer	Signed by for and on behalf of the Contractor
Signature	Signature
Title	Title
in the presence of	in the presence of

CONTRACT AGREEMENT
dated the ..... day of ……..... 20.....

BETWEEN

("the Employer")

and

("the Contractor")

(Separate Contract Agreements shall be executed by the Employer and the Contractor in accordance with the Construction of the Contract stipulated at clause 44 of CC. The forms of Contract would be similar except for necessary changes required to suit the individual Contracts).

APPENDICES

Appendix 1	Terms and Procedures of Payment
Appendix 2	Price Adjustment
Appendix 3	Insurance Requirements
Appendix 4	Time Schedule
Appendix 5	List of Approved Subcontractors
Appendix 6	Scope of Works and Supply by the Employer
Appendix 7	List of Document for Approval or Review
Appendix 8	Functional Guarantees
Appendix 9	Integrity Pact (*to be appended at the Stage of Contract Award.)*

APPENDIX 1

1.0 TERMS AND PROCEDURES OF PAYMENT

The payment to the Contractor under the Contract will be made by the Owner in line with Clause 12.0, Section-CC, Conditions of Contract, Volume-I of the Bidding Documents and as per the guidelines and conditions specified hereunder, on the basis of the Price Break-up given in the section on price schedules. Payments will be made in Indian currency i.e. INR. The Contractor may make applications for payment in respect of part deliveries as work proceeds.

In addition to the Conditions stipulated under Clause 12.0, Section-CC, Conditions of Contract, the following terms & Conditions will apply.

All payments made during the Contract will be on account payment only.

1.1 Supply Portion

a) Advance Payment

10% (Ten percent) of the Ex-works price component (inclusive of mandatory spares) of the Contract price shall be paid as *interest bearing advance after signing the Contract Agreement and on submission of:

i) Unconditional acknowledgement of LOA by the contractor
ii) Contractor's detailed invoice
iii) Unconditional and irrevocable Advance Bank Guarantee** for 110% of the advance amount
iv) Performance Security
v) Detailed BAR CHART and its approval by DTL
vi) Execution of Contract Agreement.

Note:

*This payment is an optional payment. The Contractor has the option of taking the interest bearing initial advance or otherwise. In case, the Contractor opts for this interest bearing initial advance, the same shall be paid to the Contractor on fulfillment of above conditions and an interest on monthly outstanding amount will be charged at the rate of SBI MCLR at the time of disbursement of advance. The Interest shall be calculated from the date of interest amount paid and charged till the date of posting of Invoice by Finance department. The monthly outstanding amount for the purpose of calculating the interest shall be worked out at the end of each calendar month considering proportionate adjustment of advance against dispatch payment. In case, the Contractor opts not to take interest bearing advance as above, it would be mandatory for him to submit the documents listed at S. No.(i), (iv) and (v) and (vi) above within thirty (30)days of issuance of LOA.

**The bank guarantee(s) for advance shall be kept valid till 90 days after issuance of Operational Acceptance Certificate. Recovery of the advance amount shall be made from each running bill proportionately.

b) Progressive Payment

i) Sixty percent (60%) [##] of the CIF / Ex-works price component (inclusive of mandatory spares) of each item (as identified in the price schedule) shipped shall be paid through irrevocable Letter of Credit (L/C) established in favour of the Contractor and on submission of documents specified in CC Clause 21.0.

[##] In case, the Contractor opts not to take interest bearing initial advance then this payment shall be 70% instead of 60%.

ii) Further Twenty percent (20%) of the CIF / Ex-Works price (exclusive of mandatory spares) of each item shipped shall be paid after receipt and storage of material at site and on physical verification by the Employer.

iii) For mandatory spares, balance Thirty percent (30%) of the CIF / Ex-Works Price of each item shipped shall be paid after receipt and storage of material at site and on physical verification by the Employer.

c) Final Payment

Balance 10% (Ten percent) of the Ex-works price component of Main Equipment/Materials (excluding Mandatory Spares) shall be paid as per the following:

i. 5% (Five percent) on Successful completion of erection, testing and commissioning of individual bays (for Substation) and/or circuit (for Transmission Line). For other than bay items, this payment shall be released upon respective commissioning/completion.

ii. 5% (Five percent) on proof of submission of required number of reproducible, O&M Manuals, approved drawings, data sheets, test report, pamphlets and manuals of mandatory spares, maintenance & testing equipment and on successful completion of erection, testing and commissioning of all bays (for Substation) and/or circuit (for Transmission Line) and issuance of Taking Over Certificate.

However, in case of delay, which is not attributable to contractor, in testing and commissioning & issuance of taking over certificate by Employer beyond six (6) months from the date of receipt of equipment at site, the last 10% of Ex-Works price of respective equipment shall be paid after issuance of a certificate by Employer's representative that the equipment have been received in good condition and on submission of a bank guarantee of equivalent amount, which shall be kept valid initially for a period of twelve (12) months or until three (3) months after the expected date of commissioning (in case it is possible to anticipate the same), whichever is earlier, provided all other conditions as per above are complied with by the Contractor. If the commissioning does not take place within the validity period of BG, the validity of BG shall be extended from time to time. The bank guarantee shall, however, be released within one month of successful commissioning of the respective equipment by the Employer.

1.2 DELETED

1.3 TRANSPORTATION & INSURANCE CHARGES

Hundred Percent (100%) of transportation and insurance charges shall be paid to the Contractor pro-rata to the value of the equipment received at site and on production of invoices by the Contractor. The aggregate of all such pro-rata payments shall, however, not exceed the total amount quoted by the bidder in his proposal and incorporated in the Contract.

1.4 ERECTION PRICE COMPONENT (INCLUDING CHARGES FOR CIVIL WORKS)

a) Advance

Ten Percent (10%) of the total Contract Price for services viz. installation (including civil works) component except transportation & insurance shall be paid as * interest bearing initial advance on establishment of Contractor's Site office and submission of a bank guarantee* of 110% of the advance amount valid till 90 days after issuance of Operational Acceptance Certificate.

*This payment is an optional payment. The Contractor has the option of taking the interest bearing advance or otherwise.

In case, the Contractor opts for this interest bearing advance, the same shall be paid to the Contractor on fulfillment of above conditions and an interest on monthly outstanding amount will be charged at the rate of SBI MCLR at the time of disbursement of advance. The monthly outstanding amount for the purpose of calculating the interest shall be worked out at the end of each calendar month against the progressive payment for the work done.

In case, the Contractor opts not to take interest bearing advance as above, it would be mandatory for him to submit the documents listed at S. No.(i), (iv),(v) and (vi) of 1.1 (a) above within thirty (30)days of issuance of LOA.

b) Progressive Payment

Eighty Percent (80%) of the total installation (including civil works) component of the Contract price (In case the contractor opts to take interest bearing advance as above) or Ninety Percent (90%) of the total installation (including civil works) component of the Contract price (In case the contractor opts not to take interest bearing advance as above) shall be paid progressively monthly on pro-rata basis on certification by Employer's representative.

c) Final Payment

Final 10% payment of the total installation (including civil works) shall be made as follow:

a) 5% (Five percent) of the Installation price component shall be paid on commissioning of individual bay (for Substation) and/or circuit (for

Transmission Line) and

b) balance 5% (Five percent) on proof of submission of required number of reproducible, O&M Manuals, approved drawings, data sheets, test report, pamphlets and manuals of mandatory spares, maintenance & testing equipment and on successful completion of erection, testing and commissioning of all bays (for Substation) and/or circuit (for Transmission Line) and issuance of Taking Over Certificate.

1.5 Deleted

1.6 "Commissioning" for the purpose of payments shall mean satisfactory completion of all supplies, erection, inspection, commissioning checks and successful completion of all site tests and continuous energisation of the equipment/ materials at rated voltage at site as per the Contract and to the satisfaction/ approval of DTL. The contractor will clear the sites and the balance materials, if any, will be shifted to proper place as per instruction of the Site Engineer. The necessary "No Dues Certificates" for electricity and water will required to be submitted, if any, from local agency(s)/ authority(s).

1.7 **Taxes & Duties**

Taxes & Duties in respect of transaction between Employer and the Contractor as applicable for destination site/state on all items of supply including bought-out finished items (as identified in the Contract), which shall be dispatched directly from the sub-vendor's works to the Employer's site will be paid after each shipment against documentary evidence. This payment shall be released by Employer directly to the Contractor against invoices to be submitted by the Contractor.

1.8 **MODE OF PAYMENT**

Payments shall be made by DTL within Thirty (30) days of receipt of Complete GST compliance tax invoices and supported by the requisite documents and fulfillment of stipulated conditions, if any. All the payment shall be released to the Contractor directly through ECS. For this the contractor shall have to provide their Bank Account No., Bank Name, RTGS / MICR / IFSC and other details to our AM(F)SB / AM(F)Works, IInd Floor, pre-fabricated building, Rajghat Power House, New Delhi - 110002.

Payment of GST component shall be made only if vendor deposited the GST and the credit for the same reflected in the form GSTR3 (Monthly Return) of the GST network and in case of dis- allowance of credit in GSTR3, the amount shall be recovered from vendor with the penalty as per the provision stipulated in GST Act/Law.

APPENDIX 2

PRICE ADJUSTMENT

The prices are to remain FIRM and FIXED for the duration of the Contract.

APPENDIX 3

INSURANCE REQUIREMENTS

Insurances to be taken out by the Contractor

In accordance with the provisions of CC Clause 34, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld.

(a) Transit / Marine insurance During supply of materials for supply/ Supply portion of Contract

covering loss or damage occurring, whilst in transit from the Contractor's or manufacturer's works or stores until arrival at the Site, to the Facilities (including spare parts therefore) and to the Construction Equipment to be provided by the Contractor or its Subcontractors.

(i) For Imported Plant/ Equipment/ Materials

Amount	Deductible limits	Parties Insured	From	To
125%* of the (CIF value)	NIL	Contractor & Employer	Warehouse	Warehouse + 90 Days

***Price variation @ 10 % per Annum of CIF cost shall be taken subject to a maximum of 30% or specified otherwise, whichever is lower.**

(ii) For Domestic Plant/ Equipment/ Materials

Amount	Deductible limits	Parties Insured	From	To
110%* of the (FOR value)	NIL	Contractor & Employer	Warehouse	Warehouse + 90 Days

*Price variation @ 10 % per Annum of CIF cost shall be taken subject to a maximum of 30% or specified otherwise, whichever is lower.

(b) Storage Cum Erection (SCE)/ Installation Insurance: All Risks Coverage

Covering physical loss or damage to all the equipment, material and facilities being supplied, under the contract, from point of receipt at site to Completion of the Facilities/ commissioning including handling, storage, erection, testing etc. with an

extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the Defect Liability Period while the Contractor is on the Site for the purpose of performing its obligations during the Defect Liability Period.

Amount	Deductible limits	Parties Insured	From	To
105% of the (Contract Price)	NIL	Contractor / Sub-contractor & Employer	Receipt at site	Upto Defect Liability period.

(c) Materials/Plants/ Equipments supplied By Employer As per (a) Above

(d) Third Party Liability Insurance

covering bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property (including the Employer's property and any parts of the Facilities which have been accepted by the Employer) occurring in connection with the supply and installation of the Facilities.

Amount	Deductible limits	Parties Insured	From	To
Rs. 0.5 million per person per occasion	NIL	Contractor / Sub-contractor	Commencement of work	Upto Defect Liability period

(e) Automobile Liability Insurance

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

(f) Worker's Compensation

in accordance with the statutory requirements applicable in any country where the Facilities or any part thereof is executed.

(g) Contractor' plant and Machinery (CPM) insurance

The Employer (including without limitation any consultant, servant, agent or employee of the Employer) shall not in any circumstances be liable to the Contractor for any loss of or damage to any of the Contractor's Equipment or for any losses, liabilities, costs, claims, actions or demands which the Contractor may incur or which

may be made against it as a result of or in connection with any such loss or damage. In this regard the vendor will submit an undertaking to DTL.

(h) Other Insurances

The Contractor is also required to take out and maintain at its own cost the following insurances:

Amount	Deductible limits	Parties Insured	From	To
	NIL	Contractor / Sub-contractor & Employer	Receipt at site	Upto Defect Liability period

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to CC Sub-Clause 34.1, except for the Third Party Liability, Worker's Compensation Insurance, and the Contractor's Subcontractors shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to CC Sub Clause 34.1 above except for the **Transit / Marine insurance**, Worker's Compensation Insurance, and all insurer's rights of subrogation against such co-insured for losses or claims arising out of the performance of the Contract shall be waived under such policies.

Insurances to be taken out by the Employer

The Employer shall at its expense take out and maintain in effect during the performance of the Contract the following insurances.

Details:...

Amount	Deductible limits	Parties Insured	From	To

---------- NIL----------

APPENDIX 4

TIME SCHEDULE

1. The Project Completion Schedule shall be as follows:

Sl. No.	Activities	Duration in months from the effective date of Contract
1.	**Package-I:** Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala, Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis. **Package-II:** Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis. **Package-III:** Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis. **Package-IV:** Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.	As Per SCC

1.1 The bidder shall include in his proposal his programme for furnishing and installation of the equipment including related civil work covered under this package. The programme shall be in the form of a master network plan (MNW) and shall identify the various activities like design, engineering, manufacturing, supply, installation, factory testing, transportation to site, site testing and commissioning guarantee test and operational acceptance etc. of the entire project work. The network plan shall confirm to the above completion schedule. No credit will be given for earlier completion.

This master network will be discussed and agreed before Award in line with above,

engineering drawing and data submission schedule shall also be discussed and finalized before Award. Liquidated damages for delay in successful completion of taking over at rates specified in Clause 26.2 of CC shall be applicable beyond the date specified above.

1.2 The employer reserves the right to request minor changes in the work schedule at the time of Award of Contracts to the successful Bidder.

1.3 The successful Bidder shall be required to prepare detailed Network(s) and project implementation plans & programs and finalize the same with the Employer as per the requirement specified in Technical Specifications, which shall from a part of the Contract.

APPENDIX 5

LIST OF APPROVED SUBCONTRACTORS

Prior to award of Contract, the following details shall be completed indicating those sub-contractors proposed by the Bidder by Attachment to its bid that are approved by the Employer for engagement by the Contractor during the performance of the contract.

The following Subcontractors are approved for carrying out the item of the facilities indicated. Where more than one Subcontractor is listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. In accordance with CC Sub-Clause 19.1, the Contractor is free to submit proposals for Subcontractors for additional items from time to time. No Subcontractors shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

Item of Facilities	**Approved Subcontractors**	**Nationality**

APPENDIX 6

SCOPE OF WORKS AND SUPPLY BY THE EMPLOYER

The following personnel, facilities, works and supplies will be provided/ supplied by the Employer, and the provisions of CC 10, 20, 21 and 24 as well as Employer responsibilities stated in technical specifications shall apply as appropriate.

All personnel, facilities, works and supplies will be provided by the Employer in good time so as not to delay the performance of the Contractor in accordance with the approved Time Schedule and Program of Performance pursuant to CC Sub-Clause 18.2.

Unless otherwise indicated, *all personnel,* facilities, *works and supplies* will be provided free of charge to the Contractor.

Personnel ***Charge to Contractor – None***

NIL

Facilities **Charge to Contractor - None except as noted**

1. Permission will be arranged by the Employer for full site and facilities access as required for site surveys and for the installation, connection and testing of complete equipment and systems. Such permission shall be requested by the Contractor one month prior to the Scheduled need for such access, consistent with the Contractors "Project Implementation Plan", Subsequent to approval of such "Plan" by Employer.

Electricity and Water ***Charge to Contractor - as noted***

The Contractor shall be entitled to use for the purposes of the facilities such supplies of electricity and water as may be available on the Site and shall provide any apparatus necessary for such use. The Contractor shall pay the Employer at the applicable tariff plus Employer's overheads, if any, for such use. Where such supplies are not available, the Contractor shall make his own arrangement for provision of any supplies he may require.

Works **Charge to Contractor - None**

----------NIL----------

Supplies **Charge to Contractor - None**

----------NIL----------

APPENDIX - 7

LIST OF DOCUMENTS FOR APPROVAL OR REVIEW

Pursuant to CC Sub-Clause 20.3.1, the Contractor shall prepare or cause its Subcontractor to prepare, and present to the Project Manager in accordance with the requirements of CC Sub-Clause 18.2 (Program of Performance), the following documents for:

A. Approval

1.

2.

3.

B. Review

1.

2.

3.

Note :

Bidder shall furnish the exhaustive list, which shall be discussed and finalized for incorporation into the Contract Agreement.

APPENDIX – 8

FUNCTIONAL GUARANTEES

GUARANTEES, LIQUIDATED DAMAGES FOR NON PERFORMANCE

1. The equipment offered shall meet the rating and performance requirements stipulated in Technical Specification for various equipment or indicated in Data requirement.

2. The ratings and performance figures of the below mentioned equipment are guaranteed by you.

Sl. No.	**Item**	**Guaranteed AC Resistance (R_{AC}) in Ohm per km corresponding to the temperature at continuous operating current of 1200 A under normal condition**	**Rate of Liquidated Damages in Indian Rupees per KW (applicable for Average Ohmic Loss)**
1.	HTLS Conductor		Rs. 152,600/- (Rupees One Lakh Fifty Two Thousand Six Hundred only)

3. If the aforementioned guarantees are not established at factory tests, then the Employer at his discretion may reject or accept the equipment after assessing the liquidated damages as per table above against the Contract and such amounts shall be deducted from the Contract Price or otherwise recovered from the Contractor.

6. PROFORMA OF BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No…… Date …….....

To,

To
[Name and address of the Employer]

1) In consideration of the Delhi Transco Limited (hereinafter called "The Undertaking") having agreed to accept from M/s…….. (hereinafter called the said contractor(s) from the demand, under the terms & conditions of an agreement dated…….. between Delhi Transco Limited& M/s……. for supply of……... Nos.…… in respect of NOA No……. dated……. (hereinafter called the agreement) security deposit for the due fulfillment of the said contract of the terms & conditions contained in the said agreement on production of Bank Guarantee for Rs……..…. (Rupees……..……..). We Name of Bank with address) (hereinafter referred to as "The Bank") do hereby undertake to pay to the undertaking amount not exceeding Rs……(Rupees……) against any loss or damage caused to or suffered or would be caused to the said contractor of any of the terms & conditions in the said agreement. As 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 restrict to an amount not exceeding Rs…….. (Rupees…….).

2) We (Name of Bank with address) do hereby undertake to pay the amount due and payable under this guarantee without any demur, merely on a demand for the undertaking stating that the amount claimed due by a way of loss or damage caused to or would be caused to suffered by the undertaking by reason of any breach, by the said contractor(s) or any of the terms & conditions contained in the said agreement. 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…… (Rupees……).

3) We (Name of Bank with address), further agree that the guarantee herein contained shall remain I full force and effect during the period that would be taken for performance of the said agreement and that it shall continue to be enforceable till all the dues of the undertaking by virtue of the said agreement have been fully paid and its claims satisfied or discharged of till (Date of validity) the undertaking certified that the terms & conditions of the said agreement have been fully and properly carried out by the said contractor(s) and accordingly guarantee is made on us in writing on or before the (Date of validity).

4) We (Name of Bank with address), further agree with the undertaking that the undertaking shall have the fullest liberty without our consent and without effecting in any manner our obligations hereunder to vary any of the agreement or to enforce any of the performance by the said contractor and to forebear or enforce any of the terms & conditions relating to the said or any such variation, or extension being warrantee to the said contract(s) for any forbearance, act or omission on the part of the undertaking or any indulgence by the Undertaking to the 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.

5) We, (Name of Bank with address), lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Undertaking in writing and to extend the period of guarantee, if required for any reason.

6) "Notwithstanding anything contained herein above, our liability under this guarantee is restricted to Rs…… (Rupees……..) and the guarantee shall remain in force upto (date of validity) unless a demand or claim in writing is presented on the bank within (date of validity). The Bank shall be relieved and discharged from all liabilities there under"

Dated the…….. Day of …….200

For (Name of Bank)

(BRANCH MANAGER)

WITNESS

1…….

7. BANK GUARANTEE FORM FOR ADVANCE PAYMENT

Date……..
Contract No……..

[Name of Contract]

To: *[Name and address of the Employer]*

Dear Ladies and/or Gentlemen,

We refer to the Contract ("the Contract") signed on..... between you and..... .... ("the Contractor") concerning design, execution and completion of (Brief description of the Facilities) …….....

Whereas, in accordance with the terms of the said Contract, the Employer has agreed to pay or cause to be paid to the Contractor an Advance Payment in the amount of Indian Rupees (INR)…….… ……
(Amount in words)
...…….....(.....)
(Amount in figures in INR)

By this letter we, the undersigned, ……..., a Bank (or company) organized under the laws of ..... and having its registered/principal office at……... do hereby jointly and severally with the Contractor irrevocably guarantee repayment of the said amounts upon the first demand of the Employer without cavil or argument in the event that the Contractor fails to commence or fulfill its obligations under the terms of the said Contract, and in the event of such failure, refuses to repay all or part (as the case may be) of the said advance payment to the Employer.

Provided always that the Bank's obligation shall be limited to an amount equal to the outstanding balance of the advance payment, taking into account such amounts, which have been repaid by the Contractor from time to time in accordance with the terms of payment of the said Contract as evidenced by appropriate payment certificates.

This Guarantee shall remain in full force from the date upon which the said advance payment is received by the Contractor until the date upon which the Contractor has fully repaid the amount so advanced to the Employer in accordance with the terms of the Contract. At the time at which the outstanding amount is NIL, this Guarantee shall become null and void, whether the original is returned to us or not.

Any claims to be made under this Guarantee must be received by the Bank during its period of validity, i.e. upto 90 (ninety) days after the date of operational acceptance by the Employer i.e. on or before.....(year, month, date).

Yours truly,
For and on behalf of the Bank

[*Signature of the authorised signatory(ies)*]
Signature_____

Name_____

Designation_____

POA Number_____

Contact Number(s): Tel._____Mobile_____

Fax Number_____

email _____

Common Seal of the Bank_____

Witness:

Signature_____

Name_____

Address_____

Contact Number(s): Tel._____Mobile_____

email _____

Note :

1. The non-judicial stamp papers of appropriate value shall be purchased in the name of bank who issues the 'Bank Guarantee'.
2. Advance Bank Guarantee is to be provided by the successful bidder in the form of a bank guarantee which should be issued either:

   (a) by a reputed bank located in the country of Employer and acceptable to the Employer, or
   (b) by a foreign bank confirmed by either its correspondent bank located in the country of Employer which should be reputed and acceptable to the Employer, or

   (c) by a Public Sector Bank in the country of Employer.

   All banks shall be nationalized and scheduled banks operating in India.

8. FORM OF COMPLETION CERTIFICATE

Date……...

Name of Contract……
Contract No……...

To:

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to CC 24 (Completion of the Facilities) of the Conditions of the Contract entered into between yourselves and the Employer dated ……..……... relating to the ...……...
(Brief description of the Facilities)

we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below :

1. Description of the Facilities or part thereof ...……...

2. Date of Completion :……

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defects Liability Period.

Very truly yours,

Title
(Project Manager)

9. FORM OF OPERATIONAL ACCEPTANCE CERTIFICATE

Date……...

Name of Contract……
Contract No……...

To:

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to CC 25.3 (Operational Acceptance) of the Conditions of the Contract entered into between yourselves and the Employer dated.....…….
relating to the .....……...
(Brief description of the facilities)

we hereby notify you that the Functional Guarantees of the following part(s) of the Facilities were satisfactorily attained on the date specified below.

1. Description of the Facilities or part thereof .....……....

2. Date of Operational Acceptance : ……..

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defects Liability Period.

Very truly yours,

Title
(Project Manager)

10. CHANGE ORDER PROCEDURE

Contract No. ……

CONTENTS

1. GENERAL

2. CHANGE ORDER LOG

3. REFERENCE FOR CHANGES

1. ANNEXURES

ANNEX 1	Request for Change Proposal
ANNEX 2	Estimates for Change Proposal
ANNEX 3	Acceptance of Estimates
ANNEX 4	Change Proposal
ANNEX 5	Change Order
ANNEX 6	Pending Agreement Change Order
ANNEX 7	Application for Change Proposal
ANNEX 8	Change Order Log

CHANGE ORDER PROCEDURE

1. General

This section provides samples of procedures and forms for implementing changes in the Facilities during the performance of the Contract in accordance with CC 39 (Change in Facilities) of the Conditions of Contract.

2. Change Order Log

The Contractor shall keep an up-to-date change Order Log to show the current status of Requests for Change and Changes authorized or pending as Annex-8 Entries of the Changes in the Change Order Log shall be made to ensure that the log is up-to-date. The Contractor shall attach a copy of the current Change Order Log in the monthly progress report to be submitted to the Employer.

3. References for Changes

(i) Request for Changes as referred to in CC Clause 39 shall be serially numbered CR-X-nnn.

(ii) Estimate for Change Proposal as referred to in CC Clause 39 shall be serially numbered CN-X-nnn.

(iii) Acceptance of Estimate as referred to in CC Clause 39 shall be serially Numbered CA-X-nnn.

(iv) Change Proposal as referred to in CC Clause 39 shall be serially numbered CP-X-nnn.

(v) Change Order as referred to in CC Clause 39 shall be serially numbered CO-X-nnn.

Notes :

(a) Requests for Change issued from the Employer's Home Office and the site representatives of the Employer shall have the following respective references:

Home Office	CR-H-nnn
Site	CR-S-nnn

(b) The above number "nnn" is the same for Request for Change, Estimate for Change Proposal Acceptance of Estimate, Change Proposal Change Order.

[ANNEXURE 1]

REQUEST FOR CHANGE PROPOSAL

…….
(Employer's Letterhead)
…….

To : (Contractor's Name and Address) Date : ……

……
……
……

Attention : (Name and Title)
……
……

(Contract Name)…… (Contract No.)……..
……..
……..

Dear Ladies and/ or Gentlemen :

With reference to the captioned Contract, you are requested to prepare and submit a Change Proposal for the Change noted below in accordance with the following instructions within ……days of the date of this letter. (or on before[date])

1. Title of Change :……

2. Change Request No…… (Rev…… …….)

3. Originator of Change:
   Employer (Name)……..
   Contractor (by Application for Change Proposal No……*)
   * Refer to ANNEX 7.

4. Brief Description of Change :

   ……
   ……
   ……

5. Facilities and/ or Item No. of equipment related to the requested Change :
   ……
   ……
   ……

6. Reference drawings and /or technical documents for the request of Change :

Drawings No. / Document No.	**Description**
……	……
……	……
……	……

7. Detailed conditions or special requirements on the requested Change :

…… ……
…… ……
…… ……

8. **General Terms and Conditions** :

(1) Please submit your estimate to us showing what effect the requested Change will have on the Contract Price.

(2) Your estimate shall include your claim for the additional time, if any for completion of the requested Change.

(3) If you have any opinion negative to the adoption of the requested Change in connection with the conformability to the other provisions of the Contract on the safety of the Plant or Facilities Please inform us of your opinion in your proposal of revised provisions.

(4) Any increase or decrease in the work of the Contractor relating to the services of its personnel shall be calculated.

(5) You shall not proceed with the execution of the work for the requested Change Until we have accepted and confirmed the amount and nature in writing

…….
(Employer's Name)

(Signature)
……..

(Name of signatory)
…….……

(Title of signatory)

[ANNEXURE 2]

ESTIMATE FOR CHANGE PROPOSAL

……
(Contractor's Letterhead)
……

To : (Employer's Name and Address) Date : …….

Attention : (Name and Title)
……

Contract Name…….

Contract Number……

Dear Ladies and /or Gentlemen:

With reference to your Request for Change Proposal, we are pleased to notify you of the approximate cost of preparing the below-referenced Change Proposal in accordance with CC Sub-Clause 39.2.1 of the Conditions of Contract. We acknowledge that your agreement to the cost of preparing the Change Proposal, in accordance with CC Sub-Clause 39.2.2, is required before estimating the Cost for Change work.

1. Title of Change ……

2. Change Request No……..(Rev……)

3. Brief Description of Change :
   ……
   ……

4. Scheduled Impact of Change :
   ……
   ……

5. Cost for Preparation of Change Proposal (in the currencies of the Contract)
   ……
   ……

(a)	Engineering		(Amount)
	(i)	Engineer _____hrs x_____rate/hr =	_____
	(ii)	Draftsperson _____hrs x_____rate/hr =	_____
		Sub-total _____hrs	_____
		Total Engineering Cost	_____

(b) Other Cost _____

Total Cost (a) + (b) _____

…….
(Contractor's Name)

…….
(Signature)

…….
(Name of Signatory)

(Title of signatory)

[ANNEXURE 3]

ACCEPTACE OF ESTIMATES

……
(Employer's Letterhead)
……

To : (Contractor's Name and Address) Date : ……

Attention : (Name and Title)…….
……..

Contract Name : ……
Contract Number…….

Dear Ladies and /or Gentlemen :

We hereby accept your Estimate for Change Proposal and agree that you should proceed with the preparation of the Change Proposal.

1. Title of Change : …….

2. Change Request No. …….. (Rev ……)

3. Estimate for Change Proposal No. …… (Rev ……)

4. Acceptance of Estimate No…….. (Rev ……)

5. Brief Description of Change :
……..……..……..……..……
……..……..……..……..……

6. Other Terms and Conditions In the event that we decide not to order the Change accepted, you shall be entitled to compensation for the cost of preparation of Change Proposal described in your estimate for Change Proposal mentioned in para. 3 above in accordance with CC Clause 39.0 of the Conditions of Contract.

……..……
(Employer's Name)
……..……
(Signature)
……..……
(Name and Title of signatory)

[ANNEXURE 4]

CHANGE PROPOSAL

……..……..……..
(Contractor's Letterhead)
……..……..……...

To : (Employer's Name and Address) Date : ……
……..……..……
……..……..……
……..……..……

Attention : (Name and Title)
……..……..…….
……..……..…….

(Contract Name) ……. (Contract No.) ……
……
……

Dear Ladies and / or Gentlemen

In response to your Request for Change Proposal No. ……we hereby submit our proposal as follows :

1. Title of Change : (Name) ……..…….

2. Change Request No. ……(Rev ……)

3. Originator of Change : Employer (Name) ……..
   Contractor (Name) …….

4. Brief Description of Change :
   ……..……..……
   ……..……..……

5. Reasons for Change :
   ……..……..……
   ……..……..……

6. Facilities and/ or Item No. of equipment related to the requested Change :
   ……..……..……
   ……..……..……

7. Reference drawings and/ or technical documents for the requested Change :

Drawing No. / Document No.	Description
……	……..
……	……..

8. Estimate of increase / decease / (in the currencies of the contract to the Contract Price resulting from Change Proposal

		(Amount)
(a)	Direct Material	…….
(b)	Major construction equipment	……..
(c)	Direct field labour (Total hrs)	…….
(d)	Subcontracts	…….
(e)	Indirect material and labour	…….
(f)	Site supervision	…….

(g) Head office technical staff salaries

Process engineer	_____hrs @	_____rate/hr	_____
Project engineer	_____hrs @	_____rate/hr	_____
Equipment engineer	_____hrs @	_____rate/hr	_____
Procurement	_____hrs @	_____rate/hr	_____
Draftsperson	_____hrs @	_____rate/hr	_____
Total _____hrs @			_____

(h) Extraordinary costs (computer, travel, etc.) _____

(i) Fee for general administration_____% of Items _____

(j) Taxes and customs duties _____

Total lump sum cost of Change Proposal
[sum of Items (a) to (j)] _____

Cost to prepare Estimate for Change Proposal
(amount payable if Change is not accepted _____

9. Additional time for Completion required due to Change Proposal :

10. Effect on the other Functional Guarantees.

11. Effect on the other terms and Conditions of the Contract.

12. Validity of this Proposal : Within …….days after receipt of this Proposal by the Employer.

13. Other Terms and Conditions of this Change Proposal:

(a) You are requested to notify us of your acceptance, comments or rejection of this detailed Change Proposal within…….days from your receipt of this Proposal.

(b) The amount of any increase and/ or decrease shall be taken into account In the adjustment of the Contract Price.

(c) Contractor's cost for preparation of this Change Proposal :

(Note) This cost shall be reimbursed by the Employer in case of Employer's withdrawal or rejection of this Change Proposal without default of the Contractor in accordance with CC Clause 39.0 of the Conditions of Contract.

……..
(Contractor's Name)

……
(Signature)

……
(Name of signatory)

……
(Title of signatory)

ANNEXURE 5]

CHANGE ORDER

……..……..……..
(Contractor's Letterhead)
……..……..……...

To : (Employer's Name and Address) Date : ……
……..……..……
……..……..……
……..……..……

Attention : (Name and Title)
……..……..…….
……..……..…….

(Contract Name) ……. (Contract No.) ……
……
……

Dear Ladies and / or Gentlemen :

We approve the Change Order for the work specified in the Change Proposal No……..… and agree to adjust the Contract Price, Time for Completion and/ or other conditions of the Contract in accordance with CC Clause 39.0 of Conditions of Contract.

1. Title of Change : (Name) ……..…….

2. Change Request No. ……(Rev ……)

3. Change Order No…….(Rev……)

4. Originator of Change : Employer (Name) ……..
Contractor (Name) …….

5. Authorized Price :
Ref. No. …… ……(Number)
Date : ……..
Foreign currency portion ……plus Local currency portion…….

6. Adjustment of Time for Completion

None Increase ……..days Decrease ……..days

7. Other effects, if any
Authorized by :…….Date : …….
(Employer)
Accepted by : …….. ..Date : ……
(Contractor)

……..
(Contractor's Name)

……
(Signature)

……
(Name of signatory)

……
(Title of signatory)

[**ANNEXURE 6]**

PENDING AGREEMENT CHANGE ORDER

……..……..……..
(Contractor's Letterhead)
……..……..……...

To : (Employer's Name and Address) Date : ……
……..……..……
……..……..……

Attention : (Name and Title)
……..……..…….
……..……..…….

(Contract Name) ……. (Contract No.) ……
……
……

Dear Ladies and / or Gentlemen :

We instruct you to carry out the work in the Change Order detailed below in accordance with CC 39.0 of the Conditions of Contract.

1. Title of Change : (Name) ……..…….
2. Employer Request for Change Proposal No……(Rev ……) Dated……
3. Contractor's Change Proposal No……(Rev…….) Dated……
4. Brief Description of Change :
   ……..……..……..
   ……..……..……
5. Facilities and/ or Item No. of equipment related to the requested Change :
   ……..……..……..
   ……..……..……..
6. Reference drawings and/ or technical documents for the requested Change

Drawing No. / Document No.	Description
……	…….……..
……	…….……..

7. Adjustment of time for completion :
8. Other change in the Contract terms :
9. Other terms and Conditions :

……..……
(Contractor's Name)

(Signature)
……..
(Name of signatory)
……..
(Title of signatory)

[ANNEXURE 7]

APPLICATION FOR CHANGE PROPOSAL

……..……..……...

(Contractor's Letterhead)

……..……..……...

To : (Employer's Name and Address) Date : ……

……..……..……

……..……..……

……..……..……

Attention : (Name and Title)

……..……..…….

……..……..…….

(Contract Name) ……. (Contract No.) ……

……

……

Dear Ladies and / or Gentlemen :

We hereby propose that the below mentioned work be treated as a Change in the Facilities.

1. Title of Change :
   (Name) ……..……..…….

2. Application for Change Proposal No……(Rev ……)
   Dated …….

3. Brief Description of Change :
   ……..……..……..…
   ……..……..…….

4. Reasons for Change :
   ……..……..……..
   ……..……..……..

5. Order of Magnitude Estimation (in the currencies of the Contract).
   …….
   …….

6. Scheduled Impact of Change :
   …….
   …….

7. Effect on Functional Guarantee. If any :
   …….
   …….

8. Appendix

…….
…….

……..……
(Contractor's Name)

(Signature)

……..
(Name of signatory)

……..
(Title of signatory)

[ANNEXURE 8]

CHANGE ORDER LOG

……..…….…….....

(Contractor's Letterhead)

……..…..……..……...

To : (Employer's Name and Address) Date : ……

……..……..……

……..……..……

Attention : (Name and Title)

……..……..…….

……..……..…….

(Contract Name) ……. (Contract No.) ……

……

Dear Ladies and / or Gentlemen :

(Contract Name)……. (Contract No…….

…….

We hereby furnish the up-to date change order log to show the current status of request for changes and authorized or pending.

S1. No.	Employer's Request for change proposal revision	Contractor application for change including revision	Contractor's Change proposal including revision	Change order No. including revision	Pending proposal No.	Remarks*

..……..……

(Contractor's Name)

(Signature)

……..……...

(Name of signatory)

…….

Title of Signatory

Note :

(i) *In case Employer has authorized to carryout the work pending agreement change order, the details of such authorization shall be furnished.

(ii) The contractor shall attach a copy of the current change order log in the monthly progress report to be submitted to the Employer every month.

11. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN ONE LOT BY DELHI TRANSCO LTD. FOR PERFORMANCE OF ITS CONTRACT

INDEMNITY BOND

THIS INDEMNITY BOND is made this ……..… day of…… 200…… by…… a Company registered under the Companies Act, 1956/ Partnership firm/ proprietary concern having its Registered Office at……..(hereinafter called as 'Contractor' or "Obligor" which expression shall include its successors and permitted assigns) in favour of DELHI TRANSCO LTD, a Company incorporated under the Companies Act, 1956 having its Registered Office at Shakti Sadan, Kotla Road, New Delhi-110002.

WHEREAS DELHI TRANSCO LTD. has awarded to the Contractor a contract for ……...vide its Notification of Award/ Contract No……. ……..... dated ……..and its Amendment No…….(applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which DTL is required to hand over various Equipments to the Contractor for execution of the Contract.

And WHEREAS by virtue of Clause No……of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of DTL for the Equipment handed over to it by DTL for the purpose of performance of the Contract/ Erection portion of the contract (hereinafter called the "Equipment")

AND THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipments as mentioned in the Contract, valued at (amount in words……) handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep DTL indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipments as per dispatch title documents handed over to the Contractor duly endorsed in their favour and detailed in the Schedule appended hereto. It is expressly understood by the Contractor that handing over of the dispatch title documents in respect of the said equipments duly endorsed by DTL in favour of the contractor shall be construed as handling over of the equipment purported to be covered by such title documents and the contractor shall hold such equipment in trust as a Trustee for and on behalf of DTL.

2. That the contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the equipment of DTL project Site against all risks whatsoever till the equipment are duly used/erected in accordance with the terms of the contract and the plant/package duly erected and commissioned in accordance with the terms of the contract, is taken over by DTL. The contractor undertakes to keep DTL harmless against any loss or damage that may be caused to the equipments.

3. The contractor undertakes that the equipment shall be used exclusively for the performance/execution of the contract strictly in accordance with its terms and

conditions and no part of the equipment shall be 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 DTL is and shall remain the exclusive owner of the equipment free from all encumbrances, charges or liens of any kind, whatsoever. The equipment shall be all times be open to inspection and checking by the employer or employer's representative in this regard. Further DTL shall always be free at all times to take possession of the equipment in whatever form the equipment may be, if in its opinion, the equipments are likely to be endangered, mis-utilised or intended for use 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 DTL to return the equipment without any demur or reservation.

5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is mis-utilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Employer's Representative as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and /or damaged Equipment at its own cost and/ or shall pay the amount of loss to DTL without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to DTL 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 DTL, THEN. The above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS, 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.

SCHEDULE

Particulars of the Equipment	Quantity	Particulars of Despatch title Documents RR/ GR No. Date of lading & Carrier	Value of the Equipment	Signature of Attorney in Handed token of receipt

For and on behalf of

M/s……..
WITNESS

1.	1.	Signature…….	Signature……
	2.	Name……	Name……
	3.	Address……	Address……
			Authorized representative
2.	1.	Signature…….	
	2.	Name……	(Common Seal) (In case of Company)
	3.	Address……	

Indemnity Bonds are to be executed by the authorized person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute Indemnity Bonds, (iii) in case of (ii), the original Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.

12. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN INSTALLMENTS BY DELHI TRANSCO LTD FOR PERFORMANCE OF ITS CONTRACT

INDEMNITY BOND

THIS INDEMNITY BOND is made this …..…….day of ……..200…….by…..…… ……..……a Company registered under the Companies Act, 1956/ Partnership firm/ proprietary concern having its Registered Office at ……..……(hereinafter called as 'Contractor' or 'Obligor' which expression shall include its successors and permitted assigns) in favor of DELHI TRANSCO LTD a Company incorporated under the Companies Act, 1956 having its Registered Office at Shakti Sadan, Kotla Marg, New Delhi-110002

WHEREAS DTL has awarded to the Contractor a Contractor for ……vide Its Notification of Award/Contract No. ……dated …….and Amendment No. ……..... (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which DTL is required to handover various Equipments to the Contractor for execution of the Contract.

AND WHEREAS by virtue of Clause No……of the said Contract, the Contractor is Required to execute an Indemnity Bond in favour of DTL for the Equipment handed over to it by DTL for the purpose of performance of the contract/ Erection portion of the Contract (hereinafter called the "Equipment".)

NOW THEREFORE, This Indemnity Bond witnessed as follows:

1. That in consideration of various Equipments as mentioned in the Contract, valued at (amount in words ……..) to be handed over to the Contractor in installments from time to for the purpose of performance of the contract, the Contractor hereby undertakes to indemnify and shall keep DTL indemnified, for the full value of Equipment. The Contractor hereby acknowledges receipt of the initial installment of the equipment per details in the schedule appended hereto. Further, the Contractor agrees to acknowledge receipt of the subsequent installments of the Equipment as required by DTL 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 shall be construed as handing over the Equipment purported to be covered by such title documents and the Contractor shall hold Equipments in trust as a Trustee for and on behalf of DTL

2 That the contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the equipment of DTL project Site against all risks whatsoever till the equipment are duly used/erected in accordance with the terms of the contract and the plant/package duly erected and commissioned in accordance with the terms of the contract, is taken over by DTL. The contractor undertakes to keep DTL harmless against any loss or damage that may be caused to the equipments.

3. The contractor undertakes that the equipment shall be used exclusively for the performance/execution of the contract strictly in accordance with its terms and

conditions and no part of the equipment shall be 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 DTL is and shall remain the exclusive owner of the equipment free from all encumbrances, charges or liens of any kind, whatsoever. The equipment shall be all times be open to inspection and checking by the employer or employer's representative in this regard. Further DTL shall always be free at all times to take possession of the equipment in whatever form the equipment may be, if in its opinion, the equipments are likely to be endangered, mis-utilised or intended for use 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 DTL to return the equipment without any demur or reservation.

5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is mis-utilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Employer's Representative as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and /or damaged Equipment at its own cost and/ or shall pay the amount of loss to DTL without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to DTL 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 DTL, then, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS, 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.

SCHEDULE No. 1

Particulars of the Equipment	Quantity	Particulars of Despatch title Documents	Value of the Equipment	Signature of Attorney in Handed token of receipt
		RR/ GR No. Date of lading & Carrier		

For and on behalf of

M/s……..

WITNESS

1.	1.	Signature…….	Signature……
	2.	Name……	Name……
	3.	Address……	Address……
			Authorized representative
2.	1.	Signature…….	
	2.	Name……	(Common Seal) (In case of Company)
	3.	Address……	

Indemnity Bonds are to be executed by the authorized person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute Indemnity Bonds, (iii) in case of (ii), the original Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.

13. FORM OF AUTHORIZATION LETTER: DELHI TRANSCO LIMITED.

REF. No.

DATE:

TO,

M/s…….

……

……

REF: Contract No…… dated …… for…… awarded by Delhi Transco limited.

Dear Sir,

Kindly refer to Contract No. ……. Dated …….. for …….. You are hereby authorized on behalf of Delhi Transco Limited, having its registered office at Delhi Transco Limited, Shakti Sadan, Kotla Road New Delhi-110002 and its project at …….to take physical delivery of materials/equipments covered under Dispatch Document/Consignment Note No……dated…… and as detailed in the enclosed schedule for the sole purpose of successful performance of the aforesaid contract and for no other purpose, whatsoever.

(Signature of Project Authority)**

Designation …….
Date …….

Encl: As above

** To be signed not below the rank of Manager.

- Mention LR/RR No.

14. FORM OF TRUST RECEIPT FOR PLANT, EQUIPMENT AND MATERIALS RECEIVED

We M/s (Contractor's Name)_____ having our Principal place of business at _____having been awarded a Contract No. _____ dated _____for (Contract Name) by (Name of Employer) _____.

We do hereby acknowledge the receipt of the Plant, Equipment and Materials as are fully described and mentioned under Documents of Title/RR/LR etc and in the schedule annexed here to, which shall form an integral part of this receipt as "Trustee" of _____ (Name of Employer). The aforesaid materials etc. so received by us shall be exclusively used in the successful performance of the aforesaid contract and for no other purpose whatsoever. We undertake not to create any charge, lien or encumbrance over the aforesaid materials etc, in favour of any other person /institution (s) / Banks.

For M/s _____
(Contractor's Name)

Dated:_____

Place: _____

(AUTHORISED SIGNATORY)

SEAL OF COMPANY

15. FORM OF EXTENSION OF BANK GUARANTEE

Ref. No…….. **Dated……**

Delhi Transco Limited,
Shakti Sadan, Kotla Road
New Delhi 110002.
India

Dear Sirs,

Sub: - Extension of Bank Guarantee No. …… for…….. favoring yourself expiring on …… On account of M/s…….. in respect of Contract No……. dated …….. (hereinafter called original Bank Guarantee).

At the request of M/s ……. We …….. Bank branch office at……. Having its Head Office at …… do hereby extend our liability under the above mentioned Guarantee No…… dated …….. for a further period of ……. Years/Month from ……. Expire on ……. Except as provided above, all other terms and conditions of the original Bank Guarantee No……. dated…… shall remain unaltered and binding.

Please treat this as an integral part of the original Guarantee to which it would be attached.

Yours Faithfully,

For…….

Manager. Agent/Accountant

Power of attorney No…….

Dated …….

SEAL OF BANK

Note : The non. Judicial stamp paper of appropriate value shall be purchased in the name of the bank who has issued the bank Guarantee.

16. FORM OF POWER OF ATTORNEY FOR JOINT VENTURE/CONSORTIUM

(On Non-judicial Stamp paper of Appropriate Value to be purchased in the name of joint venture/ Consortium)

KNOW ALL MEN BY THESE PRESENTS THAT WE, the partners whose details are given hereunder …….. have formed a Joint venture/ Consortium under the laws of ……. And having our Registered Office(S) / Head Office (s) at …… (hereinafter called the Joint venture/ Consortium which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) acting through M/s ……being the partner in-charge do hereby constitute, nominate and appoint M/s …… a Company incorporated under the laws of ……and having its registered / Head Office at …….. as our duly constituted lawful Attorney (hereinafter called " Attorney" or " Authorized Representative" or " Partner In- charge") to exercise all or any of the powers for and on behalf of the joint venture/ Consortium in regard to Specification No…… Package …… the bids for which have been invited by Delhi Transco Limited, Shakti Sadan Building, Kotla Road, New Delhi, India (hereinafter called the " Employer") to undertaking the following acts :

i) To submit proposal and participate in the aforesaid Bid Specification of the Employer on behalf of the "Joint venture/ Consortium".
ii) To negotiate with the employer the terms and conditions for award of the Contract pursuant to the aforesaid Bid and to sign the Contract with the Employer for and on behalf of the 'JOINT VENTURE/ CONSORTIUM'.
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/ Consortium".

It is clearly understood that the partner In-charge (Lead Partner) shall ensure performance of the Contract(s) and if one or more partner fail to perform their respective portions of the Contract(s), the same shall be deemed to be default by all the partners.

It is expressly understood that this Power of Attorney shall remain valid binding and irrevocable till completion of the Defect Liability Period in terms of the Contract.

The joint venture/ Consortium hereby agrees and undertakes to ratify and confirm all and whatsoever the said Attorney/ Authorized Representatives/Partner in- charge quotes in the bid, negotiates And signs the Contract with Employer and / or proposes to act on behalf of the Joint venture/ Consortium by virtue of this Power of Attorney and the same shall bind the joint venture/ Consortium as if done by itself.

In WITNESS THEREOF the partners Constituting the joint venture/ Consortium as aforesaid have executed these present on this …… day of ……. Under the Common Seal(s) of their Companies.

for and on behalf of the

Partners of joint venture/ Consortium

...……..

…….

The Common Seal of the above Partners of the Joint venture/ Consortium:

The Common Seal has been affixed the unto in the presence of:

WITNESS

1. Signature……..
   Name……..
   Designation ……..
   Occupation…….

2. Signature……..
   Name……..
   Designation ……..
   Occupation…….

17. FORM OF JOINT VENTURE/ CONSORTIUM AGREEMENT

(On non-judicial stamp paper of appropriate value to be purchased in the name of joint venture/ Consortium)

PERFORMA OF JOINT VENTURE/ CONSORTIUM AGREEMENT BETWEEN ……. AND …….. FOR BID SPECIFICATION NO……. OF DELHI TRANSCO LIMITED

THIS joint venture/ Consortium agreement executed on this …… day of Two thousand……. between M/s ……. 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), M/s …… ……..…… a company incorporated under the laws of ……. and having its registered office at……(hereinafter called "the 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 partner" which expression shall include its successors, executors and permitted assigns) for the purpose of making a bid and entering into a contract (in case of award) against the specification No…… for……(Name of the Package) ……..under……..(Name of the project) …….of Delhi Transco limited ,a company incorporated under the Companies Act of 1956 having its registered Shakti Sadan, Kotla Road New Delhi-110002, India (hereinafter caller the; "Employer")

Whereas the employer invited bids as per the above mentioned Specification for the design, engineering, manufacture, supply, installation, testing and commissioning of equipment/materials stipulated in the bidding documents for……(Name of the Package) …….under…….(Name the project)

AND WHEREAS Annexure-A, section-CC (qualification of the bidder) forming part of the bidding documents, .stipulates that a joint venture/ Consortium of two or more qualified firms as partners, meeting the joint venture/ Consortium fulfills all other requirements under Annexure-A, Section CC (qualification of the bidder) and in such a case, the BID FROM shall be signed by all the partners so as to legally bind all the partners of the Joint venture/ Consortium, who will be jointly and severally liable to perform the contract and all obligations hereunder.

The above clause further states that the joint venture/ Consortium agreement shall be attached to the bid and the contract performance guarantee will be as per the format enclosed with the bidding document without any restriction or liability for either party.

AND WHEREAS the bid has been submitted to the Employer vide proposal No…….. dated…….by Lead partner based on the joint venture/ Consortium agreement between all the partners under these present and the bid in accordance with the requirements of Annexure-A, section CC (Qualification of the Bidders), has been signed by all the partners.

NOW THIS INDENTURE WITNESS AS UNDER:

In consideration of the above premises and agreements all the partners to this joint venture/ Consortium do hereby now agree as follow:

1. In consideration of the award of the contract by the Employer to the joint venture/ Consortium partners, we, the partners to the joint venture/ Consortium agreement do hereby agree that M/s …….. shall act as lead partner and further declare and confirm that we shall joint and severally be bound unto the Employer for the successful performance of the Contract and shall be fully responsible for the design, engineering, manufacture, supply, and successful performance of the equipments in accordance with the Contract.

2. In case of any breach of the said Contract by the Lead Partner or other partner(s) of the joint venture/ Consortium agreement, the partner(s) do hereby agree to be fully responsible for the successful performance of the contract and carry out all the obligations and responsible under the Contract in accordance with the requirements of the Contract.

3. Further if the Employer suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance of the equipment in meeting the performance guaranteed as per the specification in terms if the Contract, the partner(s) of these present undertake to promptly make good such loss or damages caused to the Employer, on its demand without any demur. It shall not be necessary or obligatory for the Employer to proceed against Lead Partner to these presents before proceeding against or dealing with the other Partner(s).

4. The financial liability of the partner of this joint venture/ Consortium agreement to the Employer, with respect to any of the claims arising out of the performance or non-performance of the obligations set forth in the said joint venture/ Consortium agreement, 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 of any of the partners of the joint venture/ Consortium agreement.

5. It is expressly understood and agreed between the partners to the joint venture/ Consortium agreement that the responsibilities and obligations of each of the partners shall be as delineated in Appendix-I (* To be incorporated suitably by the partners) to this agreement. It is further agreed by the partners that the above sharing of responsibilities and obligations shall not in any way be a limitation of joint and servable responsibilities of the partners under this Contract.

6. This joint venture/ Consortium agreement shall be constructed and interpreted in accordance with the laws of India and the courts of New Delhi shall have the exclusive jurisdiction in all matters arising there under.

7. In case of an award of a Contract, we the partners to the joint venture/ Consortium agreement do hereby agree that we shall be jointly and severe ally responsible for furnishing a contract performance security from a bank in favour of the Employer in the currency of the Contract.

8. It is further agreed that the venture agreement shall be irrevocable and shall from an integral part of the Contract, and shall continue to be enforceable till the Employer

discharges the same. It shall be effective from the date first mentioned above for all purpose and intents.

IN WITNESS WHEREOF, the partners to the joint venture/ Consortium agreement have through their authorized representatives executed these present and affixed Common Seals of their companies, on the day, month and year first mentioned above.

1. Common Seal of ……
has been affixed in my/our
presence pursuant to the
Board of Director's resolution dated...
Signature.....
Name.....
Designation……..

For Lead partner

(Signature of authorized representative)
Name.....
Designation.....
Common Seal of the company
…….....

2. Common Seal of ……
has been affixed in my/our
presence pursuant to the
Board of Director's resolution dated...
Signature.....
Name.....
Designation……..

For partner

(Signature of authorized representative)
Name.....
Designation.....
Common Seal of the company
…….....

WITNESSES:

1 ……..
(Signature)
Name……..
…….
(Official address)

2. ……..
(Signature)
Name……..
…….
(Official address)

18. PROFORMA OF JOINT UNDERTAKING BY THE COLLABORATOR/ PARENT COMPANY/ GROUP COMPANY/ SUBSIDIARY COMPANY/PRINCIPAL/ SISTER CONCERN ALONGWITH THE BIDDER/MANUFACTURER

(On non-judicial stamp paper of appropriate value)

THIS DEED OF UNDERTAKING executed this …… day of Two Thousand and…… by M/s…… a company incorporated under the laws of ……..and having its registered office at……(hereinafter called the "Collaborator/Parent Company/ Group Company/ Subsidiary Company /Principal/sister concern" which expression shall include its successors, administrators, executors and permitted assigns) and M/s…..…….a company incorporated under the laws of …….. and having its registered office at…… ……(hereinafter called the "Bidder/Manufacturer" which expression shall include its successors, administrators, executors and permitted assigns) in favour of Delhi Transco Limited, having its Registered office at Shakti Sadan, Kotla Marg, New Delhi.(herein after called the "Employer" which expression shall include its successors, executors and permitted assigns)

WHEREAS the "Employer" invited Bid as per Specification No. …….. for the execution of ……..(Insert name of the Project)…….

AND WHEREAS Clause No. ……, Section ……..,of ……., Vol.-……forming part of the Bidding Documents inter-alia stipulates that the Bidder and/or Manufacturer alongwith its collaborator/parent company/ group company/ subsidiary company/principal/sister concern must fulfill the Qualifying Requirements for the *…….. and be jointly and severally bound and responsible for the successful performance of the *…….offered in the event the bid submitted by the bidder is accepted by the Employer resulting in Contract.

AND WHEREAS the bidder has submitted its bid to the Employer vide Proposal No. ……..dated …….based on the collaboration /association of the collaborator/parent company/principal/sister concern with the Bidder/Manufacturer.

NOW THEREFORE THIS UNDERTAKING WITNESSTH as under.

1.0 In consideration of the award of Contract by the Employer to the Bidder (herein after referred to as the "Contract") we, the collaborator/parent company/ group company/ subsidiary company/principal/sister concern and the Bidder/Contractor and /or manufacturer do hereby declare that we shall be jointly and severally bound unto the DELHI TRANSCO LIMITED , for the guarantee quality, timely supply ,successful performance and warranty obligations of the * …….. and shall be fully responsible for the design, manufacturer , testing, supply on FOR destination delivery at site basis and supervision of unloading at site, storage, erection, testing & commissioning and successful performance of the *…….in accordance with the Contract Specifications.

2.0 Without in any way affecting the generality and total responsibility in terms of deed of Undertaking, the Collaborator in particular hereby agrees to depute their technical experts from time to time to the Bidder/Contractor's/Manufacture's Works/ Owner's project site as mutually considered necessary by the Owner, bidder/Contractor, Manufacturer and the collaborator to ensure proper design, engineering, manufacturer, testing ,supply on for destination delivery at site basis and supervision of unloading at site , storage, erection, testing and commissioning and successful performance of the collaborator shall advise the manufacturer/ contractor suitable modifications of designs and implement necessary corrective measures to discharge the obligations under the contract.

3.0 This deed of undertaking shall be construed and interpreted in accordance with the laws of India and the Courts in New Delhi shall have exclusive jurisdiction in all matters arising under the undertaking.

4.0 As a security, the bidder shall apart from the contractor's performance guarantee furnish a contract performance guarantee from its Bank in favour of the Employer on a form acceptable to the Employer. The value of such guarantee shall be equivalent to 10% of price of such equipments manufactured in India as identified in the contract awarded by the Employer to the bidder/contractor and it shall be part of guarantee towards the faithful performance/ compliance of this deed of undertaking in terms of the contract. The guarantee shall be unconditional, irrevocable and valid for the entire period of the contract, namely till the end of the defect liability period of Project under the contract. The bank guarantee amount shall be payable to the Employer on demand without any reservation or demur. This shall be in addition to the contract performance guarantee furnished by the contractor.

5.0 We the collaborator/parent company/ group company/ subsidiary company/principal/sister concern and bidder/contractor and /or manufacturer agree that this undertaking shall be irrevocable and shall from an integral part of the contract and further agree that this undertaking shall continue to be enforceable till the Employer discharges it. It shall become operative from the effective date of contract.

IN WITNESS WHEREOF the collaborator/parent company/ group company/subsidiary company/principal/sister concern and bidder/contractor and /or manufacturer, have through their Authorized Representatives executed these present and affixed common seals of their respective Companies, on the day, month and year first above mentioned.

WITNESSES:

For Collaborator/parent company/ group company/ subsidiary company/principal/sister concern

1.---------- Signature of Authorized Representative

(Signature)

(Name in Block Letter) Name----------

(Office Address) Common seal of Company ----------

2.---------- Signature of Authorized Representative

(Signature)

(Name in Block Letter) Name----------

(Office Address) Common seal of Company----------
-

For Manufacturer

3.---------- Signature of Authorized Representative

(Signature)

(Name in Block Letter) Name----------

(Office Address) Common seal of Company----------

Note:

(i) This deed of Joint undertaking duly certified by the Company Secretary shall be submitted along with the bid. Further, the deed of Joint Undertaking attested by Notary Public of the place(s) of the respective executants (s) or registered with the Indian Embassy/ High Commission in the country shall be submitted by the bidder before opening of price bid. In case the bidder fails to submit the deed of Joint Undertaking as mentioned above, the bidders bid guarantee may be forfeited.

(ii) In the event the bidder is a Manufacturer and the collaboration is between collaborator and the Bidder, then the Joint deed of Undertaking shall be continued accordingly.

(iii) *The name(s) of equipment for which Joint deed of undertaking is to be submitted is to be inserted.

(iv) The manufacturer may be having ongoing collaboration agreement or had collaboration agreement in the past with the collaborator.

19. FORM OF TAKING OVER CERTIFICATE

Date……...

Name of Contract……
Contract No……...

To:

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to CC 24 & 25 of the Conditions of the Contract entered into between yourselves and the Employer dated ……..……relating to the ...……...
(Brief description of the Facilities)

we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below:

1. Description of the Facilities or part thereof... ……...

2. Date of Completion…

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defects Liability Period.

Very truly yours,

Title
(Project Manager)

DELHI TRANSCO LTD

(A Government of NCT of Delhi Undertaking)

Bidding Documents
For

Package-I: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala, Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Package-II: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.**

Package-III: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Package-IV: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Volume – II

TECHNICAL SPECIFICATION

Tender No: T25R220472

I N D E X

VOLUME – II

TECHNICAL SPECIFICATION

S. No	Contents		Description
1.	Section I	:	Project
2.	Section II	:	Technical Specification - HTLS Conductor And Associated H/W Fittings And Accessories
3.	Section III	:	Technical Specification: Polymer Insulator
4.	Section IV	:	Technical Specification: Circuit Breaker (CB)
5.	Section V	:	Technical Specification: Current Transformer
6.	Section VI	:	Technical Specification: Isolator
7.	Section VII	:	Tower
8.	Section VIII	:	Pre-Commissioning
9.	Section IX	:	General Technical Requirement (GTR)
10.	Section X	:	Tower Schedule

SECTION-I

PROJECT

SECTION-I
PROJECT

1.0 General Information & Scope

1.1 General Information

1.1.1 Delhi Transco Limited (hereinafter called **'DTL'/ 'Owner')** intends to carryout following work under the scope of following Re-Conductoring package:-:

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala, Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

1.2 Scope

1.2.1 The scope of work inter-alia includes:

1.2.1.1 **For Package-I:** Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan- Kanjhawala, Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi):

i) Design, Engineering, Manufacturing, Testing & Supply (including local transportation and other incidental services) of High Temperature Low Sag (HTLS) conductor, hardware fittings & clamps for hardware fittings suitable for HTLS conductor, accessories for HTLS conductor, composite long rod polymer insulators and Petty items.

ii) Site Inspection.

iii) Dismantling of Old ACSR Zebra conductor (Line/Bus-Bar) including insulators, fittings, equipments, accessories and transportation of the same to any DTL store

or other site store along with proper stacking etc.

iv) Installation of necessary hardware, hoisting of insulator string, installing and stringing of each circuit with HTLS Conductor along with all necessary line accessories/ Petty items with the other circuit under live condition (including river/ railway crossing section), testing & commissioning.

v) Replacement of CT, Line isolator, CB, insulator, double bus bar and Jack Bus conductor at Najafgarh end.

vi) Replacement of CB, CT, Line isolator, Bus isolator, insulator, double bus bar and Jack Bus conductor at Kanjhawala end.

vii) Any Petty work required for completion of work shall be in the scope of Contractor

1.2.1.2 **For Package-II:-** Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi):

i) Design, Engineering, Manufacturing, Testing & Supply (including local transportation and other incidental services) of High Temperature Low Sag (HTLS) conductor, hardware fittings & clamps for hardware fittings suitable for HTLS conductor, accessories for HTLS conductor, composite long rod polymer insulators and Petty items.

ii) Site Inspection.

iii) Dismantling old ACSR Zebra Conductor including insulators, hardware fittings, equipments and accessories and transportation of these items from site to DTL store or other site store along with proper stacking etc

iv) Installation of necessary hardware, hoisting of insulator string, installing and stringing of each circuit with HTLS Conductor along with all necessary line accessories/ Petty items with the other circuit under live condition (including river/ railway crossing section), testing & commissioning.

v) Replacement of bus and line isolators, CT and jack bus conductor etc. at Gopalpur & CT at Subzi Mandi end.

vi) Any Petty work required for completion of work shall be in the scope of Contractor.

1.2.1.3 **For Package-III: -** Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi):

i) Design, Engineering, Manufacturing, Testing & Supply (including local transportation and other incidental services) of High Temperature Low Sag (HTLS) conductor, hardware fittings & clamps for hardware fittings suitable for HTLS conductor, accessories for HTLS conductor, composite long rod polymer insulators and Petty items.

ii) Site Inspection.

iii) Dismantling of Old ACSR Zebra conductor (Line/Bus-Bar), fittings, accessories & equipments and transportation of the same to any DTL store or other site store

along with proper stacking etc.

iv) Installation of necessary hardware, hoisting of insulator string, installing and stringing of each circuit with HTLS Conductor along with all necessary line accessories/ Petty items with the other circuit under live condition (including river/ railway crossing section), testing & commissioning.

v) Replacement of CT, Line isolator, Bus isolator, insulator, double bus bar and Jack Bus conductor at Geeta Colony end & replacement of CT at Patparganj end.

vi) Replacement of CT, Line isolator, insulator, double bus bar and Jack Bus conductor at IP end.

vii) Replacement of Line isolator, insulator double bus bar and Jack Bus conductor at Pragati end.

viii) Any Petty work required for completion of work shall be in the scope of Contractor.

1.2.1.4 **For Package-IV: -** Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi):

i) Design, Engineering, Manufacturing, Testing & Supply (including local transportation and other incidental services) of High Temperature Low Sag (HTLS) conductor, hardware fittings & clamps for hardware fittings suitable for HTLS conductor, accessories for HTLS conductor, composite long rod polymer insulators and Petty items.

ii) Site Inspection.

iii) Dismantling of Old ACSR Zebra conductor (Line/Bus-Bar), fittings, accessories & equipments and transportation of the same to any DTL store or other site store along with proper stacking etc.

iv) Installation of necessary hardware, hoisting of insulator string, installing and stringing of each circuit with HTLS Conductor along with all necessary line accessories/ Petty items with the other circuit under live condition (including river/ railway crossing section), testing & commissioning.

v) Replacement of CT, insulator, double bus bar and Jack Bus conductor at Narela end.

vi) Replacement of CB, CT, Line isolator, Bus isolator, insulator, Double Bus Bar and Jack Bus conductor at DSIIDC Bawana end.

vii) Any Petty work required for completion of work shall be in the scope of Contractor.

1.2.2 The material to be supplied on final destination at site basis as covered in the bidding documents shall be designed, manufactured, tested, supplied and installed as per the requirements specified in this volume and the requirements, conditions, appendices etc. specified in other Sections of bidding documents.

1.2.3 The entire quantity of dismantled bay equipment as well as line materials viz. ACSR ZEBRA conductor, hardware fittings & conductor accessories etc. transported from

site to DTL store or other site store along with proper stacking etc.

1.2.4 The Owner shall arrange shut down of one circuit at a time and the other circuit shall be kept under charged condition. The contractor shall de-string the existing conductor and restring the circuit with the new HTLS conductor section by section and restore the line in original conditions as per program finalized in co-ordination with site engineer.

Appropriate safety measures along with necessary safety tools and equipments to carry out de-stringing and stringing operations under the above conditions including mechanical/ structural safety of the towers shall be the responsibility of the contractor. Necessary calculations shall be carried out by the contractor to ensure that by replacing the existing ACSR ZEBRA conductor with the offered HTLS conductor, the loadings on the towers due to conductor tensions as well as loads on account of there-Conductoring activities shall be within specified limits. These calculations shall be submitted by the contractor during detailed engineering.

1.2.5 The materials covered in this package shall be supplied complete in all respects, including all components, fittings and accessories which are necessary or are usual for their efficient performance and satisfactory operation under the various operating and atmospheric conditions. The supplier shall be responsible for ensuring compatibility with associated fittings and accessories and satisfactory performance of complete conductor system (along with associated fittings and accessories) for continuous operation at the designed continuous operating temperature of the offered HTLS conductor. Such parts shall be deemed to be within the scope of the Contract, whether specifically included or not in the Specification or in the Price Schedules. The contractor shall not be eligible for any extra charges for such fittings, etc.

1.2.6 The contractor shall inspect the entire stretch of transmission line and shall accordingly devise appropriate methodology/procedure of carrying out the Re-Conductoring works during detailed engineering. The contractor shall deploy appropriate tools / equipments / machinery to ensure that the stringing operation is carried out without causing damage to conductor and conductor is installed at the prescribed sag-tension as per the approved stringing charts. Further, the contractor having requisite experience has freedom to use helicopter for stringing/ de-stringing. The contractor intending to use helicopter shall furnish detailed description of the procedure, type & number of helicopter & accessories etc., to be deployed for stringing operation. The payment for stringing shall be done as per the payment clauses under section F&P irrespective of the methodology adopted for stringing.

1.2.7 The scope of the package shall inter-alia include Re-Conductoring works at site as per the approved procedure during the entire period of stringing. The stringing works including installation of HTLS conductor & its fittings & accessories shall be supervised by a team of supplier's engineers / supervisory staff/ workmen already

experienced in stringing work associated with the type of HTLS conductor being supplied. In case the stringing is carried out by sub contractor, the bidder shall Co-ordinate with the sub-contractor and train its workers for carrying out Re-Conductoring works.

Charges for supervision by core supplier (if required) shall be deemed to be included in the charges for installation & stringing of the offered HTLS conductor as per the Technical Specification. Further, cost for supply of one set of all the special tools & tackles required for stringing of the offered HTLS conductor shall be included in the bid price.

1.2.8 If Tee-taps required as per site condition for execution of work, bidders are required to supply and install these Tee-taps and Cost of the same shall be included.

2.0 Technical Description

The technical description of HTLS Conductor and its associated H/W fittings & accessories along with the tests and standards shall be as specified in Section-HTLS Conductor and Section- Hardware fitting & accessories.

3.0 Tests

The Type test, Acceptance test and Routine tests and tests during manufacturing shall be in accordance with the Technical Specification, Volume-II.

The bidder shall submit all the applicable type test reports of the equipment in line with latest edition of IS/IEC and validity of the type test reports shall be as per latest CEA guidelines. The type test reports shall be submitted along with the bid. If any applicable type test has not been conducted by the bidder, then the same shall be conducted by the bidder free of cost and without affecting the completion period of the project/tender.

4.0 Guaranteed Technical Particulars

4.1 The Guaranteed Technical Particulars of the various items shall be furnished by the Bidders in the prescribed schedules of the specifications. The Bidder shall also furnish any other schedule information as in their opinion is needed to give full description and details to judge the item(s) offered by them.

4.2 The data furnished in Guaranteed Technical Particulars should be the minimum or maximum value (as per the requirement of the specification) required. A Bidder may guarantee a value more stringent than the specification requirement. However, for testing purpose or from performance point of view, the material shall be considered performed successfully if it achieves the minimum/maximum value required as per the technical specification. No preference what so ever shall be given to the bidder offering better/more stringent values than those required as per specification.

5.0 Details of Existing Transmission Line and Terrain

5.1 The tower schedule of the transmission lines prepared by the Owner is enclosed for

reference in Section-Tower Schedule of this Volume.

5.2 Bidders are advised to visit the line route to acquaint themselves with terrain/ topography etc and local conditions of the site and associated details of the existing transmission line to be Re-Conductored with HTLS conductor before bidding. For this purpose they are requested to contact the following address:

General Manager (O&M)-I / II
Delhi Transco Limited.
220kV Sub-Station Building, Park Street,
Opposite Talkatora Stadium
New Delhi-110001

5.3 Line Termination Details

220KV D/C Bamnauli-Najafgarh transmission line is emanating from Bamnauli 400KV Substation and terminating at Najafgarh 220kV Substation of DTL, Delhi.

220KV D/C Najafgarh- Tikri Kalan- Kanjhawala transmission line is emanating from Najafgarh 220kV Substation and terminating at at Kanjhawala 220kV Substation of DTL, Delhi with single circuit LILO at Tikri Kalan 400kV Substation.

220KV D/C Kanjhawala- Bawana transmission line is emanating from Kanjhawala 220kV Substation and terminating at Bawana 400kV Substation of DTL, Delhi.

220KV D/C Bawana- DSIIDC Bawana transmission line is emanating from Bawana 400KV Substation and terminating at DSIIDC Bawana 220kV Substation of DTL, Delhi.

220KV D/C Gopalpur-Timarpur-Subzi Mandi transmission line is emanating from Gopalpu220kVSubstation and terminating at Subzi Mandi 220kV Substation of DTL, Delhi through Timarpur 220kV Substation.

220KV D/C Geeta Colony-Patparganj transmission line is emanating from Geeta Colony 220kVSubstation and terminating at Patparganj 220kV Substation of DTL, Delhi.

220KV D/C Patparganj- IP transmission line is emanating from Patparganj 220kVSubstation and terminating at IP (Indraprastha) 220kV Substation of DTL, Delhi.

220KV D/C IP- Pragati transmission line is emanating from IP (Indraprastha) 220kVSubstation and terminating at Pragati 220kV Substation of DTL, Delhi.

220KV D/C DSIIDC Bawana – Narela - Mandola transmission line is emanating from DSIIDC Bawana 220 kV Substation and terminating at Mandola 400kV Substation of DTL, Delhi with LILO at Narela 220kV Substation.

List of address: -

Address of Bamnauli 400KV Substation:
Village-Bamnauli, P.O. Dhul Sirus,
Near Chhawala Camp (BSF) Najafgarh-Bijwasan Road,
Delhi-110094

Address of Najafgarh 220kV Substation:-
Opp. Delhi Jal Board Office, New Delhi-110043

Address of Tikri Kalan 400kV Substation:-
Neelwal Road, Near Vaishno Devi Mandir,
New Delhi-110041

Address of Kanjhawala 220kV Substation:-
Near Police Station & DTC Depot, Ghewra Road,
Delhi-110081

Address of Bawana 400KV Substation:-
Sector-5, DSIIDC Bawana, Bawana, Delhi-110039

Address of DSIIDC Bawana 220kV Substation:-
Near H Block, J.J. colony, Bawana Hanuman Mandir,
Bawana, Delhi-110039

Address of Gopalpur 220kV Substation:-
Vill.Gopalpur, Near Gandhi Vihar Colony,
Outer Ring Road, Delhi-110009

Address of Timarpur 220kV Substation:-
Near Old Shiv Temple, Nehru Vihar Turn,
Wazirabad Flyover Outer Ring Road,
North West Delhi, Timarpur – 110054

Address of Sabzi Mandi 220kV Substation:-
Kabir Basti Road, Near Barafkhana Chowk,
Subzi Mandi, Delhi-110007
Address of Geeta Colony 220kV Substation:-
Near Sai Memorial Public School Geeta Colony, Delhi-110031

Address of Patparganj 220kV Substation:-
Near Mother Dairy, Mandawali, Fazalpur, Delhi-110092

Address of Indraprastha 220kV Substation:-
IP Station, New Delhi-110002
Address of Pragati 220kV Substation:-
Pragati Power Station Complex, IP Estate, Ring Road, Delhi-110002

Address of Narela 220kV Substation
Piyo Maniyari Road, Near Kanya Gurukul,
Narela, Delhi-110040

Address of Mandola 400kV Substation
Power Grid Corporation Of India Ltd,
Mandaula, Ghaziabad, Uttar Pradesh, 201102

6.0 Line Data

Details of existing 220KV D/C Transmission line are as follows:-

6.1 Electrical System Data

1.	Nominal Voltage	kV	220
2.	Maximum system voltage	kV	245
3.	BIL (Impulse)	kV (Peak)	1050
4.	Power frequency withstand voltage (Wet)	kV (rms)	460
5.	Minimum Corona extinction voltage at 50 Hz AC system under dry condition	kV (rms) phase to earth.	154 (Min)
6.	Radio interference voltage at one MHz for phase to earth voltage of 154 KV under dry condition.	Micro Volts	1000 (Max

6.2 Details of Line Materials: Conductor

Sl. No.	Description	Conductor
1.	Type	ACSR 'ZEBRA' conductor
2.	Stranding and wire diameter	
	Aluminium	54/3.18
	Steel	7/3.18
3.	Conductor per phase	1
4.	Spacing between conductor of same phase(sub conductor spacing)(mm)	NA
5.	Configuration	Vertical (for D/C with 5200 mm min. inter phase spacing)
6.	Overall Diameter (mm)	28.62
7.	Unit mass (kg/km)	1621
8.	Min. UTS (kN)	130.32

6.3 Ruling Design span for Narrow base tower is 225 meters and for Broad Base tower is 320 meters.

6.4 **Sag-Tensions of the transmission line:**
Sag- Tension requirement shall be as per Technical Specification of HTLS Conductor.

6.5 Right of Way for existing line: 35 meters

7.0 As per CEA Notification dt. 23.12.2022, the transmission system shall be planned and designed in accordance with Central Electricity Authority's "Manual on Transmission Planning Criteria" Provided that the minimum rated short time withstand current of the equipment shall be as per Table -6 of chaptar-4 (Part-A) which specify that voltage level for 220KV, the rated short term withstand current shall be 50KA (for 1 sec.). Accordingly, rated short term withstand current shall be considered as 50KA (for 1 sec.).

8.0 **Reference Standards**

1.	IS: 802(Part-I) Section 1-1995 Section 2-1992	Code of practice for General Building Construction in Steel in Overhead Transmission Line tower Material, Loads and Permissible stresses Section-1: Materials and Loads Section-2: Permissible stresses
2.	IS:802 1977	Indian Standard Code of Practice for Use of Structural Steel in Overhead Transmission Line Towers
3.	IS: 5613	Code of practice for Design, installation and Maintenance of Overhead Power lines Section 1: Design Section 2: Installation and Maintenance
4.		Indian Electricity Rules
5.		Guide to the installation of overhead transmission line conductors (IEEE STD524with latest revision) with additional instructions and precautions for live line working.

9.0 Deleted.

10.0 TRAINING OF PURCHASER'S ENGINEERS AND JOINTERS:
The contractor shall organize and conduct complete and thorough training programme (to be conducted in English language) providing necessary training material, at no

extra cost to the Employer. However, To & fro air fare including boarding and lodging shall be borne by the owner/purchaser and no separate charges for training shall be paid. The training shall be arranged at the manufacturer's works/ facility from where the equipment is being supplied for 120-man days to cover design, manufacture and jointing techniques of HTLS Conductor being supplied and testing, operation & maintenance along with complete operational and maintenance aspects.

11.0 ORDER OF PRECEDENCE OF DIFFERENT SECTIONS OF TECHNICAL SPECIFICATION

In case of any discrepancy between Section Project, Bill of Material, GTR, equipment Technical Specification, Section-PROJECT shall prevail over all other sections and the order of precedence shall be as follows:
Section-1, Vol-II: Section Project
Section-4, Vol-III: Price Schedules
Section 2 to Section 10, Vol-II

For the purpose of present scope of work, the order of precedence between various sections of Volume-II (Technical specification) shall be as under and they should be read in conjunction with each other:
In case of any discrepancy between Section-PROJECT, Section- GTR and other technical specifications on scope of works, Section-PROJECT shall prevail over all other sections.

In case of any discrepancy between Section-GTR and individual sections for various equipments, requirement of individual equipment section shall prevail.

SECTION-II

TECHNICAL SPECIFICATION HTLS CONDUCTOR

AND

ASSOCIATED H/W FITTINGS AND ACCESSORIES

TECHNICAL SPECIFICATIONS OF HTLS CONDUCTORS

1. Description of High Temperature Low Sag (HTLS) Conductor and its Technical Requirements

1.1 The HTLS Conductor except Gap Conductor shall be capable of providing the specified ampacity **as per Annexure -1** at a continuous operating conductor temperature higher than that of the maximum permissible temperature of the existing Conductor **and without exceeding the level of existing sag at worst loading condition in case of reconductoring**.

The physical and operating performance requirements of the transmission line after its up rating by means of re-conductoring with HTLS conductor are mentioned below. The bidder shall offer HTLS conductor complying with the specified requirements. The Bidder shall indicate particulars of the proposed conductor in the relevant GTP schedule along with calculations to establish compliance with the specified requirements.

1.2 **Current Carrying Capacity / Ampacity Requirements**

1.2.1 Each conductor/sub conductor in the HTLS conductor shall be suitable to carry minimum 50 Hz alternating current of **desired Amperes** per conductor, **as per scheme** under the ambient conditions & maximum conductor sag specified **in Annexure-1** while satisfying other specified technical requirements/ parameters.

Reference Ambient Temperature:	50^0 C
Minimum Temperature of Air:	0^0 C
Relative Humidity:	
Maximum:	100%
Minimum:	10%
Wind Velocity:	0.56 m/s
Solar absorption Coefficient:	0.8
Solar Radiation:	1045 watt/sq.m
Emissivity Constant:	0.45
Effective angle of incidence of sun's rays	90 degree

Maximum Conductor sag for [Ruling span as per Annexure - 1] span at steady state conductor temperature and nil wind corresponding to 50 Hz alternating current of **desired** Amperes per conductor under ambient conditions specified above = [Maximum conductor sag as per Annexure - 1] m

The calculations for Ampacity shall be based on latest edition of IEEE Standard 738. The bidder in his bid shall furnish calculations for the ampacity based on the above Standard for the proposed HTLS conductor.

The AC resistance and DC resistance for HT/ HTLS conductor shall be calculated as follows:

$Rac = Rdc \times (1+ 0.00519 X (mr)^{n} \times k1 + k2)$ where,

$mr = 0.3544938/ (R_{dc})^{½}$

if $mr< 2.8$, then $n = 4- 0.0616 + 0.0896 X mr – 0.0513 X(mr)^2$

if $2.8 <mr< 5.0$, then $n = 4+ 0.5363 -0.2949X mr +0.0097 X(mr)^2$

$k1 = \{\cos (90 (d/D)^{P})\}^{2.35}$ where,

$p = 0.7 + 0.11Xmr – 0.04Xmr^2 + 0.0094Xmr^3$

k2 = 0.15 for single aluminium layer INVAR type HTLS conductor

= 0.03 for three aluminium layer INVAR type HTLS conductor

= 0.003 for two or four aluminium layer INVAR type HTLS conductor

= 0 for carbon fiber composite core type HTLS conductor

where,

D= conductor outer diameter in meters

d = conductor inner diameter in meters

R_{dc} = dc resistance of conductor at given temperature, ohms/ km

Rac = ac resistance of conductor at given temperature, ohms/ km

The bidder in his bid shall furnish calculations for the ampacity based on the above for the proposed HT/ HTLS conductor.

1.2.2 The design of conductor shall be suitable for operation at a steady state conductor temperature experienced for a conductor AC current flow of **desired Amperes as per Annexure-1** under the above ambient conditions based on ampacity calculations mentioned above. The bidder shall also indicate the maximum permissible conductor temperature for continuous operation without any deterioration of its electrical, mechanical & metallurgical properties. The bidder shall also furnish the maximum permissible conductor temperature for short term operations including permissible duration of such short term operation. The UTS of conductor at ambient temperature and maximum continuous operating temperature shall be declared in the GTP. Further, UTS of conductor achieved at maximum continuous operating temperature (i.e. at the designed maximum steady state conductor temperature corresponding to desired ampacity) shall not be less than 80% of UTS at ambient temperature declared in the GTP.

1. 3 Technical Particulars of HTLS Conductor

1.3.1 The HTLS conductor shall meet the technical particulars as detailed in Annexure-1 in line with requirement of scheme:

The bidder shall indicate the technical particulars and details of the construction of the conductor in the relevant schedule of GTP. The bidder shall also guarantee the DC resistance of conductor at 20 deg C and AC resistance at the calculated temperature corresponding to 50Hz alternating current flow of **desired** amperes per conductor **as per Annexure-1** at specified ambient conditions (maximum continuous operating temperature). The value of maximum DC resistance of the offered HTLS conductor shall **be as per Annexure-1**

The bidder shall submit the supporting calculations for the AC resistance indicating details & justifications of values of temperature coefficient of resistance & DC to AC resistance conversion factor(s) with due reference to construction / geometry of the conductor.

1.3.2 Evaluation of Ohmic Losses and Differential price loading:

Based on the conductor parameters guaranteed by the bidders, average ohmic losses for different conductors offered by the bidders shall be calculated as per the following:

Average Ohmic loss = Loss load factor x line length x No. of sub conductors x (continuous maximum operating current under normal conditions)^2 x AC resistance corresponding to the temperature at continuous operating current under normal conditions.

Note: value of continuous maximum operating current under normal condition shall be taken as the current carrying capacity of the conductor specified in **Annexure-1 as required in scheme.**

Differential price evaluation for the conductors offered by the bidders shall be carried out considering the average ohmic losses calculated as above and considering Rs.1,52,600/- per KW.

The load loss factor shall be taken as 0.3. The best parameter of loss (Lowest ohmic loss for conductor) corresponding to lowest AC resistance quoted among bidders by any technically responsive and qualified bidder shall be taken as basis and that quoted by the particular bidder shall be used to arrive at differential price to be applied for each bid.

1.4 Sag-Tension Requirements

1.4.1 **The HTLS conductor shall meet the sag tension requirements with the required design span as per Annexure-1. Sag of the offered HTLS conductor at designed maximum temperature should not be more than that specified in Annexure-1. Further for reconductoring works, the sag of offered HTLS conductor at designed maximum temperature under NIL wind condition shall not exceed the corresponding sag of existing conductor for any of the spans of the Line (s) being reconductored.**

Sag-Tension calculation for HTLS conductor can be carried out by using PLSCAD. Following values shall be considered for the purpose of sag-tension calculations:-

(i) Final values of modulus of elasticity of Aluminium/ Aluminium alloy/core, Coefficient of Linear Expansion of Aluminium/ Aluminium alloy/ core, Stress-Strain coefficients & Creep coefficients of aluminium/ Aluminium alloy/ core in the cable data (.wir file) used for calculation of sag in PLSCAD shall be based on either of the following:

a) Existing '.wir' files for offered conductor as available on PLS website.
b) A file derived from existing standard file for conductor of equivalent/ near equivalent stranding.
c) A file derived from type test conducted on conductor of same stranding.

In each of the above cases, proper justification in the form of test reports/ calculations/ print out of '.wir' file as available on PLS website, etc. shall be required to be submitted during detailed engineering.

(ii) PLSCAD Sagging criteria/conditions shall be based on the sag tension limits specified **in Annexure-1** and shall be carried out in a manner that the above mentioned sag-tension limits are met in 'After Creep' as well as in 'After Load' condition.

However, for INVAR type HTLS conductor, following conventional methodology may also be adopted for sag-tension calculations.. Following values shall be considered for the purpose of sag tension calculation:

i) Modulus of Elasticity of Thermal resistant Al alloy strands: 55 GPa to 61.8 GPa (one value from the above specified range to be selected conforming to the Al alloy strands in the offered conductor)

ii) Modulus of Elasticity of INVAR core strands: 155 GPa

iii) Coefficient of Linear Expansion of Thermal resistant Al. Alloy: 23 X $10^{-6}/^{o}C$

iv) Coefficient of Linear Expansion of INVAR core strands (max): 3.7 X $10^{-6}/^{o}C$

v) Initial temperature in manufacturing conductor- not less than $15^{o}C$. In case the bidder proposes the coefficient of linear expansion of INVAR core strands less than 3.7 X $10^{-6}/ ^{o}C$, proper justification in the form of test reports, documents, etc. shall be submitted during detailed engineering.

1.4.2 After award of the contract, the Supplier shall submit Sag-Tension calculations corresponding to various conditions given above for all the existing spans as per detailed survey and spans ranging from 100 m to 1100 m in intervals of 50m.

1.4.3 The Contractor shall also furnish sag & tensions under no wind for various temperatures starting from 0oC to designed maximum temperature in steps of 5oC during detailed engineering.

1.4.4 Besides above, the Supplier shall also furnish details of creep characteristics in respect of HTLS conductor based on laboratory investigations/ experimentation (creep test as per IEEE1138 or IEC 61395) conducted on similar type of conductor and shall indicate creep strain values corresponding to 1 month, 6 months, 1 year, 10 years & 20 years creep at everyday tension and at maximum continuous operating temperature as well as room temperature..

1.5 Workmanship

1.5.1 All the conductor strands shall be smooth, uniform and free from all imperfections, such as spills and splits, cracks, die marks, scratches, abrasions, rust etc.

1.5.2 The finished conductor shall be smooth, compact, uniform and free from all imperfections including kinks (protusion of wires), wire cross over, over riding, looseness (wire being dislocated by finger/hand pressure and/or unusual bangle noise on tapping), material inclusions, white rust, powder formation or black spot (on account of reaction with trapped rain water etc.), dirt, grit etc.

1.6 Joints in Wires

1.6.1 **Aluminium Alloy Wires**

1.6.1.1 During stranding, no Aluminium Alloy wire welds shall be made for the purpose of achieving the required conductor length.

1.6.1.2 No joints shall be permitted in the individual wires in the outer most layer of the finished conductor. However joints are permitted in the inner layer(s) of the conductor unavoidably broken during stranding provided such breaks are not associated with either inherently defective wire or with the use of short lengths of Aluminium Alloy wires. Such joints shall not be more than four (4) per conductor length and shall not be closer than 15 meters from joint in the same wire or in any other Aluminium Alloy wire of the completed conductor. A record of such joints for each individual length of the conductor shall be maintained by the Contractor for Employers review.

1.6.1.3 Joints shall be made by cold pressure butt welding and shall withstand a stress of not less than the breaking strength of individual strand guaranteed.

1.6.2 **Core Wires**

There shall be no joint of any kind in the finished wire entering into the manufacture of the strand. There shall also be no joints or splices in any length of the completed stranded core. **However during production run, splicing of the galvanic protection barrier is allowed as per ASTM B987, provided diameter specifications are maintained**

1.7 Tolerances

Manufacturing tolerances on the dimensions to the extent of one percent (+/- 1%) shall be permitted for individual strands and the complete conductor. **In case of composite core conforming to ASTM B987, the tolerances shall be ± 0.05mm as per ASTM B987.**

1.8 Materials

The materials used for construction of the conductor shall be such that the conductor meets the specified technical and performance requirements.

1.8.1 **Outer layer**

1.8.1.1 The material of outer layer of HTLS conductor shall be of high temperature resistant aluminum alloy added with zirconium or any other suitable element(s) etc. to electrolytic aluminium having purity not less than 99.5% and a copper content not exceeding 0.04%. The strands shall be manufactured through appropriate manufacturing process to ensure consistent electrical mechanical and metallurgical properties under continuous high temperature operation. Bidder shall guarantee the chemical composition in the schedule GTP and also furnish description of the manufacturing process in the Bid.

1.8.1.2 In case of fully annealed type (0 tempered) aluminium/ alloy strands /round wire /trapezoidal/Z-shaped wire shall only be accepted.

1.8.2 **Core**

The core wire strand(s) shall be of galvanized steel wires/ aluminium clad steel wires / Zinc – 5% Aluminium – Misch metal alloy coated invar wire / galvanized invar wires/ aluminium clad invar wires/ composite materials etc. and shall have properties conforming to the technical performance requirements of the finished conductor. In case, the designed maximum temperature of the offered HTLS conductor exceeds 180 deg C, ordinary zinc coating/ galvanizing of the Steel/Invar core wires shall not be accepted and only aluminium clad or Misch metal coated wires shall be permitted. Bidder shall furnish properties and composition of the core wire strand(s)in the GTP.

The zinc used for galvanizing in case of steel /invar core shall be electrolytic High Grade Zinc of 99.95% purity. It shall conform to and satisfy all the requirements of IS: 209. The minimum mass of zinc coating shall be as per requirements of Class-1 coating as per IEC-888. Zinc-5% Aluminium –Mischmetal alloy coating, if used, shall conform to and satisfy all the requirements of ASTM B 803 / B 958.The aluminium cladding of invar/ steel wires shall be with aluminum having purity not less than 99.5 % and shall be thoroughly bonded to the core wire strand(s). The minimum thickness of aluminium cladding shall be 0.07mm to achieve a minimum conductivity of 14% of International Annealed Copper Standard (IACS).

Where composite material for core is offered, the material shall be either of High strength grade or extra high strength grade as per ASTM B987. The materials shall be of such proven quality that its properties are not adversely influenced by the normal operating conditions of a 220 kV transmission line in tropical environment conditions as experienced by the existing line. The bidder shall provide adequate details including specifications/test reports/operating experience details/performance certificates etc. in support of the suitability of the offered materials.

1.9 Conductor Length

1.9.1 The standard length of the conductor shall be indicated in the guaranteed technical particulars of offer. A tolerance of +/-5% on the standard length offered by the Bidder shall be permitted. Standard Length shall not be more than 2500 meters. All lengths outside this limit of tolerance shall be treated as random lengths.

1.9.2 Random lengths will be accepted provided no length is less than 70% of the standard length and the total quantity of such random lengths shall not be more than 10% of the total quantity ordered. At no point, the cumulative quantity supplied of such random lengths shall be more than 12.5% of the total cumulative quantity supplied including such random lengths. However, the last 20% of the quantity ordered shall be supplied only in standard lengths as specified.

1.9.3 Bidder shall also indicate the maximum single length, above the standard length, he can manufacture in the guaranteed technical particulars of offer. This is required for special stretches like river crossing etc. The Employer reserves the right to place orders for the above lengths on the same terms and conditions applicable for the standard lengths during the pendency of the Contract.

2.0 Tests and Standards

2.1 Type Tests

2.1.1 Type Tests on Stranded Conductor/ Stranded wire

The following tests shall be conducted once on sample/samples of conductor from each manufacturing facility:

(i) On complete Conductor

a)	DC resistance test on stranded conductor	: As per Annexure-A
b)	UTS test on stranded conductor	: As per Annexure-A
c)	Radio interference voltage test (dry)	: As per Annexure-A
d)	Corona extinction voltage test (dry)	: As per Annexure-A
e)	Stress- Strain test on stranded conductor and core at room temperature	: IEC 1089
f)	Stress-strain test on stranded conductor and core at elevated temperature	:As per Annexure-A
g)	High temperature endurance & creep test on stranded conductor	: As per Annexure-A

h)	Sheaves Test	: As per Annexure-A
i)	Axial Impact Test	: As per Annexure-A
j)	Radial Crush Test	: As per Annexure-A
k)	Torsional Ductility Test	: As per Annexure-A
l)	Aeolian Vibration	: As per Annexure-A
m)	Temperature Cycle Test	: As per Annexure-A
(ii)	**On Conductor Strand/core**	
a)	Heat resistance test on Aluminium Alloy strands or core	: As per Annexure-A
b)	Bending test on core	: As per Annexure-A
c)	Compression test on core	: As per Annexure-A
d)	Coefficient of linear expansion on core/ core strands	: As per Annexure-A
e)	Strand Brittle fracture Test (for polymer composite core only)	: As per Annexure-A
f)	**Galvanic protection barrier layer thickness test (on polymer composite core) as per ASTM B987)**	**as per ASTM B987**

Type tests specified above shall not be required to be carried out if a valid test certificate is available for the offered design **with validity of the certificate in line with CEA guidelines**. The tests conducted earlier should have been conducted in accredited laboratory (accredited based on ISO/IEC guide 25/17025 or EN 45001 by the National Accreditation body of the country where laboratory is located) or witnessed by the representative (s) of DTL or Utility. In the event of any discrepancy in the test report (i.e., any test report not applicable due to any design / material/manufacturing process change including substitution of components or due to non-compliance with the requirement stipulated in the

Technical Specification) the tests shall be conducted by the Contractor at no extra cost to the Employer/ Purchaser.

2.2 Acceptance Tests

a)	Visual and dimensional check on drum	: As per Annexure-A
b)	Visual check for joints scratches etc. and length measurement of conductor by rewinding	: As per Annexure-A
c)	Dimensional check on core strands/composite core and Aluminium Alloy strands	: As per Annexure-A
d)	Check for lay-ratios of various layers	: As per Annexure-A
e)	Galvanizing test on core strands **(If applicable)**	: As per Annexure-A
f)	aluminum thickness on aluminium clad wires	
g)	Torsion and Elongation tests on core strands/composite core	: As per Annexure-A
h)	Breaking load test on core strands and Aluminium / Aluminium Alloy strands	: As per Annexure-A
i)	Wrap test on core strands and Aluminium Alloy strands	: As per IEC:888 & IEC:889
j)	Minimum conductivity test on thermal resistant Aluminium Alloy strands	: As per IEC : 889 and IEC: 468

k)	Procedure qualification test on welded joint of Aluminium Alloy strands	: As per Annexure-A
l)	Heat resistance test on Aluminium Alloy strands	: As per Annexure-A
m)	Ageing test on filler (if applicable)	: As per Annexure-A
n)	Minimum conductivity test on aluminium clad core strands	: As per Annexure-A
o)	Glass transition temperature test (for polymer composites only)	: As per Annexure-A
p)	Flexural Strength test (for polymer composites only)	: As per Annexure-A
q)	Bending Test on composite core	: As per Annexure-A
r)	Galvanic protection barrier layer thickness test (on polymer composite core) as per ASTM B987	
s)	Coating test on zinc – 5% Al-Mischmetal alloy coating (if applicable)	: As per ASTM B803 / B958
t)	Adherence of Coating Test on Zinc – 5% Al - Mischmetal alloy Coating (if applicable)	: As per ASTM B803 / B958

Note: All the above tests except (k) shall be carried out on Aluminium / Aluminium Alloy and core strands after stranding only.

2.3 Routine Test

a) Check to ensure that the joints are as per Specification

b) Check that there are no cuts, fins etc., on the strands.

c) Check that drums are as per Specification

d) All acceptance tests as mentioned above to be carried out on 10% of drums.

2.4 Tests During Manufacture

a)	Chemical analysis of zinc used for galvanizing	: As per Annexure-A
b)	Chemical analysis of Aluminium alloy used for making Aluminium Alloy strands	: As per Annexure-A
c)	Chemical analysis of core strands (not on polymer composite core)	: As per Annexure-A

2.5 Testing Expenses

2.5.1 No type test charges shall be payable to the supplier.

2.5.2 Bidder shall indicate the laboratories in which they propose to conduct the type tests. They shall ensure that adequate facilities are available in the laboratories and the tests can be completed in these laboratories within the time schedule guaranteed by them.

2.5.3 In case of failure in any type test the Supplier is either required to manufacture fresh sample lot and repeat the entire test successfully once or repeat that particular type test three times successfully on the sample selected from the already manufactured lot at his own expenses. In case a fresh lot is manufactured for testing then the lot already manufactured shall be rejected.

2.5.4 The entire cost of testing for the acceptance and routine tests and Tests during manufacture specified herein shall be treated as included in the quoted unit price of conductor, except for the expenses of the inspector/Employer's representative.

2.5.5 In case of failure in any type test, if repeat type tests are required to be conducted, then all the expenses for deputation of Inspector/Employer's representative shall be deducted from the contract price. Also if on receipt of the Supplier's notice of testing, the Employer's representative does not find material/ testing facilities to

be ready for testing the expenses incurred by the Employer for re-deputation shall be deducted from contract price.

2.5.6 The Supplier shall intimate the Employer about carrying out of the type tests alongwith detailed testing programme at least 3 weeks in advance (in case of testing in India) and at least 6 weeks in advance (in case of testing abroad) of the schedule date of testing during which the Employer will arrange to depute his representative to be present at the time of carrying out the tests.

2.6 Additional Tests

2.6.1 The Employer reserves the right of having at his own expenses any other test(s) of reasonable nature carried out at Supplier's premises, at site or in any other place in addition to the aforesaid type, acceptance and routine tests to satisfy himself that the materials comply with the Specifications.

2.6.2 The Employer also reserves the right to conduct all the tests mentioned in this specification at his own expense on the samples drawn from the site at Supplier's premises or at any other test centre. In case of evidence of non compliance, it shall be binding on the part of Supplier to prove the compliance of the items to the technical specifications by repeat tests, or correction of deficiencies, or replacement of defective items all without any extra cost to the Employer.

2.7 Sample Batch For Type Testing

2.7.1 The Supplier shall offer material for selection of samples for type testing only after getting Quality Assurance Plan approved from Employer's Quality Assurance Deptt. The sample shall be manufactured strictly in accordance with the Quality Assurance Plan approved by Employer.

2.7.2 The Supplier shall offer at least three drums for selection of sample required for conducting all the type test.

2.7.3 The Supplier is required to carry out all the acceptance tests successfully in presence of Employer's representative before sample selection.

2.8 Test Reports

2.8.1 Copies of type test reports shall be furnished in at least three copies along with one original. One copy will be returned duly certified by the Employer only after which the commercial production of the material shall start.

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

2.8.3 Test Certificates of tests during manufacture shall be maintained by the Supplier. These shall be produced for verification as and when desired by the Employer.

2.9 Inspection

2.9.1 The Employer's representative shall at all times be entitled to have access to the works and all places of manufacture, where conductor shall be manufactured and representative shall have full facilities for unrestricted inspection of the Supplier's works, raw materials and process of manufacture for conducting necessary tests as detailed herein.

2.9.2 The Supplier shall keep the Employer informed in advance of the time of starting and of the progress of manufacture of conductor in its various stages so that arrangements can be made for inspection.

2.9.3 No material shall be dispatched from its point of manufacture before it has been satisfactorily inspected and tested, unless the inspection is waived off by the Employer in writing. In the later case also the conductor shall be dispatched only after satisfactory testing for all tests specified herein have been completed.

2.9.4 The acceptance of any quantity of material shall in no way relieve the Supplier of any of his responsibilities for meeting all requirements of the Specification, and shall not prevent subsequent rejection it such material is later found to be defective.

2.10 Test Facilities

2.10.1 The following additional test facilities shall be available at the Supplier's works:

a) Calibration of various testing and measuring equipment including tensile testing machine, resistance measurement facilities, burette, thermometer, barometer etc.

b) Standard resistance for calibration of resistance bridges.

c) Finished conductor shall be checked for length verification and surface finish on separate rewinding machine at reduced speed (variable from 8 to 16 meters per minute). The rewinding facilities shall have appropriate clutch system and free of vibrations, jerks etc. with traverse laying facilities.

2.11 Packing

2.11.1 The conductor shall be supplied in non-returnable, strong, wooden/painted steel/hybrid (painted steel cum wood) drums provided with lagging of adequate strength, constructed to protect the conductor against all damage and displacement during transit, storage and subsequent handling and stringing operations in the field. The Supplier shall select suitable drums for supply of conductor and shall be responsible for any loss or damage to conductor and/or drum during transportation handling and storage due to improper selection of drum or packing. The drums shall generally conform to IS:1778, except as otherwise specified hereinafter.

2.11.2 The drums shall be suitable for wheel mounting and for letting off the conductor under a minimum controlled tension of the order of 5 kN.

2.11.3 The Bidder should submit their proposed drum drawings along with the bid.

2.11.4 One standard length only shall be wound on each drum.

2.11.5 The conductor ends shall be properly sealed and secured on the side of one of the flanges to avoid loosening of the conductor layers during transit and handling.

2.11.6 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 shall be applied to the entire drum with preservatives of a quality which is not harmful to the conductor.

2.11.7 The flanges shall be of two ply construction with each ply at right angles to the adjacent ply and nailed together. The nails shall be driven from the inside face flange, punched and then clenched on the outer face. The thickness of each ply shall not vary by more than 3mm from that indicated in the figure. There shall be

at least 3 nails per plank of ply with maximum nail spacing of 75mm. Where a slot is cut in the flange to receive the inner end of the conductor the entrance shall be in line with the periphery of the barrel.

2.11.8 The wooden battens used for making the barrel of the conductor shall be of segmental type. These shall be nailed to the barrel supports with at least two nails. The battens shall be closely butted and shall provide a round barrel with smooth external surface. The edges of the battens shall be rounded or chamfered to avoid damage to the conductor.

2.11.9 Barrel studs shall be used for the construction of drums. The flanges shall be holed and the barrel supports slotted to receive them. The barrel studs shall be threaded over a length on either end, sufficient to accommodate washers, spindle plates and nuts for fixing flanges at the required spacing.

2.11.10 Normally, the nuts on the studs shall stand protruded of the flanges. All the nails used on the inner surface of the flanges and the drum barrel shall be counter sunk. The ends of barrel shall generally be flushed with the top of the nuts.

2.11.11 The inner cheek of the flanges and drum barrel surface shall be painted with a bitumen based paint.

2.11.12 Before reeling, card board or double corrugated or thick galvanized water-proof bamboo paper shall be secured to the drum barrel and inside of flanges of the drum by means of a suitable commercial adhesive material. After reeling the conductor, the exposed surface of the outer layer of conductor shall be wrapped with water proof thick galvanized bamboo paper to preserve the conductor from dirt, grit and damage during transport and handling.

2.11.13 A minimum space of 75 mm for conductor shall be provided between the inner surface of the external protective tagging and outer layer of the conductor.

2.11.14 Each batten shall be securely nailed across grains as far as possible to the flange, edges with at least 2 nails per end. The length of the nails shall not be less than twice the thickness of the battens. The nails shall not protrude above the general surface and shall not have exposed sharp, edges or allow the battens to be released due to corrosion.

2.11.15 The nuts on the barrel studs shall be tack welded on the one side in order to fully secure them. On the second end, a spring washer shall be used.

2.11.16 A steel collar shall be used to secure all barrel studs. This collar shall be located between the washers and the steel drum and secured to the central steel plate by welding.

2.11.17 Outside the protective lagging, there shall be a minimum of two binders consisting of hoop iron/ galvanized steel wire. Each protective lagging shall have two recesses to accommodate the binders.

2.11.18 As an alternative to wooden drum, Bidder may also supply the conductors in returnable/ non-returnable painted steel drums. After preparation of steel surface according to IS:9954, synthetic enamel paint shall be applied after application of one coat of primer. Wooden/Steel drum will be treated at par for evaluation purpose and accordingly the Bidder should quote in the package.

2.11.19 In case of returnable steel drums for conductor, following clauses shall apply:

(a) The ownership of the empty conductor drums shall lie with the conductor supplier who shall ultimately take back the empty conductor drum from the Project site(s) from the erection contractor's designated stores after the running out of conductor from the drum.

(b) The erection contractor shall intimate the Conductor supplier and Employer regarding empty steel drums at their designated stores.

(c) Necessary coordination for taking back the empty steel drums in this regard shall be done by the Conductor Supplier with the erection Contractor.

(d) The empty drum shall be taken back by the conductor supplier from the stores of erection contractor as & when these are available after usage of conductor. Conductor supplier shall be required to take back the empty steel drum within a period of one month from date of information by erection contractor regarding availability of the drums at erection contractor stores. However, 2% of the total drums shall not be returned to the conductor supplier as these may be used for storage of spare conductor by the Purchaser.

(e) The steel drums may get damage and wear & tear due to transportation, normal handling & operation at site, which shall be rectified by the conductor supplier before re-use. However, 2% of the total drums shall not be returned on account of damages / wastage for which no compensation will be payable. The wastage beyond 2% shall be reimbursed by Erection Contractor. Thus, 4% of total drums shall not be returnable to the conductor supplier.

2.11.20 As an alternative to outer wooden lagging, in case of returnable/ non-returnable steel drums, solid polypropylene sheet (of min 5mm thickness) can be used for outer covering of conductor. In case of PP sheets are proposed to be used by the supplier, the conductor supplier shall supply two nos. additional binders per drum for re-wrapping PP sheet with each lot of conductor and 5 nos. crimping machines with the first lot of conductor for crimping the binders at site.

2.11.21 **Marking**

Each drum shall have the following information stenciled on it in indelible ink along with other essential data:

(a) Contract/Award letter number.

(b) Name and address of consignee.

(c) Manufacturer's name and address.

(d) Drum number

(e) Size of conductor

(f) Length of conductor in meters

(g) Arrow marking for unwinding

(h) Position of the conductor ends

(i) Distance between outer-most Layer of conductor and the inner surface of lagging.

(k) Barrel diameter at three locations & an arrow marking at the location of the measurement.

(l) Number of turns in the outer most layer.

(m) Gross weight of drum after putting lagging.

(n) Tear weight of the drum without lagging.

(o) Net weight of the conductor in the drum.

(p) CIP/MICC No.

The above should be indicated in the packing list also.

2.12 Verification of Conductor Length

The Employer reserves the right to verify the length of conductor after unreeling at least ten (10) percent of the drums in a lot offered for inspection.

2.13 Standards

2.13.1 The conductor shall conform to the following Indian/International Standards, which shall mean latest revisions, with amendments/changes adopted and published, unless specifically stated otherwise in the Specification.

2.13.2 In the event of the supply of conductor conforming to standards other than specified, the Bidder shall confirm in his bid that these standards are equivalent to those specified. In case of award, salient features of comparison between the standards proposed by the Supplier and those specified in this document will be provided by the Supplier to establish their equivalence**.**

Sl. No.	**Indian/International Standard**	**Title**
1.	IS: 209-1992	Zinc Ingot – specification
2.	IS: 398-1982	Aluminium conductors for overhead transmission purposes- specification
3.	IS:398-1990 Part-II	Aluminum Conductor Galvanised Steel Reinforced
4.	IS:398- 1992 Part V	Aluminium conductor – Galvanized steel

		Reinforced for Extra High Voltage (400kV and above)
5	IS : 1778-1980	Specification for Reels and Drums for Bare Conductors
6	IS : 1521-1991	Method of Tensile Testing of Steel Wire
7	IS : 2629-1990	Recommended Practice for Hot Dip Galvanising of Iron and Steel
8.	IS : 2633-1992	Method of Testing Uniformity of Coating on Zinc Coated Articles
9.	IS : 4826-1992	Hot dipped Galvanised Coating on Round Steel Wires
10.	IS : 6745-1990	Methods of Determination of Weight of Zinc Coating of Zinc Coated Iron and Steel Articles
11.	IS : 8263-1990	Method of Radio Interference Tests on High Voltage Insulators
12.	IS : 9997-1988	Aluminium Alloy Redraw Rods for electrical purposes – specification
13.	IEC :888-987	Zinc Coated steel wires for stranded Conductors
14.	IEC:889-1987	Hard drawn Aluminium wire for overhead line conductors
15.	IS:398 (Part-IV)	Aluminium Alloy stranded conductor
16.	IEC:1232	Aluminium clad steel wires
17.	IEC: 468	Method of measurement of resistivity of metallic materials
18.	IEEE738	Standard for calculating the current temperature relationship of bare overhead

		conductors
19.	IEC62004	Thermal resistant aluminium alloy wire for overhead line conductor.
20.	ASTM B498	Standard specification for zinc coated steel core wire for use in overhead electrical conductors
21.	ASTM B606	Standard specification for high strength zinc coated steel core wire for aluminium and aluminium alloy conductors , steel reinforced.
22.	ASTM B502	Standard specification for aluminium clad steel core wire for use in overhead electrical aluminium conductors
23.	ASTM B388	Standard specification for thermostat metal sheet and strip
24.	ASTM B753	Standard specification for thermostat component alloys
25.	ASTM A856	Standard specification of zinc- 5% Aluminium Misch metal alloy coated carbon steel wire.
26.	ASTM A857	Steel sheet piling , cold formed , light gauge.
27.	ASTM B230	Aluminium 1350-H19 wire for electrical purposes.
28.	ASTM B398	Aluminium alloy 6201-T81 and 6201-T83 wire for electrical purposes.
29.	ASTM B609	Aluminium 1350 round wire, annealed and intermediate tempers for electrical purpose.
30.	SS 424 0813	Aluminium alloy wire for stranded conductors for overhead lines – Al-59 wire

31.	SS 424 0814	Aluminium alloy stranded conductors for overhead lines – Al-59 wire
32.	BS EN 50540	Conductor for overhead lines . (ACSS)
33.	ASTM B941	Heat resistant Al-zirconium alloy wire for electrical purposes
34.	ASTM B 957	Extra high strength and ultra high strength zinc coated steel core wire for overhead electrical conductors.
35.	ASTM B 802	Standard specification of zinc- 5% Aluminium Misch metal alloy coated steel core wire for aluminium conductors , steel reinforced.
36.	ASTM B 958	Extra high strength and ultra high strength class-A zinc 5% aluminium mischmetal alloy coated steel core wire for overhead electrical conductors.
37.	ASTM B 976	Fibre reinforced aluminium matrix composite (AMC) core wire for aluminium conductors , composite reinforced
38.	ASTM B 987-17	Carbon fiber thermoset polymer matrix composite core (CFC) for use in overhead electrical conductors.
39	ASTM- B117	Applicable for salt spray test.

Note: GTP of HTLS conductor is at Schedule-1, technical particulars as Annexure-1 and Test methods as Annexure-A

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ANNEXURE-A

1. Tests on Conductor

1.1 UTS Test on Stranded Conductor

Circles perpendicular to the axis of the conductor shall be marked at two places on a sample of conductor of minimum 5 m length between fixing arrangement suitably fixed by appropriate fittings on a tensile testing machine. The load shall be increased at a steady rate upto 50% of minimum specified UTS and held for one minute. The circles drawn shall not be distorted due to relative movement of strands. Thereafter the load shall be increased at steady rate to minimum UTS and held for one minute. The Conductor sample shall not fail during this period. The applied load shall then be increased until the failing load is reached and the value recorded.

Note: The test is to be conducted at ambient temperature, between minimum and maximum ambient temperature of 0 deg C and 50 deg C respectively.

b) UTS Test on Stranded Conductor at elevated temperature UTS Test on Stranded Conductor shall be conducted as per clause no. 1.1(a) specified above keeping conductor temperature at the designed maximum temperature.

1.2 Corona Extinction Voltage Test

The sample of the conductor of 5 m length shall be strung at a height not exceeding 7.01 m above ground. The sample assembly when subjected to power frequency voltage shall have a corona extinction voltage of not less than 154 kV (rms) line to ground under dry condition. There shall be no evidence of corona on any part of the samples. The test should be conducted without corona control rings. However, small corona control rings may be used to prevent corona in the end fittings. The voltage should be corrected for standard atmospheric conditions.

1.3 Radio Interference Voltage Test

Under the conditions as specified under (1.2) above, the conductor sample shall have radio interference voltage level below 1000 micro volts at one MHz when subjected to 50 Hz AC voltage of 154 kV line to ground under dry conditions. This test may carried out with corona control rings and arcing horns.

1.4 D.C. Resistance Test on Stranded Conductor

On a conductor sample of minimum 5m length two contact- clamps shall be fixed with a predetermined bolt torque. The resistance shall be measured by a Kelvin double bridge or using micro ohm meter of suitable accuracy by placing the clamps initially zero meter

and subsequently one meter apart. The test shall be repeated at least five times and the average value recorded. The value obtained shall be corrected to the value at 20°C as per IS:398-(Part-IV)/(Part-V). The resistance corrected at 20deg C shall conform to the requirements of this Specification.

1.5 Stress-strain test at elevated temperature

Stress-strain test as per IEC-61089 shall be conducted keeping conductor temperature at designed maximum temperature (i.e. at the designed maximum steady state conductor temperature corresponding to desired ampacity) . UTS for this test shall be 80% of the UTS guaranteed in the GTP.

1.6 High Temperature endurance & creep test

Two conductor samples of length equal to at least 100 X d + 2 X a (where, d is the conductor diameter and a is the distance between the end fitting and the gauge length) shall be strung at tension equal to 25 % of conductor UTS. The distance, a, shall be at least 25 % of the gauge length or 2 m whichever is the smaller. The conductor samples shall be subjected to tests as indicated below:

(i) On one of the conductor samples, the conductor temperature shall be maintained at 20 deg C for 1000 hours. The elongation/creep strain of the conductor during this period shall be measured and recorded at end of 1 hour, 10 hour, 100 hour and subsequently every 100 hour up to 1000 hours' time period.

(ii) On other conductor sample, the conductor temperature shall be increased to designed maximum temperature in steps of20 deg. C and thermal elongation of the conductor sample shall be measured & recorded at each step. The temperature shall be held at each step for sufficient duration for stabilization of temperature. Further, the temperature of the conductor shall be maintained at designed maximum temperature +10 Deg. C for 1000 hours. The elongation/creep strain of the conductor during this period shall be measured and recorded at end of 1 hour, 10 hour, 100 hour and subsequently every 100 hour up to 1000 hours time period. After completion of the above, the core of the conductor sample shall be subjected to UTS test as mentioned above at clause 1.1. The conductor core shall withstand a load equivalent to 95 % of UTS. In case of polymer composite core conductor, the flexural strength & glass transition temperature of the core shall also be evaluated and the same shall not be

degraded by more than 10 % over the initial value. The supplier shall plot the thermal elongation with temperature.

The supplier shall furnish details of creep characteristic in respect of the conductor based on laboratory test and other laboratory investigations/experimental conducted on similar type of conductor and shall indicate creep strain values corresponding to 1 month, 6 month, 1 year, 10 year & 20 year creep at everyday tension & designed maximum temperature as well as room temperature.

1.7 Sheaves Test

The conductor sample of minimum length of 35 meter shall be tensioned at 25 % of the UTS and shall be passed through pulleys having diameter of 32 times that of the conductor with angle of 20 deg. between the pulleys. The conductor shall be passed over the pulleys 36 times a speed of 2 m/sec. After this test UTS test on the conductor shall be carried out as mentioned above at clause 1.1. In case of polymer composite core conductors, the core shall be inspected for any sign of damage or cracking through dye penetration test as per ASTM D5117.

1.8 Axial Impact Test

The conductor sample shall be suspended vertically and load applied by dropping a 650 Kg from an elevation of 4 meters above the sample. The impact velocity shall not be less than 8 m/sec. with an intial pre-tension of 200 kgs. The curve for load vs time shall be recorded and recorded load of failure for core shall not be less than UTS of core.

1.9 Radial Crush Test

A section of conductor is to be crushed between two six inch steel platens. Load shall be held at 350 Kgs for 1 minute and then released. All the strands shall be subsequently disassembled and tensile tested. All the strands shall exhibit full strength retention.

1.10 Torsional Ductility Test

The conductor sample of 10-15m shall be loaded to 20% of UTS and then rotated in increasing steps of +/- 180 degrees. The entire conductor shall withstand at least 16 such rotation and there shall not be any damage to Aluminium Alloy or core wires. In case of composite core conductors, after 4 rotations or after separation of aluminium strands, the aluminium wires shall be cut and removed from the conductor and the exposed core shall be twisted and shall withstand up to 16 rotations.

1.11 Aeolian Vibration Test

The conductor and supporting hardware shall be loaded to 25% of RTS (rated tensile strength). A dynamometer, load cell, calibrated beam or other device shall be used to measure the conductor tension. Some means should be provided to maintain constant tension to allow for temperature fluctuations during the testing. The overall span between system terminations shall be a minimum of 30 m. The span shall be supported at a height such that the static sag angle of the cable to horizontal is (1.5 $\pm$ 0.5) deg in the active span. Means shall be provided for measuring and monitoring the mid-loop (antinode) vibration amplitude at a free loop, not a support loop. An electronically controlled shaker shall be used to excite the conductor in the vertical plane. The shaker armature shall be securely fastened to the conductor so it is perpendicular to the conductor in the vertical plane. The shaker should be located in the span to allow for a minimum of six vibration loops between the suspension assembly and the shaker.

The test shall be carried out at one or more resonance frequencies (more than 10 Hz). The amplitude at the antinode point shall be one third of conductor diameter. The assembly shall be vibrated for not less than 10 million cycles without any failure. After the test, the conductor should not exhibit any damage (broken strands). The conductor shall be tested to demonstrate that it retains at least 95% RTS.

1.12 Temperature Cycle Test

The purpose of this test is verification of degradation characteristics of metallic and non-metallic material when subjected to thermal cycling. Temperature cycling can create large internal stresses due to thermal expansion mismatch between constituents.

Test Methods:-

- Mechanical tension, 20 % RBS (rated breaking strength), marks on the conductor at the edge of the conductor
- 100 cycles from room temperature up to **designed** maximum temperature. Hold at **Designed maximum temperature + 2.5 deg. C for 05 minutes.**
- **After the above mentioned 100 cycle** , Mechanical tension up to 70 % RBS at room temperature during 24 H and release to 20 % RBS.
- This cycling test shall be repeated 5 times.
- During the test, temperature of connectors, conductor and resistance are recorded according to ANSI C 119.
- A breaking load test is applied at the end of the test. Conductor strength has to be higher than 95 % UTS.
- In case of polymer composites, the flexural strength should not degrade by more than 10 % and the Glass Transition temperature shall not degrade by more than 10 % after thermal cycling. Flexural strength shall be obtained on the basis of test procedure indicated **at 1.32** below.

1.13 Heat Resistance test on Aluminium Alloy wire

Breaking load test as per clause 1.25 shall be carried out before and after heating the sample in uniform heat furnace at following temperature for one hour. The breaking strength of the wire after heating shall not be less than the 90% of the breaking strength before heating.

Maximum continuous operating temperature of the conductor	Test Temperature
Up to 150 deg. C	230 deg. C(+5/-3 deg C)
More than 150 & up to 210 deg. C	280 deg. C(+5/-3 deg C)
More than 210 & up to 230 deg. C	400 deg. C(+5/-3 deg C)

1.14 Bending test on aluminium clad core strand

A sample of aluminium clad invar strand measuring 30 cm in length shall be subject to bending with help of a vise. The vised length of wire should be 5 cm and radius of bend 4.8 mm. The bending should be first 90 degrees left and 90 degree right. After this operation the strand should cut at the bending point. There should be no separation of core and aluminium at the bending point after this operation.

1.15 Compression test on aluminium clad strand

A sample of aluminium clad core strand 10 mm in length is to be compressed by a plate with a load of 3600 kgs. The aluminium and core strand should not break.

1.16 Coefficient of linear expansion for core/core strands

The temperature and elongation on a sample shall be continuously measured and recorded at interval of approximately 15 degree C from 15 degree C to maximum continuous operating temperature corresponding to rated current **as per Annexure-1** by changing the temperature by suitable means. Coefficient of linear expansion shall be determined from the measured results.

1.17 Strand Brittle fracture test (for polymer composite core only)

The sample shall be tensioned with simultaneous application of 1N-HNO3 acid directly in contact with naked polymer composite core. The contact length of acid shall not be less than 40mm and thickness around the core not less than 10mm.The rod shall withstand 80% of SML for 96 hours.

1.18 Visual and Dimensional Check on Drums

The drums shall be visually and dimensionally checked to ensure that they conform to the approved drawings.

1.19 Visual Check for Joints, Scratches etc.

Conductor drums shall be rewound in the presence of the Employer. The Employer shall visually check for scratches, joints etc. and that the conductor generally conform to the requirements of this Specification. Ten percent (10%) drums from each lot shall be rewound in the presence of the Employer's representative.

1.20 Dimensional Check on Core Strands and Aluminium Alloy Strands

The individual strands shall be dimensionally checked to ensure that they conform to the requirement of this Specification.

1.21 Check for Lay-ratios of Various Layers

The lay-ratios of various layers shall be checked to ensure that they conform to the guaranteed values furnished by the Contractor.

1.22 Galvanizing Test

The test procedure shall be as specified in IEC: 888. The material shall conform to the requirements of this Specification. The adherence of zinc shall be checked by wrapping around a mandrel four times the diameter of steel wire.

1.23 Aluminum thickness on aluminum clad wires

The thickness of aluminium of the specimen shall be determined by using suitable electrical indicating instruments operating on the permeameter principle, or direct measurement. Measurements shall be read to three decimal places, and number rounded to two decimal places is considered as measured thickness. For reference purposes, direct measurement shall be used to determine aluminium thickness on specimens taken from the end of the coils.

1.24 Torsion and Elongation Tests on Core Strands/ Composite core

The test procedures for Torsion and Elongation Tests on Core wires shall be as per clause No. 6.3.3 and 6.3.2 b) of IEC 61232 respectively. In torsion test, the number of complete twists before fracture shall not be less than the value specified in the GTP on a length equal to 100 times the standard diameter of the strand. In case test sample length is less or more than 100 times the stranded diameter of the strand, the minimum number of twists will be proportioned to the length and if number comes in the fraction then it will be rounded off to next higher whole number. In elongation test, the elongation at fracture of the strand shall not be less than the value specified in the GTP for a gauge length of 250 mm. In case of composite core HTLS conductor, the following procedure shall be applicable:

(i) Elongation Test: The elongation of the composite core sample at shall be determined using extensometer. The load along the core shall be gradually increased. The elongation achieved on reaching the tensile strength of the core shall not be less than the value guaranteed in the GTP.

(ii) Torsion Test: The purpose of the test is to determine the resilience of the composite core to twisting and to show that after the composite core has experienced the prescribed twisting, it will not crack or have a loss in tensile strength due to the twisting. A sample length that is 170 times the diameter of the composite core being tested is mounted in the gripping fixtures. One grip shall then be fixed so that it does not twist and the other end shall be twisted a full 360 degrees and then fixed in this position for 2 minutes. Once the twist time is completed, the core is untwisted and inspected for any crazing or other damage. If no damage is observed, the composite core is then tensile tested to failure and the final load recorded. For the test to be accepted, the composite core must withstand at least 100% of its rated tensile strength. Two samples need to be completed in order to satisfy the testing requirement.

1.25 Breaking load test on Aluminium Alloy & Core strands and D.C Resistance test on Aluminium Alloy wire

The above tests shall be carried out as per IEC: 888/889 and the results shall meet the requirements of the specification.

1.26 Wrap test on Core strand (Applicable for steel/Al clad Steel core only)

The wrap test on steel strands shall be meeting the requirements of IEC: 888. In case of aluminium clad core wire, the same shall be wrapped around a mandrel of diameter of five times that of the strand to form a helix of eight turns. The strand shall be unwrapped. No breakage of strand shall occur.

1.27 Minimum conductivity test on thermal resistant aluminium alloy strands

Resistivity test as per IEC-468/IEC 889 shall be conducted to confirm minimum conductivity as per specification requirement.

1.28 Procedure Qualification test on welded Aluminium Alloy strands.

Two Aluminium Alloy wire shall be welded as per the approved quality plan and shall be subjected to tensile load. The breaking strength of the welded joint of the wire shall not be less than the guaranteed breaking strength of individual strands.

1.29 Ageing Test on Filler (if applicable)

The test shall be done in accordance with Grease drop point test method. The specimen should be drop as a droplet when kept at a temperature 40 deg. C above designed maximum operating temperature of the conductor for 30 minutes. The temperature shall then be increase till one droplet drops and the temperature recorded.

1.30 Aluminium conductivity test on aluminium clad strand

Resistivity test as per IEC-468 shall be conducted to confirm minimum conductivity as per specification requirement.

1.31 Glass Transition Temperature Test (for polymer composite core only)

Test shall be conducted as per ASTM B987. The minimum glass transition temperature shall be either (i) the design maximum continuous operating temperature of the offered HTLS conductor + 35 deg C or (ii) minimum glass transition temperature as per ASTM B987 i.e.180 deg. C + 25 deg C ; Whichever is lower. In case, the design maximum continuous operating temperature of the offered HT/HTLS conductor is more than the minimum glass transition temperature as per ASTM B987 i.e. more than 180 deg. C then, the test shall be conducted as per ASTM B987 & the minimum glass transition temperature shall be the design maximum continuous operating temperature of the offered HTLS conductor + 25 deg C..

1.32 Flexural Strength Test (for polymer composite core only)

Test method shall be as per ASTM D7264, ASTM D4475 or ISO 14125. The flexural strength shall not be less than the value guaranteed in the GTP.

1.33 Chemical Analysis of Aluminium Alloy and Core

Samples taken from the Aluminium and core coils/strands shall be chemically/spectrographically analyzed. The same shall be in conformity to the particulars guaranteed by the bidder so as to meet the requirements stated in this Specification.

1.34 Chemical Analysis of Zinc

Samples taken from the zinc ingots shall be chemically/ spectrographically analyzed. The same shall be in conformity to the requirements stated in the Specification.

1.35 Bending test on polymer composite core (Type test):

Bending test on polymer composite core (CFC) before stranding shall be performed as per ASTM B987/B987M-17 on polymer composite core samples taken from composite core at conductor manufacturing unit before stranding of conductor. Alternatively Bending test on polymer composite core (CFC) before stranding may be performed at the core manufacturing unit on the samples taken from the same reel

being supplied to conductor manufacturer subject to proper traceability of the same at the conductor manufacturers works.

Bending test on polymer composite core (CFC) shall be performed as per ASTM B987/B987M-17 on polymer composite core samples taken from stranded conductor. For test after stranding the diameter of cylindrical mandrel shall be as following:

1) For high strength grade CFC – 60 times the diameter of CFC
2) For Extra high strength grade CFC – 70 times the diameter of CFC

1.36 Bending test on polymer composite core (Acceptance test):

Bending test on polymer composite core (CFC) shall be performed as per ASTM B987/B987M-17 on polymer composite core samples taken from stranded conductor. For test after stranding the diameter of cylindrical mandrel shall be as following:

1) For high strength grade CFC – 60 times the diameter of CFC
2) For Extra high strength grade CFC – 70 times the diameter of CFC

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Annexure-1

Technical Requirements of High Temperature Low Sag (HTLS) Conductor for 220kV lines

The offered HTLS conductor shall meet the following technical requirement:

S.NO.	Parameters	Requirements.
A)	Electrical Requirements	
1	Minimum Current carrying capacity/Ampacity At Maximum Design Continuous Operating Temperature (A)	1200
2	Maximum DC Resistance at 20^0 C (Ohm/km)	≤0.06868
B)	**Physical Dimension Requirements**	
1	Overall diameter of complete conductor	
a)	Minimum (mm)	25
b)	Maximum (mm)	28.62
2)`	**Nominal mass of complete conductor (kg/km)**	≤ 1621
3)	Direction of lay of outer layer	Right Hand
C)	**Sag Tension Requirements for HTLS conductor for compatibility with lattice towers**	
1)	Tension of HTLS at knee point temperature & no wind condition (kg)	No exceeding 40% of UTS of core @ of proposed HTLS conductor.
2)	Tension at every day condition (32°C, no wind)	≤ 25% of UTS of proposed conductor
3)	Tension at 32°C, full wind (kg/m2)	≤ 70% of UTS of proposed conductor
4)	Tension at designed maximum temperature and no wind condition	Not exceeding 25% of UTS at designed maximum temperature ((i.e. at the designed maximum steady state conductor temperature corresponding to

		desired ampacity)
5)	Tension at designed maximum temperature and full wind	not exceeding 70% of UTS at designed maximum temperature (i.e. at the designed maximum steady state conductor temperature corresponding to desired ampacity) of proposed conductor

Sag Details of Narrow based Towers with span length of 225M

S.No.	Temperature & wind condition	Conductor (ACSR Zebra)	Ground wire (19/2.50MM, Grade-3, 1100N/mm2)
1	0^0C & still wind	2.814m	2.532m
2	32^0C & still wind	3.783m	3.117m
3	65^0C/ 50^0C & still wind	4.808m	3.469m
4	0^0C & 2/3rd full wind	2.665m	2.425m
5	32^0C & full wind	3.229m	2.765m

Sag Details of broad based Towers with span length of 320M

S.No.	Temperature & wind condition	Conductor (ACSR Zebra)	Ground wire (19/2.50MM, Grade-3, 1100N/mm2)
1	5^0C & still wind	5.173m	4.656m
2	32^0C & still wind	6.245m	5.310m
3	67^0C & still wind	7.626m	5.757m
4	5^0C & 2/3rd full wind	5.558m	5.010m
5	32^0C & full wind	6.898m	5.956m

Note :

1. In case more than one sag tension conditions are specified in the above table, Bidder shall offer only one design of HTLS conductor, which shall comply with all the above sag- tension requirements.

2. @ UTS of core of HTLS conductor shall be equal to the Breaking strength of individual core wires before stranding x No. of wires in the core of offered conductor.

3. The above sag details are indicative and the bidder shall submit complete sag tension details as per scheme requirement with respect to the line being reconductored with calculations with the bid for evaluation during detailed engineering.

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Technical Specifications of Hardware fittings and accessories for HTLS conductors (For 400kV and 220kV overhead lines)

1. Technical Description of Hardware Fittings

1.1 General

This section details technical particulars of fittings viz. suspension clamps and compression type dead end clamps for the HTLS Conductor to be supplied by the bidder. Each fitting shall be supplied complete in all respects.

1.2 The fittings shall be suitable for attachment to suspension and tension insulator strings along with hardware fittings and shall include 2.5 % extra fasteners and Aluminium filler plugs. The supplier shall be responsible for satisfactory performance of complete conductor system along with fittings offered by them for continuous operation at the designed maximum temperature specified by them for the conductor.

1.3 **Corona and RI Performance**

Sharp edges and scratches on all the hardware fittings shall be avoided. All surfaces must be clean, smooth, without cuts and abrasions or projections. The Supplier shall be responsible for satisfactory corona and radio interference performance of the materials offered by him.

1.4 **Maintenance**

1.4.1 The hardware fittings offered shall be suitable for employment of hot line maintenance technique so that usual hot line operations can be carried out with ease, speed and safety. The technique adopted for hot line maintenance shall be generally bare hand method & hot stick method.

1.5 **Split Pins**

1.5.1 Split pins shall be used with bolts & nuts.

1.6 **Suspension Assembly**

1.6.1 The suspension assembly shall be suitable for the HTLS Conductor, the bidder intends to supply. The technical details of the conductor shall be as proposed by the bidder.

1.6.2 The suspension assembly shall include either free centre type suspension clamp along with standard preformed armour rods or armour grip suspension clamp.

1.6.3 The suspension clamp along with standard preformed armour rods set shall be designed to have maximum mobility in any direction and minimum moment of inertia so as to have minimum stress on the conductor in the case of oscillation of the same.

1.6.4 The suspension clamp suitable for various type of Conductor along with standard preformed armour rods/armour grip suspension clamp set shall have slip strength in conformity with relevant Indian/International Standards.

1.6.5 The suspension clamp shall be designed for continuous operation at the temperature specified by the bidder for conductor.

1.6.6 The suspension assembly shall be designed, manufactured and finished to give it a suitable shape, so as to avoid any possibility of hammering between suspension assembly and conductor due to vibration. The suspension assembly shall be smooth without any cuts, grooves, abrasions, projections, ridges or excrescence which might damage the conductor.

1.6.7 The suspension assembly/clamp shall be designed so that it shall minimize the static & dynamic stress developed in the conductor under various loading conditions as well as during wind induced conductor vibrations. It shall also withstand power arcs & have required level of Corona/RIV performance.

1.6.8 **Free Centre Type Suspension Clamp**

For the Free Centre Suspension Clamp seat shall be smoothly rounded and curved into a bell mouth at the ends. The lip edges shall have rounded bead. There shall be at least two U-bolts for tightening of clamp body and keeper pieces together.

1.6.9 **Standard Preformed Armour Rod Set**

1.6.9.1 The Preformed Armour Rods Set shall be used to minimize the stress developed in the sub-conductor due to different static and dynamic loads because of vibration due to wind, slipping of conductor from the suspension clamp as a result of unbalanced conductor tension in adjacent spans and broken wire condition. It shall also withstand power arcs, chafing and abrasion from suspension clamp and localized heating effect due to magnetic power losses from suspension clamps as well as resistance losses of the conductor.

1.6.9.2 The preformed armour rods set shall have right hand lay and the inside diameter of the helics shall be less than the outside diameter of the conductor to have gentle but permanent grip on the conductor. The surface of the armour rod when fitted on the conductor shall be smooth and free from projections, cuts and abrasions etc.

1.6.9.3 The pitch length of the rods shall be determined by the Bidder but shall be less than that of the outer layer of conductor and the same shall be accurately controlled to maintain uniformity and consistently reproducible characteristic wholly independent of the skill of linemen.

1.6.9.4 The length and diameter of each rod shall be furnished by the bidder in the GTP. The tolerance in length of the rods between the longest and shortest rod in complete set should be within the limits specified in relevant Indian/International Standards. The ends of armour rod shall be parrot billed.

1.6.9.5 The length and diameter of each rod shall be specified in the GTP. The tolerance in length of the rods in complete set should be within 13 mm between the longest and shortest rod. The ends of armour rod shall be parrot billed.

1.6.9.6 The number of armour rods in each set shall be suppliers design to suit HTLS conductor offered standards. Each rod shall be marked in the middle with paint for easy application on the line. The armour rod shall not lose their resilience even after five applications. The conductivity of each rod of the set shall not be less than 40% of the conductivity of the International Annealed Copper Standard (IACS).

1.6.10 **Armour Grip Suspension Clamp**

1.6.10.1 The armour grip suspension clamp shall comprise of retaining strap, support housing, elastomer inserts with aluminium reinforcements and AGS preformed rod set.

1.6.10.2 Elastomer insert shall be resistant to the effects of temperature up to designed maximum conductor temperature guaranteed by the bidder corresponding to peak current, Ozone, ultraviolet radiations and other atmospheric contaminants likely to be encountered in service. The physical properties of the elastomer shall be of approved standard. It shall be electrically shielded by a cage of AGS performed rod set. The elastomer insert shall be so designed that the curvature of the AGS rod shall follow the contour of the neoprene insert.

1.6.10.3 The supplier shall submit relevant type/performance test certificates as per applicable standard/product specifications for elastomer to confirm suitability of the offered elastomer for the specified application.

1.6.10.4 The AGS preformed rod set shall be as detailed in clause no.1.6.9.4 to 1.6.9.6 in general except of the following: The length of the AGS preformed rods shall be such that it shall ensure sufficient slipping strength as detailed under clause 1.6.4 and shall not introduce unfavourable stress on the conductor under all operating conditions. The length of the AGS preformed rods shall be indicated in the GTP.

1.7 **Envelope Type Suspension Clamp**

1.7.1 The seat of the envelope type suspension clamp shall be smoothly rounded & suitably curved at the ends. The lip edges shall have rounded bead. There shall be at least two U-bolts for tightening of clamp body and keeper pieces together. Hexagonal bolts and nuts with split-pins shall be used for attachment of the clamp.

1.8 **Dead end Assembly**

1.8.1 The dead end assembly shall be suitable for the offered HTLS Conductor.

1.8.2 The dead end assembly shall be of compression type with provision for compressing jumper terminal at one end. The angle of jumper terminal to be mounted should be 30° with respect to the vertical line. The area of bearing surface on all the connections shall be sufficient to ensure positive electrical and mechanical contact and avoid local heating due to I^2R losses. The resistance of the clamp when compressed on Conductor shall not be more than 75% of the resistance of equivalent length of Conductor.

1.8.3 Die compression areas shall be clearly marked on each dead-end assembly designed for continuous die compressions and shall bear the words 'COM

PRESS FIRST' suitably inscribed near the point on each assembly where the compression begins. If the dead end assembly is designed for intermittent die compressions it shall bear identification marks 'COMPRESSION ZONE' AND 'NON-COMPRESSION ZONE' distinctly with arrow marks showing the direction of compressions and knurling marks showing the end of the zones. Tapered aluminium filler plugs shall also be provided at the line of demarcation between compression & non-compression zone. The letters, number and other markings on the finished clamp shall be distinct and legible. The dimensions of dead end assembly before & after compression along with tolerances shall be guaranteed in the relevant schedules of the bid and shall be decided by the manufacturer so as to suit the conductor size & conform to electrical & mechanical requirement stipulated in the specification. These shall be guaranteed in the relevant schedules of bid.

1.8.4 The assembly shall not permit slipping of, damage to, or failure of the complete conductor or any part thereof at a load less than 95% of the ultimate tensile strength of the conductor.

1.8.5 Jumper bolting arrangement between jumper terminal/cone and terminal pad/plate of dead end assembly of tension hardware fittings shall be designed to suit the required current as per Annexure-1 in the TS of HTLS conductor and shall conform to the relevant Indian/International standards

1.8.6 For composite core HTLS conductor, dead end assembly shall inter- alia include collets, collect housing, inner sleeve etc., suitable for the offered design of HTLS conductor

1.9 **Fasteners: Bolts, Nuts and Washers**

1.9.1 All bolts and nuts shall conform to IS 6639. All bolts and nuts shall be galvanized as per IS 1367 (Part-13)/IS 2629. All bolts and nuts shall have hexagonal heads, the heads being forged out of solid truly concentric, and square with the shank, which must be perfectly straight.

1.9.2 Bolts up to M16 and having length up to 10 times the diameter of the bolt should be manufactured by cold forging and thread rolling process to obtain good and reliable mechanical properties and effective dimensional control. The shear strength of bolt for 5.6 grade should be 310 MPa minimum as per IS 12427. Bolts should be provided with washer face in accordance with IS 1363 (Part-1) to ensure proper bearing.

1.9.3 Nuts should be double chamfered as per the requirement of IS 1363 Part-III 1984. It should be ensured by the manufacturer that nuts should not be over tapped beyond 0.4 mm oversize on effective diameter for size up to M16.

1.9.4 Fully threaded bolts shall not be used. The length of the bolt shall be such that the threaded portion shall not extend into the place of contact of the component parts.

1.9.5 All bolts shall be threaded to take the full depth of the nuts and threaded enough to permit the firm gripping of the component parts but no further. It shall be ensured that the threaded portion of the bolt protrudes not less than 3 mm and not more than 8 mm when fully tightened. All nuts shall fit and tight to the point where shank of the bolt connects to the head.

1.9.6 Flat washers and spring washers shall be provided wherever necessary and shall be of positive lock type. Spring washers shall be electro-galvanized. The thickness of washers shall conform to IS: 2016.

1.9.7 The Contractor shall furnish bolt schedules giving thickness of components connected, the nut and the washer and the length of shank and the threaded portion of bolts and size of holes and any other special details of this nature.

1.9.8 To obviate bending stress in bolt, it shall not connect aggregate thickness more than three time its diameter.

1.9.9 Bolts at the joints shall be so staggered that nuts may be tightened with spanners without fouling.

1.9.10 To ensure effective in-process Quality control it is essential that the manufacturer should have all the testing facilities for tests like weight of zinc coating, shear strength, other testing facilities etc, in-house. The manufacturer should also have proper Quality Assurance system which should be in line with the requirement of this specification and IS-14000 services Quality System standard.

1.9.11 Fasteners of grade higher than 8.8 are not to be used and minimum grade for bolt shall be 5.6.

1.10 Materials

The materials of the various components shall be as specified hereunder. The Bidder shall indicate the material proposed to be used for each and every component of hardware fittings stating clearly the class, grade or alloy designation of the material, manufacturing process & heat treatment details and the reference standards.

1.10.1 The details of materials for different component are listed as in Table No-1.

1.11 Workmanship

1.11.1 All the equipment shall be of the latest design and conform to the best modern practices adopted in the Extra High Voltage field. The Bidder shall offer only such equipment as guaranteed by him to be satisfactory and suitable for 400kV / 220 kV transmission lines and will give continued good performance. For employer's review of the offered design of clamps/ fittings, the supplier shall submit document/design details of similar type of clamps/ fittings used in past for similar type of HTLS conductor application.

1.11.2 High current, heat rise test shall be conducted by the supplier to determine the maximum temperature achieved in different components of fittings under simulated service condition corresponding to continuous operation of conductor at rated maximum temperature. The material of the components should be suitable for continued good performance corresponding to these maximum temperatures. The supplier shall submit relevant type/performance test certificates as per applicable standards/product specifications to confirm suitability of the offered material.

1.11.3 The design, manufacturing process and quality control of all the materials shall be such as to give the specified mechanical rating, highest mobility, elimination of sharp edges and corners to limit corona and radio-interference, best resistance to corrosion and a good finish.

1.11.4 All ferrous parts including fasteners shall be hot dip galvanized, after all machining has been completed. Nuts may, however, be tapped (threaded) after galvanizing and the threads oiled. Spring washers shall be electro galvanized. The bolt threads shall be undercut to take care of the increase in diameter due to galvanizing. Galvanizing shall be done in accordance with IS 2629 / IS 1367 (Part-13) and shall satisfy the tests mentioned in IS 2633. Fasteners shall withstand four dips while spring washers shall withstand three dips of one minute duration in the standard Preece test. Other galvanized materials shall have a minimum average coating of zinc equivalent to 600 gm/sq.m., shall be guaranteed to withstand at least six successive dips each lasting one (1) minute under the standard preece test for galvanizing.

1.11.5 Before ball fittings are galvanized, all die flashing on the shank and on the bearing surface of the ball shall be carefully removed without reducing the dimensions below the design requirements.

1.11.6 The zinc coating shall be perfectly adherent, of uniform thickness, smooth, reasonably bright, continuous and free from imperfections such as flux, ash rust, stains, bulky white deposits and blisters. The zinc used for galvanizing shall be grade Zn 99.95 as per IS:209.

1.11.7 Pin balls shall be checked with the applicable ‚GO' gauges in at least two directions one of which shall be across the line of die flashing, and the other 90^{o} to this line. "NO GO" gauges shall not pass in any direction.

1.11.8 Socket ends, before galvanizing, shall be of uniform contour. The bearing surface of socket ends shall be uniform about the entire circumference without depressions of high spots. The internal contours of socket ends shall be concentric with the axis of the fittings as per IS:2486/IEC : 120.

The axis of the bearing surfaces of socket ends shall be coaxial with the axis of the fittings. There shall be no noticeable tilting of the bearing surfaces with the axis of the fittings.

1.11.9 In case of casting, the same shall be free from all internal defects like shrinkage, inclusion, blow holes, cracks etc. Pressure die casting shall not be used for casting of components with thickness more than 5 mm.

1.11.10 All current carrying parts shall be so designed and manufactured that contact resistance is reduced to minimum.

1.11.11 No equipment shall have sharp ends or edges, abrasions or projections and cause any damage to the conductor in any way during erection or during continuous operation which would produce high electrical and mechanical stresses in normal working. The design of adjacent metal parts and mating surfaces shall be such as to prevent corrosion of the contact surface and to maintain good electrical contact under service conditions.

1.11.12 All the holes shall be cylindrical, clean cut and perpendicular to the plane of the material. The periphery of the holes shall be free from burrs.

1.11.13 All fasteners shall have suitable corona free locking arrangement to guard against vibration loosening.

1.11.14 Welding of aluminium shall be by inert gas shielded tungsten arc or inert gas shielded metal arc process. Welds shall be clean, sound, smooth, uniform without overlaps, properly fused and completely sealed. There shall be no cracks, voids incomplete penetration, incomplete fusion, under-cutting or inclusions. Porosity shall be minimized so that mechanical properties of the aluminium alloys are not affected. All welds shall be properly finished as per good engineering practices.

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1.12 **Bid Drawings**

1.12.1 The Bidder shall furnish full description and illustrations of materials offered.

1.12.2 Fully dimensioned drawings of the hardwares and their component parts shall be furnished in five (5) copies along with the bid. Weight, material and fabrication details of all the components should be included in the drawings.

1.12.3 All drawings shall be identified by a drawing number and contract number. All drawings shall be neatly arranged. All drafting & lettering shall be legible. The minimum size of lettering shall be 3 mm. All dimensions & dimensional tolerances shall be mentioned in mm.

The drawings shall include:

(i) Dimensions and dimensional tolerance.
(ii) Material, fabrication details including any weld details & any specified finishes & coatings. Regarding material designation & reference of standards are to be indicated.
(iii) Catalogue No.
(iv) Marking
(v) Weight of assembly
(vi) Installation instructions
(vii) Design installation torque for the bolt or cap screw.
(viii) Withstand torque that may be applied to the bolt or cap screw without failure of component parts.
(ix) The compression die number with recommended compression

pressure.

(x) Placement charts for spacer/ spacer damper and damper

(xi) All other relevant terminal details.

1.12.4 After placement of award, the Contractor shall submit fully dimensioned drawing including all the components in four (4) copies to the Owner for approval. After getting approval from the Owner and successful completion of all the type tests, the Contractor shall submit ten (10) more copies of the same drawings to the Owner for further distribution and field use at Owner's end.

TABLE-1 (Details of Materials)

Sl. No.	Name of item	Material treatment	Process of Standard	Reference	Remarks
1.	Security Clips	Stainless Steel/ Phospher Bronze	-	AISI 302 or 304-L/ IS-1385	
2.	**For Free Centre /Envelope type clamps**				
(a)	Clamp Body, Keeper Piece	High Strength Al. Alloy 4600/ LM-6 or 6061/65032	Casted or forged & Heat treated	IS:617or ASTM-B429	
(b)	Cotter bolts/ Hangers, Shackles, Brackets	Mild Steel	Hot dip galvanized	As per IS-226 or IS-2062	
(c)	U Bolts	Stainless Steel or High Strength Al alloy 6061/ 65032	Forged & Heat treated	AISI 302 or 304-L ASTM-B429	
(d)	P. A. Rod	High Strength Al. Alloy 4600/ LM-6 or 6061/65032	Heat treatment during manufacturing	ASTM-B429	Min. tensile strength of 35kG / mm^2
3.	**For AGS type clamp**				
(a)	Supporting House	High Strength Corrosion resistant Al. Alloy 4600/ LM-6 or 6061/65032	Casted or forged & Heat treated	IS:617or ASTM-B429	
(b)	Al insert & Retaining strap	High Strength Al. Alloy 4600/ LM-6 or 6061/65032	Casted or forged & Heat treated	IS:617or ASTM-B429	High strength Al. Alloy 4600 / LM-6 or 6061/65032
(c)	Elastomer	Moulded on Al. reinforcement			

4.	**For Dead End Assembly**				
(a)	Outer Sleeve	EC grade Al of purity not less than 99.50%			
(b)	Steel Sleeve	Mild Steel	Hot Dip Galvanized	IS:226/ IS-2062	
5.	Ball & Socket Fittings,	Class-IV Steel	Drop forged & normalized Hot dip galvanized	As per IS: 2004	
6.	Yoke Plate	Mild Steel	Hot dip galvanized	As per IS-226 or IS-2062	
7.	Sag Adjustment plate	Mild Steel	Hot dip galvanized	As per IS-226 or IS-2062	
8(a)	Corona Control ring/ Grading ring	High Strength Al. Alloy tube (6061/ 6063/1100 type or 65032/ 63400 Type)	Heat treated Hot dip galvanized	ASTM-B429 or as per IS	Mechanical strength of welded joint shall not be less than 20kN.
8(b)	Supporting Brackets & Mounting Bolts	High Strength Al Alloy 7061/ 6063/ 65032/63400 Type) or Mild Steel	Heat treated Hot dip galvanized	ASTM-B429 or as per IS:226 or IS:2062	

Note: Alternate materials conforming to other national standards of other countries also may be offered provided the properties and compositions of these are close to the properties and compositions of material specified. Bidder should furnish the details of comparison of material offered vis-a- vis specified in the bid or else the bids are liable to be rejected.

2.0 Accessories for the HTLS Conductor

2.1 General

2.1.1 This portion details the technical particulars of the accessories for Conductor.

2.1.2 2.5% extra fasteners, filler plugs and retaining rods shall be provided.

2.1.3 The supplier shall be responsible for satisfactory performance of complete conductor system along with accessories offered by him for continuous operation at temperature specified for the HTLS Conductor.

2.2 Mid Span Compression Joint

2.2.1 Mid Span Compression Joint shall be used for joining two lengths of conductor. The joint shall have a resistivity less than 75% of the resistivity of equivalent

length of conductor. The joint shall not permit slipping off, damage to or failure of the complete conductor or any part thereof at a load less than 95% of the ultimate tensile strength of the conductor. It must be able to withstand the continuous design temperature of conductor.

2.2.2 The dimensions of mid span compression joint before & after compression along with tolerances shall be guaranteed in the relevant schedules of the bid and shall be decided by the manufacturer so as to suit the conductor size & conform to electrical & mechanical requirement stipulated in the specification. For composite core conductor, suitable sleeve, collets, collet housing shall be used for core jointing.

2.3 **Repair Sleeve**

Repair Sleeve of compression type shall be used to repair conductor with not more than two strands broken in the outer layer. The sleeve shall be manufactured from 99.5% pure aluminium / aluminium alloy and shall have a smooth surface. It shall be able to withstand the continuous maximum operating temperature of conductor. The repair sleeve shall comprise of two pieces with a provision of seat for sliding of the keeper piece. The edges of the seat as well as the keeper piece shall be so rounded that the conductor strands are not damaged during installation. The dimensions of Repair sleeve along with tolerances shall be guaranteed in the relevant schedules of the bid and shall be decided by the manufacturer so as to suit the conductor size & conform to electrical & mechanical requirement stipulated in the specification.

2.4 **Vibration Damper**

2.4.1 Vibration dampers of 4R-stockbridge type with four (4) different resonances spread within the specified aeolian frequency band width corresponding to wind speed of 1 m/s to 7 m/s are installed in the existing line at suspension and tension points on each conductor in each span to damp out aeolian vibration as well as sub- span oscillations,. One damper minimum on each side per sub-conductor for suspension points and two dampers minimum on each side per sub-conductor for tension points has been used for a ruling design span of (ruling span as per Annxure-1 in TS of HTLS conductor) meters.

2.4.2 The bidder shall offer damping system including Stockbridge type dampers for HTLS conductor for its protection from wind induced vibrations which could cause conductor fatigue /strand breakage near a hardware attachment, such as suspension clamps. Alternate damping systems with proven design offering equivalent or better performance also shall be accepted provided the manufacturer meets the qualifying requirements stipulated in the Specifications. Relevant technical documents including type test reports to establish the technical suitability of alternate systems shall be furnished by the Bidder along with the bid.

The damper shall be designed to have minimum 4 nos. of resonance frequencies to facilitate dissipation of vibration energy through inter-strand friction of the messenger cable and shall be effective in reducing vibration over a wide frequency range (depending upon conductor diameter) or wind velocity range specified above. The vibration damper shall meet the requirement of frequency or wind velocity range and also have mechanical impedance closely matched

with the offered HTLS conductor. The vibration dampers shall be installed at suitable positions to ensure damping effectiveness across the frequency range. The power dissipation of the vibration dampers shall exceed the wind power so that the vibration level on the conductor is reduced below its endurance limit. The bidder shall clearly indicate the method for evaluating performance of dampers including analytical and laboratory test methods. The bidder shall indicate the type tests to evaluate the performance of offered damping system.

2.4.3 The clamp of the vibration damper shall be made of high strength aluminium alloy of type LM-6. It shall be capable of supporting the damper and prevent damage or chafing of the conductor during erection or continued operation. The clamp shall have smooth and permanent grip to keep the damper in position on the conductor without damaging the strands or causing premature fatigue failure of the conductor under the clamp. The clamp groove shall be in uniform contact with the conductor over the entire clamping surface except for the rounded edges. The groove of the clamp body and clamp cap shall be smooth, free from projections, grit or other materials which could cause damage to the conductor when the clamp is installed. Clamping bolts shall be provided with self locking nuts and designed to prevent corrosion of threads or loosening in service.

2.4.4 The messenger cable shall be made of high strength galvanized steel/stain less steel with a minimum strength of 135 kg/sq mm. It shall be of preformed and postformed quality in order to prevent subsequent drop of weight and to maintain consistent flexural stiffness of the cable in service. The number of strands in the messenger cable shall be 19. The messenger cable other than stainless steel shall be hot dip galvanized in accordance with the recommendations of IS:4826 for heavily coated wires..

2.4.5 The damper mass shall be made of hot dip galvanized mild steel/cast iron or a permanent mould cast zinc alloy. All castings shall be free from defects such as cracks, shrinkage, inclusions and blowholes etc. The surface of the damper masses shall be smooth.

2.4.6 The damper clamp shall be casted over the messenger cable and offer sufficient and permanent grip on it. The messenger cable shall not slip out of the grip at a load less than the mass pull-off value of the damper. The damper masses made of material other-than zinc alloy shall be fixed to the messenger cable in a suitable manner in order to avoid excessive stress concentration on the messenger cables which shall cause premature fatigue failure of the same. The messenger cable ends shall be suitably and effectively sealed to prevent corrosion. The damper mass made of zinc alloy shall be casted over the messenger cable and have sufficient and permanent grip on the messenger cable under all service conditions.

2.4.7 The damper assembly shall be so designed that it shall not introduce radio interference beyond acceptable limits.

2.4.8 The vibration damper shall be capable of being installed and removed from energised line by means of hot line technique. In addition, the clamp shall be capable of being removed and reinstalled on the conductor at the designated torque without shearing or damaging of fasteners.

2.4.9 The contractor must indicate the clamp bolt tightening torque to ensure that the slip strength of the clamp is maintained between 2.5kN and 5 kN. The clamp when installed on the conductor shall not cause excessive stress concentration on the conductor leading to permanent deformation of the conductor strands and premature fatigue failure in operation.

2.4.10 The vibration analysis of the system, with and without damper and dynamic characteristics of the damper shall have to be submitted in line with latest CEA guidelines. The technical particulars for vibration analysis and damping design of the system are as follows:

Sl. No.	Description	Technical particulars
1.	Span length in meters	
i)	Ruling design span	[ruling span as per Annexure – 1 of TS of HTLS conductor]
ii)	Maximum span	1100 meters
iii)	Minimum span	100 meters
2.	Configuration	As required in scheme
3.	Tensile load in Conductor at temperature of 0 deg. C and still air	as per sag tension calculations
4.	Armour rods used	Standard preformed armour rods/AGS
5.	Maximum permissible dynamic strain i.e. endurance limit.	+/- 150 micro strains

2.4.11 The damper placement chart shall be submitted for spans ranging from 100m to 1100m. Placement charts should be duly supported with relevant technical documents and sample calculations.

2.4.12 The damper placement charts shall include the following

(1) Location of the dampers for various combinations of spans and line tensions clearly indicating the number of dampers to be installed per conductor per span.

(2) Placement distances clearly identifying the extremities between which the distances are to be measured.

(3) Placement recommendation depending upon type of suspension clamps (viz Free centre type/Armour grip type etc.)

(4) The influence of mid span compression joints, repair sleeves and armour rods (standard and AGS) in the placement of dampers.

2.5 Bundle Spacer (For 400kV twin HTLS conductor configuration)

2.5.1 Armour grip bundle spacers shall be used to maintain the spacing of 450 mm between the sub-conductors of each bundle under all normal working conditions.

2.5.2 Spacers offering equivalent or better performance shall also be accepted provided offer meets the qualifying requirements stipulated in the Specification.

2.5.3 The offer shall include placement charts recommending the number of spacers per phase per span and the sub span lengths to be maintained between the spacers while installing on the bundle conductors.

2.5.3.1 The placement of spacers shall be in such a way that adjacent sub spans are sufficiently detuned and the critical wind velocity of each sub span shall be kept more than 30 km/hr. and to avoid clashing of sub conductors. The placement shall ensure bundle stability under all operating conditions.

2.5.3.2 The placement chart shall be provided for spans ranging from 100 m to 1100m. The number of spacers recommended for a ruling design span of 400m [for 400kV] shall however be seven with no sub-span greater than 70m and no end sub-span longer than 40m.

2.5.3.3 The Bidder may offer more number of spacers per ruling design span than the specified. However, in such case, suitable price compensation shall be considered for evaluation. For the purpose of price compensation, all the spans shall be assumed to be ruling design spans.

2.5.3.4 The Bidder shall also furnish all the relevant technical documents in support of their placement charts along with the bid.

2.5.4 Jumpers at tension points shall also be fitted with spacers so as to limit the length of free conductor to 3.65m and to maintain the sub conductor spacing of 450 mm [for 400kV] for bundle conductors. Bidder shall quote for rigid spacer for jumper. It shall meet all the requirements of spacer used in line except for its vibration performance. Spacers requiring retaining rods shall not be quoted for jumpers.

2.5.5 The spacer offered by the Bidder shall satisfy the following requirements.

2.5.5.1 Spacer shall restore normal spacing of the sub-conductors after displacement by wind, electromagnetic and the electrostatic forces under all operating conditions including the specified short circuit level without permanent deformation damage either to conductor or to the assembly itself. They shall have uniform grip on the conductor.

2.5.5.2 For spacer requiring retaining rods, the retaining rods shall be designed for the specified conductor size. The preformed rods shall be made of high strength, special aluminum alloy of type 6061/65032 and shall have minimum tensile strength of 35 kg/sq.mm. The ends of retaining rods should be ball ended. The rods shall be heat-treated to achieve specified mechanical properties and give proper resilience and retain the same during service.

2.5.5.3 Four numbers of rods shall be applied on each clamp to hold the clamp in

position. The minimum diameter of the rods shall be 7.87 $\pm$ 0.1 mm and the length of the rods shall not be less than 1100 mm.

2.5.5.4 Where elastomer surfaced clamp grooves are used, the elastomer shall be firmly fixed to the clamp. The insert should be forged from aluminum alloy of type 6061/65032. The insert shall be duly heat treated and aged to retain its consistent characteristics during service.

2.5.5.5 Any nut used shall be locked in an approved manner to prevent vibration loosening. The ends of bolts and nuts shall be properly rounded for specified corona performance or suitably shielded.

2.5.5.6 Clamp with cap shall be designed to prevent its cap from slipping out of position when being tightened.

2.5.5.7 The clamp grooves shall be in uniform contact with the conductor over the entire surface, except for rounded edges. The groove of the clamp body and clamp cap shall be smooth and free of projections, grit or other material which cause damage to the conductor when the clamp is installed.

2.5.5.8 For the spacer involving bolted clamps, the manufacturer must indicate the clamp bolt tightening torque to ensure that the slip strength of the clamp is maintained between 2.5 kN and 5 kN. The clamp when installed on the conductor shall not cause excessive stress concentration on the conductor leading to permanent deformation of the conductor strands and premature fatigue failure in operation.

2.5.5.9 Universal type bolted clamps, covering a range of conductor sizes, will not be permitted.

2.5.5.10 No rubbing, other than that of the conductor clamp hinges or clamp swing bolts, shall take place between any parts of the spacer. Joint incorporating a flexible medium shall be such that there is no relative slip between them.

2.5.5.11 The spacer shall be suitably designed to avoid distortion or damage to the conductor or to themselves during service.

2.5.5.12 Rigid spacers shall be acceptable only for jumpers.

2.5.5.13 The spacer shall not damage or chafe the conductor in any way which might affect its mechanical and fatigue strength or corona performance.

2.5.5.14 The clamping system shall be designed to compensate for any reduction in diameter of conductor due to creep.

2.5.5.15 The spacer assembly shall not have any projections, cuts, abrasions etc. or chattering parts which might cause corona or RIV.

2.5.5.16 The spacer tube shall be made of aluminum alloy of type 6061/65032. If fasteners of ferrous material are used, they shall conform to and be galvanized conforming to relevant Indian Standards.

2.5.5.17 Elastomer, if used, shall be resistant to the effects of temperature up to the designed maximum temperature specified for the conductor, ultraviolet radiation and other atmospheric contaminants likely to be encountered in service. It shall have good fatigue characteristics. The physical properties of the elastomer shall be of approved standard. The supplier shall submit relevant type/ performance test certificate as per applicable standard/ product

specification for elastomer to confirm suitability of the offered elastomer for the specified application.

2.5.5.18 The spacer assembly shall have electrical continuity. The electrical resistance between the sub-conductor across the assembly in case of spacer having elastomer clamp grooves shall be suitably selected by the manufacturers to ensure satisfactory electrical performance and to avoid deterioration of elastomer under all service conditions.

2.5.5.19 The spacer assembly shall have complete ease of installation and shall be capable of removal/reinstallation without any damage.

2.5.5.20 The spacer assembly shall be capable of being installed and removed from the energized line by means of hot line technique.

2.6 Spacer Damper (Alternative to Vibration Damper & Bundle Spacer for 400kV twin HTLS conductor configuration)

2.6.1 Suitable spacer dampers for HTLS conductor can be offered as an alternative to the combination of Vibration Damper and Bundle Spacer. The spacer damper covered by this specification shall be designed to maintain the bundle spacing of 450 mm under all normal operating conditions and to effectively control Aeolian vibrations as well as sub span oscillation and to restore conductor spacing after release of any external extraordinary load. The nominal sub conductor spacing shall be maintained within ±5 mm.

2.6.2 The spacer damper shall restore the normal sub-conductor spacing due to displacement by wind, electromagnetic and electrostatic forces including the specified short circuit level without permanent deformation or damage either to bundle conductors or to spacer damper itself.

2.6.3 The design offered shall be presented as a system consisting of spacer dampers and their staggering scheme for spans ranging from 100 m to 1100m.

2.6.4 Under the operating conditions specified, the spacer damper system shall adequately control Aeolian vibrations throughout the life of the transmission line with wind velocity ranging from 0 to 30 km per hour in order to prevent damage to conductor at suspension clamps, dead end clamps and spacer damper clamps.

2.6.5 The spacer damper system shall also control the sub-span oscillations in order to prevent conductor damage due to chaffing and severe bending stresses at the spacer damper clamps as well as suspension and dead end clamps and to avoid wear to spacer damper components.

2.6.6 The spacer damper shall consist of a rigid central body called the frame linked to the conductor by two articulated arms terminated by suitable clamping system. The articulation shall be designed to provide elastic and damping forces under angular movement of the arms. The dynamic characteristics of the articulations shall be maintained for the whole life of the transmission line.

2.6.7 The clamping system shall be designed to provide firm but gentle and permanent grip while protecting the conductor against local static or dynamic stresses expected during normal operating conditions. The clamping system

shall be designed to compensate for any reduction of conductor diameter due to creep.

2.6.8 Bolted type clamps shall allow installation without removal of the bolts or the clamps from clamp body. Locking mechanism shall be suitable to prevent bolt loosening. Clamp locking devices with small loose components shall not be accepted. Nut cracker, hinged open or boltless type clamps are acceptable provided adequate grip can be maintained on the conductor.

2.6.9 Bolts and nuts shall be of mild steel, stainless steel, or high strength steel in accordance with the design of the spacer damper.

2.6.10 Where elastomer surfaced clamps are used, the elastomer elements shall be firmly fixed to the clamp. The insert should be forged from aluminum alloy of type 6061 or equivalent aluminum alloy having minimum tensile strength of 25 kg/mm2. The insert shall be moulded on the insert surface. The insert shall be duly heat treated and aged to retain its consistent characteristics during service. The grain flow of the forged insert shall be in the direction of the maximum tension and compression loads experienced.

2.6.11 If clamps involving preformed rods are used, these rods shall be designed for specific conductor size. They shall be made of high strength aluminum alloy of type 6061 or equivalent aluminum alloy having a minimum tensile strength of 35 kg/mm3. The rods shall be ball ended. The rods shall be heat treated and aged to achieve specified mechanical properties and to retain the same during service. The length of the rods shall be such that the ends fall inside the imaginary square whose sides are vertical and horizontal outer tangents to the conductor sections.

2.6.12 The spacer damper body shall be cast/ forged from suitable high strength corrosion resistant aluminum alloy. The aluminum alloy shall be chosen in relation with the process used.

2.6.13 The rubber components involved in the design such as damping elements shall be made with rubber compound selected specifically for that particular application. The Contractor shall submit a complete list of physical and mechanical properties of the elastomer used. This list shall make reference to all applicable ASTM standards.

2.6.14 The rubber components used shall have good resistance to the effects of temperature up to the designed maximum temperature of the conductor and to ultraviolet radiation, ozone and other atmospheric contaminants. The rubber shall have good wear and fatigue resistance and shall be electrically semi-conductive.

2.6.15 The spacer damper involving ferrous material shall not have magnetic power loss more than 1 watt.

2.6.16 The spacer damper assembly shall have electrical continuity. The electrical

resistance between the sub-conductors across the assembly in case of spacer damper involving elastomer surfaced clamps shall be suitably selected by the manufacturer to ensure satisfactory electrical performance and avoid deterioration of elastomer under service conditions. The spacer damper assembly shall have complete ease of installation and shall be capable of removal/reinstallation without any damage.

2.6.17 The spacer damper assembly shall be capable of being installed and removed from the energized line by means of hot line techniques. The Bidder shall supply with the bid the complete description of the installation, removal and reinstallation procedure.

2.6.18 The Bidder shall recommend the staggering scheme for installation of spacer dampers on the line which shall ensure most satisfactory fatigue performance of the line as specified. The scheme shall indicate the number of spacer dampers per phase per span and the sub span lengths to be maintained between spacer dampers while installing on the bundle conductors.

2.6.19 The staggering scheme shall be provided for spans ranging from 100 m to 1100 m. The number of spacer dampers for a nominal ruling span of 400 m [for 400kV] shall not be less than six.

2.6.20 No sub span shall be greater than 70 m and no end sub span shall be longer than 40 m.

2.6.21 The staggering scheme shall be such that the spacer dampers be unequally distributed along the span to achieve sufficient detuning of adjacent subs pans for oscillations of sub span mode and to ensure bundle stability for wind speeds up to 60 km/hr.

2.6.22 The manufacturer / supplier shall supply free of cost 25 number fixed setting torque wrench (of torque as per spacer damper design) along with 1st batch of supply of spacer dampers for installation of spacer damper on the line by the tower contractors.

2.6.23 The Bidder shall furnish all the relevant technical documents in supports of the staggering scheme recommended for the spacer damper.

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2.7 Material and Workmanship

2.7.1 All the equipment shall be of the latest proven design and conform to the best modern practice adopted in the extra high voltage field. The Bidder shall offer only such equipment as guaranteed by him to be satisfactory and suitable for 400kV/ 220 kV (as per scheme requirement) transmission line applications and will give continued good performance at all service conditions. For employer's review of the offered design of accessories, the supplier shall submit

document/design details of similar type of accessories used in past for similar type of HTLS conductor application

2.7.2 The design, manufacturing process and quality control of all the materials shall be such as to achieve requisite factor of safety for maximum working load, highest mobility, elimination of sharp edges and corners, best resistance to corrosion and a good finish.

2.7.3 High current, heat rise test shall be conducted by the supplier to determine the maximum temperature achieved in different components of fittings/accessories under simulated service condition corresponding to continuous operation of conductor at rated maximum temperature. The material of the components should be suitable for continued good performance corresponding to these maximum temperatures. The supplier shall submit relevant type/ performance test certificates as per applicable standards/product specifications to confirm suitability of the offered material.

2.7.4 All ferrous parts shall be hot dip galvanized, after all machining has been completed. Nuts may, however, be tapped (threaded) after galvanizing and the threads oiled. Spring washers shall be electro galvanized as per grade 4 of IS-1573. The bolt threads shall be undercut to take care of increase in diameter due to galvanizing. Galvanizing shall be done in accordance with IS: 2629/ IS-1367 (Part-13) and satisfy the tests mentioned in IS-2633. Fasteners shall withstand four dips while spring washers shall withstand three dips. Other galvanized materials shall have a minimum average coating of Zinc equivalent to 600 gm/sq.m and shall be guaranteed to withstand at least six dips each lasting one minute under the standard Preece test for galvanizing unless otherwise specified.

2.7.5 The zinc coating shall be perfectly adherent, of uniform thickness, smooth, reasonably bright, continuous and free from imperfections such as flux, ash, rust stains, bulky white deposits and blisters. The zinc used for galvanizing shall be of grade Zn 99.95 as per IS: 209.

2.7.6 In case of castings, the same shall be free from all internal defects like shrinkage, inclusion, blow holes, cracks etc.

2.7.7 All current carrying parts shall be so designed and manufactured that contact resistance is reduced to minimum and localized heating phenomenon is averted.

2.7.8 No equipment shall have sharp ends or edges, abrasions or projections and shall not cause any damage to the conductor in any way during erection or during continuous operation which would produce high electrical and mechanical stresses in normal working. The design of adjacent metal parts and mating surfaces shall be such as to prevent corrosion of the contact surface and to maintain good electrical contact under all service conditions.

2.7.9 Particular care shall be taken during manufacture and subsequent handling to ensure smooth surface free from abrasion or cuts.

2.7.10 The fasteners shall conform to the requirements of IS: 6639-1972. All fasteners and clamps shall have corona free locking arrangement to guard against vibration loosening.

2.8 **Compression Markings**

Die compression areas shall be clearly marked on each equipment designed for continuous die compressions and shall bear the words 'COMPRESS FIRST' 'suitably inscribed on each equipment where the compression begins. If the equipment is designed for intermittent die compressions, it shall bear the identification marks 'COMPRESSION ZONE' and 'NON-COMPRESSION ZONE' distinctly with arrow marks showing the direction of compression and knurling marks showing the end of the zones. The letters, number and other markings on finished equipment shall be distinct and legible.

2.9 **Bid Drawings**

2.9.1 The Bidder shall furnish detailed dimensioned drawings of the equipments and all component parts. Each drawing shall be identified by a drawing number and Contract number. All drawings shall be neatly arranged. All drafting and lettering shall be legible. The minimum size of lettering shall be 3 mm. All dimensions and dimensional tolerances shall be mentioned in mm.

2.9.2 The drawings shall include

(i) Dimensions and dimensional tolerances
(ii) Material fabrication details including any weld details and any specified finishes and coatings. Regarding material, designations and reference of standards are to be indicated.
(iii) Catalogue No.
(iv) Marking
(v) Weight of assembly
(vi) Installation instructions
(vii) Design installation torque for the bolt or cap screw
(viii) Withstand torque that may be applied to the bolt or cap screw without failure of component parts
(ix) The compression die number with recommended compression pressure.
(x) All other relevant technical details

2.9.3 The above drawings shall be submitted with all the details as stated above along with the bid document. After the placement of award, the Contractor shall again submit the drawings in four copies to the Owner for approval. After Owner's approval and successful completion of all type tests, 10 (ten) more sets of drawings shall be submitted to Owner for further distribution and field use at Owner's end.

3.0 Tests and Standards

3.1 Type Tests

3.1.1 On Suspension Clamp

a) Magnetic power loss test : As per Annexure-A

b) Clamp slip strength Vs torque test : As per Annexure-A

c) Ozone Test on elastomer : As per Annexure-A

	d)	Vertical Damage load and failure load test	IEC-61284
3.1.2	**On Dead end Tension Assembly**		
	a)	Electrical resistance test for dead end Assembly	: As per IS:2486-(Part-I)
	b)	Heating cycle test for dead end Assembly	: As per Annexure-A
	c)	Slip strength test for dead end assembly	: As per Annexure-A
	d)	Ageing test on filler (if applicable)	: As per Annexure-A
3.1.3	**Mid Span Compression Joint for Conductor**		
	a)	Chemical analysis of materials	: As per Annexure-A
	b)	Electrical resistance test	:As per IS:2121 (Part-II)
	c)	Heating cycle test	: As per Annexure-A
	d)	Slip strength test	: As per Annexure-A
	e)	Corona extinction voltage test (dry) (for 400kV)	: As per Annexure-A
	f)	Radio interference voltage test (dry) (for 400kV)	: As per Annexure-A
3.1.4	**Repair Sleeve for Conductor**		
	a)	Chemical analysis of materials	: As per Annexure- A
	b)	Corona extinction voltage test (dry) (for 400kV)	: As per Annexure- A
	c)	Radio interference voltage test (dry) (for 400kV)	: As per Annexure- A
3.1.5	**Vibration Damper for Conductor**		
	a)	Chemical analysis of materials	: As per Annexure- A
	b)	Dynamic characteristics test*	: As per Annexure- A
	c)	Vibration analysis	: As per Annexure- A
	d)	Clamp slip test	: As per Annexure- A
	e)	Fatigue tests	: As per Annexure- A
	f)	Magnetic power loss test	: As per Annexure- A
	g)	Corona extinction voltage test (dry) (for 400kV)	: As per Annexure- A
	h)	Radio interference voltage test (dry) (for 400kV)	: As per Annexure- A
	i)	Damper efficiency test	: As per IS:9708

* Applicable for 4 R Stockbridge dampers. For alternate type of vibration dampers (permitted as per clause 2.4.2), as an alternative to dynamic characteristic test, damper efficiency test as per IEEE-664 may be proposed/ carried out by the supplier.

3.1.6 **Bundle spacer for Line**

a)	Chemical analysis of materials	: As per Annexure- A
b)	Clamp slip test	: As per Annexure- A
c)	Vibration test	: As per Annexure- A
	(i) Vertical Vibration	: As per Annexure- A
	(ii) Longitudinal vibration	: As per Annexure- A
	(iii) sub span Oscillation	: As per Annexure- A
d)	Corona extinction voltage test (dry) (for 400kV)	: As per Annexure- A
e)	Radio interference voltage test (dry) (for 400kV)	: As per Annexure- A
f)	Ozone test on elastomer	: As per Annexure-A
g)	Magnetic power loss test (If applicable)	: As per Annexure-A
h)	Compressive and tension test	: As per Annexure-A

3.1.7 **Rigid Spacer for Jumper**

a)	Chemical analysis of materials	: As per Annexure- A
b)	Clamp slip test	: As per Annexure- A
c)	Corona extinction voltage test (dry) (for 400kV)	: As per Annexure- A
d)	Radio interference voltage test (dry) (for 400kV)	: As per Annexure- A
e)	Tension Compression test	: As per Annexure-A
f)	Magnetic power loss test (If applicable)	: As per Annexure-A

3.1.8 **Spacer Damper (Alternative to combination of Vibration Damper & Bundle spacer)**

a)	Chemical analysis of materials	: As per Annexure- A
b)	Clamp slip test	: As per Annexure- A
c)	Vibration test	: As per Annexure- A
	(i) Vertical Vibration	: As per IS 10162
	(ii) Longitudinal vibration	: As per IS 10162
	(iii) sub span Oscillation	: As per IS 10162

d)	Dynamic characteristics test	: As per Annexure- A
e)	Fatigue tests	: As per Annexure- A
f)	Magnetic power loss test (If applicable)	: As per Annexure- A
g)	Compressive and tension test	: As per Annexure- A
h)	Corona extinction voltage test (dry) (for 400kV)	: As per Annexure- A
i)	Radio interference voltage test (dry) (for 400kV)	: As per Annexure- A
j)	Ozone test on elastomer	: As per Annexure- A
k)	Log Decrement test	: As per Annexure- A

Type tests specified above shall not be required to be carried out if a valid test certificate is available for the offered design with validity of the test certificate as per latest CEA guidelines. The tests conducted earlier should have been conducted in accredited laboratory (accredited based on ISO/IEC guide 25/17025 or EN 45001 by the National Accreditation body of the country where laboratory is located) or witnessed by the representative (s) of DTL or Utility.

In the event of any discrepancy in the test report (i.e., any test report not applicable due to any design / material/manufacturing process change including substitution of components or due to non-compliance with the requirement stipulated in the Technical Specification) the tests shall be conducted by the Contractor at no extra cost to the Employer/ Purchaser.

3.2 **Acceptance Tests**

3.2.1 **On Both Suspension Clamp and Tension Assembly**

a)	Visual Examination	: As per IS:2486-(Part-I)
b)	Verification of dimensions	: As per IS:2486-(Part-I)
c)	Galvanizing/Electroplating test	: As per IS:2486-(Part-I)
d)	Mechanical strength test of each component	: As per Annexure- A
e)	Mechanical Strength test of welded joint	: As per Annexure- A
f)	Chemical analysis, hardness tests, grain size, inclusion rating & magnetic particle inspection for forgings/castings	: As per Annexure- A

3.2.2 **On Suspension Clamp only**

a)	Clamp Slip strength Vs Torque test for suspension clamp	: As per Annexure- A
b)	Shore hardness test of elastomer cushion for AG suspension clamp	: As per Annexure- A

c)	Bend test for armour rod set	: As per IS:2121(Part-I), Clause 7.10
d)	Resilience test for armour rod set	: As per IS:2121(Part-I), Clause 7.11
e)	Conductivity test for armour rods set	: As per IS:2121(Part-I), Clause 7.5

3.2.3 **On Tension Hardware Fittings only**

a)	Slip strength test for dead end assembly	: As per Annexure-A
b)	Ageing test on filler (if applicable)	: As per Annexure-B

3.2.4 **On Mid Span Compression Joint for Conductor**

a)	Visual examination and dimensional verification	: As per IS:2121 (Part-II), Clause 6.2, 6.3 & 6.7
b)	Galvanizing test	: As per IS-2121(part-II)
c)	Hardness test	: As per Annexure-B
d)	Ageing test on filler (if applicable)	: As per Annexure-B

3.2.5 **Repair Sleeve for Conductor**

a)	Visual examination and dimensional verification	: As per IS:2121(Part-II) Clause 6.2, 6.3

3.2.6 **Vibration Damper for Conductor**

a)	Visual examination and dimensional verification	: As per IS:2121(Part-II) Clause 6.2, 6.3
b)	Galvanizing test	: As per IS-2121 (Part-II)
	(i) On damper masses	
	ii) On messenger cable	
c)	Verification of resonance frequencies	: As per Annexure-B
d)	Clamp slip test	: As per Annexure-B
e)	Clamp bolt torque test	: As per Annexure-B
f)	Strength of the messenger cable	: As per Annexure-B
g)	Mass pull off test	: As per Annexure-B

h) Dynamic characteristics test* : As per Annexure-B

* Applicable for 4 R stockbridge dampers. For alternate type of vibration dampers (permitted as per clause 2.4.2), as an alternative to dynamic characteristic test, damper efficiency test as per IEEE-664 may be proposed/ carried out by the supplier.

3.2.7 **Bundle spacer for line/ Rigid spacer for jumper for conductor**

a) Visual examination and dimensional verification

b) Galvanizing test

c) Movement test (except for spacer jumpers) : As per Annexure-B

d) Clamp slip test : As per Annexure-B

e) Clamp bolt torque test : As per Annexure-B

f) Compression tension test : As per Annexure-B

g) Assembly torque test : As per Annexure-B

h) Hardness test for elastomer (If applicable) : As per Annexure-B

3.2.8 **Spacer Damper for conductor/ rigid spacer for jumper**

a) Visual examination and dimensional verification

b) Galvanizing test

c) Movement test (except for spacer jumpers) : As per Annexure-B

d) Clamp slip test : As per Annexure-B

e) Clamp bolt torque test : As per Annexure-B

f) Compression tension test : As per Annexure-B

g) Assembly torque test : As per Annexure-B

h) Hardness test for elastomer (If applicable) : As per Annexure-B

3.3 **Routine Tests**

3.3.1 **For Hardware Fittings**

a) Visual examination IS:2486-(Part-I)

b) Proof Load Test : As per Annexure- A

3.3.2 **For conductor accessories**

a) Visual examination and dimensional verification : As per IS:2121(Part-II) Clause 6.2, 6.3 & 6.7

3.4 **Tests During Manufacture on all components as applicable**

a)	Chemical analysis of Zinc used for galvanizing	IS:2486-(Part-I)
b)	Chemical analysis mechanical metallographic test and magnetic particle inspection for malleable castings	: As per Annexure- A
c)	Chemical analysis, hardness tests and magnetic particle inspection for forging	: As per Annexure- A

3.5 **Testing Expenses**

3.5.1 Testing charges for the type test specified shall be indicated separately in the prescribed schedule.

3.5.2 Bidder shall indicate charges for all type tests covered under Clause No. 3.1.1 to 3.1.5 separately. The charges for each type test shall be separately indicated.

3.5.3 Bidder shall indicate the laboratories in which they propose to conduct the type tests. They shall ensure that adequate facilities for conducting the tests are available in the laboratory and the tests can be completed in these laboratories within the time schedule guaranteed by them in the appropriate schedule.

3.5.4 The entire cost of testing for acceptance and routine tests and tests during manufacture specified herein shall be treated as included in the quoted Ex-works/CIF Price.

3.5.5 In case of failure in any type test, repeat type tests are required to be conducted, then, all the expenses for deputation of Inspector/ Owner's representative shall be deducted from the contract price. Also if on receipt of the Contractor's notice of testing, the Owner's representative/Inspector does not find material & facilities to be ready for testing the expenses incurred by the Owner's for re-deputation shall be deducted from contract price.

3.5.6 The Contractor shall intimate the Owner about carrying out of the type tests along with detailed testing program at least 3 weeks in advance (in case of testing in India and at least 6 weeks advance in case of testing abroad) of the scheduled date of testing during which the Owner will arrange to depute his representative to be present at the time of carrying out the tests.

3.6 **Sample Batch For Type Testing**

3.6.1 The Contractor shall offer material for sample selection for type testing only after getting Quality Assurance Programme approved by the Owner. The Contractor shall offer at least three times the quantity of materials required for conducting all the type tests for sample selection. The sample for type testing will be manufactured strictly in accordance with the Quality Assurance Programme approved by the Owner.

3.6.2 Before sample selection for type testing the Contractor shall be required to conduct all the acceptance tests successfully in presence of Owner's representative.

3.7 **Schedule of Testing and Additional Tests**

3.7.1 The Bidder has to indicate the schedule of following activities in their bids

(a) Submission of drawing for approval.

(b) Submission of Quality Assurance programme for approval.

(c) Offering of material for sample selection for type tests.

(d) Type testing.

3.7.2 The Owner reserves the right of having at his own expense any other test(s) of reasonable nature carried out at Contractor's premises, at site, or in any other place in addition to the aforesaid type, acceptance and routine tests to satisfy himself that the material comply with the specifications.

3.7.3 The Owner also reserves the right to conduct all the tests mentioned in this specification at his own expense on the samples drawn from the site at Contractor's premises or at any other test centre. In case of evidence of non compliance, it shall be binding on the part of Contractor to prove the compliance of the items to the technical specifications by repeat tests, or correction of deficiencies, or replacement of defective items, all without any extra cost to the Owner.

3.8 **Co-ordination for testing**

The Contractors shall have to co-ordinate testing of their hardware fittings with insulators to be supplied by other Supplier to the *Owner* and shall have to also guarantee overall satisfactory performance of the hardware fittings with the insulators.

3.9 **Test Reports**

3.9.1 Copies of type test reports shall be furnished in at least four copies along with one original. One copy shall be returned duly certified by the Owner, only after which the commercial production of the concerned material shall start.

3.9.2 Copies of acceptance test report shall be furnished in at least four copies. One copy shall be returned, duly certified by the Owner, only after which the materials will be dispatched.

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

3.9.4 Test certificates of tests during manufacture shall be maintained by the Contractor. These shall be produced for verification as and when desired by the Owner.

3.10 **Inspection**

3.10.1 The Owner's representative shall at all times be entitled to have access to the works and all places of manufacture, where the material and/or its component

parts shall be manufactured and the representatives shall have full facilities for unrestricted inspection of the Contractor's, sub-Contractor's works, raw materials manufacturer's of all the material and for conducting necessary tests as detailed herein.

3.10.2 The material for final inspection shall be offered by the Contractor only under packed condition as detailed in the Specification. The engineer shall select samples at random from the packed lot for carrying out acceptance tests.

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

3.10.4 Material shall not be dispatched from its point of manufacture before it has been satisfactorily inspected and tested unless the inspection is waived off by the Owner in writing. In the latter case also the material shall be dispatched only after all tests specified herein have been satisfactorily completed.

3.10.5 The acceptance of any quantity of material shall in no way relieve the Contractor of his responsibility for meeting all the requirements of the Specification, and shall not prevent subsequent rejection, if such materials are later found to be defective.

3.11 **Packing and Marking**

3.11.1 All material shall be packed in strong and weather resistant wooden cases/crates. The gross weight of the packing shall not normally exceed 200 Kg to avoid handling problems.

3.11.2 The packing shall be of sufficient strength to withstand rough handling during transit, storage at site and subsequent handling in the field.

3.11.3 Suitable cushioning, protective padding, dunnage or spacers shall be provided to prevent damage or deformation during transit and handling.

3.11.4 Bolts, nuts, washers, cotter pins, security clips and split pins etc. shall be packed duly installed and assembled with the respective parts and suitable measures shall be used to prevent their loss.

3.11.5 Each component part shall be legibly and indelibly marked with trade mark of the manufacturer and year of manufacture.

3.11.6 All the packing cases shall be marked legibly and correctly so as to ensure safe arrival at their destination and to avoid the possibility of goods being lost or wrongly dispatched on account of faulty packing and faulty or illegible markings. Each wooden case/crate shall have all the markings stencilled on it in indelible ink.

3.12 **Standards**

3.12.1 The Hardware fittings; conductor and earthwire accessories shall conform to the following Indian/International Standards which shall mean latest revisions, with amendments/changes adopted and published, unless specifically stated otherwise in the Specification.

3.12.2 In the event of the supply of hardware fittings; conductor and earthwire accessories conforming to standards other than specified, the Bidder shall confirm in his bid that these standards are equivalent to those specified. In case of award, salient features of comparison between the Standards proposed by the Contractor and those specified in this document will be provided by the Contractor to establish their equivalence.

Sl. No.	Indian Standard	Title	International Standard
1.	IS: 209-1992	Specification for zinc	BS:3436-1986
2.	IS 1573	Electroplated Coating of Zinc on iron and Steel	
3.	IS : 2121 (Part-II)	Specification for Conductor and Earthwire Accessories for Overhead Power lines: Mid-span Joints and Repair Sleeves for Conductors	
4.	IS:2486 (Part-I)	Specification for Insulator Fittings for Overhead power Lines with Nominal Voltage greater than 1000 V: General Requirements and Tests	
5.	IS:2629	Recommended Practice for Hot Dip Galvanising of Iron and Steel	
6.	IS:2633	Method of Testing Uniformity of Coating on Zinc Coated Articles	
7.		Ozone test on Elastomer	ASTM- D1171
8.		Tests on insulators of Ceramic material or glass for overhead lines with a nominal voltage greater than 1000V	IEC:383-1993
9.	IS:4826	Galvanised Coating on Round Steel Wires	ASTM A472-729 BS:443-1969
10.	IS:6745	Methods of Determination of Weight of Zinc Coating of Zinc Coated Iron and Steel Articles	BS:433 ISO : 1460 (E)
11.	IS:8263	Method of Radio Interference Tests on High Voltage Insulators	IEC:437 NEMA:107 CISPR
12.	IS:6639	Hexagonal Bolts for Steel Structures	ISO/R-272
13.	IS:9708	Specification for Stock Bridge Vibration Dampers for Overhead Power Lines	

14.	IS:398	Aluminium conductor galvanized steel reinforced for extra high voltage	IEC:1089-1991 BS:215-1970
15.	IS 10162	Specifications for spacers dampers for twin horizontal bundle conductors	

Note: GTP of hardware fittings and accessories is attached as Annexure-C

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ANNEXURE - A

1.0 Tests on Hardware Fittings

1.1 Magnetic Power Loss Test for Suspension Assembly

Two hollow aluminium tubes of 32 mm diameter for the conductor shall be placed 450 mm (for 400kV) apart. An alternating current over the range of 1200 to 1800 amps shall be passed through each tube. The reading of the wattmeter with and without suspension assemblies along with line side yoke plate, clevis eye shall be recorded. Not less than three suspension assemblies shall be tested. The average power loss for suspension assembly shall be plotted for each value of current. The value of the loss corresponding to 1200/1600 amperes (as the case may be in line with scheme) shall be read off from the graph and the same shall be limited to the value guaranteed by the supplier.

1.2 Galvanising/Electroplating Test

The test shall be carried out as per Clause no. 5.9 of IS: 2486-(Part-1) except that both uniformity of zinc coating and standard preecee test shall be carried out and the results obtained shall satisfy the requirements of this specification.

1.3 Mechanical Strength Test of Each Component

Each component shall be subjected to a load equal to the specified minimum ultimate tensile strength (UTS) which shall be increased at a steady rate to 67% of the minimum UTS specified. The load shall be held for five minutes and then removed. The component shall then again be loaded to 50% of UTS and the load shall be further increased at a steady rate till the specified UTS and held for one minute. No fracture should occur. The applied load shall then be increased until the failing load is reached and the value recorded.

1.4 Mechanical Strength Test of Welded Joint

The welded portion of the component shall be subjected to a Load of 2000 kgs for one minute. Thereafter, it shall be subjected to die-penetration/ ultrasonic test. There shall not be any crack at the welded portion.

1.5 Clamp Slip Strength Vs Torque Test for Suspension Clamp

The suspension assembly shall be vertically suspended by means of a flexible attachment. A suitable length of conductor shall be fixed in the clamp. The clamp slip strength at various tightening torques shall be obtained by gradually applying the load at one end of the conductor. The Clamp slip strength vs torque curve shall be drawn. The above procedure is applicable only for free centre type suspension clamp. For AG suspension clamp only clamp slip strength after assembly shall be found out. The clamp slip strength at the recommended tightening torque shall be as indicated in the GTP.

1.6 Heating Cycle Test

Heating cycle test shall be performed in accordance with IS 2486 (Part-I) with following modifications:-

i) Temperature of conductor during each cycle: 40 deg. C above designed maximum operating temperature of the conductor, but not exceeding the emergency temperature of the conductor

ii) Number of cycle: 100

iii) Slip strength test shall also be carried out after heating cycle test.

1.7 **Slip strength test for dead end assembly**

The test shall be carried out as per IS:2486 (Part-I) except that the load shall be steadily increased to 95% of minimum ultimate tensile strength of conductor/earth wire and retained for one minute at this load.

1.8 **Ageing Test on Filler (if applicable)**

The test shall be done in accordance with Grease drop point test method. The specimen should be drop as a droplet when kept at a temperature 40 deg. C above designed maximum operating temperature of the conductor for 30 minutes. The temperature shall then be increase till one droplet drops and the temperature recorded.

1.9 **Shore Hardness Test for Elastomer Cushion for AG Suspension Assembly**

The shore hardness at various points on the surface of the elastomer cushion shall be measured by a shore hardness meter and the shore hardness number shall be between 65 to 80.

1.10 **Proof Load Test**

Each component shall be subjected to a load equal to 50% of the specified minimum ultimate tensile strength which shall be increased at a steady rate to 67% of the UTS specified. The load shall be held for one minute and then removed. After removal of the load the component shall not show any visual deformation.

1.11 **Tests for Forging Casting and Fabricated Hardware**

The chemical analysis, hardness test, grain size, inclusion rating and magnetic particle inspection for forging, castings and chemical analysis and proof load test for fabricated hardware shall be as per the internationally recognized procedures for these tests. The sampling will be based on heat number and heat treatment batch. The details regarding test will be as in the Quality Assurance programme.

1.12 **Ozone Test for Elastomer**

This test shall be performed in accordance with ASTM D-1171 by the Ozone chamber exposure method (method B). The test duration shall be 500 hours and the ozone concentration 50 PPHM. At the test completion, there shall be no visible crack under a 2 x magnification.

2.0 Tests on Accessories for Conductor

2.1 **Mid Span Compression Joint for Conductor**

(a) **Slip Strength Test**

The fitting compressed on conductor shall not be less than one metre in length. The test shall be carried out as per IS:2121 (Part-ii)-1981 clause 6.4 except that the load shall be steadily increased to 95% of minimum ultimate tensile strength of conductor/earthwire and retained for one minute at this load. There shall be no movement of the conductor/ earthwire relative to the fittings and no failure of the fittings during this one minute period.

(b) **Heating Cycle Test**

Heating cycle test shall be performed in accordance with IS 2121 (Part-II- 1981) with following modifications:-

i) Temperature of conductor during each cycle: 40 deg. C above designed maximum operating temperature of the conductor.

ii) Number of cycle: 100

iii) Slip strength test shall also be carried out after heating cycle test.

2.2 **Vibration Damper for Conductor**

(a) Dynamic Characteristics, 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 Aeolian vibration frequency band ranging from 0.18/d to 1.4/d where d is the conductor diameter in meters. The damper assembly shall be vibrated vertically with a + 1 mm amplitude from 5 to 15 Hz frequency and beyond 15 Hz at ± 0.5mm to determine following characteristics with the help of suitable recording instruments

(i) Force Vs frequency
(ii) Phase angle Vs frequency
(iii) Power dissipation Vs frequency

The Force Vs frequency curve shall not show steep peaks at resonance frequencies and deep troughs between the resonance frequencies. The resonance frequencies shall be suitably spread within the aeolian vibration frequency-band between the lower and upper dangerous frequency, limits determined by the vibration analysis of conductor without dampers.

Acceptance criteria for vibration damper:

(i) The above dynamic characteristics test on five damper shall be conducted.
(ii) The mean reactance and phase angle Vs frequency curves shall be drawn with the criteria of best fit method.
(iii) The above mean reactance response curve should lie within 0.191 f to 0.762 f Kgf/mm limits where f is frequency in Hz.

(iv) The above mean phase angle response curve shall be between 25^{o} to 130^{o} within the frequency range of interest.

(v) If the above curve lies within the envelope, the damper design shall be considered to have successfully met the requirement.

(vi) Visual resonance frequencies of each mass of damper is to be recorded and to be compared with the guaranteed values.

(b) Vibration Analysis

The vibration analysis of the conductor shall be done with and without damper installed on the span. The vibration analysis shall be done on a digital computer using energy balance approach. The following parameters shall be taken into account for the purpose of analysis:

(i) The analysis shall be done for single conductor without armour rods as per the parameters given in the Specification. The tension shall be taken from Sag & Tension calculation (0 deg. C & no wind condition and ruling span as per Annexure-I of TS of HTLS conductor) for a span ranging from 100 m to 1100.

(ii) The self damping factor and flexural stiffness (El) for conductor shall be calculated on the basis of experimental results. The details for experimental analysis with these data should be furnished.

(iii) The power dissipation curve obtained from Dynamic Characteristics Test shall be used for analysis with damper.

(iv) Examine the aeolian vibration level of the conductor with and without vibration damper installed at the recommended location or wind velocity ranging from 0 to 30 Km per hour, predicting amplitude, frequency and vibration energy input.

(v) From vibration analysis of conductor without damper, anti-node vibration amplitude and dynamic strain levels at clamped span extremities as well as antinodes shall be examined and thus lower and upper dangerous frequency limits between which the Aeolian vibration levels exceed the specified limits shall be determined.

(vi) From vibration analysis of conductor with damper/dampers installed at the recommended location, the dynamic strain level, at the clamped span extremities, damper attachment point and the antinodes on the conductor shall be determined. In addition to above damper clamp vibration amplitude and anti-node vibration amplitudes shall also be examined.

The dynamic strain levels at damper attachment points, 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) Clamp Slip and Fatigue Tests

(i) **Test Set Up**

The clamp slip and fatigue tests shall be conducted on a laboratory set up with a minimum effective span length of 30 m. The conductor shall be tensioned at tension corresponding to 0 deg & no wind condition and ruling span (ruling span as per annexure-1 of TS of HTLS conductor) m from sag –tension calculation 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 conductor has been tensioned, clamps shall be installed to support the conductor 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 conductor. 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 stepless speed control as well as stepless amplitude arrangement. Equipment shall be available for measuring the frequency, cumulative number of cycles and amplitude of vibration at any point along the span.

(ii) Clamp Slip test

The vibration damper shall be installed on the test span. The damper clamp, after lightning with the manufacturer's specified tightening torque, when subjected to a longitudinal pull of 2.5 kN parallel to the axis of conductor for a minimum duration of one minute shall not slip i.e. the permanent displacement between conductor and clamp measured after removal of the load shall not exceed 1.0 mm. The load shall be further increased till the clamp starts slipping. The load at which the clamp slips shall not be more than 5 kN.

(iii) 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 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 hereinabove shall be repeated after fatigue test without re-torquing 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 conductor and subjected to dynamic characteristics test. There shall not be any major deterioration in the characteristic 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 conductor under clamp shall also be free from any damage.

For the purpose of acceptance, the following criteria shall be applied.

(1) There shall not be any frequency shift by more than $\pm$2 Hz for frequencies lower than 15 Hz and ± 3 Hz for frequencies higher than 15 Hz.

(2) The force response curve shall generally lie within guaranteed % variation in reactance after fatigue test in comparison with that before fatigue test by the Contractor.

(3) The power dissipation of the damper shall not be less than guaranteed % variation in power dissipation before fatigue test by the Contractor. 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.

2.3 **Spacer / Spacer Damper**

(a) Vibration Tests

The test set up shall as per clause no.2.2 (c) (i) of Annexure-A. The spacer/ spacer damper assembly shall be clamped to conductor. During the vibration tests the axis of the clamp of sample shall be maintained parallel to its initial static position by applying a tension (tension from sag-tension calculations at minimum temperature and no wind condition and ruling span as per Annexure-1 of TS of HTLS conductor). The spacer/ spacer damper assembly shall be free to vibrate and shall not be re-torqued or adjusted between the tests.

All the vibration tests mentioned hereunder shall be conducted on the same sample on the same test span. The samples shall withstand the vibration tests without slipping on the conductor, loosening, damage or failure of component parts. After each vibration test, clamp slip test shall be carried out as per the procedure given in clause no. 2.3 (e) below:

(b) Longitudinal Vibration Tests

The stationary conductor and the vibrating conductor/equivalent diameter of aluminum alloy tube shall be restrained by fixed clamps. The displacement of the vibrating conductor shall be 25 mm minimum on either side. The longitudinal movement shall be parallel to the conductor at frequency not less than 2 Hz for minimum one million cycles.

(c) Vertical Vibration Tests

The spacer/spacer damper shall be installed in the middle of the test span and the frequency chosen so as to get an odd number of loops. The shaker shall be positioned at least two loops away from the test specimen to allow free movement of the conductor close to the test specimen. One conductor shall be connected to the shaker and vibrated to an amplitude such that

$F^{1.8}\ Y_{max} > 1000$mm/sec.

Where Ymax being the anti node displacement (mm) and f is the test frequency (Hz). The test frequency shall be greater than 24 Hz and the total number of cycles shall be more than 10 million.

(d) Sub-span Oscillation Test

The test shall be conducted for oscillation in horizontal plane at frequency higher than 3 Hz for minimum one million cycles. The amplitude for oscillation shall be kept equivalent to amplitude of 150 mm for a full sub-span of 80m. Both the conductor shall be vibrated 180deg. Out of phase with the above minimum amplitude.

(e) Clamp Slip Test

The spacer assembly shall be installed on test span of twin conductor bundle string at a tension of tension at 0 deg. C & No wind. In case of spacer for jumper, the. clamp of sample shall be tightened with a specified tightening torque. One of the sample clamps, when subjected to a longitudinal pull parallel to the conductor axis for a minimum duration of one minute, shall not slip on the conductor i.e. the permanent displacement between the conductor and the clamp of the sample measured after removal of the load shall not exceed specified values. The minimum slip under longitudinal pull varies with clamp type according to the following table:

Clamp Type	**Longitudinal Load (kN)**	**Maximum Slip (mm)**
Metal-Metal bolted	6.5	1
Rubber loaded	2.5	2.5
Clamp using Preformed rods	2.5	12

(f) Compressive and tensile test

This test shall be conducted on 3 (three) nos samples The spacer assembly shall withstand ultimate compressive load of 14 kN and tensile load of 7.0 kN applied

between sub-conductor bundle and held for one minute without failure. Line distance between clamps shall be recorded during each of the compression and tension test. Measurement shall be recorded at (i) no load (ii) with load (iii) after release of load. The center line distance under load shall be within ± 100 mm of the nominal design spacing. After release of load it shall be possible to retain the clamps at their original position using only slight hand pressure. There shall be no deformation or damage to the spacer assembly which would impair its function of maintaining the normal spacing.

(g) Dynamic Characteristic Test (For spacer dampers only)

The purpose of this test is to obtain quantitative information regarding the dynamic characteristics of the spacer damper. The values obtained during this test will serve as references to evaluate the behavior of the same spacer damper under the fatigue test. The test will consist in the application of sinusoidal movement of the spacer-damper articulation and measuring the force (F), displacement (X) and phase angle (Ø) between these two, from these values, the stiffness (K) and the damping factor (n) will be calculated.

$K = (F/X) \cos(\theta)$; $n = \tan(\theta)$

The test frequency shall not be higher than 3 Hz. The test shall be performed at five different displacement amplitudes. The amplitudes shall be selected to reproduce 10, 20, 40, 60 and 90 percent of the maximum displacement permitted by the spacer-damper design. The test shall be performed on three samples.

(h) Fatigue Test (For spacer dampers only)

The purpose of this test is to evaluate the capacity of the spacer damper to sustain without damage the cyclic movements which can be induced by vibrations.

The spacer damper articulation shall be subjected to cyclic motions for a total of 10 million cycles. The test frequency shall be between 2 and 3 Hz. The amplitude of motion shall be established on the following basis:

I. the load applied on the spacer damper clamp shall not be less than ± 300 N.

II. the clamp displacement under the applied load shall not be less than 60% of the maximum displacement permitted by the design.

III. if the 300 N load generates movement exceeding the maximum permitted displacement, the load can be reduced to limit the movement to 95% of the maximum displacement.

IV. After the test, the sample shall be subjected to a second dynamic characteristic test. This test shall be performed at two amplitudes, 10% and 60% of the maximum displacement.

V. The spacer damper shall show no signs of cracks or deterioration, loosening of bolts or abnormal wear.

The dynamic characteristics (k and n) shall not be less than 60% of the values measured before the fatigue test. The test shall be performed on three samples.

(i) Ozone Test

The test shall be performed in accordance with ASTM D-1171 by the ozone chamber exposure method (method B). The test duration shall be 500 hours and the ozone concentration 50 PPHM. At the test completion, there shall be no visible crack under a 2 x magnification.

(j) Log Decrement Test (For spacer dampers only)

The spacer damper assembly shall be mounted on test span of conductor bundle at a tension of 0 deg. C and no wind and ruling span of 400 m. The test span shall be instrumented to continuously monitor and record the horizontal motion of the sub-conductor in the sub-span between suspension point and the fist sample. The log decrement test shall be made with an initial peak to peak amplitude of four to six times the conductor diameter in the middle of the sub-span being considered. The conductor shall be excited in a horizontal one loop per sub-span resonant mode with a slow and steady buildup of amplitude that minimizes harmonics and other distortions. After achieving a steady state motion, the conductor excitation shall be discontinued leaving the conductor undisturbed. The motion shall be recorded until it reduces to an amplitude of half of the conductor diameter. The logarithmic (log) decrement shall be the value for a minimum reduction of 80% in amplitude. The minimum acceptable log decrement average for five or more excitation shall be 0.04 based upon the following formula for decay:

$$\text{Loge}\ \frac{An}{An+1} = \frac{1}{n}\ \text{Loge}\ \frac{A0}{A}$$

Where A0 is the initial amplitude and An is the amplitude 'n' cycles later.

2.4 Magnetic Power Loss test for spacer

The sample involving ferrous parts shall be tested in a manner to simulate service conditions for 50Hz pure sine-wave. The test should be carried out at various currents ranging from 1200 to 1800A per sub conductor (for 400kV) the magnetic power loss at various currents should be specified in tabulated graphical form. The difference between the power losses without and with sample at room temperature shall be limited to value guaranteed by the supplier for desired Amperes (At steady state conductor temperature). The losses shall be determined by averaging the observations obtained from at least 04 samples.

2.5 Corona Extinction Voltage Test (Dry) (For 400kV)

The sample when subjected to power frequency voltage shall have a corona extinction voltage of not less than 320 kV rms line to ground under dry condition. There shall be no evidence of corona on any part of the sample. The atmospheric condition during testing shall be recorded and the test results shall be accordingly corrected with suitable correction factor as stipulated in IS: 731-1971.

2.6 **Radio Interference Voltage Test (Dry)**

Under the conditions as specified above, the sample shall have a radio interference voltage level below 1000 micro volts at one MHz when subjected to 50 Hz AC voltage of 320 kV rms line to ground under dry condition. The test procedure shall be in accordance with IS: 8263.

2.7 **Chemical Analysis Test**

Chemical analysis of the material used for manufacture of items shall be conducted to check the conformity of the same with Technical Specification and approved drawing.

3.0 **Tests on All components (As applicable)**

3.1 **Chemical Analysis of Zinc used for Galvanizing**

Samples taken from the zinc ingot shall be chemically analyzed as per IS-209-1979. The purity of zinc shall not be less than 99.95%.

3.2 **Tests for Forgings**

The chemical analysis hardness tests and magnetic particle inspection for forgings, will be as per the internationally recognized procedures for these tests. The, sampling will be based on heat number and heat treatment batch. The details regarding test will be as discussed and mutually agreed to by the Contractor and Owner in Quality Assurance Programme.

3.3 **Tests on Castings**

The chemical analysis, mechanical and metallographic tests and magnetic particle inspection for castings will be as per the internationally recognized procedures for these tests. The samplings will be based on heat number and heat treatment batch. The details regarding test will be as discussed and mutually agreed to by the Contractor and Owner in Quality Assurance Programme.

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ANNEXURE-B

Acceptance Tests

1 **Mid Span Compression Joint for Conductor**

(a) **Hardness Test**

The Brinnel hardness at various points on the steel sleeve of conductor core and tension clamp shall be measured.

2. **Vibration Damper for Conductor**

(a) **Verification of Resonance Frequencies**

The damper shall be mounted on a shaker table and vibrate at damper clamp displacement of +/-0.5 mm to determine the resonance frequencies. The resonance shall be visually identified as the frequency at which damper mass vibrates with maximum displacement on itself. The resonance frequency thus identified shall be compared with the guaranteed value. A tolerance of ± 1 Hz at a frequency lower than 15 Hz and ± 2 Hz at a frequency higher than 15 Hz only shall be allowed.

(b) **Clamp Slip Test**

Same as Clause 2.2 (c) (ii) of Annexure-A.

(c) **Clamp Bolt Torque Test**

The clamp shall be attached to a section of the conductor/earthwire. A torque of 150 percent of the manufacturer's specified torque shall be applied to the bolt. There shall be no failure of component parts. The test set up is as described in Clause 2.2 (c) (i), Annexure-A.

(d) **Strength of the Messenger Cable**

The messenger cable shall be fixed in a suitable tensile testing machine and the tensile load shall be gradually applied until yield point is reached. Alternatively, each strand of messenger cable may be fixed in a suitable tensile testing machine and the tensile load shall be gradually applied until yield point is reached. In such a case, the 95% of yield strength of each wire shall be added to get the total strength of the cable. The load shall be not less than the value guaranteed by the Contractor.

(e) **Mass Pull off Test**

Each mass shall be pulled off in turn by fixing the mass in one jaw and the clamp in the other of a suitable tensile testing machine. The longitudinal pull shall be applied gradually until the mass begins to pull out of the messenger cable. The pull off loads shall not be less than the value guaranteed by the Contractor.

(f) **Dynamic Characteristics Test**

The test will be performed as acceptance test with the procedure mentioned for type test with sampling mentioned below:

Vibration Damper below	-	1 Sample for lot of 1000 Nos. &
	-	3 Samples for lot above 1 000 & up to 5000 nos.
	-	Additional 1 sample for every additional 1500 pieces above 5000.

The acceptance criteria will be as follows

(i) The above dynamic characteristics curve for reactance & phase angle will be done for frequency range of 5 Hz to 40 Hz.

(ii) If all the individual curve for dampers are within the envelope as already mentioned for type test for reactance & phase angle, the lot passes the test.

(iii) If individual results do not fall within the envelope, averaging of characteristics shall be done.

(iv) Force of each damper corresponding to particular frequency shall be taken & average force of three dampers at the frequency calculated.

(v) Similar averaging shall be done for phase angle.

(vi) Average force Vs frequency and average phase Vs frequency curves shall be plotted on graph paper. Curves of best fit shall be drawn for the entire frequency range.

(vii) The above curves shall be within the envelope specified.

3. **Spacer/ Spacer damper**

(a) **Test set up**

The test set up for the test described hereunder shall be as per clause 2.3 (a) of Annexure-A

(b) **Movement Test**

The spacer assembly shall be capable of the following movements without damaging the conductor, assuming one conductor is fixed and the other moving:

(i) Longitudinal movement parallel to the conductor: $\pm$ 50mm.

(ii) Vertical movement in a vertical direction at right angle to the conductor: $\pm$ 25mm.

(iii) Torsional movement / angular movement in a vertical plane parallel to the conductor: $\pm$ 5 deg.

(c) **Compressive and Tensile test**

The spacer assembly shall withstand ultimate compressive load of 14kN and tensile load of 7.0 kN applied between sub-conductor bundle and held for one minute without failure. Line distance between clamps shall be recorded during each of the compression and tension test. Measurement shall be recorded at (i) no load (ii) with load (iii) after release of load. The center line distance under load shall be within ± 100mm of the nominal design spacing. After release of load it shall be possible to retain the clamps at their original position using only slight hand pressure. There shall be no deformation or damage to the spacer assembly which would in pair its function of maintaining the normal spacing.

(d) **Clamp slip test**

Same as clause 2.3 (e) of Annexure-A.

(e) **Clamp Bolt Torque test**

The spacer assembly shall be attached to conductor. A torque of 150 per cent of the manufacturer's specified tightening torque shall be applied to the clamp bolts or cap screws. There shall be no failure of the component parts.

(f) **Assembly Torque Test**

The spacer assembly shall be installed on conductor. The same shall not rotate on either clamp on applying a torque of 0.04 kN in clockwise or anti-clockwise direction.

(g) **Hardness test for elastomer**

The shore hardness at different points on the elastomer surface of cushion grip clamp shall be measured by shore hardness meter. They shall lie between 65 to 80.

(h) **UTS of Retaining rods**

The UTS of the retaining rods shall be measured. The value shall not be less than 35kg/ sq. mm.

(i) Ageing test on filler (If applicable)

Same as clause 1.8 of Annexure-A.

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SECTION-III

TECHNICAL SPECIFICATION

POLYMER INSULATOR

TECHNICAL SPECIFICATIONS

SECTION-I

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TECHNICAL SPECIFICATIONS
SECTION-I

1.0 General Information

1.1 The material covered in this specification shall be used in the pollution stretches of existing *220* kV Transmission Lines of Delhi Transco Limited.

2.0 Scope

2.1 The material to be supplied on final destination at site basis as covered in this volume shall be designed, manufactured and tested as per the requirements specified.

Final Destination shall mean the stores established by the Owner/Contractor of the Owner along the Transmission Lines.

2.2 The materials covered here under this specification shall be supplied complete in all respects, including all components, fittings and accessories which are necessary or are usual for their efficient performance and satisfactory maintenance under the various operating and atmospheric conditions. Such parts shall be deemed to be within the scope of the Contract, whether specifically included or not in the Specification or in the Contract Schedules. The Supplier shall not be eligible for any extra charges for such fittings, etc.

The details of the materials required for the Insulator package under this Specification are mentioned in the bidding documents.

3.0 Weights and Measures

All weights and measures shall be in System International (S.l.) units. All fasteners shall be of Metric size only.

4.0 General Technical Conditions

4.1 The following provisions shall supplement all the detailed technical specifications and requirements brought out in the accompanying Technical Specifications. The Bidder's proposal shall be based on the use of equipment and materials complying fully with the requirements, specified herein.

The Bidder shall furnish clause-by-clause commentary (with detailed technical data as required) on the Technical Specifications demonstrating the goods substantial responsiveness to the specifications or deviations and exceptions to the provisions of the Technical Specification.

4.2 Equipment Performance Guarantee

4.2.1 The performance requirements of the items are detailed separately in this Specification. These guarantees shall supplement the general performance guarantee

provisions covered under General Terms and Conditions of Contract in clause entitled 'Guarantee'.

4.2.2 Liquidated damages for not meeting specified Technical performance shall be assessed and recovered from the Supplier. Such liquidated damages shall be without any limitation whatsoever and shall be in addition to damages, if any payable under any other clause of Conditions of Contract.

4.3 Engineering Data

4.3.1 The furnishing of engineering data by the Supplier shall be in accordance with the appropriate Schedule appended to this document. The review of these data by the Owner will cover only general conformance of the data to the specifications and drawings. This review by the Owner may not indicate a thorough review of all dimensions, quantities and details of the equipment, materials, any devices or items indicated or the accuracy of the information submitted. This review and/or approval by the Owner shall not be considered by the Supplier, as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these Specifications and documents.

4.3.2 All engineering data submitted by the Supplier after final process including review and approval by the Owner shall form part of the Contract Document and the entire works performed under these Specifications shall be performed in strict conformity, unless otherwise expressly requested by the Owner in writing.

4.4 **Drawings**

4.4.1 All drawings submitted by the Supplier 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, fixing arrangement required, the dimensions required for installation and any other information specifically requested in the Specifications.

4.4.2 Each drawing submitted by the Supplier shall be clearly marked with the name of the Owner, the unit designation, the Specification title, title Specification number and title name of the Project. All titles, noting, markings and in writings on the drawing shall be in English. All the dimensions should be to the scale and in metric units.

4.4.3 The drawings submitted by the Supplier shall be reviewed by the Owner as far as practicable within four (4) weeks and shall be modified by the Supplier if any modifications and/or corrections are required by the Owner in compliance with Specifications. The Supplier shall incorporate such modifications and or corrections and submit the final drawings for approval. Any delays arising out of failure by the Supplier to rectify the drawings in good time shall not alter the Contract completion date.

The drawings submitted for approval to the Owner shall be in quadruplicate. One print of such drawings shall be returned to the Supplier by the Owner marked approved/approved with corrections". The Supplier shall there upon furnish the Owner additional print as stipulated in Technical Specification along with one reproducible in original of the drawings after incorporating all corrections.

4.4.4 Further work by the Supplier shall be strictly in accordance with these drawings and no deviation shall be permitted without the written approval of the Owner, if so required.

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

4.5 Manufacturing Schedule

The Supplier shall submit to the Owner his manufacturing, testing and delivery schedules of various items within thirty (30) days from the date of the Letter of Award in accordance with the delivery requirements stipulated. Schedules shall also include the materials and items purchased from outside Suppliers, if any.

4.6 **Reference Standards**

4.6.1 The Codes and/or Standards referred to in Specifications shall govern, in all cases wherever such references are made. In case of a conflict between such Codes and/or Standards and the specifications, latter shall govern. Such Codes and/or Standards, referred to shall mean the latest revisions, amendments/ changes adopted and published by the relevant agencies.

4.6.2 Other Internationally acceptable Standards which ensure equivalent or better performance than those specified shall also be accepted.

4.7 **Design Improvements**

4.7.1 The Owner or the Supplier may propose changes in the Specification of the equipment or quality thereof and if the parties agree upon any such changes, the Specification shall be modified accordingly.

4.7.2 If any such agreed upon change is such that it affects the price and schedule of completion, the parties shall agree in writing as to the extent of any change in the price and/or schedule of completion before the Supplier proceeds with the change. Following such agreement, the provision thereof, shall be deemed to have been amended accordingly.

4.8 **Quality Assurance**

4.8.1 To ensure that the equipment under the scope of this Contract whether manufactured within the Supplier's Works or at his Sub-Supplier's premises is in accordance with the specifications, the Supplier shall adopt suitable Quality Assurance Programme to control such activities at all points necessary. Such programme shall be outlined by the Supplier and shall be finally accepted by the Owner after discussions before the

award of Contract. A Quality Assurance Programme of the Supplier shall generally cover but not limited to the following:

(a) His organisation structure for the management and implementation of the proposed Quality Assurance Programme.

(b) Documentation control system.

(c) Qualification data for key personnel;

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

(e) System for shop manufacturing including process 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 authorising release of manufactured product to the Owner.

(l) System for maintenance of records.

(m) System for handling, storage and delivery and

(n) A Quality Plan detailing out the specific quality control procedure adopted for controlling the quality characteristics of the product.

The Quality Plan shall be mutually discussed and approved by the Owner after incorporating necessary corrections by the Supplier as may be required.

4.8.2 **Quality Assurance Documents**

The Supplier shall be required to submit all the Quality Assurance Documents as stipulated in the Quality Plan at the time of Owner's inspection of equipment/material.

4.8.3 The Owner or his duly authorised representatives reserves the right to carry out Quality Audit and quality surveillance of the systems and procedures of the Supplier's/his vendor's Quality Management and Control Activities.

4.9 **Owner's Supervision**

4.9.1 To eliminate delays and avoid disputes and litigation it is agreed between the parties to the Contract that all matters and questions shall be resolved in accordance with the provisions of this document.

4.9.2 The manufacturing of the product shall be carried out in accordance with the specifications. The scope of the duties of the Owner, pursuant to the contract, will include but not be limited to the following:

(a) Interpretation of all the terms and conditions of these Documents and Specifications.

(b) Review and interpretation of all the Supplier's drawings, engineering data etc.

(c) Witness or authorize his representative to witness tests at the manufacturer's works or at site, or at any place where work is performed under the Contract.

(d) Inspect, accept or reject any equipments, material and work under the Contract, in accordance with the Specifications.

(e) Issue certificate of acceptance and/or progressive payment and final payment certificate.

(f) Review and suggest modification and improvement in completion schedules from time to time, and

(g) Supervise the Quality Assurance Programme implementation at all stages of the works.

4.10 Inspection, Testing & Inspection Certificate

4.10.1 The Owner, his duly authorised representative and/or outside inspection agency acting on behalf of the Owner shall have at all reasonable times access to the Supplier's premises and works and shall have the power at all reasonable times to inspect and examine the materials and workmanship of the product during its manufacture and if part of the product is being manufacture or assembled at other premises or works, the Supplier shall obtain from the Owner and / or his duly authorised representative permission to inspect as if the equipment / materials were manufactured or assembled on the Supplier's own premises or works.

4.10.2 The Supplier shall give the Owner Inspector fifteen (15) days written notice of any material being ready for testing. Such tests shall be to the Supplier's account except for the expenses of the Inspector. The Owner/inspector, unless witnessing of the tests is waived, will attend such tests within fifteen (15) days of the date of which the equipment is notified as being ready for test/inspection or on a mutually agreed date, failing which the Supplier may proceed with the test which shall be deemed to have been made in the Inspector's presence and he shall forthwith forward to the Inspector duly certified copies of tests in triplicate.

4.10.3 The Owner/Inspector shall, within fifteen (15) days from the date of inspection as defined herein give notice in writing to the Supplier, 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 Supplier shall give due consideration to such objections and shall make the modifications that may be necessary to meet the said objections.

4.10.4 When the factory tests have been completed at the Supplier's or Sub-Supplier's works, the Owner inspector shall issue a certificate to this effect within fifteen (15) days after completion of tests but if the tests are not witnessed by the Owner/inspector, the

certificate shall be issued within fifteen (15) days of receipt of the Supplier's Test Certificate by the Owner/ Inspector. The completion of these tests or the issue of the certificate shall not bind the Owner to accept the equipment should it, on further tests after erection, be found not to comply with the Contract.

4.10.5 In all cases where the Contract provides for test whether at the premises or works of, the Supplier or of any Sub-Supplier, the Supplier except where otherwise specified shall provide free of charge such item as labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the Owner inspector or his authorised representative to carry out effectively such tests of the equipment in accordance with the Contract and shall give facilities to the Owner/Inspector or to his authorised representative to accomplish testing.

4.10.6 The inspection by Owner and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the Supplier in respect of the agreed Quality Assurance Programme forming a part of the Contract.

5.0 Technical Description

5.1 The technical description of Composite Long Rod Insulator shall be as specified in Section- II of this Technical Specifications.

6.0 Tests and Standards

6.1 Tests

The following type, acceptance and routine tests and tests during manufacture shall be carried-out on the material. For the purpose of this clause:

6.1.1 Type Tests shall mean those tests which are to be carried out to prove the process of manufacture and general conformity of the material to this Specification. These tests shall be carried out on samples prior to commencement of commercial production against the order. The Bidder shall indicate his schedule for carrying out these tests.

6.1.2 Acceptance Tests shall mean those tests which are to be carried out on samples taken from each lot offered for pre-dispatch inspection, for the purposes of acceptance of that lot.

6.1.3 Routine Tests shall mean those tests, which are to be carried out on the material to check requirements which are likely to vary during production.

6.1.4 Tests during Manufacture shall mean those tests, which are to be carried out during the process of manufacture and end inspection by the Supplier to ensure the desired quality of the end product to be supplied by him.

6.1.5 The norms and procedure of sampling for these tests will be as per the Quality Assurance Programme to be mutually agreed to by the Supplier and the Owner.

6.1.6 The standards and norms to which these tests will be carried out are listed against them. Where a particular test is a specific requirement of this Specification, the norms

and procedure of the test shall be as specified in Annexure-A or as mutually agreed to between the Supplier and the Owner in the Quality Assurance Programme.

6.1.7 For all type and acceptance tests, the acceptance values shall be the values specified in this Specification or guaranteed by the Bidder, as applicable.

7.0 Guaranteed Technical Particulars

7.1 The Guaranteed Technical Particulars of the various items shall be furnished by the Bidders in one original and four (4) copies in the prescribed schedules of the specifications. The Bidder shall also furnish any other schedule informations as in their opinion is needed to give full description and details to judge the item(s) offered by them

7.2 The data furnished in Guaranteed Technical Particulars should be the minimum or maximum value (as per the requirement of the specification) required. A Bidder may guarantee a value more stringent than the specification requirement. However, for testing purpose or from performance point of view, the material shall be considered performed successfully if it achieves the minimum or maximum value required as per the technical specification. No preference what so ever shall be given to the bidder offering better/more stringent values than those required as per specification.

8.0 Technical Information

8.1 Electrical System Data

a. Nominal Voltage	KV	220
b. Maximum system voltage	KV	245
c. BIL (Impulse)	KV(peak)	1050
d. Power frequency withstand voltage (Wet)	KV(rms)	460
e. Minimum Corona extinction voltage at 50 Hz AC system under dry condition	KV(rms)	154 (Min) Phase to earth
f. Radio interference voltage at one MHz for phase to earth voltage (dry condition.)	Micro volts	1000 (max)

8.2 Details of Line Materials

8.2.1 Conductor and Earthwire for 220kV Transmission Line

S No	Description	Unit	Conductor	Earthwire
1	Name/Type		ACSR ZEBRA	19/2.64 mm Galvanised steel wire stranded of grade 3
2	Size	mm	54/3.18 Aluminium 7/3.18 Steel	19/2.64 steel
3	Conductor per phase		1	N.A.
4	Spacing between conductor of same phase (sub conductor spacing)	mm	-	N.A.
5	Configuration		Vertical single	Single running on top of the tower
6	Overall diameter	mm	28.62	12.50
7	Unit mass	Kg/KM	1623	-

8	Ruling Design Span	Meter	320 (Broad Base)/225 (narrow Base)	320 (Broad Base)/225 (narrow Base)

8.2.2 **Detail of Insulator String with Composite Long Rod Insulators for Pollution Stretches**

SL. No.	Particulars	Single *'I'* suspension String	Double tension String	Single tension String	Single Suspension Pilot String	Double Suspension	Double Suspension for JCT
1	Size of Composite insulator (Core Dia x Nominal length) mm	20-24 *x2175*	24 *x2720*	24 x 2720	20-24 *x2175*	20-24 x2175	24x2175
2	E&M strength of each insulator unit in the string in KN	90/120	2x160	160	90/120	2x90/120	2x160
3	No.of Long rod insulators per string	l x l	2xl	l x l	l x l	2x1	2x1
4	Minimum creepage distance of each composite long rod in mm	7595	7595	7595	7595	7595	7595

9.0 **Service Condition**.

Equipment/material to be supplied against this specification shall be suitable for satisfactory continuous operation under conditions as specified below:

Maximum ambient temperature (Degree Celcius) : 50

Minimum ambient temperature (Degree Celsius) : 0

Relative humidity (% range) : 10-100

Maximum annual rainfall & snowfall (Cm) as per published Meteorological/ Climatological data

Wind zone : 5

Basic wind velocity (m/sec.) : 50 m/sec.

Maximum altitude above mean sea level (Metres) Upto 1000m

Isoceraunic level (days/years) 50

Moderately hot and humid tropical, climate, conducive to rust and fungus growth.

TECHNICAL SPECIFICATIONS

SECTION-II

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TECHNICAL SPECIFICATIONS
SECTION-II

1.0 **Technical Description of Composite Long Rod Insulators**

1.1 **Details of Composite Long Rod Insulators**

1.1.1 The insulators of the strings shall consist of composite long rod insulators for a three phase, 50 Hz, effectively earthed 220kV transmission system in a very heavy polluted atmosphere. Couplings shall be ball and socket type.

1.1.2 Bidder shall quote such composite insulators which have proven use under saline environmental and operational condition. The Bidder shall furnish evidence in the form of certification from the power utilities that the similar type of product supplied to them had been performing satisfactory. The Bidder shall also submit certified test report for an accelerated ageing test of 5000 hours such as that described in Appendix-C of IEC-61109 or 62217.

1.1.3 Insulators shall have sheds of the "open aerodynamic profile with good self-cleaning properties. Insulator shed profile, spacing projection etc. shall be strictly in accordance with the recommendation of IEC-60815.

1.1.4 The size of long rod insulator, minimum creepage distance, the number to be used in different type of strings, their electromechanical strength and mechanical strength of insulator string along with hardware fittings shall be as follows:

S. No.	Type of String	*Size of composite Insulator (Core dia x Nominal length)(mm)	Minimum Creepage Distance (mm)	No. of individual Units per string	Electro-Mechanical Strength of Insulator Unit (KN)	Mechanical Strength of Insulator String along with Hardware fittings (KN)
1	2	3	4	5	6	7
1	Single Suspension ‘pilot’	20-24 x 2175	7595	1 x 1	90/120	90/120
2	Single ‘I’ suspension	20-24 x 2175	7595	1 x 1	90/120	90/120
3	Single tension String	24 x 2720	7595	1 x 1	160	160
4	Double tension String	24 x 2720	7595	2 x 1	160	2x 160
5	Double Suspension	20-24x2175	7595	2 x 1	90/120	2 x 90/120
6	Double Suspension for JCT	24x2175	7595	2 x 1	160	2x 160

Note: **The core dia of composite insulators mentioned at column No.3 is for indicative purpose. The bidder shall offer composite long rod insulators of suitable core dia to meet specified E&M and torsion strength requirements. For offered core dia, less than indicated in table above, the bidder shall submit documentary evidence of past supplies & satisfactory operation of the same for minimum period of three years. However, the overall string length shall be within the limits specified in the drawing.*

1.2 **Ball and Socket Designation**

The dimensions of the Ball and Socket shall be of 16 mm designation for 90KN insulators and 20mm designation for 120 KN & 160 KN Insulators in accordance with the standard dimensions stated in IEC:60120 / IS:2486 (part-II)

1.3 **Dimensional Tolerance of Composite Insulators**

The tolerances on all dimensions e.g. diameter, length and creepage distance shall be allowed as follows:
± (0.04d+ 1.5) mm when d≤ 300mm.
±: (0.025d+6) mm when d > 300 mm.

Where, d being the dimensions in millimeters for diameter, length or creepage distance as the case may be.

However, no negative tolerance shall be applicable to creepage distance.

1.4 **Interchangeability**

The composite long rod insulators inclusive of the ball & socket connection shall be standard design suitable for use with the hardware fittings of any make conforming to relevant IEC standards.

1.5 **Corona and RI Performance**

All surfaces shall be clean, smooth, without cuts, abrasions or projections. No part shall be subjected to excessive localized pressure. The insulator and metal parts shall be so designed and manufactured that it shall avoid local corona formation and no generate any radio interference beyond specified limit under the operating conditions.

1.6 **Maintenance**

1.6.1 The long rod insulators offered shall be suitable for employment of hot line maintenance technique so that usual hot line operation can be carried out with ease speed and safety.

1.6.2 All insulators shall be designed to facilitate cleaning and insulators shall have the minimum practical number of sheds and grooves. All grooves shall be so proportioned that any dust deposit can be removed without difficulty either by wiping with a cloth or by remote washing under live line condition.

1.7 Materials

1.7.1 Core

It shall be a glass-fiber reinforced (FRP rod) epoxy resin rod of high strength. The rod shall be resistant to hydrolysis. Glass fibers and resin shall be optimized. The rod shall be electrical grade corrosion resistant (ECR), boron free glass and shall exhibit both high electrical integrity and high resistance to acid corrosion.

1.7.2 Housing & Weathersheds

The FRP rod shall be covered by a sheath of a silicone rubber compound of a thickness of minimum 3mm for 220 kV AC. The housing & weathersheds should have silicon content of minimum 30% by weight. It should protect the FRP rod against environmental influences, external pollution and humidity. It shall be extruded or directly molded on the core. The interface between the housing and the core must be uniform and without voids. The strength of the bond shall be greater than the tearing strength of the polymer. The manufacturer shall follow non-destructive technique (N.D.T.) to check the quality of jointing of the housing interface with the core. The technique to be followed with detailed procedure and sampling shall be furnished by the Supplier and finalized during finalization of MQP.

The weathersheds of the insulators shall be of alternate shed profile. The weathersheds shall be vulcanized to the sheath (extrusion process) or molded as part of the sheath (injection molding process) and free from imperfections. The vulcanization for extrusion process shall be at high temperature and for injection molding shall be at high temperature & high pressure. Any seams / burrs protruding axially along the insulator, resulting from the injection molding process shall be removed completely without causing any damage to the housing. The track resistance of housing and shed material shall be class 1A4.5 according to IEC60587**.** The strength of the weathershed to sheath interface shall be greater than the tearing strength of the polymer. The composite insulator shall be capable of high pressure washing.

1.7.3 End Fittings

End fittings transmit the mechanical load to the core. They shall be made of malleable cast iron spheroidal graphite or forged steel. They shall be connected to the rod by means of a controlled compression technique. The manufacturer shall have in-process Acoustic emission arrangement or some other arrangement to ensure that there is no damage to the core during crimping. This verification shall be in-process and done on each insulator. The system of attachment of end fitting to the rod shall provide superior sealing performance between housing and metal connection. The gap between fitting and sheath shall be sealed by a flexible silicone rubber compound. The sealing shall stick to both housing and metal end fitting. The sealing must be humidity proof and durable with time.

End fittings shall have suitable provisions for fixing grading rings at the correct position as per design requirements.

1.7.4 Grading Rings

Grading rings shall be used at both ends of each composite insulator unit for reducing the voltage gradient on and within the insulator and to reduce radio and TV noise to acceptable levels. The size and placement of the metallic grading rings shall be designed to eliminate dry band arcing/corona cutting/ exceeding of permissible electrical stress of material. The insulator supplier shall furnish design calculations using appropriate electric field software showing electric field at surface of housing, inside housing & core and at the interface of housing and metal fittings with the proposed placement and design of corona. Grading rings shall be capable of installation and removal with hot line tools without disassembling any other part of the insulator assembly. They shall have simple locking mechanism to ensure they are installed at the correct position.

The design &supply of grading rings shall be in the scope of the composite insulator supplier.

1.8 Workmanship

1.8.1 All the materials shall be of latest design and conform to the best modern practices adopted in the extra high voltage field. Bidders shall offer only such insulators as are guaranteed by him to be satisfactory and suitable for 220kV transmission lines and will give continued good service.

1.8.2 The design, manufacturing process and material control at various stages shall be such as to give maximum working load, highest mobility, best resistance to corrosion, good finish and elimination of sharp edges and corners to limit corona and radio interference.

1.8.3 The design of the insulators shall be such that stresses due to expansion and contraction in any part of the insulator shall not lead to deterioration.

1.8.4 The core shall be sound and free of cracks and voids that may adversely affect the insulators.

1.8.5 Weathersheds/ Housing shall be uniform in quality. They shall be clean, sound, smooth and free from gross defects and excessive flashing at parting lines.

1.8.6 End fittings shall be free from cracks, seams, shrinks, air holes and rough edges. End fittings should be effectively, sealed to prevent moisture ingress, effectiveness of sealing system must be supported by test documents. All surfaces of the metal parts shall be perfectly smooth with the projecting points or irregularities which may cause corona. All load bearing surfaces shall be smooth and uniform so as to distribute the loading stresses uniformly.

1.8.7 All ferrous parts shall be hot dip galvanized to give a minimum average coating of zinc equivalent to 600 gm/sq.m. and shall be in accordance with the requirement of ISO: 1461 (E) and shall satisfy the tests mentioned in ISO: 1460 (E). The zinc used for galvanizing shall be of purity of 99.95%. The zinc coating shall be uniform,

adherent, smooth, reasonably bright continuous and free from imperfections such as flux, ash rust stains, bulky white deposits and blisters. The galvanized metal parts shall be guaranteed to withstand at least six successive dips each lasting for one (I) minute duration under the standard preece test. The galvanizing shall be carried out only after any machining.

2.0 Equipment Marking

2.1 Each composite long rod unit shall be legibly and indelibly marked with the trade mark of the manufacturer, name of Delhi Transco Limited and month & year of manufacture. The guaranteed combined mechanical and electrical strength shall be indicated in kilo Newton followed by the word 'kN' to facilitate easy identification and to ensure proper use.

2.2 One 10 mm thick ring or 20 mm thick spot of suitable quality of paint shall be marked on the cap/end fitting of each composite long rod of particular strength for easy identification of the type of insulator. The paint shall not have any deteriorating effect on the insulator performance. Following codes shall be used as identification mark:

For	90 kN long rod unit	: Orange
For	120 kN long rod unit	: Yellow
For	160 kN long rod unit for nominal length of 2720 mm	: Green
For	160 kN long rod unit for nominal length of 2175 mm	: Blue

3.0 Bid Drawings

3.1 The Bidder shall furnish full description and illustration of the material offered.

3.2 The Bidder shall furnish along with the bid the outline drawing of each insulator unit including a cross sectional view of the long rod insulator unit. The drawing shall include but not limited to the following information:

(a) Major Dimensions with manufacturing tolerances

(b) Minimum Creepage distance with positive tolerance

(c) Protected creepage distance

(d) Unit mechanical and electrical characteristics

(e) Size and weight of ball and socket parts

(f) Weight of composite long rod units

(g) Materials

3.3 After placement of award, the Supplier shall submit full dimensioned insulator drawings containing all the details as given in Clause No. 3.2 above, in four (4) copies to Owner for approval. After getting approval from Owner, the Supplier shall submit 10 more copies of the same drawing along with a soft copy to the Owner for further distribution and field use at Owner's end.

3.4 After placement of award the Supplier shall also submit fully dimensioned insulator crate drawing for different type of insulators.

4.0 Tests and Standards

4.1 Type Tests

The required type tests on composite long rod units, components, materials and complete strings are stipulated hereunder.

The specified type tests under the following clause shall not be required to be carried out if a valid test certificate is available for a similar design. The tests certificate shall be considered valid if:

i. Tests conducted earlier is either conducted in accredited laboratory (accredited based on ISO/IEC vide 25/17025 or EN 45001 by the National accreditation body of the country where laboratory is located) or witnessed by the representative(s) of DTL or utility and

ii. Tests have been conducted not prior to 5 (five) years from the date of bid opening.

In case the test have been conducted earlier than the above stipulated period or in the event of any discrepancy in the test report (i.e., any test not applicable due to any design/manufacturing change including substitution of components or due to non-compliance with the requirement stipulated in the Technical Specifications), the tests shall be conducted by the Supplier at no extra cost to the Purchaser.

4.1.1 On the complete composite Long Rod Insulator String with Hardware Fittings

	Tests	**Ref**
a)	Power frequency voltage withstand test with corona control rings/grading ring and arcing horns under wet condition	As per IEC:60383
b)	Impulse voltage withstand test under dry condition	As per IEC:60383
c)	Corona and RIV test under dry condition	As per Annex-A
f)	Mechanical Strength test	As per Annex-A
g)	Vibration test	As per Annex-A
h)	Salt-fog pollution withstand test	As per Annex-A

Note: Above test should have to be conducted on single suspension and single tension.

4.1.2 **On Composite Insulator Units**

(a)	Tests on interfaces and connections of metal fittings	IEC: 61109-2008
(b)	Assembled core load time test	IEC: 61109-2008
(c)	Damage limit proof test and test of tightness of interface between end fittings and insulator housing.	IEC: 61109-2008
(d)	High Pressure washing test	Annexure-A
(e)	Brittle fracture resistance test	Annexure-A
(f)	Dye penetration test	IEC: 61109-2008
(g)	Water diffusion test	IEC: 61109-2008
(h)	Tracking and erosion test	IEC: 61109-2008
(i)	Hardness test	IEC: 61109-2008
(j)	Accelerated weathering test	IEC: 61109-2008
(k)	Flammability test	IEC: 61109-2008
(l)	Silicone content test	Annexure-A
(m)	Recovery of Hydrophobicity test	Annexure-A
(n)	Torsion test	Annexure-A

Hardness test, Accelerated weathering test and Flammability test specified under clause no. 4.1.2 above shall be conducted on housing/weather shed of either 90 KN or 120 KN or 160 KN composite long rod for the same type of material.

4.2 Acceptance Tests:

4.2.1 For Composite Long Rod Insulators

a)	Verification of dimensions	IEC : 61109**-**2008
b)	Galvanising test	IEC : 60383
c)	Verification of end fittings	IEC: 61109 -2008
d)	Recovery of Hydrophobicity	Annexure-A
e)	Verification of tightness of interface between end fittings and insulator housing and of specified mechanical load	IEC : 61109-2008
f)	Tests on interfaces and connections of metal fittings	IEC: 61109**-**2008
g)	Silicone content test	Annexure-A

h)	Brittle Fracture Resistance Test	Annexure-A
i)	Dye Penetration Test	IEC :61109-2008
j)	Water Diffusion Test	IEC : 61109-2008

The test 4.2.1 (f) to (j) shall be carried out as acceptance test on any one lot.

In the event of failure of the sample to satisfy the acceptance test(s) specified in 4.2 above, the retest procedure shall be as per IEC 61109.

4.3 **Routine Tests**

4.3.1 For Composite Long Rod Insulator Units

a) Mechanical routine test IEC: 61109-2008
b) Visual Inspection IEC: 61109-2008

4.4 **Tests During Manufacture**

On all components as applicable

a)	Chemical analysis of zinc used for galvanising	As per Annexure-A
b)	Chemical analysis, mechanical, metallographic test and magnetic particle inspection for malleable castings.	As per Annexure-A
c)	Chemical analysis hardness tests and magnetic particle inspection for forgings	As per Annexure-A
d)	Tracking and erosion test on insulating material	IEC 60587

4.5 **Testing Expenses**

As mentioned under clause 4.1 above, no type test charges shall be payable to the supplier.

4.5.1 For Type Tests which involves the tests on the complete insulator string with hardware fitting, standard hardware fittings similar to existing insulator strings shall be arranged and used by the insulator supplier at his own cost.

4.5.2 In case of failure in any type test the supplier is either required to modify the design of the material & successfully carryout all the type tests as has been detailed out in Clause 4.1 of this specifications or to repeat that particular type test at least three times successfully at his own expenses.

4.5.3 Bidder shall indicate the laboratories in which they propose to conduct the type tests. They shall ensure that adequate facilities are available in the laboratory and the tests can be completed in these laboratories within the time schedule guaranteed by them in the appropriate schedule.

4.5.4 The entire cost of testing for acceptance and routine tests and tests during manufacture specified herein shall be treated as included in the quoted Ex-works/CIF Price.

4.5.5 In case of failure in any type test, if repeat type tests are required to be conducted, then all the expenses for deputation of Inspector/ Owner's representative shall be deducted from the contract price. Also if on receipt of the Supplier's notice of testing, the Owner's representative does not find the material or test setup / equipments to be ready for testing, the expenses incurred by the Owner for re-deputation shall be deducted from contract price.

4.5.6 The Supplier shall intimate the Owner about carrying out of the type tests alongwith detailed testing programme at least 3 weeks in advance (in case of testing in India) and at least 6 weeks advance (in case of testing abroad) of the scheduled date of testing during which the Owner will arrange to depute his representative to be present at the time of carrying out the tests.

4.6 **Sample Batch for Type Testing**

4.6.1 The bidder shall offer material for sample selection for type testing only after getting Quality Assurance Programme approved by the Owner. The bidder shall offer at least three times the quantity of materials required for conducting all the type tests for sample selection. The sample for type testing will be manufactured strictly in accordance with the Quality Assurance Programme approved by the Owner.

4.6.2 Before sample selection for type testing, the bidder shall be required to conduct all the acceptance tests successfully in presence of Owner's representative.

4.7 **Schedule of Testing**

4.7.1 The Bidder has to indicate the schedule of following activities in their bids:

a) Submission of drawing for approval.

b) Submission of Quality Assurance Programme for approval.

c) Offering of material for sample selection for type tests.

d)Type testing.

4.8 Additional Tests:

4.8.1 The Owner reserves the right of having at his own expenses any other test(s) of reasonable nature carried out at Supplier's premises, at site, or in any other place in addition to the aforesaid type, acceptance and routine tests to satisfy himself that the material comply with the Specifications.

4.8.2 The Owner also reserves the right to conduct all the tests mentioned in this specification at his own expense on the samples drawn from the site at Supplier's premises or at any other test centre. In case of evidence of non compliance, it shall be binding on the part of the Supplier to prove the compliance of the items to the technical specifications by repeat tests or correction of deficiencies or replacement of defective items, all without any extra cost to the Owner.

4.9 **Guarantee**

The Supplier of insulators shall guarantee overall satisfactory performance of the insulators.

4.10 **Test Reports**

4.10.1 Copies of type test reports shall be furnished in at least six (6) copies along with one original. One copy shall be returned duly certified by the Owner only after which the commercial production of the concerned material shall start.

4.10.2 Copies of acceptance test reports shall be furnished in at least six (6) copies. One copy shall be returned duly certified by the Owner, only after which the material shall be dispatched.

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

4.10.4 Test certificates of test during manufacture shall be maintained by the Supplier. These shall be produced for verification as and when desired by the Owner.

4.11 **Inspection**

4.11.1 The Owner's representative shall at all times be entitled to have access to the works and all places of manufacture, where insulator, and its component parts shall be manufactured and the representatives shall have full facilities for unrestricted inspection of the Supplier's and sub-Supplier's works, raw materials, manufacture of the material and for conducting necessary test as detailed herein.

4.11.2 The material for final inspection shall be offered by the Supplier only under packed condition as detailed in clause No 4.12 of the specification. The Owner shall select samples at random from the packed lot for carrying out acceptance tests. The lot should be homogeneous and should contain insulators manufactured in 3-4 consecutive weeks.

4.11.3 The Supplier shall keep the Owner informed in advance of the time of starting and the progress of manufacture of material in their various stages so that arrangements could be made for inspection.

4.11.4 No material shall be dispatched from its point of manufacture before it has been satisfactorily inspected and tested unless the inspection is waived off by the Owner in writing. In the latter case also the material shall be dispatched only after satisfactory testing for all tests specified herein have been completed.

4.11.5 The acceptance of any quantity of material shall in no way relieve the Supplier of his responsibility for meeting all the requirements of the specification and shall not prevent subsequent rejection, if such materials are later found to be defective.

4.12 Packing and Marking

4.12.1 All insulators shall be packed in suitable PVC/ plastic tubes/any other suitable packing. The packing shall provide protection against rodent. The Supplier shall furnish detailed design of the packing. For marine transportation, crates shall be palleted.

4.12.2 The packing shall be of sufficient strength to withstand rough handling during transit, storage at site and subsequent handling in the field.

4.12.3 Suitable cushioning, protective padding, or dunnage or spacers shall be provided to prevent damage or deformation during transit and handling.

4.12.4 All packing cases shall be marked legibly and correctly so as to ensure safe arrival at their destination and to avoid the possibility of goods being lost or wrongly dispatched on account of faulty packing and faulty or illegible markings. Each case/crate shall have all the markings stenciled on it in indelible ink.

4.12.5 The Supplier shall guarantee the adequacy of the packing and shall be responsible for any loss or damage during transportation, handling, storage and installation due to improper packing.

4.13 Standards

The insulator strings and its components shall conform to the following Indian/ International Standards which shall mean latest revision, with amendments/ changes adopted and published, unless specifically stated otherwise in the Specification.

4.13.1 In the event of supply of insulators conforming to standards other than specified, the Bidder shall confirm in his bid that these standards are equivalent or better to those specified. In case of award, salient features of comparison between the standards proposed by the Bidder and those specified in this document will be provided by the Supplier to establish equivalence.

Sl No.	Indian Standard	Title	International Standard
1.	IS:209-1992	Specification for zinc	BS:3436
2.	IS:406-1991	Method of Chemical Analysis of Slab Zinc	BS:3436
3.	IS:731-1991	Porcelain insulators for overhead Power lines with a nominal voltage greater than 1000 V	BS:137- (I&II) IEC:60383
4.	IS:2071 Part (1) - 1993	Methods of High Voltage Testing	IEC:60060-1

	(Part(II)- 1991 Part(III)- 1991		
5.	IS:2486 Part- 1-1993 Part- II-1989 Part-III-1991	Specification for Insulator fittings for Overhead Power Lines with a nominal voltage greater than 1000V General Requirements and Tests Dimensional Requirements Locking Devices	 BS:3288 IEC:60120 IEC:60372
6.	IS:2629-1990	Recommended Practice for Hot, Dip Galvanisation for iron and steel	1S0-1461 (E)
7.	IS:2633-1992	Testing of Uniformity of Coating of zinc coated articles	
8.	IS:6745-1990	Determination of Weight of Zinc Coating on Zinc coated iron and steel articles	BS:433-1969 1S0:1460-1973
9.	IS:8263-1990	Methods of RI Test of HV insulators	IEC:60437 NEMA Publication No.07/ 1964/ ClSPR
10.	IS:8269-1990	Methods for Switching Impulse test on HV Insulators	IEC:60506
11.		Thermal Mechanical Performance test and mechanical performance test on string insulator units	IEC: 60575
12.		Salt Fog Pollution Voltage Withstand Test	IEC:60507
13.		Insulators for overhead lines – Composite suspension and tension insulators for a.c. systems with a nominal voltage greater than 1000 V – definitions, test methods and acceptance criteria	IEC: 61109
14.		Selection and dimensioning of high voltage insulators intended for use in polluted conditions: Polymer Insulators for AC systems	IEC:60815-**3**
15.		Tests on insulators of Ceramic material or glass or glass for overhead lines with a nominal voltage greater than 1000V	IEC:60383
16.		Composite string insulator units for overhead lines with a nominal voltage above 1000V : Standard strength classes and end fittings	IEC 61466-1

17.		Composite string insulator units for overhead lines with a nominal voltage above 1000V : Dimensional and electrical characteristics	IEC 61466-2
18.		Electrical Insulating materials used under severe ambient conditions –Test methods for evaluating resistance to tracking and erosion	IEC 60587
19.		Polymeric insulators for indoor and outdoor use with nominal voltage greater than 1000V- General definitions, tests, methods and acceptance criteria.	IEC 62217

The standards mentioned above are available from:

Reference Abbreviation	**Name and Address**
BS	British Standards, British Standards Institution 101, Pentonvile Road, N - 19-ND, UK
IEC/CISPR	International Electro technical Commission, Bureau Central de la Commission, electro Technique international, 1 Rue de verembe, Geneva, SWITZERLAND
BIS/IS	Beureau Of Indian Standards. ManakBhavan, 9, Bahadur Shah ZafarMarg, New Delhi - 110001.INDIA
ISO	International Organisation for Standardization. Danish Board of Standardization Danish Standardizing Sraat, Aurehoegvej-12 DK-2900, Heeleprup, DENMARK
NEMA	National Electric Manufacture Association, 155, East 44th Street. New York, NY 10017U.S.A.
ASTM	American Society for Testing and Materials, 1916 Race St. Philadelphia, PA19103 USA

1.0 Tests on Complete Strings with Hardware Fittings

1.1 Corona Extinction Voltage Test (Dry)

The sample assembly when subjected to power frequency voltage shall have a corona extinction voltage of not less than 154 kV (rms) line to ground under dry condition for 220 kV lines. There shall be no evidence of corona on any part of the sample. The atmospheric condition during testing shall be recorded and the test results shall be accordingly corrected with suitable correction factor as stipulated in IEC: 60383.

1.2 RIV Test (Dry)

Under the conditions as specified under (1.1) above, the insulator string along with complete hardware fittings shall have a radio interference voltage level below 1000 micro volts at one MHz when subjected to 50 Hz AC voltage line to ground under dry condition. The test procedure shall be in accordance with IS: 8263/ IEC: 60437.

1.3 Mechanical Strength Test

The complete insulator string along with its hardware fitting excluding arcing horn, corona control ring, grading ring and suspension assembly/dead end assembly shall be subjected to a load equal to 50% of the specified minimum ultimate tensile strength (UTS) which shall be increased at a steady rate to 67% of the minimum UTS specified. The load shall be held for five minutes and then removed. After removal of the load, the string components shall not show any visual deformation and it shall be possible to disassemble them by hand. Hand tools may be used to, remove cotter pins and loosen the nuts initially. The string shall then be reassembled and loaded to 50% of UTS and the load shall be further increased at a steady rate till the specified minimum UTS 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 recorded.

1.4 Vibration Test

The suspension string shall be tested in suspension mode, and tension string in tension mode itself in laboratory span of minimum 30 metres. In the case of suspension string a load equal to 600 kg shall be applied along the axis of the suspension string by means of turn buckle. The insulator string along with hardware fittings and the each sub-conductors (each tensioned at 35 KN) shall be secured with clamps. The system shall be suitable to maintain constant tension on each sub-conductors throughout the duration of the test. Vibration dampers shall not be used on the test span. All the sub-conductors shall be vertically vibrated simultaneously at one of the resonance frequencies of the insulators string (more than 10 Hz) by means of vibration inducing equipment. The peak to peak displacement in mm of vibration at the anti node point, nearest to the string, shall be measured and the same shall not be less than $1000/f^{1.8}$ where f is the frequency of vibration in cycles/sec. The insulator string shall be vibrated for not less than 10 million cycles without any failure. After the test the insulators shall be examined for looseness of pins and cap or any crack. The hardware shall be examined for looseness, fatigue failure and mechanical strength test. There shall be no deterioration of properties of hardware components and insulators after the

vibration test. The insulators shall be subjected to the Mechanical performance test followed by mechanical strength test as per relevant standards.

1.5 **Salt-fog pollution withstand test**

This test shall be carried out in accordance with IEC: 60507. The salinity level for porcelain long rod insulators & composite long rod insulators shall be 160 Kg/m3 NACL.

2.0 **Composite Long rod Insulator Units**

2.1 **Brittle Fracture Resistance Test**

The test arrangement shall be according to Damage limit proof test with simultaneous application of 1N-HNO_3acid directly in contact with naked FRP rod. The contact length of acid shall not be less than 40mm and thickness around the core not less than 10mm.The rod shall withstand 80% of SML for 96 hours.

2.2 **Recovery of Hydrophobicity Test**

(1) The surface of selected samples shall be cleaned with isopropyl alcohol. Allow the surface to dry and spray with water. Record the HC classification. Dry the sample surface.

(2) Treat the surface with corona discharges to destroy the hydrophobicity. This can be done utilizing a high frequency corona tester, Holding the electrode approximately 3mm from the sample surface, slowly move the electrode over an area approximately l" x l". Continue treating this area for 2 - 3 minutes, operating the tester at maximum output.

(3) Immediately after the corona treatment, spray the surface with water and record the HC classification. The surface should be hydrophilic, with an HC value of 6 or 7. If not, dry the surface and repeat the corona treatment for a longer time until an HC of 6 or 7 is obtained. Dry the sample surface.

(4) Allow the sample to recover and repeat the hydrophobicity measurement at several time intervals. Silicone rubber should recover to HC 1- HC 2 within 24 to 48 hours, depending on the material and the intensity of the corona treatment.

2.3 **Silicone content test**

Minimum content of silicone as guaranteed by supplier shall be verified through FT-IR spectroscopy & TGA analysis or any other suitable method mutually agreed between Owner& Supplier in Quality Assurance Programme.

2.4 **High Pressure washing test**

The washing of a complete insulator of each E&M rating is to be carried out at 3800kPa with nozzles of 6mm diameter at a distance of 3m from nozzles to the insulator, The washing shall be carried out for 10minutes. There shall be no damage to the sheath or metal fitting to housing interface. The verification shall be 1 minute wet power frequency withstand test.

2.5 **Torsion Test**

Three complete insulators of each E&M rating shall be subjected to a torsional load of 55Nm. The torsional strength test shall be made with test specimen adequately secured to the testing machine. The torsional load shall be applied to the test specimen through a torque member so constructed that the test specimen is not subjected to any cantilever stress. The insulator after torsion test must pass the Dye Penetration Test as per IEC 61109.

3. **Tests on All components (As applicable)**

3.1 **Chemical Analysis of Zinc used for Galvanizing**

Samples taken from the zinc ingot shall be chemically analyzed as per IS: 209-1979.The purity of zinc shall not be less than 99.95%.

3.2 **Tests for Forgings**

The chemical analysis hardness tests and magnetic particle inspection for forgings, will be as per the internationally recognised procedures for these tests. The sampling will be based on heat number and heat treatment batch. The details regarding test will be as discussed and mutually agreed to by the Supplier and Owner in Quality Assurance Programme.

3.3 **Tests on Castings**

The chemical analysis, mechanical and metallographic tests and magnetic, particle inspection for castings will be as per the internationally recognised procedures for these tests. The samplings will be based on heat number and heat treatment batch. The details regarding test will be as discussed and mutually agreed to by the Supplier and Owner in Quality Assurance Programme.

COMPOSITE LONG ROD INSULATOR PACKAGE FOR 220 kV TRANSMISSION LINES

(Guaranteed Technical Particulars for Composite Long Rod Insulators)

Bidder's Name & Address

Guaranteed Technical Particulars of AC Composite Long Rod Insulators:

S.No.	Description	Unit	90 KN	120 KN	160 KN
1.	Name & Address of manufacturer				
2.	Weight of single unit	Kg.			
3.	Size and Designation of Ball & Socket assembly	mm			
4	Core diameter	mm			
5.	Tolerance on Core Diameter	±mm			
6.	Nominal length (Insulation Spacing)	Mm			
7.	Tolerance on Nominal length	±mm			
8.	Dry Arcing distance	mm			
9.	Number of sheds .	Nos.			
10.	Sheds profile (type)				
11	Shed spacing	*mm*			
12	Sheds profile (Regular/Alternating)				
13	Shed diameter	*mm*			
14	Tolerance on shed diameter	±mm			
15	Minimum Creepage distance	*mm*			
16	Tolerance on Creepage distance	*mm*			
17	Guaranteed mechanical strength	*KN*			
18	Routine mechanical load	*KN*			
19	Material a) FRP Rod b) Weather Sheds with % contents of silicon c) Housing d) End Fittings e) Grading Rings				
20	Minimum thickness of sheath covering over the core	*mm*			
21	Power frequency withstand voltage of single unit a) Dry b) Wet	 *KV(rms)* *KV(rms)*			
22	Power Frequency flashover voltage of single unit a) Dry b) Wet	 KV(rms) KV(rms)			
23	Impulse withstand voltage of single unit (Dry) a) Positive b) Negative	 kV(Peak) kV(Peak)			
24	Impulse flashover voltage of single unit (Dry) a) Positive	 kV(Peak)			

	b) Negative	kV(Peak)			
25	Purity of zinc used for galvanizing end fittings	%			
26	Number of dips which the end fittings can withstand in standard Preece test	Nos.			
27	Certified test report of accelerated ageing test of 5000 hours (enclosed) (Appendix-C of IEC-6l109)	Yes/ No			
28	Drawing enclosed	Yes/ No			

Date: (Signature)……..

Place : (Printed Name) ----------

(Designation) ----------

(Common Seal) ----------

COMPOSITE LONG ROD INSULATOR PACKAGE FOR 220 kV TRANSMISSION LINES

(Guaranteed Technical Particulars for Insulator Strings with Composite Long Rod Insulators along with Hardware Fittings)

Bidder's Name & Address

Guaranteed Technical Particulars for Insulator Strings with Composite Long Rod Insulators along with Hardware Fittings

S No.	Description	Unit	Single 'I' Suspension String	Single Suspension Pilot String	Double 'I' Suspension String	Single Tension String	Double Tension String
1	Power Frequency withstand voltage of string with arcing horns, corona control rings/ grading rings under wet condition	Kv rms					
2	Switching Surge withstand voltage (Wet) a) Positive b) Negative	kV (Peak) kV (Peak)					
3	Impulse withstand voltage (dry) a) Positive b) Negative	kV (Peak) kV (Peak)					
4	Impulse flashover voltage (dry) c) Positive d) Negative	kV (Peak) kV (Peak)					
5	Minimum Corona extinction voltage under dry condition	Kv					
6	RIV at 1 MHZ when the string is energized at 154 kV(rms) under dry condition	Microvolt					
7	Power Frequency withstand Voltage at salinity level of 160 Kg/m^3 NACL	KV					

S No.	Description	Unit	Single 'V' Suspension String	Single 'I' Suspension String	Single Suspension Pilot String	Double Tension String
8	Mechanical strength of complete insulator string along with hardware fittings	KN				
9	Dimensioned drawings of insulator strings enclosed.	Yes/ No				

Date:
Place:

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

SECTION-IV

TECHNICAL SPECIFICATION

CIRCUIT BREAKER (CB)

TECHNICAL SPECIFICATIONS FOR 220 KV CIRCUIT BREAKERS

1.0 GENERAL

1.1 **The 220kV SF6 gas circuit breaker shall conform to IEC:62271-100, IEC:62271-1:2017 with latest amendments/ revision and the accessories/items of the Circuit breaker shall conform to the relevant IS/IEC with latest amendments/revision** except to the extent explicitly modified in the specification and shall also be in accordance with requirements specified in Chapter-GTR

1.2 The circuit breakers offered would be of sulphur hexa fluoride (SF6) type only and of class **C2-M2 as per IEC.**

1.3 The circuit breaker shall be complete with terminal connectors, operating mechanism, control cabinets, piping, inter pole cable, cable accessories like glands, terminal blocks, marking ferrules, lugs, pressure gauges, density monitors (with graduated scale), galvanized support structure for CB and control cabinets, their foundation bolts and all other circuit breaker accessories required for carrying out all the functions the CB is required to perform.

All necessary parts to provide a complete and operable circuit breaker installation such as main equipment, terminals, control parts, connectors and other devices whether specifically called for herein or not shall be provided.

1.4 The support structure of circuit breaker as well as that of control cabinet shall be hot dip galvanized. All other parts shall be painted, as per shade 697 of IS -5.

1.5 The circuit breakers shall be designed for use in the geographic and meteorological conditions as given hereunder:

The equipment covered under this specification is for outdoor installation and the climatic conditions that are prevailing at the sites in Delhi.

- **Temperature: The reference ambient temperature be taken as 43.3^{0}C as per IS 9676**
- **Maximum Ambient Air Temp. : 50deg. C**
- **Maximum Daily Average Ambient Temp : 40deg C**
- **Relative Maximum Humidity : 100%**
- **Relative Minimum humidity: 10%**
- **Average annual rainfall:750mm**
- **Average No. of rainy days per annum : 50**
- **Average No. of Thunder Storm days per annum: 40**
- **Altitude: Less than 300Mtr.**
- **Rainy months: June to September**
- **Wind pressure : 195 kg/m2 up to 30 meter Elevation as per IS 875-1975**
- **CB shall be designed to withstand seismic forces, corresponding to an acceleration of 0.3g horizontal.**

- **The NCT of Delhi region is heavily polluted and as a mandatory requirement the creepage distance for the insulators to be utilized is minimum 31mm/KV in line with IEC.**

2.0 DUTY REQUIREMENTS:

2.1 The circuit breaker shall be re-strike free as per IEC under all duty conditions and shall be capable of performing their duties.

2.2 The circuit breaker shall meet the duty requirements for any type of fault or fault location also for line switching when used on a effectively grounded system, and perform make and break operations as per the stipulated duty cycles satisfactorily.

2.3 The breaker shall be capable of interrupting the steady state and transient magnetizing current corresponding of power transformers**/reactors.**

2.4 The circuit breaker shall also be capable of :

i) Interrupting line/ cable charging current as per IEC without any re-strikes.
ii) Clearing short line fault (Kilometric faults) with source impedance behind the bus equivalent to symmetrical fault current specified.
iii) Breaking 25% of the rated fault current at twice rated voltage under phase opposition condition.

2.5 The Breaker shall satisfactorily withstand the high stresses imposed on them during fault clearing, load rejection and re-energization of lines with trapped charges. The breaker shall also withstand the voltages specified under **Clause 16** of this specification.

3.0 TOTAL BREAK TIME:

3.1 The total break time as specified under this Chapter shall not be exceeded under any of the following duties:

i) Test duties 1,2,3,4,5 (TRV as per IEC: 62271-100)
ii) Short line fault L75, L90 (- do -)

3.2 The Bidder may please note that total break time of the breaker shall not be exceeded under any duty conditions specified such as with the combined variation of the trip coil voltage, (70-110%), pneumatic and arc extinguishing medium pressure etc. While furnishing the proof of the total break time of complete circuit breaker, the Bidders may specifically bring out the effect of non-simultaneity between contacts within a pole or between poles and show how it is covered in the guaranteed total break time.

3.3 The values guaranteed shall be supported with the type test reports.

4.0 CONSTRUCTIONAL FEATURES:

The features and constructional details of circuit breakers shall be in accordance with requirements stated hereunder:

4.1 Contacts

4.1.1 The gap between the open contacts shall be such that it can withstand at least the rated phase to ground voltage for 8 hours at zero gauge pressure of SF6 gas due to the leakage. The breaker should be able to withstand all dielectric stresses imposed on it in open condition at lock out pressure continuously (i.e.2 p.u. across the breaker continuously).

4.2 If multi-break interrupters are used, these shall be so designed and augmented that a uniform voltage distribution is developed across them. Calculations/ test reports in support of the same shall be furnished. The thermal and voltage withstand of the grading elements shall be adequate for the service conditions and duty specified.

4.3 The SF6 Circuit Breaker shall meet the following additional requirements:

a) The circuit breaker shall be single pressure type. The design and construction of the circuit breaker shall be such that there is a minimum possibility of gas leakage and entry of moisture. There should not be any condensation of SF6 gas on the internal insulating surfaces of the circuit breaker.

b) All gasketted surfaces shall be smooth, straight and reinforced, if necessary, to minimize distortion and to make a tight seal, the operating rod connecting the operating mechanism to the arc chamber (SF6 media) shall have adequate seals. The SF6 gas leakage should not exceed 1% per year. In case the leakage under the specified conditions is found to be greater than 1% after one year of commissioning of circuit breaker, the manufacturer will have to supply free of cost, the total gas requirement for subsequent ten (10) years, based on actual leakage observed during first year of operation after commissioning.

c) In the interrupter assembly there shall be an absorbing product box to minimize the effect of SF6 decomposition products and moisture. The material used in the construction of the circuit breakers shall be such as fully compatible with SF6 gas decomposition products.

d) Each pole shall form an enclosure filled with SF6 gas independent of two other poles, the SF6 density of each pole shall be monitored. Typical scheme for SF6 gas density monitoring **shall be submitted by the bidder with all the drawings and manuals.**

e) The dial type SF6 density monitor shall be adequately temperature compensated to model the pressure changes due to variations in ambient temperature within the body of circuit breaker as a whole. The density monitor shall have graduated scale and shall meet the following requirements:

i) It shall be possible to dismantle the density monitor for checking/replacement without draining the SF6 gas by providing suitable interlocked non- return valve coupling.

f) Each Circuit Breaker shall be capable of withstanding a vacuum of minimum 8 millibars without distortion or failure of any part.

g) Sufficient SF6 gas including that will be required for gas analysis during filling shall be provided to fill all the circuit **breaker** installed. In addition spare gas shall be supplied in separate unused cylinders **for future maintenance of the circuit breaker.**

4.4 Provisions shall be made for attaching an operational analyzer after installation of circuit breakers at site to record contact travel, speed and making measurement of operating timings, synchronization of contacts in one pole. In case operation analyzer is already available at a particular site, the contractor shall have to supply a suitable adopter/transducer so that the offered circuit breaker can be used with the operational analyzer.

5.0 SULPHUR HEXAFLUORIDE GAS (SF6 GAS) :

a) The SF6 gas shall comply with IEC 376, 376A and 376B and shall be suitable in all respects for use in the switchgear under the operating conditions.

b) The high pressure cylinders in which the SF6 gas is shipped and stored at site shall comply with requirements of the relevant standards and regulations.

c) Test: SF6 gas shall be tested for purity, dew point, air, hydrolysable fluorides and water content as per IEC 376, 376A and 376B and test certificates shall be furnished to the **purchaser** indicating all the tests as per IEC 376 **for the SF6 gas**. Gas bottles should be tested for leakage during receipt at site.

6.0 INSULATORS :

a) Hollow column insulators shall be manufactured and type tested in accordance with IEC 233/IS 5621. The support insulators shall be manufactured tested as per IS-2544/ IEC-169 and IEC-273. The support insulators shall also conform to IEC 815 as applicable.

Hollow column insulators shall be manufactured from high quality porcelain. Porcelain used shall be homogeneous, free from laminations, cavities and other flaws or imperfections that might affect the mechanical or dielectric quality and shall be thoroughly vitrified tough and impervious to moisture.

Glazing of the porcelain shall be uniform brown in color, free from blisters, burrs and similar other defects.

Hollow column insulators shall be designed to have ample insulation, mechanical strength and rigidity for the conditions under which they will be used for 245 KV voltage outdoor system.

All iron parts shall be hot dip galvanized and all joints shall be air tight. Surface of joints shall be trued up porcelain parts by grinding and metal parts by machining. Insulator design shall be such as to ensure a uniform compressive pressure on the joints.

Tests:

In bushing, hollow column insulators and support insulators shall conform to type tests and shall be subjected to routine tests in accordance with relevant IS/IEC. The type test reports shall be submitted for approval.

b) The mechanical characteristics of insulators shall match with the requirements specified under this **specification.**

c) All insulators shall conform to IEC-61264 (for pressurized hollow column insulators) and IEC-233 (for others). All routine and sample tests shall be conducted on the hollow column insulators as per relevant IS/IEC.

d) Hollow Porcelain for pressurized columns/chambers should be in one integral piece in green and fired stage.

7.0 SPARE PARTS AND MANDATORY MAINTENANCE EQUIPMENT :

The bidder shall include in his proposal spare parts and maintenance equipment **for the proper working and maintenance of the circuit breaker after commissioning.** Calibration certificates of each maintenance equipment shall be supplied along with the equipment.

8.0 OPERATING MECHANISM AND CONTROL

8.1 General Requirements

8.1.1 Circuit breaker shall be operated by pneumatic mechanism or spring charged mechanism or a combination of these. The mechanism shall be housed in a weather proof and dust proof control cabinet as detailed below:

- **Control cabinet shall generally conform to & be tested in accordance with IS-5039/IS-8623, IEC-439, as applicable.**
- **Control cabinet shall be made of sheet steel or aluminum enclosure and shall be dust, water and vermin proof. Sheet steel used shall be at least 2.0 mm thick cold rolled or 2.5 mm hot rolled. The box shall be properly braced to prevent wobbling. There shall be sufficient reinforcement to provide level surfaces, resistance to vibrations and rigidly during transportation and installation. In case of aluminum enclosed box the thickness of aluminum shall be such that it provides adequate rigidity and long life as comparable with sheet steel of specified thickness.**
- **Cabinet shall be provided with double hinged doors with padlocking arrangements. The distance between two hinges shall be adequate to ensure uniform sealing pressure against atmosphere. The quality of the gasket shall be such that it does not get damaged/cracked during the operation of the equipment.**
- **All doors, removable covers and plates shall be gasketed all around with suitably profiled EPDM gaskets. The gasket shall be tested in accordance with approved quality plan. The quality of gasket shall be such that it does not get damaged/cracked during the ten years of operation of the equipment or its major overhaul whichever is earlier.**
- **All gasketted surfaces shall be smooth straight and reinforced if necessary to minimize distortion and to make a tight seal. Ventilating Louvers, if provided, shall have screen and filters. The screen shall be fine wire mesh made of brass.**
- **Cabinet shall be designed for the entry of cables from bottom by means of weather proof and dust-proof connections. cabinet shall be designed with generous clearance to avoid interference between the wiring entering from below and any terminal blocks or accessories mounted within the cabinet. Suitable cable gland plate projecting at**

least 150 mm above the base of the marshalling kiosk/box shall be provided for this purpose along with the proper blanking plates. Necessary number of cable glands shall be supplied and fitted on this gland plate. The gland shall project at least 25 mm above gland plate to prevent entry of moisture in cable crutch. Gland plate shall have provision for some future glands to be provided later, if required. The Nickel plated glands shall be dust proof, screw on & double compression type and made of brass. The gland shall have provision for securing armor of the cable separately and shall be provided with earthing tag. The glands shall conform to BS:6121.

- **Positive earthing of the cabinet shall be ensured by providing two separate earthing pads. The earth wire shall be terminated on to the earthing pad and secured by the use of self etching washer. Earthing of hinged door shall be done by using a separate earth wire. The following routine tests along with the routine tests as per IS:5039 shall also be conducted:**
    - **i. Check for wiring.**
    - **ii. Visual and dimension check**
- **The enclosure of bay marshalling kiosk, junction box, terminal box shall conform to IP-55 as per IS: 13947 including application of 2.5 KV rms for 1(one) minute, insulation resistance and functional test after IP-55 test.**
- **Auxiliary Switches: The following type tests reports on auxiliary switches shall be submitted for approval:**
    - **i. Electrical endurance test – A minimum of 2000 operation for 2A, D,C with a time constant greater than or equal to 20 millisecond with a subsequent examination of mV drop/visual defects/temperature rise test.**
    - **ii. Mechanical endurance test. A minimum of 1,00,000 operations with a subsequent checking of contact pressure test/visual examination.**
    - **iii. Heat run tests on contacts.**
    - **iv. IR/HV test etc.**

8.1.2 The operating mechanism shall be suitable for high speed re-closing, strong & rigid, not subject to rebound and shall be readily accessible for maintenance for a man standing on ground.

8.1.3 The mechanism shall be anti -pumping and trip free (as per IEC definition) under every method of closing.

8.1.4 The mechanism shall be such that the failure of any auxiliary spring will not prevent tripping and will not cause trip or closing operation of the power operating devices.

8.1.5 A electrical as well as mechanical indicator shall be provided to show open and close position of the breaker. It shall be located in a position where it will be visible to a man standing on the ground level with the mechanism housing closed. An operation counter shall also be provided in the central control cabinet.

8.1.6 Working parts of the mechanism shall be corrosion-resisting material, bearings which require grease shall be equipped with pressure type grease fittings. Bearing pin, bolts, nuts and other parts shall be adequately pinned or locked to prevent loosening or changing adjustment with

repeated operation of the breaker.

8.1.7 The bidder shall furnish detailed operation and maintenance manual of the mechanism alongwith the operation manual for the circuit breaker. The instruction manuals shall contain exploded diagrams with complete storage, handling, and erection, commissioning, troubleshooting, servicing and overhauling instructions.

8.2 Control:

8.2.1 The close and trip circuits shall be designed to permit use of momentary contact switches and push buttons.

8.2.2 Each breaker pole shall be provided with two (2) independent tripping circuits, pressures switches and coils each connected to a different set of protective relays.

8.2.3 The breaker shall normally be operated by remote electrical control. Electrical tripping shall be performed by shunt trip coils. However, provisions shall be made for local electrical control. For this purpose a local/remote selector switch and close and trip control switch/push buttons shall be provided in the Breaker central control cabinet.

8.2.4 The trip coils shall be suitable for trip circuit supervision during both open and close position of breaker. The trip circuit supervision relay would be provided on relay panels.

8.2.5 Closing coil and associated circuits shall operate correctly at all values of voltage between 85% and 110% of the rated voltage. Shunt trip coil and associated circuits shall operate correctly under all operating conditions of the circuit breaker upto the rated breaking capacity of the circuit breaker and at all values of supply voltage between 70% and 110% of rated voltage. However, even at 50% of rated voltage the breaker shall be able to operate. If additional elements are introduced in the trip coil circuit their successful operation and reliability for similar applications on outdoor circuit breakers shall be clearly brought out in the additional information schedules.

8.2.6 Density Meter contacts and pressure switch contact shall be suitable for direct use as permissive in closing and tripping circuits. Separate contacts have to be used for each of tripping and closing circuits. If contacts are not suitably rated and multiplying relays are used then fail safe logic/schemes are to be employed. DC supplies for all auxiliary circuits shall be monitored and provision shall be made for remote annunciations and operation lockout in case of D.C. failures. Density monitors are to be so mounted that the contacts do not change on vibration during operation of circuit Breaker.

8.2.7 The auxiliary switch of the breaker shall be positively driven by the breaker operating rod.

8.3 Pneumatically operated mechanism :

a) Each pneumatic operated breaker shall be equipped with compressed air system in accordance with Clause 15.0.

b) The breaker local air receivers shall comply with the requirements under Clause 15.4 and shall have sufficient capacity for at least two CO operations of the breaker at the lowest pressure for auto re-closing duty without refilling.

c) Independently adjustable pressure switches with potential free, ungrounded contacts to actuate a lock out device shall be provided. This lockout device with provision of remote alarm indication shall be incorporated in the circuit breaker to prevent operation whenever the pressure of the operating mechanism is below that required for satisfactory operation of the circuit breaker. The scheme should permit operation of all blocking and alarm relays as soon as the pressure transient present during the rapid pressure drop has been damped and a reliable pressure measurement can be made. Such facilities shall be provided for following conditions :

i) Trip lockout pressure - 2 Nos.
ii) Close lockout pressure - 1 No.
iii) Auto re-close lockout pressure - 1 No.
iv) Extreme low pressure - 1 No.

d) The compressed air mechanism shall be capable of operating the circuit breaker under all duty conditions with the air pressure immediately before operation between 85% and 110% of the rated supply pressure. The make/break time at this supply pressure shall not exceed the specified make/break time within any value of trip coil supply voltage as specified.

e) The compressed air piping shall comply to requirements under Clause 15.0.

8.4 Spring operated mechanism :

a) Spring operated mechanism shall be complete with motor **whose specifications shall be as per clause no.8.5**. Opening spring and closing spring with limit switch for automatic charging and other necessary accessories to make the mechanism a complete operating unit shall also be provided.

b) As long as power is available to the motor, a continuous sequence of the closing and opening operations shall be possible. The motor shall have adequate thermal rating for this duty.

c) After failure of power supply to the motor one close open operation shall be possible with the energy contained in the operating mechanism.

d) Breaker operation shall be independent of the motor which shall be used solely for compressing the closing spring. Facility for manual charging of the closing spring shall also be provided. The motor rating shall be such that it requires not more than 30 seconds for full charging of the closing spring.

e) Closing action of circuit breaker shall compress the opening spring ready for tripping.

f) When closing springs are discharged after closing a breaker, closing springs shall be automatically charged for the next operation and an indication of this shall be provided in the local and remote control cabinet.

g) Provisions shall be made to prevent a closing operation of the breaker when the spring is in the partial charged condition. Electrical interlocks shall be provided in the operating mechanism to prevent discharging of closing springs when the breaker is already in the closed position.

h) The spring operating mechanism shall have adequate energy stored in the operating spring to close and latch the circuit breaker against the rated making current and also to provide the required energy for the tripping mechanism in case the tripping energy is derived from the operating mechanism.

8.5 MOTORS:

- **Motors shall be "Squirrel Cage" three phase induction motors of sufficient size capable of satisfactory operation for the application and duty as required for the driven equipment and shall be subjected to routine tests as per applicable standards. The motors shall be of approved make.**
- **Enclosures:**
  - **a. Motors to be installed outdoor without enclosure shall have hose proof enclosure equivalent to IP 55 as per IS:4691. For motors to be installed indoor i.e. inside a box, the motor enclosure, shall be dust proof equivalent to IP 44 as per IS: 4691**
  - **b. Two independent earthing points shall be provided on opposite sides of the motor for bolted connection of earthing conductor.**
  - **c. Motors shall have drain plugs so located that they will draw water resulting from condensation or other causes from all pockets in the motor casing.**
  - **d. Motors weighing more than 25 kg. shall be provided with eyebolts, lugs or other means to facilitate lifting.**
- **Operational Features:**
  - **a. Continuous motor rating (name plate rating) shall be at least ten (10) percent above the maximum load demand of the driven equipment at design duty point and the motor shall not be over loaded at any operating point of driven equipment that will rise in service.**
  - **b. Motor shall be capable at giving rated output without reduction in the expected life span when operated continuously in the system having the particulars as given in Clause 15.0 of this Specification.**
- **Starting Requirements:**
  - **a. All induction motors shall be suitable for full voltage direct-online starting. These shall be capable of starting and accelerating to the rated speed along with the driven equipment without exceeding the acceptable winding temperature even when the supply voltage drops down to 80% of the rated voltage.**
  - **b. Motors shall be capable of withstanding the electro-dynamic stresses and heating imposed if it is started at a voltage of 110% of the rated value.**
  - **c. The locked rotor current shall not exceed six (6) times the rated full**

load current for all motors, subject to tolerance as given in IS: 325.

d. **Motors when started with the driven equipment imposing full starting torque under the supply voltage conditions specified under Clause 15.0 shall be capable of withstanding at least two successive starts from cold condition at room temperature and one start from hot condition without injurious heating of winding. The motors shall also be suitable for three equally spread starts per hour under the above referred supply condition**.

e. **The locked rotor withstand time under hot condition at 110% of rated voltage shall be more than starting time with the driven equipment of minimum permissible voltage by at least two seconds or 15% of the accelerating time whichever is greater. In case it is not possible to meet the above requirement, the Bidder shall offer centrifugal type speed switch mounted on the motor shaft which shall remain closed for speed lower than 20% and open for speeds above 20% of the rated speed. The speed switch shall be capable of withstanding 120% of the rated speed in either direction of rotation.**

- **Running Requirements:**
  a. **The maximum permissible temperature rise over the ambient temperature of 50 degree C shall be within the limits specified in IS:325 (for 3- phase induction motors) after adjustment due to increased ambient temperature specified.**
  b. **The double amplitude of motor vibration shall be within the limits specified in IS:4729. Vibration shall also be within the limits specified by the relevant standard for the driven equipment when measured at the motor bearings.**
  c. **All the induction motors shall be capable of running at 80% of rated voltage for a period of 5 minutes with rated load commencing from hot condition.**
- **Testing and Commissioning: An indicative list of tests is given below. Contractor shall perform any additional test based on specialties of the items as per the field Q.P./Instructions of the equipment Contractor or Owner without any extra cost to the Owner. The Contractor shall arrange all instruments required for conducting these tests along with calibration certificates and shall furnish the list of instruments to the Owner for approval**

9.0 SUPPORT STRUCTURE:

a) The structure design shall be such that during operation of circuit breaker vibrations are reduced to minimum.

b) If required, the Contractor shall provide suitable platform with steps on both sides of the circuit breaker for easy accessibility for monitoring the density/pressure of gas.

10.0 TERMINAL CONNECTOR PAD:

The circuit breaker terminal pads shall be made up of high quality electrolytic copper or aluminium. The terminal pad shall have protective covers which shall be removed before interconnections.

11.0 INTERPOLE CABLING :

11.1 All cables to be used by contractor shall be armoured and shall be as per IS-1554 (1100 Volts Grade). All cables within & between circuit breaker poles shall be supplied by the CB manufacturer.

11.2 Only stranded conductor shall be used. Minimum size of the conductor shall be 2.5 sq.mm. (Copper).

11.3 The cables shall be with oxygen index Min-29 and temp. index as 250^0 C as per relevant standards.

12.0 FITTINGS AND ACCESSORIES

12.1 Following is a partial list of some of the major fittings and accessories to be furnished by Contractor in the Central Control cabinet. Number and exact location of these parts shall be indicated in the bid.

i) Cable glands (Double compression type), Lugs, Ferrules etc.
ii) Local/remote changeover switch.
iii) Operation counter
iv) Pneumatic pressure gauges.
v) Control switches to cut off control power supply.
vi) Fuses as required.
vii) The number of terminals provided shall be adequate enough to wire out all contacts and control circuits plus 24 terminals spare for future use.
viii) Anti-pumping relay.
ix) Pole discrepancy relay.
x) D.C. Supervision relays.
xi) Rating and diagram plate in accordance with IEC incorporating year of manufacture.

12.2 Additional fittings for pneumatically operated circuit breaker

a) Unit compressed air system in accordance with Clause 15.0.
b) Breaker air receivers.
c) Pressure gauge, spring loaded safety valve and pressure switch with adjustable contacts.
d) Pressure switch to initiate an alarm if the pressure in the auxiliary reservoir remains below a preset level for longer than it is normally necessary to refill the reservoir.
e) Stop, non-return and other control valves, pipings and all accessories upto breaker mechanism housing.

13.0 ADDITIONAL DATA TO BE FURNISHED ALONGWITH THE OFFER :

a) Drawing, showing contacts in close, arc initiation, full arcing, arc extinction and open position.

b) The temperature v/s pressure curves for each setting of density monitor along with details of density monitor.

c) Method of checking the healthiness of voltage distribution devices (condensers) provided across the breaks at site.

d) Data on capabilities of circuit breakers in terms of time and number of operations at duties ranging from 100% fault currents to load currents of the lowest possible value without requiring any maintenance or checks.

e) The effect of non-simultaneity between contacts between poles and also show how it is covered in the guaranteed total break time.

f) Sectional view of non-return couplings if used for SF6 pipes.

g) Details & type of filters used in interrupter assembly and also the operating experience with such filters.

h) Details of SF6 gas :

i) The test methods used in controlling the quality of gas used in the circuit breakers particularly purity and moisture content.

ii) Proposed tests to assess the conditions of the SF6 within a circuit breaker after a period of service particularly with regard to moisture contents of the gas.

iii) The precise procedure to be adopted by maintenance personnel for handling equipment who are exposed to the products of arcing in SF6 gas so as to ensure that they are not affected by possible irritants of the skin and respiratory system. Recommendations shall be submitted for suitable protective clothing, methods of disposal of circuit breaker cleaning utensils and other relevant matters.

i) A complete catalogue on operation analyser satisfying all the requirements of this Chapter.

j) The bidders shall furnish along with the bid, curves supported by test data indicating the opening time under close open operation with combined variation of trip coil voltage and pneumatic pressure.

k) All duty requirements as applicable to CBs specified under Clause 2.0 of this Chapter shall be provided with the support of adequate test reports to be furnished along with the bid failing which the bid is likely to be rejected.

l) Field test report or laboratory test report in case of CB meant for reactor switching duty.

14.0 TESTS:

14.1 The bidder shall submit reports of all the mandatory type tests applicable for 245kV voltage class circuit breaker for the offered design in line with IEC:62271-100, IEC:62271-1:2017 with the latest amendments/revision. The type test reports shall not be more than 10 years old from the last date of bid opening and shall be submitted with the offer for the purchaser's review.

14.2 Routine and Acceptance Tests

- **All routine tests shall be carried out on each breaker in line with IEC:62271-100, IEC:62271-1:2017 with the latest amendments/revision.**
- **All acceptance tests shall be carried out on the lot in line with IEC:62271-100, IEC:62271-1:2017 with the latest amendments/revision.**

15.0 UNIT COMPRESSED AIR SYSTEM FOR CIRCUIT BREAKERS:

15.1 The unit compressed air system shall meet the following requirements:

a) The compressed air system shall be provided with necessary piping, piping accessories, control valves, safety valves, filters, reducing valves, isolating valves, drain ports, etc. Also the Unit compressed air system shall be provided with suitable anti-vibration pads.
b) The compressors or pumps shall be of the air cooled type and mounted within the operating mechanism housing or a separate weather-proof and dust-proof housing.
c) The air receiver shall have stored energy for 2 CO operations of the breaker at the blocking pressure for auto reclosing duty without refilling. The unit compressor shall be capable of building up required pressure for another 2 CO operations within 30 minutes.
d) The size of the compressor shall be determined by the bidder. The compressor shall be of sufficient capacity for performing all the operations above mentioned.

15.2 Air Compressor:

a) The air compressor shall be of air cooled type complete with cylinder lubrication, drive motor etc. The compressor shall be rated for the following duty:

i)	Total running time of compressor to build up the rated pressure from atmospheric pressure.	Not exceeding 80 minutes
ii)	Normal running air charging considering 10% leakage / day.	Not exceeding 15 minutes
iii)	Air charging time after one close-open operation from rated pressure.	Not exceeding 15 minutes.

b) **Compressor shall be driven by automatically controlled motors conforming to requirements of motors as per clause no.8.5 of this specification**.
c) The compressor shall be provided with automatic adjustable unloading device during starting.
d) The compressor shall be equipped with a Time totalizer and a Pressure gauge.

15.3 Intercooler and After cooler :(If applicable)

Intercooler between compressor stage and after cooler at discharge if any of H.P. cylinder shall be included in Contractor's scope. They shall be of air- cooled type and shall be designed as per ASME Code of IEMA Standards. The design pressure on the air side of cooler shall be 1.25 times the working pressure. A corrosion allowance of 3 mm shall be included for all steel parts.

15.4 Air Receivers:

a) Air receiver shall be designed in accordance with the latest edition of the ASME Code for Pressure Vessel - Section VIII of BS : 5179. A corrosion allowance of 3.0 mm shall be provided for shell and dished ends. Receivers shall be coated on the inside face with antirust medium if it is not hot dip galvanized.

b) Connections for air inlet and outlet, drain and relief valves shall be flanged type or screwed type. Pressure gauge and pressure switch connections shall be screwed type only.

c) Accessories such as suitable sized safety valve to relieve full compressor discharge at a set pressure equal to 1.1 times the maximum operating pressure, blow off valve, auto drain tap with isolating and bypass valve, dial type pressure gauge with isolating and drain valve and test connection shall be provided.

d) Air receiver shall be offered with at least 50% spare capacity, calculated on the basis of total air requirement for 2 CO-operations.

15.5 Quality of Air:

Compressed air used shall be dry and free of dust particles and fully compatible with the materials used in the pneumatic operating mechanism. Arrangement for conditioning the compressed air if required shall be provided as an integral part of air compressor system.

If situation warrants, because of the severe ambient conditions, the supplier may offer centralized compressed air system.

15.6 Control and Control Equipment:

a) The compressor control shall be of automatic start/stop type initiated by pressure switches.
b) Duplicate incoming supply of 415 V, AC shall be provided by the **purchaser** at switchyard bay marshaling box from where the Contractor shall take the feed to the operating mechanism.
c) All the necessary compressor control equipment shall be housed in a totally enclosed sheet steel cabinet also conforming to **clause no.8.1.1**. Pressure gauges and other indicating devices, control switches shall be mounted on the control cabinet.
d) A glass window shall be provided for viewing the indicating instrument/gauges. The max. height shall be 2000 mm.

15.7 Compressed Air Piping, Valves and Fittings:

a) The flow capacity of all valves shall be at least 20% greater than the total compressor capacity.
b) The high pressure pipe and air system shall be such that after one O-0.3 sec-CO-operation the

breaker shall be capable of performing one CO operation within 3 minutes.

c) All compressed air piping shall be bright annealed, seamless phosphorous Deoxidized Non-Arsenical Copper alloy as per BS: 2874 or stainless steel pipe (C - 106 of BS : 2871-1957).

d) All joints and connections in the piping system shall be brazed or flared as necessary.

e) All compressed air piping shall be carried out in accordance with BS :162.

f) Compressed air piping system shall be complete with Saddle clamps to support the piping system at suitable intervals. Necessary bolts, nuts, pipe fixing clamps etc shall be included in the scope of Contractor.

15.8 Tests: The compressors and its accessories shall conform to the type tests and shall be subjected to routine tests as per applicable IS/IEC standard with latest revisions.

16.0 TECHNICAL PARAMETERS: (In addition to those indicated in Chapter-GTR)

S.No.	Description	Range/Value
1	Rated continuous current at design ambient temperature.	1600/2500A (As applicable)
2	Rated short circuit current breaking capacity at rated voltage	**50 kA** with % d.c. component as per IEC:62271-100 corresponding to minimum opening time under operating conditions specified.
3	Symmetrical interrupting capabilities (kA, rms)	**50 kA** RMS
4	Rated short circuit making current	**125**kAp
5	Short time current carrying capability for one second	**50kA**
6	Rated Operating duty	O-0.3-CO-3min-CO cycle
7	Reclosing	Single and three phase Auto reclosing
8	First Pole to clear factor	1.3
9	Rated line/cable charging current at 90deg. Leading power factor angle (A,rms) (The breaker shall be able to interrupt the rated line/cable charging current with test voltage immediately before opening equal to the product of U/ √3 & 1.4 as per IEC: 62271-100)	As per IEC
10	Temperature rise over the design ambient temperature	As per IEC 62271-100
11	Total break time as per clause 3 of this specification	65ms
12	Rated break time as per IEC	60ms

13	Operating mechanism	Pneumatic/spring or a combination of both
14	Max. difference in the instants of closing/ opening of contacts (ms)	
(i)	Within a pole	2.5
(ii)	Between poles (opening)	3.3
(Iii)	Between poles (closing) The above shall be at rated control voltage and rated operating and quenching media pressures	5.0
15	Trip coil and closing coil voltage	220V DC with variation as per IS/IEC
16	Noise level at base and up to 50m (distance from base of breaker)	140dB (Max.)
17	Rated Terminal Load	As per IEC 62271-100
18	Auxiliary Contacts	Besides requirement of specifications, the bidder shall wire up to 10NO + 10NC contacts for future use of purchaser
19	Number of terminal in common control cabinet	All contacts and control circuits to be wired out up to common control cabinet plus 24 terminals exclusively for purchaser's use.
20	Lightening full wave impulse withstand voltage (1.2/50 micro second)	
20 (i)	Between line terminals and ground	1050 kVp
20(ii)	Between terminals with CB contacts open	1050 kVp
21	One minute power frequency withstand voltage	
21 (i)	Between line terminals and ground	460KVp
21(ii)	Between terminals with CB contacts open	460 kVp
22	Minimum corona extinction voltage in open and close position	156KV rms
23	Maximum radio interference voltage for frequency between 0.5 to 2 MHz in open and close position	1000 micro-volt (at 156kV rms)
24	Maximum line charging current	125A rms
25	Rated cable charging breaking current capacity	250A rms
26	Closing Time	Less than 200ms
27	Minimum Creepage Distance	31mm/kV for heavily polluted region.
28	Minimum Clearances (phase to phase)	4000 mm
29	System Neutral Earthing	Effectively earthed
30	Seismic Acceleration	0.3g horizontal
31	Rating of auxiliary contacts	10A at 220V DC
32	Breaking capacity of auxiliary contacts	2A DC with circuit time constant of not less than 20ms
33	Number of Poles of CB	3

17.0 TESTING AND COMMISSIONING

17.1 An indicative list of tests is given below. Contractor shall perform any additional test based on specialties of the items as per the field Q.P./instructions of the equipment Supplier or Employer without any extra cost to the Employer. The Contractor shall arrange all instruments required for conducting these tests along with calibration certificates and shall furnish the list of instruments to the Employer for approval.

(a) Insulation resistance of each pole.
(b) Check adjustments, if any suggested by manufacturer.
(c) Breaker closing and opening time.
(d) Slow and Power closing operation and opening.
(e) Trip free and anti pumping operation.
(f) Minimum pick up voltage of coils.
(g) Dynamic Contact resistance measurement.
(h) Functional checking of compressed air plant and all accessories.
(i) Functional checking of control circuits interlocks, tripping through protective relays and auto reclose operation.
(j) Insulation resistance of control circuits, motor etc.
(k) Resistance of closing and tripping coils.
(l) SF6 gas leakage check.
(m) Dew Point Measurement
(n) Calibration of pressure switches and gas density monitor.
(o) Checking of electrical 'CLOSE' interlock, wherever applicable.

SECTION-V

TECHNICAL SPECIFICATION

CURRENT TRANSFORMER (CT)

Technical Specification of 220kV Current Transformer of Ratio 1600-800/1-1-1-1-1 A.

1.0 GENERAL

1.1. The 220 kV Current Transformer shall be single phase outdoor of ratio 1600-800/1-1-1-1-1 A complete with terminal connectors.

1.2. The Technical features and construction details of each current transformer shall be in accordance with the requirement stated herein under.

1.3. The current Transformer shall comply with the relevant standards. The rated currents and ratio, the number of secondary cores, accuracy class, burden, secondary winding resistance, Knee point voltages and excitation current shall be in accordance with the requirements of the protection and measuring system.

1.4. The equipment quoted under this specification shall conform to the standards specified below. Unless otherwise specified, the equipment shall conform to the latest applicable IS/IEC.

1.5. The current Transformer shall be designed for use in geographic and meteorological conditions as given below.

CLIMATIC CONDITIONS:

The climatic conditions prevailing at site are as follows:

1	Maximum ambient air temperature as per IS: 9676	45ºC
2	Standard ambient air temperature as per IS: 9676	40ºC
3	Maximum Relative Humidity	100%
4	Minimum Relative Humidity	10%
5	Average annual rainfall	750 mm
6	Average no. of rainy day	50
7	Average no. of thunderstorm days per annum	40
8	Altitude	Not exceeding 300 meters
9	Rain months	June to Oct.
10	Wind pressure as per IS 875	195 Kg/Sq. meters up to 30 meters

The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subject to fog in cold months. The variation between daily minimum and maximum temperature could be to the extent of 15/20 deg. C. Heavy lightening is in the area during the rainy months. All the equipments shall be designed to withstand seismic forces corresponding to seismic zone – IV.

2.0 STANDARDS

2.1. The design, manufacture and performance of the equipment provided under this specification shall comply with the standards given in the clause 2.2.

2.2

Sr.No	Standard No.	Title
i	IS-2705 (part I to V)	Specification for current Transformer
ii	IS-4201	Application guide for current Transformer.
iii	IS-2099/ IS-5621	High voltage porcelain Bushings/Hollow Column insulators.
iv	IS-731	Insulator for O/H Power line
v	IS-335	New insulating oil for transformer and switchgear.
vi	IS-9676	Reference ambient temperature
vii	IEC: 60044/61869	Specification for current Transformer
viii	IEC:61462	Silicon Composite Insulator
ix	IEC 60529	Degrees of protection provided by enclosures (IP code)

3.0 SYSTEM PARAMETER

The 220 KV system parameters are as follows:

a)	Nominal system voltage	220KV
b)	Highest system voltage	245KV
c)	Frequency	50 Hz.
d)	Earthing of the system	solidly grounded
e)	Insulation level	
	i) Impulse voltage withstand	1050 KV (P)
	ii) Power frequency withstand	460 KV (rms)
f)	Short time current rating and its Duration	40 KA for 1.0 Sec

4.0 TECHNICAL PARTICULARS OF 220kVCURRENT TRANSFORMERS

4.1. 220 kV C.T. ratio 1600-800/1-1-1-1-1 A for Feeder Protection & Transformer of 100 /160MVA, 220/66 kV& 220/33 kV & Bus Coupler

CORE – I

a)	Secondary Current	1 Amp.
b)	Purpose	Bus Diff Check
c)	Min. Knee point voltage VK	40(R_{ct}+8) V (Rct.-Resistance of

		Secondary winding)
d)	Class of Accuracy	PS
e)	Max. Exciting current at VK/2	30 mA

CORE – II

a)	Secondary Current	1 Amp.
b)	Purpose	Bus Diff Main
c)	Min. Knee point voltage VK	40(R_{ct}+8) V (Rct.-Resistance of Secondary winding)
d)	Class of Accuracy	PS
e)	Max. Exciting current at VK/2	30 mA

CORE – III

a)	Secondary Current	1 Amp.
b)	Purpose	Metering
c)	Rated output	20VA
d)	Class of Accuracy	0.2S
e)	Instrument security factor	≤ 5

CORE – IV

a)	Secondary Current	1 Amp.
b)	Purpose	Protection
c)	Min. Knee point voltage VK	40(R_{ct}+8) V (Rct.-Resistance of Secondary winding)
d)	Class of Accuracy	PS
e)	Max. Exciting current at VK/2	30 mA

CORE – V

a)	Secondary Current	1 Amp.
b)	Purpose	Protection
c)	Class of Accuracy	PS
d)	Min. Knee point voltage VK	40(R_{ct}+8) V (Rct.-Resistance of secondary winding)
e)	Max. Exciting current at VK/2	30 mA

6.0 CONSTRUCTION DETAILS:

6.1. a) Current transformers shall have single primary either ring type, or hair pin type and suitably designed for bringing out the secondary terminals in a weather proof (IP 55) terminal box at the bottom. PF Terminal for measurement of tan delta and capacitance of the unit shall be provided. These secondary terminals shall be terminated to stud type non disconnecting terminal blocks inside the terminal box. In case "Bar primary" inverted type current transformers are offered the manufacturer will meet following additional requirements:

(i) The secondaries shall be totally encased in metallic shielding providing a uniform equipotential surface for even electric field distribution.

(ii) The lowest part of the insulation assembly shall be properly secured to avoid any risk of damage due to transportation stresses.

(iii) The upper part of insulation assembly resting on primary bar shall be properly secured to avoid any damage during transportation due to relative movement between insulation assembly & top dome.

(iv) Nitrogen if used for hermetic sealing (in case of live tank design) should not come in direct contact with oil.

Bidder/Manufacturer shall recommend whether any special storage facility is required for spare CT.

b) Different ratios specified shall be achieved by secondary taps only and primary reconnection shall not be accepted.

c) Core lamination shall be of cold rolled grain oriented silicon steel or other equivalent alloys. The cores used for protection shall produce undistorted secondary current under transient conditions at all ratios with specified CT parameters.

d) The expansion chamber at the top of the porcelain insulators should be suitable for expansion of oil.

e) Facilities shall be provided at terminal blocks in the marshalling box for star delta formation, short circuiting and grounding of CT secondary terminals.

f) Current transformer's guaranteed burdens and accuracy class are to be intended as simultaneous for all cores.

6.2. Current transformers shall be with shedded porcelain/ polymer bushings/Insulators.

6.3. The current transformers shall be oil immersed and self cooled outdoor type suitable for the specified services indicated, completed in all respects and in accordance with best engineering practice design and workmanship.

6.4. The core shall be of high grade non ageing, electrical silicon laminated steel of low hysteresis loss high permeability to ensure high accuracy at normal

and over current conditions and shall produce undistorted secondary current under transient conditions at all ratios.

6.5. The oil immersed CT shall be hermetically sealed to eliminate breathing and to prevent air and moisture and shall be provided with a pressure relieving device capable to releasing abnormal internal pressure. C.T. shall be provided with oil level gauge, and necessary arrangement for replacing the oil shall be provided.

6.6. The cantilever strength shall be not less than 350 kg for porcelain housing and not less than 150 kg for polymer housing.

6.7. Current transformer, characteristics shall be such as to provide satisfactory performance of burdens ranging from 25% to 100% of rated burden over a range of 5% to 120%(or specified rated extended current whichever is higher) of rated current in case of metering CTs and up to the accuracy limit factor/knee point voltage in case of relaying CTs. The rated extended primary current shall be 120% on all cores of the CT continuously.

6.8. The ratio changing taps shall be provided only on the secondary winding of the C.T.

6.9. The current transformer cores to be used for metering and instrumentation shall be of accuracy class specified and suitable for commercial and industrial metering. The Saturation factor of this core shall be low enough not to cause any damage to measuring instruments in the event of maximum short circuit current.

6.10. Current transformers cores to be used for protective relaying purposes shall be of accuracy class specified, suitable for distance protection, pilot wire protection, differential protection, restricted earth fault protection, over current and earth fault protection. Over current and earth fault for a maximum saturation factor as specified for the highest setting.

6.11. The secondary terminals shall be brought out in a weather proof terminal box (with degree of protection IP55) on the side of the current transformer and shall be accessible through a removable cover. The secondary tap shall be adequately reinforced to withstand normal handling without damage. Suitable cable glands shall be provided to accommodate purchaser's control cables.

6.12. The maximum permissible temperature rise of the windings over the ambient shall not exceed 40^0C.

6.13. The magnetizing curve for each core shall be furnished with the tender.

6.14. The secondary terminals shall be provided with short circuiting and earthing arrangements at the terminal block.

6.15. The C.T.s shall be suitable for horizontal as well as vertical transportation.

6.16. The Instrument security factor at all ratios shall be less than 5 for metering cores.

6.17. The C.T. shall be suitable for high speed auto-reclosing.

6.18. Power frequency terminals to measure tan delta and capacitance shall be also be provided these secondary terminals shall be terminated to stud type non-disconducting terminal blocks.

MEASUREMENT OF CAPACITANCE AND TAN DELTA:

The Current Transformer shall be provided with suitable test tap for measurement of capacitance, tan delta as well as partial discharges, in factory as well as at site. Provision shall be made of a screw on cap for solid and secured earthing of the test tap connection, when not in use. A suitable caution plate shall be provided duly fixed on the cover of the secondary terminal box indicating the purpose of the test tap and necessity of its solid earthing as per prescribed method before energizing the Current Transformers. Measurement of dielectric dissipation factor shall be as per relevent IS/IEC & Value should be not more than 0.5%

7.0 INSULATION OIL:

The quality of insulating oil in each transformer shall be best available and the complete specification of the oil shall be furnished in the tender. The current transformers offered shall be hermetically sealed completely filled with insulating oil. The insulating oil shall be of EHV grade and shall conform to the latest Indian Standard specification no. IS-335/IEC-60296.

8.0. BUSHINGS / INSULATORS :(Porcelain / Silicon Composite /Polymer)

i) a) Porcelain used in bushing/Insulator manufacture shall be homogeneous, free from laminations, cavities and other flaws or imperfections that might affect the mechanical or dielectric quality and shall be thoroughly vitrified tough and impervious to moisture. The bushing/insulator for CT shall be one piece without any metallic flange joint.

b) Glazing of the porcelain shall be of uniform brown color free from blisters, burrs and similar other defects. Bushings shall be designed to have ample insulation, mechanical strength and rigidity for the conditions, under which they will be used.

c) In case of polymer insulator housing shall be of ‘Shatter proof’ high quality Silicon Composite material. The Silicon sheds shall exhibit hydrophobic property and also should be able to transfer the property of pollution layer.

d) The polymer insulator housing shall be of a single piece construction without any joints or coupling.

ii) When operating at normal rated voltage there will be no electric discharge between the conductors and bushing which would cause corrosion or injury to conductors, insulators or supports by the formation of substances produced by chemical action. No radio interference shall be caused by the bushings/ Insulator when operating at the normal rated voltage.

iii) All iron parts shall be hot dip galvanized and all joints shall air tight. Surfaces of the joints shall be trued up, porcelain parts by grinding and metal parts by machining. Bushing/ Insulator design shall be such as to ensure a uniform compressive pressure on the joints.

iv) The minimum specific creepage distance shall be decided for the maximum pollution in the area of installation, including any transient conditions, causing different pollution levels. Creepage distance of the bushing /Insulator shall in no case be less than 25mm/KV, suitable for heavily polluted atmosphere.

v) Bushing/ Insulator shall be tested for type tests and routine tests in accordance with stipulation of IS-2099/ IS-5621/ relevant IEC. Routine as well as type tests reports in conformity with IS-2099/ IS-5621/relevant IEC shall be furnished to the purchaser.

vi) Parameters of Bushings/Insulators:

a)	Rated Voltage	245 KV
b)	Impulse withstand voltage	1050 KVp
c)	Power frequency withstand Voltage (dry & wet)	460 KV (rms)
d)	Total creepage distance	6125(mm)
e)	Pollution level	Suitable for Heavily Polluted Atmosphere

9.0 TERMINAL CONNECTORS

9.1. The current transformer offered shall be supplied with indigenous rigid type, Die casted, bimetallic (wherever applicable) terminal connectors suitable for single/double/quad ACSR Zebra conductor as per requirement conforming to IS-5561 for maximum current rating of CT.

9.2. Suitable terminal connectors for earthing connections shall also be supplied.

10.0 TESTS

10.1 The copies of certificates of all type tests as stipulated in IS: 2705/IEC with latest version shall be furnished along with the tender.

10.2 Each current transformer shall be subjected to routine tests as specified in IS: 2705/IEC with latest, in the presence of Purchaser's representative if so desired by the Purchaser. All test reports should be submitted and should be approved by the purchaser before dispatch of the equipment.

10.3 The current transformer shall be subjected to the following routine/site tests in addition to routine tests as per relevant IS/IEC with latest version.

ROUTINE TESTS:

i) Measurement of Capacitance.
ii) High voltage power frequency withstand test on Secondary Winding.
iii) Over-voltage inter turn test.
iv) Oil leakage test.
v) Measurement of tan delta at 0.3, 0.7, 1.0 and 1.1 Um / √3.
vi) Measurement of partial discharge shall be carried out as per IEC.

11.0 MARKING

11.1. Rating plate : As per IS-2705 (Part-I)

11.2. Terminal marking: As per IS- 2705 (Part. I)

12.0 Technical Parameters of current Transformer:-

S.No.	Details	Unit	Technical parameter
	Type of CT		Single phase, Dead tank or Live tank, oil filled, hermetically sealed, (Porcelain / Silicon Composite or Polymer insulator) outdoor CT
1.	Nominal/Rated system voltage	kV	220
2.	Highest system voltage	kV	245
3.	No. of cores	Nos.	5
4.	Rated primary current	A	1600-800
5.	Earthing of the system		solidly grounded
6.	Rated fault current and duration	kA	40 (1 sec)
7.	Rated dynamic short circuit current	kAp	100/125
8.	Lightning (Full wave) impulse withstand voltage (1.2/50µs) -between line terminals and ground	kVp	1050
9.	Switching impulse withstand voltage (250/2500 µs) – Between line Terminals and ground (dry & wet)	kCp	-
10.	One minute power frequency withstand voltage-between line terminals and ground	kVrms	460

11.	One minute power frequency withstand voltage of secondary winding	kV	5
12.	Minimum corona extinction voltage	kV	156
13.	Maximum radio interference voltage for frequency	volt	1000 (at 156kV rms)
14.	Maximum partial discharge level	pC	10
15.	Cantilever strength (Porcelain */ Silicon Composite or Polymer**)	Kg.	350*/150**

GUARANTEED TECHNICAL PARTICULARS FOR CURRENT TRANSFORMERS

1. Manufacturer's Name
2. Type / Designation
3. Country of Manufacture
4. Rated Voltage
5. Standard Applicable
6. Rated frequency
7. Rated primary current
    a. Rated continuous normal current (A)
    b. Rated extended primary current (A)
    c. Rated thermal current (A)
8. Transformation ratio
9. Number of Secondary turns
10. Rated Secondary current
11.

No. of Cores	Rated output (VA)	Accuracy Class at Rated and extended Primary current	Instrument Security Factor/Accuracy limit factor
Core-I			
Core-II			
Core-III			
Core-IV			
Core-V			

12.

No. of Cores	Knee Point Voltage	Corresponding Max. exciting current	Resistance of the secondary winding at different taps	Secondary limiting voltage

Core-I				
Core-II				
Core-III				
Core-IV				
Core-V				

13. Short time thermal rating of primary (kA).
    a) one Seconds
14. Rated dynamic current of primary (kAp)
15. Temp rise at rated cont. thermal
    Current over ambient at site
    A) Winding
    B) Oil at the top
16. One minute power frequency dry
    withstand voltage (KV rms)
17. One minute power frequency
    wet withstand voltage (KV rms)
18. 1.2/50 microsecond Lightning impulse
    withstand voltage (KV Peak).
19. Radio interference voltage
    (micro volts)
20. Whether corona shield is provided on not
21. Primary data
    a) Number of primary turns
    b) Material and cross section of primary
    c) Whether bar type or ring type.
    d) Current Density in the primary winding.
22. Whether CT is suitable for horizontal and
    Vertical Transportation
23. Whether Magnetization curve and
    Other characteristic curves enclosed
24. Quantity of oil per CT
25. Standard to which oil conforms.
26. Whether current transformer
    Hermetical sealed?
27. Total weight (kg)
28. Transport weight (kg)
29. Dimensional details
    a. Overall height from mounting plane
    b. Height upto terminals from mounting plane
    c. Mounting dimensions and diameter of
       Mounting holes
    d. Terminal pad diameter & length

e. Material of terminal pad
f. Diameter of insulator at
   i. top end
   ii. bottom end

30. BUSHING/SUPPORT INSULATOR

1. Manufacturer's Name and country
2. Type
3. Applicable standards
4. (i)Height
   (ii)Diameter (Top & Bottom)
5. Creepage distance Total (mm)
6. Rated voltage
7. Power frequency withstand voltage for 1 min. (KV) (rms)
   a) Dry
   b) Wet
8. 1.2/50 micro sec Lightning impulse withstand voltage (KVp)
9. Corona Extinction Voltage (KV)
10. Weight (Kg)

SECTION-VI

TECHNICAL SPECIFICATION

ISOLATOR

Technical Specification of 220 kV isolator with/ without earth switch

1.0 GENERAL :

1.1. The 220 KV Isolators shall be outdoor, horizontal mounting, centre break type (HCB) complete with terminal connectors suitable for both manual and motor operation as applicable as per existing site condition. Earth switches shall be provided on Isolators wherever called for.

1.2. The equipment quoted under this specification shall conform to the standards specified below. Unless otherwise specified, the equipment shall conform to the latest applicable IS/IEC.

1.3. The offers shall include all accessories even though not specifically mentioned in this specification, but which are essential for satisfactory operation of the equipment offered as a whole.

2.0 CLIMATIC CONDITIONS

The climatic conditions prevailing at site are as follows:

1.	Maximum ambient air temperature	**Up to 50^{o}C** during peak summer season
2.	Standard ambient air temperature as per IS: 9676	40^{o}C
3.	Maximum Relative Humidity	100%
4.	Minimum Relative Humidity	10%
5.	Average annual rainfall	750 mm
6.	Average no. of rainy day	50
7.	Average no. of thunderstorm days per annum	40
8.	Altitude	Not exceeding 300 meters
9.	Rain months	June to Oct.
10.	Wind pressure as per IS 875	195 Kg/Sq. meters up to 30 meters

The NCT of Delhi region is heavily polluted and details of pollution data shall be referred to official CPCB data, Ministry of Environment, GOI. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months. The variation between daily minimum and maximum temperature could be to the **extent** of 15/20 deg C. Heavy lightening also takes place in the area during the rainy months. All the equipments shall be designed to withstand seismic forces corresponding to seismic zone – IV.

3.0 STANDARDS:

3.1. The design, manufacture and performance of the equipment provided under this specification shall comply with the standards and rules given in the clause 3.2 **with latest amendments/revision in the relevant standards.**

3.2.

a) IS: 9921 /	: Alternating current isolators (Disconnectors & earthing switches).
IEC: 62271-102	Alternating current Disconnectors & Earthing switches.
b) IS: 2544/	: Porcelain Post insulators for systems with nominal voltages greater than 1000 Volts.
IEC 168	: Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1000 V
c) IS: 2147 /13947	: Degree of protection provided by enclosure.
d) IS: 325	: Three phase induction motors.

4.0 DUTY REQUIREMENTS:

a) Isolators and earth switches shall be capable of withstanding the dynamic and Thermal effects of the maximum possible short circuit current of the systems in their closed position. They shall be constructed such that they do not open under influence of short circuit current.

b) The earth switches, wherever provided, shall be mechanically interlocked so that the earth switches can be operated only when the isolator is open and vice versa. The mechanical interlocks shall be built in construction of isolator and shall be in addition to the electrical interlocks provided in the operating mechanism.

c) In addition to the mechanical interlock, isolator and earth switches shall have provision to prevent their electrical and manual operation unless the associated and other interlocking conditions are met. All these interlocks shall be of failsafe type. Suitable individual interlocking coil arrangements shall be provided. The inter locking coil shall be suitable for continuous operation from DC supply and within specified variation range.

d) The earthing switches shall be capable of discharging trapped charges of the associated lines.

e) The isolator shall be capable of making/breaking normal currents when no significant change in voltage occurs across the terminals of each pole of isolator on account of make / break operation.

f) The isolator shall be capable of making/breaking magnetizing current of 0.7A at 0.15 power factors and capacitive current of 0.7A at 0.15 power factor at rated voltage

g) Isolator shall be of extended mechanical endurance class - **M2** as per IEC-62271-102. All earth switches shall be of M0 duty.

f) Isolator and earth switches shall be able to bear on the terminals the total wind forces on the attached conductor without impairing reliability or current carrying capacity.

5.0 CONSTRUCTIONAL FEATURES

All constructional features should be as per best engineering practice and in conformity with standards specified in clause 3.2.

6.0 CONTACTS

a) The contacts shall be self aligning and self cleaning and so designed that binding cannot occur after remaining closed for prolonged periods of time in a heavily polluted atmosphere.

b) No undue wear or scuffing shall be evident during the mechanical endurance tests. Contacts shall be designed so that readjustments in contact pressure shall not be necessary throughout the life of the isolator or earthing switch.

c) Break contacts of main blade shall be either such that no external springs are used to achieve contact pressure OR If the spring is used then it shall not carry current & shall not get loose their characteristics due to heating effect. Each contact or pair of contacts shall be independently sprung so that full pressure is maintained on all contacts at all time.

d) Contacts shall be made out of hard drawn electrolytic grade copper having silver coating of at least 25 micron thickness (minimum). Arcing contacts wherever provided shall close first and open last. The contact surfaces shall be silver plated.

7.0 BASE

a) Each pole of the Isolator shall be provided with a complete galvanized steel base provided with holes and designed for mounting on a supporting Structure to be provided by the purchaser. The base shall be rigid and self-supporting and shall require no guying or cross bracing between phases other than the supporting structure.

b) The design of the recommended supporting structure for the Isolator, if any, shall be submitted during detail engineering.

c) The position of moving contact system (main Blade) of each Isolator and earthing switches shall be indicated by a mechanical indicator at the lower end of the vertical operating rod or shaft for the Isolator and earthing switch. The indicator shall be of metal and shall be visible from operation level.

d) The galvanization on steel structure should be as per IS 4759 and the practice for hot dip galvanizing should be as IS 2629.

8.0 BLADES :

a) The isolator blade shall be of Copper/Aluminium. All metal parts shall be of non-rusting and non-corroding material. All current carrying parts shall be made from high conductivity hard drawn electrolytic copper/Aluminium. The surface shall be wiped during closing and opening operations to remove any film, oxide coating etc., Wiping action shall not cause scouring or abrasion of surfaces. Bolts, screws and pins shall be provided with lock washers. Keys or equivalent locking facilities if provided on current carrying parts shall be made of copper silicon alloy or stainless steel or equivalent. The bolts or pins used in current carrying parts shall be made of non-corroding material. All ferrous castings except current carrying parts shall be made of malleable cast iron or cast-steel. No grey iron shall be used in the manufacture of any part of the isolator.

b) The live parts shall be designed to eliminate sharp joints, edges and other corona producing surfaces, where this is impracticable adequate corona shield shall be provided. Corona shields / rings etc. shall be made up of aluminum/aluminum alloy.

c) Isolators and earthing switches including their operating parts shall be such that they cannot be dislodged from their open or closed positions by short circuit forces, gravity, wind pressure, vibrations, shocks, or accidental touching of the connecting rods of the operating mechanism.

d) The switch shall be designed such that no lubrication of any part is required except at very infrequent intervals. i.e. after every 1000 operations or after 5 years whichever is earlier.

e) The terminal head of isolator arms where conductor will be terminated shall be strong and robust.

f) The rotating insulator shall be mounted on housing with bearing housing. The housing shall be made of gravity die-cast aluminum with smooth surfaces suitably machined for seating the bearings. Two numbers of bearings with adequate shaft diameter and distance between the bearings shall be provided to avoid wobbling during operations. The bearings shall be of reputed make and bearing assembly of frames shall be sealed such that there can not be ingress of dust/dirt water etc. Whole assemble shall be lubricated for life long service. All other friction locations shall be provided with bearings, bushes, joints, springs etc., shall be so designed that no lubrication shall be required during service. The Earthing switch shaft shall also be provided with necessary bearings.

9.0 INSULATORS

a) The insulator shall conform to IS: 2544 and/or IEC-60168. The porcelain of the insulator shall conform to the requirements stipulated in the specification and shall have a minimum cantilever strength as per relevant IS/ IEC.

b) Pressure due to the contact shall not be transferred to the insulators after the main blades are fully closed.

c) The parameters of the insulators shall meet the requirements specified in the specification.

d) Insulator shall be type and routine tested as per latest IS 2544/IEC-168.

- **Type test reports in line with IS-2544 / IEC-168 with latest amendments/revisions shall be submitted with the offer for the offered design of the insulators. The type test reports shall not be older for more than 10 years as on the last date of bid opening. However if any of the type test reports are more than 10 years old, than those type tests shall be conducted by the bidder as per IS/IEC without any additional cost burden to DTL and reports thereof shall be submitted before commencement of supply.**
- **Routine Tests shall be performed on the insulators in accordance with the latest IS/IEC with latest amendments/revisions.**
- **Acceptance tests shall also be conducted on the insulator lot as per relevant IS/IEC.**

e) Puncture voltage of hollow insulator voltage column shall be greater than dry flashover voltage.

f) Creepage distance should not be less than 31 mm/kV.

g) Insulator should be so arranged that leakage current will pass to earth and not between the phases.

h) For 245 KV Insulator: (Isolator) For

Top PCD	=	127mm
No. of holes	=	4 x M16
Bottom PCD	=	254mm
No. of holes	=	8 x 18 dia.

10.0 OPERATING MECHANISM

a) The bidder shall offer motor operated Isolators and earth switches.

b) Control cabinet/Operating mechanism box shall conform to the requirement as stipulated below :-

i. Operating mechanism box shall generally conform to be tested in accordance with IS-5039/IS-8623, as applicable, and the clauses given below:

ii. Operating mechanism box shall be made of stainless steel or aluminum enclosure and shall be dust, water and vermin proof. The control cabinet of the operating mechanism shall be made out of stainless steel sheet (min 2.64 mm thick). The box shall be properly braced to prevent wobbling. There shall be sufficient reinforcement to provide level surfaces, resistance to vibrations and rigidity during transportation and installation. In case of aluminum enclosed box the

thickness of aluminum shall be such that it provides adequate rigidity (min 3 mm thick) and long life as comparable with stainless steel of specified thickness.

iii. Operating mechanism box shall be provided with double hinged doors with padlocking arrangements. The distance between two hinges shall be adequate to ensure uniform sealing pressure against atmosphere. Sloping rain hood shall be provided to cover all sides. The quality of the gasket shall be such that it does not get damaged / cracked during the operation of the equipment.

iv. All doors, removable covers and plates shall be gasketed all around with suitably profiled EPDM/neoprene or better type of gaskets shall be provided to ensure degree of protection of at least IP:55 as per IS:2147. The gasket shall be tested in accordance with approved quality plan. The quality of gasket shall be such that it does not get damaged / cracked during the ten years of operation of the equipment or its major overhaul whichever is earlier. All gasketed surfaces shall be smooth straight and reinforced if necessary to minimize distortion and to make a tight seal. Ventilating Louvers, if provided, shall have screen and filters. The screen shall be fine wire mesh made of brass.

v. All boxes/cabinets shall be designed for the entry of cables from bottom by means of weather proof and dust-proof connections through cable sealing module for control cable. Boxes and cabinets shall be designed with generous clearances to avoid interference between the wiring entering from below and any terminal blocks or accessories mounted within the box or cabinet.

vi. A single phase 240 V 15A power socket and switch shall be provided in the motor operated operating mechanisms of the Isolators poles.

vii. A switch, MCB, holder and LED lamp ISI marked of 5W LED shall be provided in motor operated mechanism box of isolator and motor operated mechanism box of earth switch.

viii. All control switches shall be of rotary switch type and Toggle / piano switches shall not be accepted.

ix. Positive earthing of the cabinet shall be ensured by providing two separate earthing pads. The earth wire shall be terminated on to the earthing pad and secured by the use of self etching washer. Earthing of hinged door shall be done by using a separate earth wire.

x. The bay marshalling kiosks shall be provided with danger plate and a diagram showing the numbering/connection/feruling by pasting the same on the inside of the door.

xi. The following routine tests along-with the routine tests as per IS: 5039 shall also be conducted:-

A) Check for wiring
B) Visual and dimension check

xii. The enclosure of operating mechanism box shall conform to IP - 55 as per IS : 13947 including application of, 2.5 KV rms for 1 (One) minute, insulation resistance and functional test after IP-55 test.

xiii. The cabinet shall be suitable for mounting on support structure with adjustment for vertical alignment. Details of these arrangements shall be furnished during detailed engineering.

xiv. 70W, 240 V, single phase Space heater, thermostatically controlled, with protection by shall be provided for motor operated operating mechanism to prevent condensation.

xv. Four Pole MCB for three phase supply and neutral shall be provided for power supply. DP MCB shall be provided for control supply in the motor operated mechanisms of the Isolators.

c) A "Local/Remote" selector switch and a set of open/ close push buttons shall be provided on the control cabinet of the isolator to permit its operation through local or remote push buttons.

d) Provision shall be made in the control cabinet to disconnect power supply to prevent local/remote power operation.

e) Motor shall be an AC motor.

f) Suitable reduction gear shall be provided between the motor and the drive shaft of the isolator. The mechanism shall stop immediately when motor supply is switched off. If necessary a quick electromechanical brake shall be fitted on the higher speed shaft to effect rapid braking.

g) Manual operation facility (with handle) should be provided with necessary interlock to disconnect motor.

h) Gear should be of forged material suitably chosen to avoid bending/jamming on operation after a prolonged period of non-operation. Also all gear and connected material should be so chosen/surface treated to avoid rusting. The gears shall be made out of good quality material having adequate tensile strength and protection against abrasion wear manufactured by reputed manufacturer with relevant test report for successful operation under the desired working condition. Wherever necessary automatic relieving mechanism shall be provided

i) Motor operated mechanism shall be subjected to blocked rotor test as sample test/type test, at no extra cost to Owner.

11.0 MOTOR OPERATED MECHANISM:

a) The motor operating mechanism shall be provided with squirrel cage induction motor conforming to IS-325.Themotor insulation shall be given fungicidal and tropical treatment as per IS-3202. The operating supply of the motor shall be 415 ± 20% volts, 3 phase 50 cycles.

b) Suitable limit switches for motor control shall be fitted on the Isolator shaft, within the cabinet, to sense the open and close positions of the isolator.

c) Suitable relay / device shall be provided to prevent overloading of the motor. Single phase preventer shall be provided to operate on open circuiting of any phase and shall trip off the motor.

12.0 EARTHING SWITCHES :

a) Where earthing switches are specified these shall include the complete operating mechanism and auxiliary contacts.

b) The earthing switches shall form an integral part of the isolator and shall be mounted on the base frame of the isolator.

c) Earthing switches shall be only locally operated.

d) The earthing switches shall be mechanically interlocked with the isolator so that the earthing switches can be operated only when the isolator is open and vice versa. The interlocks shall be built in construction of isolator and shall be in addition to the electrical interlocks provided in the operating mechanism.

e) Each earth switch shall be provided with flexible copper/aluminum braids for connection to earth terminal. The connecting point shall be marked with the **'earth'** symbol. These braids shall have the same short time current carrying capacity as the earth blade. The transfer of fault current through swivel connection will not be accepted.

f) The plane of movement and final position of the earth blades shall be such that adequate electrical clearances are obtained from adjacent live parts in the course of its movement between ON and OFF position.

g) The frame of each isolator and earthing switches shall be provided with two reliable earth terminals for connection to the earth mat.

h) Isolator design shall be such as to permit addition of earth switches at a future date. It should be possible to interchange position of earth switch to either side.

i) The earth switch should be able to carry the same fault current as the main blades of the Isolators and shall withstand dynamic stresses.

j) The earth switches shall also comply with the requirements of IEC- 1129, 1992 in respect of induced current switching duty as defined for Class-B earthing switches and short circuit making capability class E-0 for earthing switch.

13.0 AUXILIARY SWITCHES :

a) The breaking capacity of the auxiliary switches shall be adequate for the circuits to be controlled, particulars of which should be supplied by the manufacturer. In the absence of such information the breaking capacity shall be 2 A at 220 V dc, with a circuit time constant not less than 20 ms.

b) The auxiliary circuits, the PMS value of withstand voltage shall be equal to twice the biggest rated auxiliary supply voltage plus 1000 V, with a minimum of 1500 V.

c) The auxiliary switches shall be positively driven in both directions by rigid members.

d) The isolators and the earthing switch shall be provided with auxiliary switches for indication of the open and closed position of the switch as well as providing of the electrical interlock. At least 10 Nos. NO and 10 Nos. NC for 220 KV Isolators shall be provided and for earthing device is 4 NO and 4 NC shall be provided. In addition two pairs of auxiliary contacts i.e. 2 NO + 2 NC of make-before-break (MBB) shall be provided.

e) Auxiliary switches and auxiliary circuits shall have a continuous current carrying capacity of at least 10 Amps with permissible temperature rise as per IS – 9921.

f) Auxiliary switches which are installed on the frame of Isolators of earthing switches shall be suitable protected against accidental arcing from the main circuit.

g) The insulating materials of auxiliary switches and terminals of auxiliary circuits, which are to be used in outdoor installations, shall be ceramics or other non-tracking materials.

14.0 OPERATION

a) The main Isolator and earth switches shall be gang operated for 245 kV. The operating mechanism of the three poles shall be well synchronized and interlocked.

b) The design shall be such as to provide maximum reliability under all service conditions. All operating linkages carrying mechanical loads shall be designed for negligible deflection. The length of inter insulator and inter-pole operating rods shall be capable of adjustments, by means of screw thread which can be locked with a lock nut after an adjustment has been made. The isolator and earth switches shall be provided with “over center” device in the operating mechanism to prevent accidental opening by wind, vibration, short circuit forces or movement of the support structures.

c) Each isolator/pole of isolator and earth switch shall be provided with a manual operating handle enabling one man to open or close the isolator with ease in one movement while standing at ground level. The manual operating handle shall have provision for padlocking. The operating handle shall be located at a height of 1000

mm from the base of isolator support structure.

d) The isolator shall be provided with positive continuous control throughout the entire cycle of operation. The operating pipes and rods shall be sufficiently rigid to maintain positive control under the most adverse conditions and when operated in tension or compression for isolator closing. They shall also be capable of withstanding all torsional and bending stresses due to operation of the isolator. Connecting pipes shall be of adequately dimensioned for the given duty and shall be class C. Base plate of insulators for connection of connecting pipe shall be made out of one piece 70mm width and 10 mm thick MS plate galvanized. Bolt and shackle of appropriate size shall be used to connect pipe to the base plate. The operating pipe too shall be of class C galvanized and adequately dimensioned for the given duty. The pipe shall be terminated into a suitable swivel or universal type joint between the insulator bottom bearing and the operating mechanism to take care of marginal angular misalignment at site. Wherever supported the operating rods shall be provided with bearings on either ends. The operating rods/ pipes shall be provided with suitable universal couplings to account for any angular misalignment.

e) All rotating parts shall be provided with grease packed roller or ball bearings in sealed housings designed to prevent the ingress of moisture, dirt or other foreign matter. Bearings pressure shall be kept low to ensure long life and ease of operation. Locking pins wherever used shall be rustproof.

f) Signaling of closed position shall not take place unless it is certain that the movable contacts, have reached a position in which rated normal current, peak withstand current and short time withstand current can be carried safely. Signaling of open position shall not take place unless movable contacts have reached a position such that clearance between contacts is at least 80% of the isolating distance.

g) The position of movable contact system (main blades) of each of the Isolators and earthing switches shall be indicated by a mechanical indicator at the lower end of the vertical rod of shaft for the Isolators and earthing switch. The indicator shall be of metal and shall be visible from operating level.

h) The contractor shall furnish the following details along with quality norms, during detailed engineering stage.

(i) Current transfer arrangement from main blades of isolator along with milli- volt drop immediately across transfer point.

(ii) Details to demonstrate smooth transfer of rotary motion from motor shaft to the insulator along with stoppers to prevent over travel.

15.0 Name Plate:

15.1 The Name Plate shall be visible in the position of normal service and installation.

15.2 The isolators and earthing switches may also be marked with the ISI certification mark.

15.3 The following particulars should be given on the Name Plate :

a) Manufacturer

b) Serial Number
c) Rated voltage in KV
d) Impulse withstand voltage to earth
e) Rated current in Amps.
f) Rated auxiliary voltage in volts.
g) Rated short circuit current for 1 second.

16.0 TERMINAL CONNECTOR

16.1 All Isolators shall be provided with specific type terminal connectors suitable for **Twin ACSR Zebra Conductor.**

16.2 The terminal connectors shall meet the following requirements:

i.) Terminal connectors shall be manufactured and tested as per IS: 5561.

ii.) All castings shall be free from blow holes, surface blisters, cracks and cavities. All sharp edges and corners shall be blurred and rounded off.

iii.) All ferrous parts shall be hot dip galvanised conforming to IS: 2629.

iv.) For bimetallic connectors, copper alloy liner of minimum thickness of 2 mm shall be cast integral with aluminium body.

v.) Flexible connectors shall be made from tinned copper / aluminium sheets.

vi.) All current carrying parts shall be designed and manufactured to have minimum contact resistance.

vii.) Connectors shall be designed to be corona free in accordance with the requirements stipulated in IS: 5561.

16.3 Wherever necessary bimetallic strip of standard quality shall be used to avoid galvanic corrosion.

17.0 TESTS :

i. Type Tests: All the Isolators, earthing switch along with Insulators offered shall be fully type tested, at the NABL/ Govt. accredited laboratory or witnessed by Govt. utility. The Bidder shall furnish all the applicable type test reports for the Isolators of the type and Design offered by them along with the offer in line with section-07 of IEC-62271-102 read with IEC-62271-1:2017 with latest amendment/revision. The Type Test report shall not be older than 10 years prior to the date of expiry of the Bid, otherwise the offer will not be considered.

ii. Routine Tests: All routine tests shall be performed by the bidder during manufacturing in line with section-08 of IEC-62271-102 read with IEC-62271-1:2017 with latest amendments/revision, if any.

iii. <u>Acceptance Tests</u>: All acceptance tests shall be performed by the bidder in line with IEC-62271-102 with latest amendments/revision

18.0 ELECTRICAL CHARACTERISTICS AND PERFORMANCE REQUIREMENT FOR 220 KV ISOLATORS:

18.1 The 220 KV Isolator shall be outdoor, horizontal mounting, centre break type (HCB) and suitable for very heavily polluted atmospheric condition and shall be designed for the system parameter given below:

a)	Nominal system	:	220 KV
b)	Highest system voltage	:	245 KV
c)	System frequency	:	50 Hz
d)	System earthing	:	Effectively earthed

18.2 The design parameters of the isolator shall satisfy requirements enlisted here below:-

1.	Type	outdoor, horizontal mounting, centre break type (HCB)
2.	Rated current at rated ambient temperature.	1250/1600/2500 amp
3.	Rated short time (1 sec.) withstand current of Isolator and Earth Switch.	40 kA
4.	Rated dynamic short circuit withstand current of isolator and earth switch	100 kAp (2.5 rated short time withstand current)
5.	Temperature rise over design ambient temperature	As per Table-3 of IEC-62271-1
6.	Operating mechanism of isolator/earth switch	A.C. Motor operated
7.	Operating time	12 sec. or less
8.	Rated insulation levels	i) 1.2/50 micro second lightening impulse withstand voltage (Positive& negative

		polarity). a)To Earth :1050 kV peak b)Across Isolating distance :1200kV peak ii) One minute power frequencies withstand voltage. a)To Earth :460 kV b)Across Isolating distance :530 kV
9.	Current Density	Current density to be adopted for all part of the Isolator and terminal connector shall not exceed the following limits: a) Hollow tube section: Copper – 2.0 A/mm2 Aluminum–1.25 A/mm2 b) Other sections & terminal connectors: Copper – 1.60A/mm2 Aluminum – 1.0 A/mm2
10.	Phase to phase spacing	4000 mm.
11.	Creepage distance (Total)	7595mm.

18.3 Temperature Rise Over Design Ambient Temperature: As per IS-9921.

18.4 Operating Mechanism: Motor operated as well as manually operated.

19.0 SPECIAL REQUIREMENTS:

19.1 The earthing switch should have the rated making capability for discharging the line trap charge for a line length of 50 Kms (Over-head) or 10 Kms Underground cable.

19.2 The isolator should have the rated capability for make/break of rated magnetizing current of power transformers.

20.0 PACKING AND TRANSPORT INSTRUCTIONS

i.) Bidder shall ensure that all equipment covered by this specification shall be prepared for rail/road transport and be packed in such a manner as to protect it from damage in transits.

ii.) The Bidder shall be responsible for and make good at his own expense any or all damaged due to improper preparation and packing.

iii.) Loose material, e.g. bolts, Nuts etc. shall be packed in gunny bags and sealed in polythene bags with proper tagging.

iv.) Components containing glass shall be carefully covered with shock absorbing protective material such as ‘Thermocole’.

v.) All opening in the equipment shall be tightly covered, plugged or capped to prevent dust and foreign material from entering in.

vi.) Wherever necessary, proper arrangements for attaching slings for lifting shall be provided.
vii.) All spare parts shall be packed and treated for long storage conditions at site.
viii.) Any material found short inside the intact packing cases shall be supplied by the bidder at no extra cost to the purchaser.

21.0 GUARANTEED TECHNICAL PARTICULARS OF 220 kV ISOLATOR

01. Make of Isolators.
02. Type and catalogue No. of Isolators.
03. Rated current.
04. System voltage.
05. Rated voltage
06. Short time current
    a) one second
    b) Instantaneous
07. Maximum magnetizing current make/break capacity.
08. Earthing switch making capacity for discharging line charge.
09. Construction Rate:
    a) Number of break per circuit per pole.
    b) No. of Isolators pedestals on one phase.
    c) Type of contacts
    d) Type of hearing or rotating insulator.
    e) Material for rotating blade.
    f) Material for contact.
10. Minimum clearance in air:
    a) Between poles
    b) Between live parts and earth
11. Max. Current density:
12. Number of auxiliary switches in operating mechanism:
    a) Normally close
    b) Normally open.
13. Insulation Data:
    a) Dry withstand value (1 minute) KV rms.
    b) Wet withstand value (1 minute) KV rms.
    h) Impulse withstand value (1.2/50 u.s) KV (Peak)
14. Earthing device:
    a) Short time current rating.
    b) One second.
15. Total weight of one complete triple pole isolator.
16. Mounting structure weight.
17. Terminal connectors.
18. Desired phase to phase clearance.

19. Terminal connector for ACSR ‘ZEBRA’
20. List of spares for 5 years maintenance.
21. Operating device details.
22. Rated Insulation level.
23. Length of chassis each pole.
24. Centre to centre distance between terminal stud of male and female blades.

SECTION-VII

TECHNICAL SPECIFICATION

TOWER

TECHNICAL SPECIFICATIONS

1.0 Site Inspection

1.1. Site Inspection Report

1.1.1. The contractor shall visit the site to inspect the transmission line and collect observations/information which would be useful for restringing activity. Complete BOQ of the transmission lines for re-Conductoring shall be furnished in the report.

1.1.1.1. All observations/ information which the Contractor thinks would be useful to implement the Re-Conductoring of the existing transmission line mentioned under scope of work are to be reported.

1.1.1.2. The detailed procedure for carrying out the Re-Conductoring shall be submitted to the site Engineer-in-charge before taking up the work

1.1.1.3. Suggestions regarding location for setting up stores during line construction in consultation with Employer representative shall also be provided by the contractor.

1.1.1.4. Working months available during various seasons along the transmission line, with period, time of sowing & harvesting of different type of crops and the importance attached to the crops particularly in the context of way leave problems and compensation payable shall be stated by the Contractor.

1.1.1.5. Some portions of the line may require clearance from various authorities. The Contractor shall indicate the portion of the line so affected, the nature of clearance required and the name of concerned organizations such as local bodies, municipalities, P&T (name of circle), Inland navigation, Irrigation Department, Electricity Boards and Zonal railways, Divisional Forest Authorities etc.

1.1.1.6 All the requisite data for processing the case of statutory clearances such as PTCC, Forest and Railway shall be provided along with the report.

1.1.1.7 Six copies of survey reports shall be furnished by the contractor to the Employer.

2.0 Environmental Conditions

2.1 Forest

The line route passing through forest stretches if any shall be indicated to the successful Bidder.

2.2 General Climatic Conditions

Climatic conditions shall be of tropical nature having summer period for 8 months and winter period for 4 months in a year. Working season shall be approximately 9 months/year and balance 3 months shall be monsoon period.

The maximum temperature during summer shall be of the order of 50°C and the minimum temperature in the winter shall be of the order of 4°C. Normal everyday temperature is 32°C.

2.3 Statutory Regulations and Standards

2.3.1 Statutory Regulations

The Contractor is required to follow local statutory regulations stipulated in Electricity (Supply) Act 1948, Indian Electricity Rules, 1956 as amended and other local rules and regulations referred in this Specifications.

2.3.2 Reference Standards

2.3.2.1 The Codes and/or standards referred to in the specifications shall govern, in all cases wherever such references are made. In case of a conflict between such codes and/or standards and the specifications, latter shall govern. Such codes and/or standards, referred to shall mean the latest revisions, amendments/changes adopted and published by the relevant agencies.

2.3.2.2 Other internationally accepted standards which ensure equal or better performance than those specified shall also be accepted, subject to prior approval by the Employer.

3.0 Details of Transmission Towers in existing line

3.1 General Description of the Tower

3.1.1 The towers are of the following types:

a) Double Circuit (DA, DB & DC)

3.1.2 The towers are of self supporting hot dip galvanised lattice steel type designed to carry the line conductors with necessary insulators, earthwires and all fittings under all loading conditions.

3.2 Type of Towers

3.2.1 The towers in the existing line are classified as given below:

Type of Tower	Deviation Limit	Typical Use
A/DA	0 deg	i) Used as tangent tower.
B/DB	0 deg - 30 deg	i) Angle towers with tension insulator string. ii) Also to be used for Anti Cascading Condition
B/DB	0 deg	i) Used as Section Tower.
C/DC	30 deg-60 deg	i) Angle tower with tension insulator string. ii) Also to be used for anti cascading condition. iii) Used for river crossing anchoring with longer wind span
C/DC	0 deg	i) Used as section tower. ii)Dead end with 0 deg. To 15 deg. Deviation both on line side and sub-station side (slack span)

Note: The above towers are also used for longer span with smaller angle of deviations.

3.2.2 **Extensions**

The towers are having 3M, 6M, 12 M and 15 M body extensions/leg extensions for maintaining adequate ground clearances without reducing the specified factor of safety in any manner.

3.3 Span and clearances

3.3.1 **Normal Span**

Ruling Design span for Narrow base tower is 225 meters and for Broad Base tower is 320 meters

3.3.2 **Wind Span**

The wind span is the sum of the two half spans adjacent to the support under consideration. For normal horizontal spans this equals to normal ruling span.

3.3.3 **Weight span**

The weight span is the horizontal distance between the lowest point of the conductors on the two spans adjacent to the tower.

3.4 Electrical Clearances

3.4.1 **Ground Clearance**

The minimum ground clearance from the bottom conductor is not be less than 7100 mm at the maximum sag conditions corresponding to maximum continuous operating temperature and still air.

4.0 De-stringing & Stringing of Conductor and Installation of Line Materials

4.1 General

4.1.1 The scope of erection work shall include the cost of all labour, tools and plant and all other incidental expenses in de-stringing and stringing work. The contractor shall have to destring the existing conductor and restrung with the HTLS conductor section wise and restore the line in original conditions as per program finalized in co ordination with site. Destringing and stringing of the line shall be carried out under induced voltage condition i.e. one circuit undercharged condition. Adequate safety measures and precautions shall be taken by the Contractor during this erection work.

4.1.2 The Contractor shall be responsible for transportation to site of all the materials to be provided by the Contractor as well as proper storage and preservation of the same at his own cost, till such time the erected line is taken over by the Employer. Similarly, the Contractor shall be responsible for proper storage, safe custody, and loss or damage of all Employer's supplied items, if any, as well as its transportation to site for incorporation in the lines and shall maintain and render proper account of all such materials at all times.

4.1.3 Contractor shall set up required number of stores along the line and the exact location of such stores shall be discussed and agreed upon with the Employer.

4.1.4 The complete erection work including installation of line materials (insulator strings, hardware and accessories for conductor) shall be supervised by a team of supplier/Contractor's engineers/supervisory staff/ workmen already experienced in stringing work associated with the type of HTLS conductor being supplied. The contractor shall furnish experience details of the engineers /supervisory staff proposed to be deployed.

4.1.5 The scope of work of the contractor shall inter-alia include the following:-

i) De-stringing the existing conductor, dismantling of insulators/ insulator strings, hardware fittings, and accessories for conductor etc.

ii) Disposing off of all the dismantled line materials recovered from the existing line.

iii) Installation of necessary hardware, hoisting of insulator strings, installing & stringing of HTLS conductor including fixing of conductor accessories. Corona control rings/arcing horn shall be fitted in an approved manner. Torque wrench shall be used for fixing various line materials and components.

4.3 Handling of Conductor

4.3.1 Running Out of the Conductors

4.3.1.1 The conductors shall be run out of the drums form the top in order to avoid damage. The Contractor shall be entirely responsible for any damage to tower or conductors during stringing.

4.3.1.2 A suitable braking device shall be provided to avoid damaging, loose running out and kinking of the conductors. Care shall be taken that the conductors do not touch and rub against the ground or objects which could scratch or damage the strands.

4.3.1.3 The sequence of running out shall be from the top down. Unbalanced loads on towers shall be avoided as far as possible. Inner phase of line conductors shall be strung before the stringing of the outer phases is taken up.

4.3.1.4 Tower not designed for one sided stringing shall be well guyed and step taken by contractor to avoid damage. Guying proposal along with necessary calculation shall be submitted by the contractor to Employer for approval. All expenditure related to this work is deemed to be included in the bid price and no extra payment shall be made for the same.

4.3.1.5 The Contractor shall take adequate safety precautions to protect personnel; from the potentially dangerous voltage build up due to electromagnetic and electrostatic coupling in the pulling wire, conductors during destringing and stringing operations. These precautions include measures taking in account the other circuit on the line under 220 kV line conditions.

4.3.1.6 The Contractor shall also take adequate a safety precaution to protect personnel from potentially dangerous voltage build up due to distant electrical storms/energized lines.

4.3.2 Running Blocks

4.3.2.1 The groove of the running blocks shall be of such a design that the seat is semicircular and larger than the diameter of the conductor and it does not slip over or rub against the slides. The grooves shall be lined with hard rubber or neoprene to avoid damage to conductor and shall be mounted on properly lubricated bearings.

4.3.2.2 The running blocks shall be suspended in a manner to suit the design of the cross-arm. All running blocks, especially at the tensioning end will be fitted on the cross-arms with jute cloth wrapped over the steel work and under the slings to avoid damage to the slings as well as to the protective surface finish of the steel work.

4.3.3 Repairs to Conductors

4.3.3.1 The conductor shall be continuously observed for loose or broken strands or any other damage during the running out operations.

4.3.3.2 Repairs to conductor where no more than two strands in the outermost layer are broken shall be carried out with repair sleeve with approval of Engineer-In charge.

4.3.3.3 Repairing of the conductor surface shall be carried out only in case of minor damage, scuff marks, etc. The final conductor surface shall be clean, smooth and free from projections, sharp points, cuts, abrasions, etc.

4.3.3.4 The Contractor shall be entirely responsible for any damage to the towers during stringing.

4.3.4 Crossings

Derricks or other equivalent methods ensuring that normal services need not be interrupted nor damage caused to property shall be used during stringing operations where roads, channels, telecommunication lines, power lines and railway lines have to be crossed. In case of railway crossings, shutdown might not be available and therefore, contractor shall be required to carry out reconductoring under such condition i.e. without any shutdown of railways. However, shut down shall be obtained when working at crossings of overhead power lines. The Contractor shall be entirely responsible for the proper handling of the conductor and accessories in the field.

4.4 Stringing of Conductor

4.4.1 The stringing of the HTLS conductor shall be done by the standard stringing method suitable for the type of HTLS conductor offered

4.4.1.1 The Contractor shall deploy appropriate tools/ equipments/ machinery to ensure that the stringing operation is carried out without causing damage too conductor and the conductor is installed at the prescribed sag tension as per the approved stringing chart. Prior to taking up stringing work the Contractor shall submit for approval of Site-In charge the complete details of stringing methods he proposes to follow.

4.4.1.2 If any special tools and tackles other than those generally used for stringing of ACSR conductors are deployed for stringing of HTLS conductor by the contractor, a set of those tools & tackles shall be supplied by the contractor to the Employer, on completion of the project, at no extra cost. The quantity of such tools & tackles shall be sufficient to carry out stringing operations of the longest section (from angle tower to angle tower) of the existing transmission line.

4.4.2 The contractor shall submit, for approval of site in-charge, the complete details of the stringing methods he proposes to follow. Prior to stringing the Contractor shall submit the stringing charts for the conductor showing the initial and final sags and tension for various temperatures and spans along with equivalent spans in the lines for the approval of the Employer.

4.4.3 Conductor creep are to be compensated by over tensioning the conductor at an appropriate temperature lower than the ambient temperature based on creep calculations to be furnished by the Contractor.

4.5 Jointing

4.5.1 When approaching the end of a drum length at least three coils shall be left in place when the stringing operations are stopped. These coils are to be removed carefully, and if another length is required to be run out, a joint shall be made as per the approved drawing and procedures recommended by the manufacturer of joints.

4.5.2 Conductor splices shall not crack or otherwise be susceptible to damage in the stringing operation. The Contractor shall use only such equipment/methods during conductor stringing which ensures complete compliance in this regard.

4.5.3 All the joints on the conductor shall be of the compression type, in accordance with the recommendations of the manufacturer, for which all necessary tools and equipment like compressors, dies etc., shall be obtained by the Contractor. Each part of the joint shall be cleaned by wire brush till it is free of dust or dirt etc., and be properly greased with anti-corrosive compound. If required and as recommended by the manufacturer, before the final compression is carried out with the compressors. For composite core HTLS conductor suitable sleeve, collets, collet housing shall be

used for jointing of core as per the offered design and methodology applicable for similar type of design/application

4.5.4 All the joints of splices shall be made at least 30 metres away from the tower structures. No joints or splices shall be made in spans crossing over main roads, railways and small river tension spans. Not more than one joint per sub conductor per span shall be allowed. The compression type fittings shall be of the self centering type or care shall be taken to mark the conductors to indicate when the fitting is centered properly. During compression or splicing operation; the conductor shall be handled in such a manner as to prevent lateral or vertical bearing against the dies. After compressing the joint the aluminium sleeve shall have all corners rounded, burrs and sharp edges removed and smoothened.

4.5.5 During stringing of conductor to avoid any damage to the joint, the Contractor shall use a suitable protector for mid span compression joints in case they are to be passed over pulley blocks/aerial rollers. The pulley groove size shall be such that the joint along with protection can be passed over it smoothly.

4.6 Tensioning and Sagging Operations

4.6.1 The tensioning the sagging shall be done in accordance with the approved stringing charts or sag tables. The "initial" stringing chart shall be used for the conductor. The conductors shall be pulled up to the desired sag and left in running blocks for at least one hour after which the sag shall be rechecked and adjusted, if necessary, before transferring the conductors from the running blocks to the suspension clamps.

4.6.2 The sag will be checked in the first and the last section span for sections up to eight spans, and in one additional intermediate span for sections with more than eight spans. The sag shall also be checked when the conductors have been drawn up and transferred from running blocks to the insulator clamps.

4.6.3 The running blocks, when suspended from the transmission structure for sagging, shall be so adjusted that the conductors on running blocks will be at the same height as the suspension clamp to which it is to be secured.

4.6.4 At sharp vertical angles, conductor and earth wire sags and tensions shall be checked for equality on both sides of the angle and running block. The suspension insulator assemblies will normally assume verticality when the conductor is clamped.

4.6.5 Tensioning and sagging operations shall be carried out in calm whether when rapid changes in temperature are not likely to occur.

4.7 Clipping In

4.7.1 Clipping of the conductors into position shall be done in accordance with the manufacturer's recommendations.

4.7.2 Jumpers at section and angle towers shall be formed to parabolic shape as per existing tower line diagrams to ensure minimum clearance requirements.

4.7.3 Fasteners in all fittings and accessories shall be secured in position. The security clip shall be properly opened and sprung into position.

4.8 Fixing of Conductors Accessories

Conductor accessories including spacers, spacer dampers (for bundle conductor) and vibration dampers shall be installed by the Contractor as per the design requirements and manufacturer's instruction within 24 hours of the conductor clamping. While installing the conductor accessories, proper care shall be taken to ensure that the surfaces are clean and smooth and that no damage occurs to any part of the accessories or of the conductors. Torque wrench shall be used for fixing the Dampers/Spacer Dampers, Suspension Clamps etc. and torque recommended by the manufacturer of the same shall be applied.

4.9 Permitted Extra Consumption of Line Materials

4.9.1 Contractor supplied line materials viz. Conductor, insulators, associated fittings and accessories, the extra consumption on account of damage, loss and wastage etc. shall be to the Contractor's account.

4.9.2 The Contractor shall not be required to return to the Employer any balance empty conductor drums and shall dispose off the same at his cost.

4.9.3 The quantities of line materials to be supplied by the contractor (i.e. HTLS conductor and associated hardware fittings and accessories and composite insulators) as indicated in the Bill of materials are tentative. The actual quantities shall depend upon final inspection report & site requirements & shall also include reasonable quantity of spares (of the order of 2% approx.). Contractor shall be responsible for regulating the supplies of contractor supplied materials based on actual requirements. The Employer shall have right not to take any surplus contractor supplied materials.

4.10 Final checking, Testing and Commissioning

After completion of the works, final checking of the line shall be carried out by the Contractor to ensure that all stringing have been done strictly according to the specifications and as approved by the Employer. All the works shall be thoroughly inspected in order to ensure that :

a) The stringing of the conductors has been done as per the approved sag and tension charts and desired clearances are clearly available;

b) All conductor accessories are properly installed;

c) The original tracings of profile are submitted to the Employer for reference and record.

d) The insulation of the line as a whole is tested by the Supplier through provision of his own equipment, labour etc., to the satisfaction of the Employer.

e) The line is tested satisfactorily for commissioning purpose.

5.0 Field Quality Plan

All field activity shall be carried out in accordance with Standard Field Quality plan.

6.0 Standards

6.1 The design, manufacturing, fabrication, galvanising, erection procedure and materials used for manufacture and erection of assorted tower members shall conform to the following Indian Standards (IS)/International Standards which shall mean latest revisions, with amendments/changes adopted and published, unless specifically stated otherwise in the Specification. In the event of supply of material conforming to Standards other than specified, the Bidder shall confirm in his bid that these Standards are equivalent to those specified. In case of award, salient features of comparison between the Standards proposed by the Bidder and those specified in this document will be provided by the Contractor to establish their equivalence.

6.2 The material and services covered under these specifications shall be performed as per requirements of the relevant standard code referred hereinafter against each set of equipment and services. Other internationally acceptable standards which ensure equal or higher performance than those specified shall also be accepted.

Sl. No.	Indian Standard	Title	International Standard
1.	IS:209-1992	Specification for Zinc	ISO/R/752 ASTM B6
2.	IS 278-1991	Galvanised Steel Barbed wire	ASTM A131
3.	IS 800-1991	Code of Practice for General Building Construction in Steel	CSA 6.1
4(a).	IS:802(Part 1) Sec 1-1995 Sec 2-1992	Code of Practice for General Building Construction in Steel in Overhead Transmission Line Tower : Materials, loads and Permissible Stress Section- 1: Materials and loads Section-2 : Permissible stresses.	ASCE 52 IEC 826 BS 8100
4(b).	IS:802(Part 2)-1990	Code of Practice for use of structural steel in Overhead Transmission Line : Fabrication, Galvanising, inspection & Packing	ASCE 52
4(c).	IS:802(Part 3)-1990	Code of Practice for use of structural steel in Overload Transmission Line: Tower testing	ASCE 52 IEC 652
5.	IS:808-1991	Dimensions for Hot Rolled Steel Beam, Column, Channel and Angle Sections.	
6.	IS:875-1992	Code of Practice for Design Loads (other than Earthquakes) for Buildings and Structures.	
7.	IS:1363-1990	Hexagon Nuts (size range M5 to M36)	
8.	IS:1367-1992	Technical Supply Conditions for Threaded Steel/ Fasteners	
9.	IS:1477-1990	Code of practice for Painting of Ferrous Metals in Buildings: Part-I: Pre-treatment Part-II: Painting.	
10.	IS:1573-1991	Electro-Plated Coatings of inc on iron and Steel	
11.	IS:1852-1993	Rolling and Cutting Tolerances of Hot Rolled Steel Products	
12.	IS-1893-1991	Criteria for Earthquake Resistant Design of Structures	IEEE 693
13.	IS:2016-1992	Plain Washers	ISO/R887 ANSIB18-22.1
14.	IS:2062-1992	Steel for general structural purposes	
15.	IS:2074-1992	Ready Mixed Paint. Air Drying, Oxide. Zinc Chrome, Priming Specification	
16	IS:2551-1990	Danger Notice Plates	
17.	IS:2629-1990	Recommended Practice for Hot Dip Galvanising of iron and steel.	
18.	IS:2633-1992	Method of Testing Uniformity of Coating of Zinc Coated Articles	ASTM A123 CSA G164
19.	IS:3043-1991	Code of Practice for Earthing	
20.	IS:3063-1994	Single coil Rectangular section Spring Washers for Bolts, Nuts Screws	DIN-127

21.	IS:3757-1992	High Strength Structural Bolts	
22.	IS:4759-1990	Specification for Hot zinc coatings on structural steel and other Allied products	
23.	IS:5369-1991	General Requirements for Plain Washers	
24.	IS:5613-1993	Code of Practice for Design installation and Maintenance of Overhead Power Lines Section-1: Design Part 2, Section-2: Installation and Maintenance	
25.	IS:6610-1991	Specification for Heavy Washers for Steel structures	
26.	IS:6623-1992	High Strength Structural Nuts	
27.	IS:6639-1990	Hexagon Bolts for Steel Structure.	ASTM A394 ASTM A90

SECTION-VIII

PRE-COMMISSIONING PROCEDURES

FOR TRANSMISSION LINES

PRE-COMMISSIONING PROCEDURES FOR TRANSMISSION LINES

INTRODUCTION

Over all procedure, safety rules, Statutory Requirements, dispatch procedures, switching sequences, observations, passing criteria and documentation of test results have been documented in this report.

The detailed inspection and handing over documents are required to be checked for the entire length of transmission line before energization.

The detailed inspection/test procedures for each activity has been elaborated in separate section of this documentation. The contents of this report are as following :

1. Definition
2. Overall Procedures
3. Safety procedures
4. Inspection
5. Statutory Requirements
6. Handing over
7. Protective system
8. Dispatch procedures
9. Switching procedures
10. Testing
11. Energization
12. De-energization
13. Observations and duration
14. Passing criteria
15. Documentation

1.0 DEFINITION

"Main Transmission Lines" means all high pressure cables and overhead lines (not being an essential part of the distribution system of a licensee) transmitting electricity from a generating station to another generating station or a sub-station, together with any step-up and step-down transformers, switch-gear and other works necessary to and used for the control of such cables or overhead lines, and such buildings or part thereof as may be required to accommodate such transformers, switch-gear and other works and the operating staff thereof;

"Power System" means a system under the control of the Government or any Board of Generating Company or other agency and having one or more-

i) generating station; or

ii) main transmission lines and sub-stations; or

iii) generating stations and main transmission lines and substations;

"Regional Electricity Board" means any of the Boards as constituted immediately before the commencement of the Electricity Laws (Amendment) Act, 1991, by resolution of the Central Government for ensuring integrated operation of constituent system in the region;

"Regional Load Dispatch Centre" means the Centre so designated where the operation of each of the Regional Electricity Grids constituting the country's power system is coordinated;

"Sub-Station" means a station for transforming or converting electricity for the transmission or distribution thereof and includes transformers, convertors, switch-gear, capacitors, synchronous condensers, structures cables and other appurtenant equipments and any buildings used for that purpose and the site thereof, a site intended to be used for any such purpose and any buildings used for housing the staff of the sub section;

"Tie-Line" means a line for the transfer of electricity between two power systems together with switchgear and other works necessary to, and used for the control of such line.

2.0 OVERALL PROCEDURE

First it is to be ascertained that the transmission line to be energized is ready for operation and has been properly handed over (released) in writing. This will include all safety aspects, Electrical inspector clearance, PTCC clearance, Statutory clearance, and final inspection, if any.

Instructions for the work and supervision is given by the test leader (Line in charge). However all switching and all operational activities will be executed by the regular operators.

Line charging instructions received from owner are clearly understood by the Line in charge and doubts, if any, are to be got clarified prior to the energisation of the line.

Once the line is handed over for charging no work shall be permitted without a valid WORKPERMIT.

When the whole system has been energized, including the AC line, it will be kept in this state for 8 hours or more for "soaking" with continuous inspection and monitoring. However recommendations of the owner may be checked. Otherwise it may beput into continuous operation.

3.0 SAFETY PROCEDURES

Energization implies an abrupt and serious change of the working conditions in the line.

In order to avoid serious accidents, thorough information must be imparted to all personnel involved in the construction of transmission line. In charge of the Transmission line (Group head OR Divisional head) must ensure that due publicity has been made to the public in all the villages/areas along the line route cautioning them against climbing the towers etc. and that the line is proposed to be charged on so and so date. It is also to be confirmed that the AGENCIES involved in the construction activities shall not carry out any job on the said line without a valid WORK PERMIT.

It shall be ensured before charging that all men, material, Tools and plants and any temporary earthing on any part of the entire length of line are removed.

It must be ensured that any power supply / low voltage charging used as anti-theft measure must be disconnected and isolated to avoid accidental connection.

All equipment tests and pre-commissioning tests must have been completed, re-connected (in case cables were isolated for testing purpose) and documented.

The system must be formally declared ready for energization and handed over for operation in writing.

4.0 INSPECTION

Before the line is scheduled to be handed over for the pre-commissioning/energization the same shall be inspected by representatives of DTL and Construction Agency.

Such an inspection shall include :

i) Right of way/way leave/electrical clearance

ii) Foundation and Revetments/Protection Work

iii) Tower and Tower accessories

iv) Hardware Fittings

v) Insulators

vi) Conductors and Earthwire

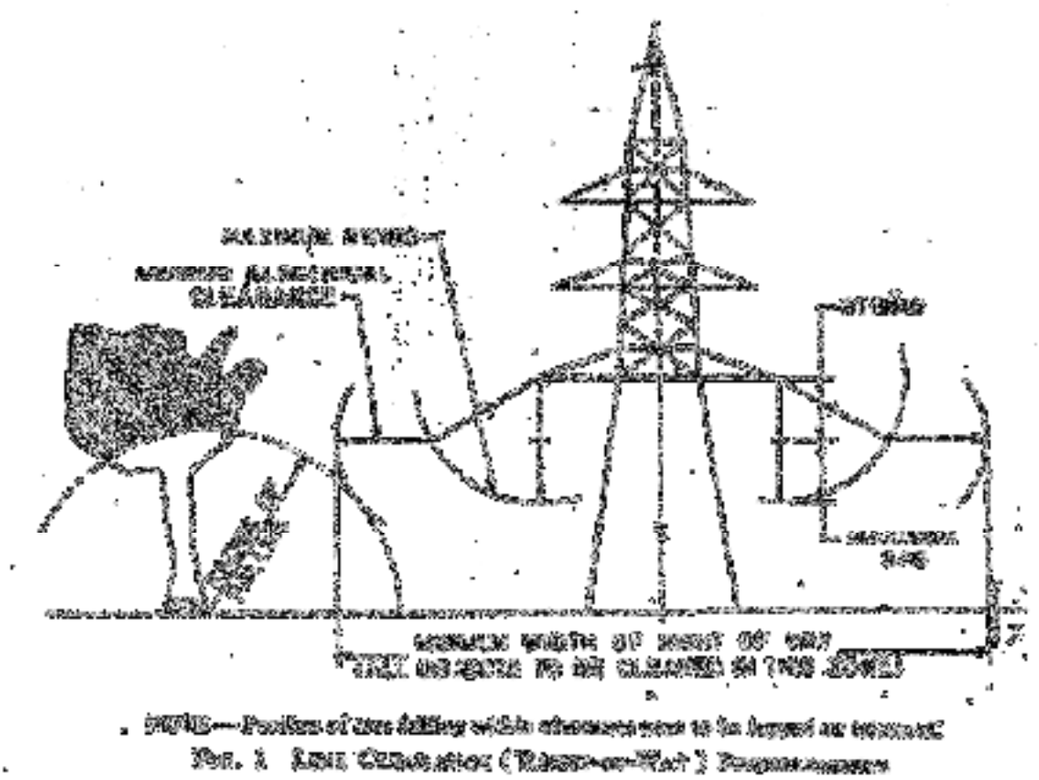
vii) Accessories for conductor and Earthwire

viii) Aviation Warning Signals (Lights/globules/painting)

4.1 RIGHT OF WAY/WAY LEAVE/ELECTRICAL CLEARANCE

4.1.1 Right of way/Way leave clearance

Ensure that no tree/tree branches are falling within the zone of minimum clearance specified as per Fig. 1.



Guidelines of forest/environmental rules shall be followed to avoid excessive tree cutting i.e. all the trees should be cut from ROUTE level in the 3 meter corridor below each line Conductor/Earthwires. In the balance corridor, Trees branches are only to be lopped to attain the specified clearance as per Table no 1.

TABLE NO. 1
CLEARANCE FOR RIGHT OF WAY

TRANSMISSION VOLTAGE (IN KV)	**MINIMUM RIGHT OF WAY (IN MTRS)**
110/132	22/27
220	35
400	52 (S/C)
400	46 (D/C)
+/- 800 kV HVDC	69

4.1.2. Electrical Clearance

In case of line crossings, clearance between lowest conductor of line and top conductor of the other line shall be adequate as follows:

(Minimum clearances in mm between lines when crossing each other)

Sl. No.	**Nominal System Voltage**	**132 kV**	**220 kV**	**400 kV**	**800 kV HVDC**
1.	132 KV	3050	4580	5490	9040
2.	220 KV	4580	4580	5490	9040
3.	400 KV	5490	5490	5490	9040
4.	800 kV HVDC	9040	9040	9040	9040

Jumpers in the tension tower are properly intact with conductor and form a parabolic shape in order to achieve adequate clearance from super steel structure.

4.1.2.1. Ground clearance

Normally at the time of construction adequate clearance is provided between lowest conductor and ground, but due to delay in charging/commissioning there are chances of dumping/heaping soil, earth and concrete etc. or staking bricks etc. which may cause reduction in ground clearance. In such cases the stored materials shall be removed.

Ensure that there is no temporary or permanent construction of houses or shades below the line. If the same has been constructed they shall be removed before charging.

The various clearances are given below as guidance however all the clearances indicated by Approved Drawings are to be referred.

The round profile at the time of commissioning shall be checked with the profile approved at the time of check survey.

Ground clearance of lowest conductors at critical points/where ever the lowest conductor is touching the ground shall be checked in the field from any of the prevalent method and the values of ground clearance at these critical points shall be recorded in the prescribed format.

In case of hilly Terrain and for building clearance, the side clearance from conductors and jumpers at critical points shall also be checked and recorded for all phases of conductor/earthwire towards hill/ building side.

The permissible minimum ground clearances for different voltages are as given below

TRANSMISSION VOLTAGE (IN KV)	**GROUND CLEARANCE (MM)**
110/132	6100
220	7015
400	8840
+/- 800 kV HVDC	18000 for rural & sub-urban areas & 20000 for urban & populated areas

.

4.1.2.2. Clearance for Telephone line crossings

The minimum clearances between the conductors of the power line and telecommunication lines are specified as follows :

TRANSMISSION VOLTAGE (IN KV)	CLEARANCE **(MM)**
110/132	2745
220	3050
400	4880
+/- 800 kV HVDC	9040

The vertical clearances between conductors and between conductor and earth-wire shall be checked randomly say in any one span of all sections and 10 sections of hilly areas from single line diagram of the towers.

4.4. HARDWARE FITTINGS

Tightening of all bolts and nuts are to be checked upto specified torque.

Check the fixing of all security clips (W/R type clips).

Surface condition of corona control rings and distance/alignment between Tower side arcing horn (wherever applicable) and line side arcing horn/corona control ring to be checked as per approved drawings.

To restrict the swing of jumpers, the provision of Pilot strings in case of Tension Towers shall be verified from the approved drawings.

4.5 INSULATORS

All the damaged/broken insulator shall be replaced.

Unusual deflection in suspension strings if observed shall be rectified.

The insulators shall be cleaned before charging.

4.6. CONDUCTORS and EARTHWIRES

Surface Condition

Surface of the conductors shall be free from scratches/rubs

Ensure that conductor strands are not cut and opened up. Wherever strands are found cut/damaged/scratched, they must be repaired with repair sleeves/repair protective rods in case the nos. of damaged strands are within specified limits(normally upto 1/6th nos. of strands in the outer layer). ***

4.7. ACCESSORIES FOR CONDUCTOR

4.7.1. Joints

All joints on conductor shall be away from the tower at a distance of at least 30 metres or as provided in the Technical specification (TS).

Ensure that not more than one joint in a conductor is provided in one span or as per the provisions of technical specifications

Ensure that no mid span joint is provided in major crossings for main roads, railway crossing and major rivers etc. or as per the provisions of technical specifications.

Ensure that all mid span joints on conductors and repair sleeves of compression type are free from sharp edges, rust and dust. Wherever grease are specified, the same shall be applied in the joints.

4.7.2. Clipping

Ensure that conductor is not over tightened in the suspension clamps.

4.7.3 Spacers, vibration dampers and copper bonds

Placement and no. of dampers on each phase shall be verified as per damper placement chart.

Spacing of Vibration dampers from the tower and spacing between damper to damper in case two Vibration Dampers (VD) were provided, shall be verified as per the damper placement chart. All loose/ displaced VD shall be properly tightened/relocated and missing VDs shall be provided.

To be ensured that no copper bond is loose/missing.

4.7.4 Jumpers

Verify Electrical clearance of jumpers to tower body as per design.

All the jumpers shall be checked properly. In case, jumpers (conductor/earthwire) is found loose, it shall be tightened sufficiently.

4.7.5 Foreign material

Ensure that all foreign materials viz dead bird. fallen tree branches, bird nests etc. on conductors, earthwires, Jumper, insulator string, cross arms are removed.

4.7.6. Others

It shall be ensured that all temporary/local earthing, guys, T&P (Tools and Plants), foreign material and other loose material which were used during stringing/tower erection have been removed.

In case there is any change in the ground profile before commissioning of line from the approved profile, the extra earth/obstruction /temporary sheds/any other construction shall be removed.

5.0 STATUTORY REQUIREMENT

5.1. The concerned authorities shall be informed before commissioning the lines and their approval obtained in accordance with Indian Electricity Act, 1910 and Indian Electricity Rule, 1956. and Electricity Act 2003.

5.2 Before charging of the line PTCC approval from P&T Dept. shall be obtained.

6.0 HANDING OVER

The transmission line shall be inspected prior to energization and a formal handing over document to be jointly signed by the representative of SUPPLIER (if available), ERECTION AGENCY,Delhi Transco Limited. However all contractual taking over has to be resolved separately as per the terms and conditions of the contract. The Handing over shall be limited to the completion of Erection and ready for Energization.

Any outstanding points or remaining activities are to be listed jointly by DELHI TRANSCO LIMITED and CONTACTOR and signed jointly. These documents are also to be retained at Group Head Quarter with a copy to Regional Head Quarter. The remaining activities/outstanding points are classified in the following category.

Details of the SECTIONS:

A. List of outstanding activities remaining in any part of the line

B. A list of temporary arrangements introduced.

C. Check list records properly documented, completed and signed.

D. Original tracing of Profile, Route Alignment, Tower Design, Structural Drawings, Bill of Materials, Shop Drawings, Stringing charts (initial and final as applicable) etc. of all towers/line submitted to DELHI TRANSCO LIMITED.

With the outstanding activities mentioned above are solved or with only minor points without influence on the charging remain (minor issues handing over of the transmission line shall be accepted by the pre-commissioning team. This handing over for energization with or without remaining activities shall be made by the group head to the commissioning in charge in writing.

Shortcomings noticed during the inspection, "List of outstanding activities" shall be recorded and a copy of the format is to be given to the responsible parties like SUPPLIER(s) and ERECTION AGENCY etc. for corrective action to be taken on a time schedule.

7.0 PROTECTIVE SYSTEM

Before energization it must be ascertained that all protective systems for the unit to be energized are operative.

This includes confirmation that the protections have been properly tested and that the tests have been documented.

It also includes verification by inspection or otherwise, if necessary by repetition of trip test, that the protections are actually functionally enabled. This verification serves to prevent that energization takes place of a unit where a protection has been disabled for test or other reason.

8.0 DISPATCH PROCEDURES

All operational activities (switching etc.) must be coordinated and communicated with the system dispatcher.

In this respect the general procedures already established by DELHI TRANSCO LIMITED will be followed.

9.0 SWITCHING PROCEDURES

For each activity the instructions to the operators and the communications to the dispatchers will be made in writing or by confirmed telephone messages. The switching procedures first to be properly documented step by step and understood by everybody involved in the switching operation prior to the energisation. Any clarification required in the procedures must be resolved. The format established by DELHI TRANSCO LIMITED for switchingorders and operational data logging shall be followed.

The implication of this is that each and every activity must be listed and described, so that complete information is available for detail investigation, if required in future.

10.0 TESTING AND MEASUREMENT PROCEDURES

10.2.2 Conductor Continuity Test

10.2.2.1 The objective of this test is to verify that each conductor of the overhead line properly connected electrically (the value of electrical resistance of line does not vary abnormally from that of a continuous conductor of the same size and length). The electrical resistance of the conductor shall be measured with a Whetstone bridge or other suitable instrument, if available taking the safety aspects of Equipment as well as testing Engineer.

11.0 ENERGIZATION

Execution of the energization is simply the last event in the switching sequence, switching of the close control button for the relevant circuit breaker.

12.0 DE-ENERGIZATION

Instructions about de-energization will be given only if this is part of the test. Otherwise de-energization will be considered part of regular operation.

13.0 OBSERVATION AND DURATION

Visual and audible inspection (look and listen) of the relevant equipment and reading of permanent instrumentation will be made.

The system shall be charged at least for 8 hours. During this time continuous monitoring and inspection will be maintained in control room, auxiliary systems areas and switch yards.

This will include frequent, scheduled inspection of all equipment and reading of all permanent instruments and recorders, and surge arrester counters, especially system parameters as per standard procedures adopted by DELHI TRANSCO LIMITED.

14.0 PASSING CRITERIA

Neither insulation breakdown nor protective system actions must occur. No irregular equipment behaviour noise, vibration, high temperature is permitted.

Corona discharges may not be “unreasonable”. Local discharges that may be attributable to sharp points shall be carefully located and recorded. After termination of the energization the equipment shall be closely inspected and the points rounded or covered.

No unscheduled changes of system or of equipment is permitted during the 8 hour energized condition.

15.0 DOCUMENTATION

Switching and operational activities will be recorded in regular manner in the operator’s log. Likewise, all readings of permanent instruments. Copies of this log, notes on special observations from inspections and other measurements will constitute the test records.

SECTION-IX

GENERAL TECHNICAL REQUIREMENTS (GTR)

GENERAL TECHNICAL REQUIREMENTS (GTR)

1.0 FOREWORD

1.1. The provisions under this section are intended to supplement general requirements for the materials, equipments and services covered under other sections of tender documents and are not exclusive. However in case of conflict between the requirements specified in this section and requirements specified under other sections, the requirements specified under respective sections shall prevail.

2.0 GENERAL REQUIREMENT

2.1 The bidders shall submit the technical requirements, data and information as per the technical data sheets provided in the Section-GTP of bid documents.

2.2. The bidders shall furnish catalogues, engineering data, technical information, design documents, drawings etc. fully in conformity with the technical specification.

2.3 It is recognized that the Contractor may have standardized on the use of certain components, materials, process or procedures different from those specified herein. Alternate proposals offering similar equipment based on the manufacturer's standard practice will also be considered provided such proposals meet the specified designs, standard and performance requirements and are acceptable to the Owner. Unless brought out clearly, the Bidder shall be deemed to conform to this specification scrupulously. All deviations from the specifications shall be clearly brought out in the respective "Schedule of Deviations" along with the bid. Any discrepancy between the specification and the catalogue or the bid, if not clearly brought out in "Schedule of Deviation", will not be considered as valid deviation and the offer in such case shall be liable to be rejected out rightly without assigning any reasons thereof.

2.4 wherever a material or article is specified or defined by the name of a particular Brand, Manufacturer or Vendor, the specific name mentioned shall be understood as establishing type, function and quality and not as limiting competition.

2.5 Equipment furnished shall be complete in every respect with all standard accessories normally provided with such equipment and/or needed for erection, completion and safe operation of the equipment as required by applicable codes though they may not have been specifically detailed in the Technical Specifications unless included in the list of exclusions. Materials and components not specifically stated in the specification but which are necessary for commissioning and satisfactory operation of the Scheme/Package unless specifically excluded shall be deemed to be included in the scope of the specification and shall be supplied without any extra cost. All similar standard components/parts of similar standard equipment provided, shall be inter-changeable with one another.

3.0 STANDARDS

3.1 The works covered by the specification shall be designed, engineered, manufactured, built, tested and commissioned in accordance with the Acts, Rules, Laws and Regulations of India.

3.2 The equipment to be furnished under this specification shall conform to latest

issue with all amendments (as on the date of bid opening) of standards specified under Annexure of this section, unless specifically mentioned in the specification.

3.3 The Bidder shall note that standards mentioned in the specification are not mutually exclusive or complete in themselves, but intended to compliment each other.

3.4 The Contractor shall also note that list of standards presented in this specification is not complete. Whenever necessary the list of standards shall be considered in conjunction with specific IS/IEC.

3.5 When the specific requirements stipulated in the specifications exceed or differ than those required by the applicable standards, the stipulation of the specification shall take precedence.

3.6 Other internationally accepted standards which ensure equivalent or better performance than that specified in the standards specified under Annexure A/ individual sections for various equipments shall also be accepted. However, the salient points of difference shall be clearly brought out in additional information along with English language version of such standard.

3.7 The bidder shall clearly indicate in his bid the specific standards in accordance with which the works will be carried out.

4.0 SERVICES TO BE PERFORMED BY THE EQUIPMENT BEING FURNISHED

4.1 All equipments shall also perform satisfactorily under various other electrical, electromechanical and meteorological conditions of the site of installation.

4.2 All equipment shall be able to withstand all external and internal mechanical, thermal and electromechanical forces due to various factors like wind load, temperature variation, ice & snow (wherever applicable) short circuit etc. for the equipment.

4.3 The equipment shall also comply to the following:

a) All outdoor equipments shall be suitable for hot line washing.

b) To facilitate erection of equipment, all items to be assembled at site shall be "match marked".

5.0 ENGINEERING DATA AND DRAWINGS

5.1 The engineering data shall be furnished by the Contractor in accordance with the schedule for each set of equipment as specified in the Technical Specifications.

5.2 The list of drawings/documents which are to be submitted to the Owner shall be discussed and finalized by the Owner at the time of award.

The Contractor shall necessarily submit all the drawings/documents unless anything is waived.

The Contractor shall submit 4 (four) sets of drawings /design documents/data/ test reports as may be required for the approval of the owner.

5.3 **DRAWINGS**

5.3.1 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, material description, Bill of Materials, weight, length/ height of each component, break-up for packing and shipment, dimensions, internal & the external connections, fixing arrangement required and any other information specifically requested in the specifications.

5.3.2 Each drawing submitted by the Contractor shall be clearly marked with the name of the Owner, the unit designation, the specifications title, the specification number and the name of the Project. If standard catalogue pages are submitted, the applicable items shall be indicated therein. All titles, noting, markings and writings on the drawing shall be in English. All the dimensions should be in metric units.

5.3.3 Further work by the Contractor shall be in strict accordance with these drawings and no deviation shall be permitted without the written approval of the Owner, if so required.

5.4 The review of these data by the Owner will cover only general conformance of the data to the specifications and documents interfaces with the equipment provided under the specifications, external connections and of the dimensions. This review by the Owner may not indicate a thorough review of all dimensions, quantities and details of the equipment, materials, any devices or items indicated or the accuracy of the information submitted. This review and/or approval by the Owner shall not be considered by the Contractor, as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these specifications and documents.

5.5 All manufacturing and fabrication work in connection with the equipment 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 conform to the provisions and intent of the Contract and such changes will again be subject to approval by the Owner. Approval of Contractor's drawing or work by the Owner shall not relieve the contractor of any of his responsibilities and liabilities under the Contract.

5.6 All engineering data submitted by the Contractor after final process including review and approval by the Owner shall form part of the Contract Document and the entire works performed under these specifications shall be performed in strict conformity, unless otherwise expressly requested by the Owner in Writing.

5.7 APPROVAL PROCEDURE

The scheduled dates for the submission of the drawings as well as for, any data/information to be furnished by the contractor would be discussed and finalized at the time of award. The following schedule shall be followed generally for approval and for providing final documentation.

i)	Initial submission by the contractor	As per agreed schedule
ii)	Approval/comments/ by Owner on intitial submission	As per agreed schedule
iii)	Resubmission	-As per agreed schedule (whenever Required)

iv) Approval or comments -As per agreed schedule

v) Furnishing of distribution copies in bound volume -2 weeks from the date of award (6 copies for final approval Planning Department)

vi) Furnishing of distribution of routine test reports (three Copies)

vii) Furnishing of instruction/ operation manuals - As per agreed schedule (3copies)

viii) As built drawings & RTFs (Two sets)

NOTE:

(1) The contractor may please note that all resubmissions must incorporate all comments given in the earlier submission by the owner or adequate justification for not incorporating the same must be submitted failing which the submission of documents is likely to be returned.

(2) The drawings which are required to be referred frequently during execution should be submitted on cloth lined paper. The list of such drawings shall be finalised with the Contractor at the time of Award.

(3) All major drawings should be submitted in latest Auto CAD Version or better.

(4) The instruction Manuals shall contain full details of drawings of all equipment being supplied under this contract, their exploded diagrams with complete instructions for storage, handling, erection, commissioning, testing, operation, trouble shooting, servicing procedures.

(5) If after the commissioning and initial operation of the transmission Line, the instruction manuals require any modifications, additions/changes, the same shall be incorporated and the updated final instruction manuals shall be submitted by the Contractor to the Owner.

5.8 The major drawing shall be submitted as per schedule finalized before award of contract. Some other drawings which are not indicated in tender documents, but form an integral part of contract shall also be submitted.

6.0 MATERIAL/WORKMANSHIP

6.1 General Requirement

6.1.1 Where the specification does not contain references to workmanship, equipment, materials and components of the covered equipment, it is essential that the same must be new, of highest grade of the best quality of their kind, conforming to best engineering practice and suitable for the purpose for which they are intended.

6.1.2 In case where the equipment, materials or components are indicated in the specification as “similar” to any special standard, the Owner shall decide upon the question of similarity. When required by the specification or when required by the Owner the Contractor shall submit, for approval, all the information concerning the materials or components to be used in manufacture. Machinery, equipment, materials and components supplied, installed or used without such approval shall run the risk of subsequent

rejection, it being understood that the cost as well as the time delay associated with the rejection shall be borne by the Contractor.

6.1.3 The design of the Works shall be such that installation, future expansions, replacements and general maintenance may be undertaken with a minimum of time and expenses. Each component shall be designed to be consistent with its duty and suitable factors of safety, subject to mutual agreements. All joints and fastenings shall be advised, constructed and documented so that the component parts shall be accurately positioned and restrained to fulfill their required function. In general, screw threads shall be standard metric threads. The use of other thread forms will only be permitted when prior approval has been obtained from the Owner.

6.1.4 Whenever possible, all similar part of the Works shall be made to gauge and shall also be made interchangeable with similar parts. Where feasible, common component units shall be employed in different pieces of equipment in order to minimize spare parts stocking requirements. All equipment of the same type and rating shall be physically and electrically interchangeable.

6.1.5 All materials and equipment shall be installed in strict accordance with the manufacturer's recommendations(s). Only first-class work in accordance with the best modern practices will be accepted. Installation shall be considered as being the erection of equipment as its permanent location. This, unless otherwise specified, shall include unpacking, cleaning and lifting into position, grouting, leveling aligning, coupling of or bolting down to previously installed equipment bases/foundations, performing the alignment check and final adjustment prior to initial operation, testing and commissioning in accordance with the manufacturer's tolerances, instructions and the Specification.

6.2 PROVISIONS FOR EXPOSURE TO HOT AND HUMID CLIMATE:

Outdoor equipment supplied under the specification shall be suitable for service and storage under tropical conditions of high temperature, high humidity, heavy rainfall and environment favourable to the growth of fungi and mildew.

6.3 RATING PLATES, NAME PLATES AND LABELS

6.3.1 Each main and auxiliary item of transmission line is to have permanently attached to it in a conspicuous position a rating plate of non-corrosive material upon which is to be engraved manufacturer's name, year of manufacture, equipment name, type or serial number together with details of the loading conditions under which the item of transmission line in question has been designed to operate, and such diagram plates as may be required by the Owner. The rating plate of each equipment shall be according to IEC requirement.

6.3.2 All such nameplates, instruction plates, rating plates of equipments shall be bilingual with Hindi inscription first followed by English. Alternatively two separate plates one with Hindi and the other with English inscriptions may be provided.

7.0 DESIGN IMPROVEMENTS/ COORDINATION

7.1 The bidder shall note that the equipment offered by him in the bid only shall be accepted for supply. However, the Owner or the Contractor may propose changes in the specification of the equipment or quality thereof and if the Owner & contractor agree upon any such changes, the specification shall be modified accordingly.

7.2 If any such agreed upon change is such that it affects the price and schedule of completion, the parties shall agree in writing as to the extent of any change in the price and/or schedule of completion before the Contractor proceeds with the change. Following such agreement, the provision thereof, shall be deemed to have been amended accordingly.

7.3 The Contractor shall be responsible for the selection and design of appropriate equipments to provide the best coordinated performance of the entire system. The basic design requirements are detailed out in this Specification. The design of various components, subassemblies and assemblies shall be so done that it facilitates easy field assembly and maintenance.

7.4 The Contractor has to coordinate designs and terminations with agencies (if any) who are Consultants/Contractor for the Owner. The names of agencies shall be intimated to the successful bidders.

7.5 The Contractor will be called upon to attend design co-ordination meetings with the Engineer, other Contractor's and the Consultants of the Owner (if any) during the period of Contract. The Contractor shall attend such meetings at his own cost at New Delhi or at mutually agreed venue as and when required and fully cooperate with such persons and agencies involved during those discussions.

8.0 QUALITY ASSURANCE PROGRAMME

8.1 To ensure that the equipment and services under the scope of this Contract whether manufactured or performed within the Contractor's Works or at his Sub-contractor's premises or at the Owner's site or at any other place of Work are in accordance with the specifications, the Contractor shall adopt suitable quality assurance programme to control such activities at all points necessary. Such programme shall be broadly outlined by the contractor and finalized after discussions before the award of contract. The detailed programme shall be submitted by the contractor after the award of contract and finally accepted by DTL after discussion. However, in case detailed valid programme approved by DTL for the equipment already exist, same would be followed till its validity. A quality assurance programe of the contractor shall generally cover the following:

(a) His organization structure for the management and implementation of the proposed quality assurance programme:
(b) Documentation control system;
(c) Qualification data for bidder'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 and site erection controls including process controls and fabrication and assembly control;

(f) Control of non-conforming items and system for corrective actions;
(g) Inspection and test procedure both for manufacture and field activities.
(h) Control of calibration and testing of measuring instruments and filed activities;
(i) System for indication and appraisal of inspection status;
(j) System for quality audits;
(k) System for authorizing release of manufactured product to the Purchaser.
(l) System for maintenance of records;
(m) System for handling storage and delivery; and
(n) A quality plan detailing out the specific quality control measures and procedures adopted for controlling the quality characteristics relevant to each item of equipment furnished and/or services rendered. The Owner or his duly authorized representative reserves the right to carry out quality audit and quality surveillance of the system and procedure of the Contractor/his vendor's quality management and control activities.

8.2 QUALITY ASSURANCE DOCUMENTS

The contractor would be required to submit all the Quality Assurance Documents as stipulated in the Quality Plan at the time of Owner's inspection of equipment/material.

9.0 INSPECTION, TESTING & INSPECTION CERTIFICATE

9.1 All equipment being supplied shall conform to type tests as per technical specification and shall be subject to routine tests in accordance with requirements stipulated under respective sections. The Contractor shall intimate the Owner the detailed program about the tests at least three (3) weeks in advance in case of domestic supplies & six (6) weeks in advance in case of foreign supplies.

9.2 The reports for all type tests and additional type test as per Technical Specification (relevant IS/ IEC) shall be furnished by the Contractor along with equipment / material drawings. The type tests conducted earlier should have either been conducted in accredited laboratory (accredited based on ISO/IEC Guide 25 / 17025 or EN 45001 by the national accreditation body of the country where laboratory is located) or witnessed by the representative(s) of DTL/other Govt. Organizations. The test reports submitted shall be of the tests conducted within last 5 (five) years prior to the date of bid opening. In case the test reports are of the test conducted earlier than 5 (five) years prior to the date of bid opening, the contractor shall repeat these test(s) at no extra cost to the Owner. In the event of any discrepancy in the test reports i.e. any test report not acceptable due to any design / manufacturing changes (including substitution of components) or due to non-compliance with the requirement stipulated in the Technical Specification or any/ all additional type tests not carried out, same shall be carried out without any additional cost implication to the Owner, failing which the bid shall be rejected.

9.3 For major equipments, type test reports as per relevant standard shall be submitted for Owner's approval.

9.4 The Owner, his duly authorized representative and/or outside inspection agency acting on behalf of the Owner shall have at all reasonable times free access to the Contractor's/sub-vendors premises or Works and shall have the power at all reasonable times to inspect and examine the materials and workmanship of the Works during its manufacture or erection if part of the

Works is being manufactured or assembled at other premises or works, the Contractor shall obtain for the Engineer and for his duly authorized representative permission to inspect as if the works were manufactured or assembled on the Contractor's own premises or works. Inspection may be made at any stage of manufacture, dispatch or at site at the option of the Owner and the equipment if found unsatisfactory due to bad workmanship or quality, material is liable to be rejected.

9.5 The Contractor shall give the Owner/Inspector fifteen (15) days written notice of any material being ready for joint testing including contractor and DTL. Such tests shall be to the Contractor's account except for the expenses of the Inspector. The Owner / inspector, unless witnessing of the tests is virtually waived, will attend such tests within fifteen (15) days of the date if which the equipment is notified as being ready for test/inspection, failing which the Contractor may proceed alone with the test which shall be deemed to have been made in the Inspector's presence and he shall forthwith forward to the Inspector duly certified copies of tests in triplicate.

9.6 The Owner or Inspector shall, within fifteen (15) days from the date of inspection as defined herein 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 either make the modifications that may be necessary to meet the said objections or shall confirm in writing to the Owner/Inspector giving reasons therein, that no modifications are necessary to comply with the Contract.

9.7 When the factory tests have been completed at the Contractor's or Sub-Contractor's works, the Owner/inspector shall issue a certificate to this effect within fifteen (15) days after completion of tests but if the tests are not witnessed by the Owner /Inspector, the certificate shall be issued within fifteen (15) days of receipt of the Contractor's Test certificate by the Engineer/Inspector. Failure of the Owner/Inspector to issue such a certificate shall not prevent the Contractor from proceeding with the Works. The completion of these tests or the issue of the certificate shall not bind the Owner to accept the equipment should, it, on further tests after erection, be found not to comply with the Contract. The equipment shall be dispatched to site only after approval of test reports and issuance of CIP by the Owner.

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

9.9 The inspection by Owner 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 programme forming a part of the Contract.

9.10 The Owner will have the right of having at his own expenses may other test(s) of reasonable nature carried out at Contractor's premises or at site or at any other place in addition of aforesaid tests, to satisfy that the material comply with the specification.

9.11 The Owner reserves the right for getting any field tests not specified in respective sections of the technical specification conducted on the completely assembled equipment at site. The testing equipments for these tests shall be provided by the Owner.

10. TESTS

10.1 Pre-commissioning Tests

On completion of erection of the equipment and before charging, each item of the equipment shall be thoroughly cleaned and then inspected jointly by the Owner and the Contractor for correctness and completeness of installation and acceptability for charging, leading to initial pre-commissioning tests at Site. The list of pre-commissioning tests to be performed are given in respective chapters and shall be included in the Contractor's quality assurance programme.

10.2 Commissioning Tests

10.2.1 The testing equipments required for testing and commissioning shall be arranged by the Contractor.

10.2.2 The specific tests requirement on equipment have been brought out in the respective chapters of the technical specification.

10.3 The Contractor shall be responsible for obtaining statutory clearances from the concerned authorities for commissioning the equipment and the transmission line. The owner will reimburse the requisite fee of Electrical Inspection only, as per actual, on production of requisite documents.

11.0 PACKAGING & PROTECTION

11.1 All the equipments shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at Site till the time of erection. On request of the Owner, the Contractor shall also submit packing details/associated drawing for any equipment/material under his scope of supply, to facilitate the owner to repack any equipment/material at a later date, in case the need arises. While packing all the materials, the limitation from the point of view of availability of Railway wagon sizes in India should be taken into account. The Contractor shall be responsible for any loss or damage during transportation, handling and storage due to improper packing. Any demurrage, wharfage and other such charges claimed by the transporters, railways etc. shall be to the account of the Contractor. Owner takes no responsibility of the availability of the wagons.

11.2 All coated surfaces shall be protected against abrasion, impact, discolouration and any other damages. All exposed threaded portions shall be suitably protected with either a metallic or a non-metallic protecting device. All ends of all valves and pipings and conduit equipment connections shall be properly sealed with suitable devices to protect them from damage.

12.0 FINISHING OF METAL SURFACES

12.1 All metal surfaces shall be subjected to treatment for anti-corrosion protection. All ferrous surfaces for external use unless otherwise stated elsewhere in the specification or specifically agreed, shall be hot-dip galvanized after fabrication. High tensile steel nuts & bolts and spring washers shall be electro galvanized to service condition. All steel conductors including those used for earthing/grounding (above ground level) shall also be galvanized according to IS: 2629.

12.2 HOT DIP GALVANISING

12.2.1 The minimum weight of the zinc coating shall be 610 gm/sq. m and minimum thickness of coating shall be 85 microns for all items thicker than 6mm. For items lower than 6mm thickness requirement of coating thickness shall be as per relevant ASTM. For surface which shall be embedded in concrete, the zinc coating shall be 610 gm/sq.m minimum.

12.2.2. The galvanized surfaces shall consist of a continuous and uniform thick coating of zinc, firmly adhering to the surface of steel. The finished surface shall be clean and smooth and shall be free from defects like discoloured patches, bare spots, unevenness of coating, spelter which is loosely attached to the steel gloubles, spiky deposits, blistered surface, flaking or peeling off, etc. The presence of any of these defects noticed on visual on visual or microscopic inspection shall render the material liable to rejection.

12.2.3 After galvanizing, no drilling or welding shall be performed on the galvanized parts of the equipment excepting that nuts may be threaded after galvanizing. Sodium dichromate treatment shall be provided to avoid formation of white rust after hot dip galvanization.

12.2.4 The galvanized steel shall be subjected to six one minute dips in copper sulphate solution as per IS-2633.

12.2.5 Sharp edges with radii less than 2.5 mm shall be able to withstand four immersions of the Standard Preece test. All other coatings shall withstand six immerisions. The following galvanizing tests should essentially be performed as per relevant Indian Standards.

- Coating thickness
- Uniformiy of zinc
- Adhesion test
- Mass of zinc coating

12.2.6 Galvanised material must be transported to ensure that galvanised surfaces are not damaged during transit. Application of zinc rich paint at site shall not be allowed.

12.3 PAINTING

12.3.1 All sheet steel work shall be degreased, pickled, phosphated in accordance with the IS-6005 “Code of practice for phosphating iron and sheet”. All surfaces, which will not be easily accessible after shop assembly, shall beforehand be treated and protected for the life of the equipment. The surfaces, which are to be finished painted after installation or require corrosion protection until installation, shall be shop pointed with at least two coats of primer. Oil, grease, dirt and swaf shall be thoroughly removed by emulsion cleaning. Rust and scale shall be removed by pickling with dilute acid followed by washing with running water, rinsing with slightly alkaline hot water and drying.

12.3.2 After phosphating, thorough rinsing shall be carried out with clean water followed by final rinsing with dilute dichromate solution and oven drying. The phosphate coating shall be sealed with application of two coats of ready mixed, stoving type zinc chromate primer. The first coat may be “ flash dried”

while the second coat shall be stoved.

12.3.3 After application of the primer, two coats of finishing synthetic enamel paint shall be applied, each coat followed by stoving. The second finishing coat shall be applied after inspection of first coat of painting.

12.3.4 The extension colour of the paint shall be as per shade no: 697 (for outdoor) & 692 (for indoor) of IS-5. Each coat or primer and finishing paint shall be supplied for minor touching up required at site after installation of the equipments.

12.3.5 In case the Bidder proposes to follow his own standard surface finish and protection procedures or any other established painting procedures, like electrostatic painting etc., the procedure shall be submitted alongwith the Bids for Owner's review & approval.

13.0 HANDLING, STORING AND INSTALLATION

13.1 In accordance with the specific installation instructions as shown on manufacturer's drawings or as directed by the Owner or his representative, the Contractor shall unload, store, erect install, wire, test and place into commercial use all the equipment included in the contract. Equipment shall be installed in a neat, workmanlike manner so that it is level, plumb, square and properly aligned and oriented. Commercial use of switchyard equipment means completion of all site tests specified and energisation at rated voltage.

13.2 Contractor may engage manufacturer's Engineers to supervise the unloading, transportation to site, storing, testing and commissioning of the various equipment being procured by them separately. Contractor shall unload, transport, store, erect, test and commission the equipment as per instructions of the manufacturer's supervisory Engineer(s) and shall extend full cooperation to them.

13.3. In case of any doubt/misunderstanding as to the correct interpretation of manufacturer's drawings or instructions, necessary clarifications shall be obtained from the Owner. Contractor shall be held responsible for any damage to the equipment consequent to not following manufacturer's drawings/instructions correctly.

13.4 Contractor shall be responsible for examining all the shipment and notify the Owner immediately of any damage, shortage, discrepancy etc. for the purpose of Owner's information only. The Contractor shall submit to the Owner every week a report detailing all the receipts during the weeks. However, the Contractor shall be solely responsible for any shortages or damages in transit, handling and/or in storage and erection of the equipment at Site. Any demurrage, wharfage and other such charges claimed by the transporters, railways etc. shall be to the account of the Contractor.

13.5 The Contractor shall be fully responsible for the equipment/material until the same is handed over to the Owner in an operating condition after commissioning. Contractor shall be responsible for the maintenance of the equipment/material while in storage as well as after erection until taken over by Owner, as well as protection of the same against theft, element of nature, corrosion, damages etc.

13.6 Where material / equipment is unloaded by Owner before the Contractor arrives at site or even when he is at site, Owner by right can hand over the same to Contractor and there upon it will be the responsibility of Contractor to store the material in an orderly and proper manner.

13.7 The Contractor shall be responsible for making suitable indoor storage facilities, to store all equipment which require indoor storage.

13.8 The words 'erection' and 'installation' used in the specification are synonymous.

13.9 Exposed live parts shall be placed high enough above ground to meet the requirements of electrical and other statutory safety codes.

13.10 The design and workmanship shall be in accordance with the best engineering practices to ensure satisfactory performance throughout the service life. If at any stage during the execution of the Contract, it is observed that the erected equipment(s) do not meet the above minimum clearances as given in clause 4.7 the Contractor shall immediately proceed to correct the discrepancy at his risks and cost.

LIST OF SPECIFICATIONS

GENERAL STANDARDS AND CODES

India Electricity Rules

Indian Electricity Act

Indian Electricity (Supply) Act

Indian Factories Act

IS-5	- Colors for Ready Mixed Paints and Enamels.
IS-335	- New Insulating Oils.
IS-617	- Aluminium and Aluminium Alloy Ingots and Castings for General Engineering Purposes
IS-2071 (P1 to P3)	- Methods of High Voltage Testing.
IS-12063	-Classification of degrees of protection provided by enclosures of electrical equipment.
IS-2165	-
P1:1997	- Insulation Coordination
P2:1983	
IS-3043	- Code of Practice for Earthing
IS-6103	-Method of Test for Specific Resistance (Resistivity)of Electrical Insulating Liquids
IS-5578	- Guide for marking of insulated conductors.
IS-11353	-Guide for uniform system of marking & identification of conductors & apparatus terminals.
IS-8263	- Methods for Radio Interference Test on High voltage Insulators.
IEC-60060 (Part 1 to 4)	- High Voltage Test Techniques
IEC 60068	- Environmental Test
IEC-60117	- Graphical Symbols
IEC-60270	- Partial Discharge Measurements.
IEC-60437	-Radio Interference Test on High Voltage Insulators.
IEC-60507	-Artificial Pollution Tests on High Voltage Insulators to be used on AC systems.
IEC-60815	- Guide for the Selection of Insulators in respect of Polluted Conditions.
ANSI-C.1/NFPA.70	- National Electrical Code
ANSI-C37.90A	- Guide for Surge Withstand Capability (SWC) Tests
ANSI-C63.21	- Specification for Electromagnetic Noise and

C63.3	- Field Strength Instrumentation 10 KHz to 1 GHZ
C36.4ANSI-C68.1	- Techniques for Dielectric Tests
ANSI-C76.1/EEE21	-Standard General Requirements and Test Procedure for Outdoor Apparatus Bushings.
ANSI-SI-4	- Specification for Sound Level Metres
ANSI-Y32-2/C337.2	- Drawing Symbols
ANSI-Z55.11	- Gray Finishes for Industrial Apparatus and Equipment No.61 Light Gray
NEMA-1071	- Methods of Measurements of RIV of High Voltage Apparatus
NEMA-ICS-II	-General Standards for Industrial Control and Systems Part ICSI-109
CISPR-1	- Specification for CISPR Radio Interference Measuring Apparatus for the frequency range 0.15 MHz to 30 MHz
CSA-Z299.1-1978h	- Quality Assurance Program Requirements
CSA-Z299.2-1979h	- Quality Control Program Requirements
CSA-Z299.3-1979h	- Quality Verification Program Requirement
CSA-Z299.4-1979h	- Inspection Program Requirements

CLAMPS & CONNECTORS

IS 5561	Electric power connectors
NEMA CC1	Electric Power connectors for substation
NEMA CC3	Connectors for use between aluminium or
Aluminum	Copper Overhead Conductors

HARDWARE AND INSULATORS

IS 2121	Fittings for Aluminium and steel cored Al. conductors for over head power lines.
IS 731	Porcelain insulators for over head power lines with a nominal voltage greater than 1000V.
IS 2486(P1 TO P4)	Insulator fittings for over head power lines with a nominal voltage greater than 1000V.
IEC 60120	Dimensions of Ball and Socket Couplings of string insulator units.
IEC 60137	Insulated bushing for alternating voltages above 1000V
IEC 60168	Tests on indoor and outdoor post insulators of ceramic material or glass for Systems with Nominal Voltages

	Greater than 1000V.
IEC 60233	Tests on Hollow Insulators for use in electrical equipment.
IEC 60273	Characteristic of indoor and outdoor post insulators for systems with nominal voltages greater than 1000V.
IEC 60305	Insulators for overhead lines with nominal voltages above 1000V ceramic or glass insulator units for a.c. systems Characteristics of String Insulator Units of the cap and pin type.
IEC 60372(1984)	Locking devices for ball and socket couplings of string insulator units: dimensions and tests.
IEC 60383(P1 and P2)	Insulators for overhead lines with a nominal voltage above 1 KV.
IEC 60433	Characteristics of string insulator units of the long rod type.
IEC 60471	Dimensions of Clevis and tongue coupling of string insulator units.
ANSI-C29	-Wet process porcelain insulators
ANSI-C29.1	-Test methods for electrical power insulators
ANSI-C92.2	- For insulators, wet-process porcelain and toughened glass suspension type
ANSI-C 29.8	- For wet-process porcelain insulators apparatus, post-type
ANSI-G.8	- Iron and steel hardware
CISPR-7B	- Recommendations of the CISPR, tolerances of form and of Position, Part 1.
ASTM A-153	- Zinc Coating (Hot-Dip) on iron and steel hardware.

GALVANIZING

IS-209	-Zinc INgot
IS-2629	Recommended Practice for Hot-Dip galvanizing on iron and steel
IS-2633	-Methods for testing uniformity of coating of zinc coated articles
ASTM-A-123	-Specification for zinc (Hot Galavanizing)Coatings, on products Fabricated from rolled, pressed and forged steel shapes, plates bars and strips.
ASTM-A-121-77	-Zinc-coated (Galvanized)steel barbed wire

PAINTING

IS-6005	Code of practice for phosphating of iron and steel
ANSI-Z551	Gray finishes for industrial apparatus and equipment
SSPEC	- Steel structure painting council

FIRE PROTECTION SYSTEM

Fire protection manual issued by tariff advisory committee (TAC) of India.

STEEL STRUCTURE

IS-228(1992)	-Method of Chemical Analysis of pig iron, cast iron and plain carbon and low alloy steels.
IS-802 (P1 to 3)	- Code of practice for use of structural steel in overhead transmission line towers.
IS-806	- Code of practice for use of steel tubes in general building construction.
IS-808	-Dimensions for hot rolled steel beam, column channel and angle sections.
IS-814	-Covered electrodes for manual are welding of carbon of carbon manganese steel.
IS-816	-Code of Practice for use of metal are welding for general construction in Mild steel
IS-817	-Code of practice for training and testing of metal are welders.

Part 1: Manual Metal are welding.

IS-875(P1 to P4)	-Code of practice for design loads (other than earthquake) for building and structures.
IS-1161	-Steel tubes for structural purposes
IS-1182	-Recommended practice for radiographic examination of fusion welded but joints in steel plates.
IS-1363(P1 to P3)	-Hexagonal head bolts, screws & nuts of products grade C
IS-1364	-Hexagon head bolts, screws and nuts of product grades A and B.
IS-1367(P1 to P18)	-Technical supply condition for threaded steel fasteners. IS-
1599	-Methods for bend test
IS-1608	-Method for tensile testing of steel products
IS-1893	-Criteria for earthquake resistant design of structures. IS-
1978	-Line pipe.
IS-2062	-Steel for general structural purposes.
IS-2595	-Code of practice for Radiographic testing.
IS-3063	-Single coil rectangular section spring washers for bolts, nuts and screws.
IS-3664	-Code of practice for ultrasonic pulse echo testing by contact and immersion methods.
IS-7205	-Safety code for erection of structural steel work.
IS-9595	-Recommendations for metal are welding of carbon and carbon manganese steels.
ANSI-B18.2.1	-Inch series square and Hexagonal bolts and screws
ANSI-B18.2.2	-Square and hexagonal nuts
ANSI-G8.14	-Round head bolts
ASTM-A6	-Specification for General Requirements for rolled steel plates, shapes, sheet piling and bars of structural use
ASTM-A36	-Specifications of structural steel
ASTM-A47	- Specification for malleable iron castings
ASTM-A143	-Practice for safeguarding against embrilement of Hot Galvanized structural steel products and procedure for detaching embrilement
ASTM-A242	-Specification for high strength low alloy structural steel

ASTM-A283 -Specification for low and intermediate tensile strength carbon steel plates of structural quality

ASTM-A394 -Specification for Galvanized steel transmission tower bolts and nuts

ASTM-441 -Specification for High strength low alloy structural manganese vanadium steel.

ASTM-A572 Specification for High strength low alloy colombium- Vanadium steel of structural quality

AWS D1-0 -Code for welding in building construction welding inspection

AWS D1-1 -Structural welding code

AISC -Manufactured graphite electrodes

NEMA-CGI -Manufactured graphite electrodes

OTHER CIVIL WORKS STANDARDS

IS-269 -33 grade ordinary portland cement IS2721

-Galvanized steel chain link fence fabric IS-278 -

Galvanized steel barbed wire for fencing

IS-383 -Coarse and fine aggregates from natural sources for concrete.

IS-432(P1 and P2) -Mild steel and medium tensile steel bars and hard-dawn steel wire for concrete reinforcement

IS-456 -Code of practice for plain and reinforced concrete. IS-516

-Method of test for strength of concrete.

IS-800 -Code of practice for general construction in steel. IS-806

-Steel tubes for structural purposes.

IS-1172 -Basic requirements for water supply, drainage and sanitation.

IS-1199 -Methods of sampling and analysis of concrete.

IS-1566 -Hard-dawn steel wire fabric for concrete reinforcement. IS-1742 Code of Practice for Building drainage.

IS-1785 -Plain hard-drawn steel wire for pre-stressed concrete.

IS-1786 -High strength deformed Steel Bars and wires for concrete reinforcement.

IS-1811 Methods of sampling Foundry sands.

IS-1893 Criteria for earthquake resistant design of structures. IS-2062 Steel for general structural purposes.

IS-2064 Selection, installation and maintenance of sanitary appliances code of practices.

IS-2065 -Code of practice for water supply in buildings.

IS-2090 -High tension steel bars used in prestressed concrete. IS-2140 -Standard Galvanized steel wire for fencing.

IS-2470(P1& P2) -Code of practice for installation of septic tanks. IS-2514 -Concrete vibrating tables.

IS-2645 -Integral cement waterproofing compounds.

IS-3025(Part 1 to Part 48)-Methods of sampling and test (Physical and chemical)for water and waste water.

IS-4091 -Code of practice for design and construction of foundations for transmission line towers and poles.

IS-4111(P 1 to P5) -Code of practice for ancillary structures in sewerage system.

IS-4990 -Plywood for concrete shuttering work. IS-5600 -Sewage and drainage pumps.

NATIONAL BUILDING CODE OF INDIA 1970

USBR E 12 -Earth Manual by United States Department of the interior Bureau of Reclamation

ASTM-A392-81 -Zinc/Coated steel chain link fence fabric

ASTM-D1557-80 -test for moisture-density relation of soils using 10-1b(4.5 kg) rame land 18-in.(457 mm)Drop.

ASTM-D1586 -Penetration Test and Split-Barrel (1967) Sampling of Soils

ASTM-D2049-69 -Test Method for Relative Density of Cohesion less Soils

ASTM-D2435 -Test method for Unconsolidated,(1982)- Undrained Strengths of Cohesive Soils in Triaxial Compression.

BS-5075 -Specification for accelerating Part I Admixures, Retarding Admixtures and Water Reducing Admixtures.

CPWD -Latest CPWD specifications

GALVANISED STEEL EARTHWIRE

IS:1521	-Method for Tensile Testing ISO/R:89-1959 of Steel Wire
IS:1778	Reels and drums for Bare Conductors
IS:2629	Recommended practice for Hot Dip Galvanising on Iron and Steel.
IS:2633	Methods for testing Uniformity of Coating of Zinc Coated Articles
IS:4826	Hot dip Galvanised Coatings ASTM:A 475-72a on Round Steel Wires BS:443-1969
IS:6745	Method for Determination BS:443-1969 of mass of Zinc Coating on Zinc coated Iron and Steel Articles. IS:209 Zinc ingot BS:3463-1961
IS:398(Pt.I to P5:1992)	Aluminum Conductors for overhead transmission purposes BS:215(Part-II)

CONDUCTS, ACCESSORIES AND JUNCTION BOXES

(1) IS:9537	Rigid steel conduits for electric wiring
(2)IS:3480	Flexible steel conduits for electrical wiring
(3)IS:2667	Fittings for rigid steel conduits for electrical wiring.
(4)IS:3837	Accessories for rigid steel conduits for electrical wiring
(5)IS:4649	Adaptors for flexible steel conduits.
(6)IS:5133	Steel land Cast Iron Boxes
(7)IS:2629	Hot dip galvanising of Iron & Steel.

SECTION-X

TOWER SCHEDULE

Tower Schedule/ details of 220 kV Najafgarh- Bamnauli								
S. No.	Location No.		Type of Tower	Span Length (in M)	Height of Tower	DOC	Tower Base	Remarks (Crossings etc.)
1	Bamnauli Gantry			50				S/Stn Land
2	Loc # 01	T. No-117	C+3	83		1999	NB	Trees & Boundry wall
3	Loc # 02	T. No-117A	C+3	60		1999	NB	Road , Drain & Trees
4	Loc # 03	T. No-118	A+0	240		1975	BB	Cultivated Land
5	Loc # 04	T. No-119	A+0	300		1975	BB	Cultivated Land
6	Loc # 05	T. No-120	A+0	290		1975	BB	Cultivated Land & Road X-ing
7	Loc # 06	T. No-121	A+0	310		1975	BB	Cultivated Land
8	Loc # 07	T. No-122	A+0	290		1975	BB	Cultivated Land, Farm House & Road X-ing
9	Loc # 08	T. No-123	A+0	300		1975	BB	Cultivated Land, Houses
10	Loc # 09	T. No-124	A+0	296		1975	BB	Cultivated Land, Houses & Road X-ing
11	Loc # 10	T. No-125	C+0	240		1975	BB	Cultivated Land,
12	Loc # 11	T. No-126	A+0	288		1975	BB	Cultivated Land, & Road X-ing
13	Loc # 12	T. No-127	A+0	296		1975	BB	Cultivated Land,
14	Loc # 13	T. No-128	A+0	300		1975	BB	Cultivated Land,
15	Loc # 14	T. No-129	A+0	300		1975	BB	Cultivated Land,
16	Loc # 15	T. No-130	A+0	300		1975	BB	Cultivated Land,
17	Loc # 16	T. No-131	A+0	290		1975	BB	Cultivated Land,
18	Loc # 17	T. No-132	A+0	280		1975	BB	
19	Loc # 18	T. No-133	A+0	304		1975	BB	
20	Loc # 19	T. No-134	A+0	300		1975	BB	
21	Loc # 20	T. No-135	B+0			1975	BB	

	Loc # 20		B+0			1975	BB	
22	Loc # 21	T. No-136	A+0	260		1975	BB	Shyam/ Sangam Vihar residetial Colony & Line passes along the road
23	Loc # 22	T. No-137	A+0	288		1975	BB	
24	Loc # 23	T. No-138	A+0	300		1975	BB	
25	Loc # 24	T. No-139	A+0	296		1975	BB	
26	Loc # 25	T. No-140	A+0	300		1975	BB	
27	Loc # 26	T. No-141	A+0	290		1975	BB	
28	Loc # 27	T. No-142	A+0	300		1975	BB	Roshan pura colony & 66 kV Line X-ing
29	Loc # 28	T. No-143	B+0	300		1975	BB	DDA Park , Road & 66 kV Line X-ing
30	Loc # 29	T. No-144	C+0	310		1975	BB	
31	Gantry Najafgarh			50				

GOVT. OF INDIA

POWER AND TELECOM CO-ORDINATION COMMITTEE

NO. PTCC(T)/DV- 9119/DL-212/2015-16 DATED 29.05.2015

CERTIFICATE OF APPROVAL TO ROUTE OF EXTRA HIGH TENSION POWER/TELECOM LINE.

Approval to the PTCC is hereby conveyed to the route of :

220KV D/C over head tower line by LILO of Kanihawala - Najafgarh T/L at 400/220KV Mundka.

EHT line /telecom particulars are given in the Appendix-I

The Approval is for the route only and is subjected to the following conditions: .

1. The approval is based on the power system/telecom system condition details as reported by the power authority/telecom authority at present. Any changes either to the transmission line or to the power system of the paralleling telecom lines which are likely to alter the low frequency induction from the estimated at present should be reported to PTCC for its prior approval.
2. The power & telecom authorities shall be required to adopt such measures as may be recommended by PTCC for counteracting any interference that might arise when the EHT line is in normal operation.
3. Each crossing should satisfy the conditions laid down in Para 8 of PTCC code of practice in r/o crossing.
4. The angle of crossing shall be 90 degree but in no case less than 60 degrees.
5. The power line shall be equipped with protective switch gear such that the duration of earth fault current should be as short as possible but never exceed 0.5 seconds
6. The power line shall be energized within a mutually acceptable time after obtaining a certificate from concerned DOI and/or railway authority regarding completion of provision of all protective measure as recommended by PTCC and also under specific clearance from the DOT and /or railway authority maintaining the telecom system.
7. Telecom lines shall be commissioned within a mutually acceptable time after completing all protective measures as recommended by PTCC are carried out on power system.
8. The later entrant in field shall bear entire cost of provisioning of G.D. tubes and their fitting as recommended by PTCC including gears and/or any other protective measures as recommended by PTCC.
9. The route approval shall be subject to special conditions as laid down under Appendix-II.
10. The power authority will ensure that the provisions of code of practice for protections from EPR are calculated.

For& on behalf Central PTCC

D.E.T.(PTCC) New Delhi

DET PTCC ND

O/o General Manager (North)
BSNL Inspection Circle,
CTS Compound, [illegible]
New Delhi

APPENDIX I
(For Power Lines)

1.	(a) Name of the Power Supply authority seeking approval	: DTL, New Delhi
	(b) Reference number & date	: F.DTL/201/Oprs(Proj)/14-15/Mgr (Proj – II)A-3/T-140/249 dated 18.3.2015
	(c) Probable date of energisation	: Immediate
2.	(a) Name of the power line	: 220KV D/C over head tower line by LILO of Kanjhawala - Najafgarh T/L at 400/220KV Mundka
	(b) Route map number & date	: --
	(c) Operating voltage	: 220 KV
	(d) Length of HT/ EHT line	: 5.5 KMs(Approx.)
	(e) Number of circuits	: Double Ckt.
3.	(a) Number of paralleling telecom lines	: 17
	(b) Length of parallelism	: As marked on Topomap
4.	Average value of earth resistivity in the region	: 10000 Ohms-cm
5.	Whether LF test necessary	: NIL
6.	Fault Current & induced voltages etc	: NIL

APPENDIX-II

i. As per Director(PTCC), O/o CEA, New Delhi Letter No: CEA/LD&T/PTCC/DL-17/525 Dated 25.05.2015 the computed IV is less than 430 Volts. So no additional protection is required for Telecom Ckts.

ii. In case of **Railway Block/Commn. Ckts**, the GM/S&T, HQ, Baroda House, New Delhi has conveyed the no objection subjected to necessary protection as para no. 2.7 of PTCC clearance manual vide letter no. 342-SIG/1/PTCC dated 27.5.2015.

LILO at Mundka
DATA as per lines construction record

S. No.	Location No.	Type of Tower	Span Length (in M)	Remarks (Crossings etc.)
1	Gantry at Mundka		40	90* Turning
2	Loc # 1	C+3	145	33kV Line
3	Loc # 2	C+6	65	90* Turning
4	Loc # 3	B+6	125	
5	Loc # 4	A+6	155	
6	Loc # 5	B+6	190	
7	Loc # 6	C+6	60	
8	Loc # 7	B+6	190	Road 11kV Line
9	Loc # 8	A+6	150	
10	Loc # 9	B+6	150	
11	Loc # 10	A+6	190	
12	Loc # 11	C+6	225	
13	Loc # 12	B+6	225	
14	Loc # 13	A+6	225	
15	Loc # 14	B+6	225	
16	Loc # 15	A+6	225	
17	Loc # 16	C+6	60	90* Turning
18	Loc # 17	B+6	200	
19	Loc # 18	B+3	200	
20	Loc # 19	C+6	180	
21	Loc # 20	B+6	180	

22	Loc # 21	B+6	200	
23	Loc # 22	B+6	220	
24	Loc # 23	B+6	200	
25	Loc # 24	B+6	190	
26	Loc # 25	B+6	200	
27	Loc # 26	B+6	200	
28	Loc # 27	B+6	200	
29	Loc # 28	C+6	225	Road
30	Loc # 29	C+6	200	
31	Loc # 30	B+6	180	11kV Line
32	Loc # 31	C+6	60	Single circuit Loop In(Kanjhawala side)-Loop Out(Najafgarh Side) of existing 220kV Line Kanjhawala-Najafgarh.
33	Loc # 32	C+6		
34	Loc # 31	C+6	135	
35	Loc # 33	C+6		

5615 Mtr

Manager(T) P-III A3

AM(T)

JE(E)

CLIENT: DELHI TRANSCO LIMITED

N K ENTERPRISES

220 KV DC KANJHAWALA TO NAJAFGARH TRANSMISSION LINE

Tower No.	Tower Type	Span (m)	Angle of Deviation	Cum. Span (m)	Wind Span (m)	Wt. Span (Cold)			Wt. Span (Hot)			Easting	Northing	Elevation	Crossing	Remarks
						Left	Right	Total	Left	Right	Total					
GANTRY	GANTRY			0	….	0	-37.724	-37.7244	0	-7.14746	-7.14746	695927	3179084	91.69		**Gantry at 220kV Kanjhawala Substation**
		72.04														
T. No-1	NC+03		7°30'36"RT	72.04	148.955	109.764	116.423	226.188	79.1875	114.977	194.164	695999	3179082	91.08		Substation land
		225.87													**BOUNDARY WALL**	
T. No-2	NB+03		12°59'13"RT	297.91	223.47	109.447	108.397	217.843	110.893	109.283	220.176	696222.2	3179047	90.73		Cultivated land of kanjhawala
		221.07													**ROAD**	
T. No-3	NA+03		0°00'00"	518.98	209.185	112.673	98.7641	211.437	111.787	98.7168	210.504	696427.3	3178965	90.94		Cultivated land of kanjhawala and Road crossing
		197.3													**ROAD**	
T. No-4	NA+03		0°00'00"	716.28	189.65	98.5359	90.7526	189.289	98.5832	90.8552	189.438	696609.2	3178888	90.93		Induustrial area , Kanjhawala
		182													**NALA**	
T. No-5	NC+03		36°39'50"LT	898.28	206.72	91.2474	113.775	205.022	91.1448	114.581	205.726	696779.6	3178824	90.95		Cultivated land of kanjhawala
		231.44														
T. No-6	NB+03		5°06'44"LT	1129.72	233.745	117.665	111.063	228.729	116.859	113.95	230.809	697001.9	3178889	91.15		Cultivated land of kanjhawala
		236.05														
T. No-7	NA+03		0°00'00"	1365.77	242.565	124.987	129.24	254.226	122.1	127.291	249.391	697222	3178974	91.88		Cultivated land of kanjhawala
		249.08														
T. No-8	NC+03		21°48'52"RT	1614.85	241.94	119.84	87.8714	207.712	121.789	100.115	221.904	697455.7	3179060	91.36		Cultivated land of kanjhawala
		234.8														
T. No-9	NB+06		17°50'38"RT	1849.65	218.395	146.929	137.215	284.143	134.685	122.197	256.882	697690.4	3179054	91.44		Cultivated land of kanjhawala
		201.99													**ROAD,2 No.DRAIN**	
T. No-10	NA+03		0°00'00"	2051.64	205.47	64.7753	107.276	172.051	79.7932	106.115	185.908	697880.9	3178987	91.19		Cultivated land of kanjhawalaand road crossing
		208.95														
T. No-11	NA+03		0°00'00"	2260.59	219.22	101.674	116.609	218.283	102.835	115.836	218.671	698079.3	3178921	90.93		Cultivated land of kanjhawala
		229.49														
T. No-12	NB+03		3°54'56"LT	2490.08	204.945	112.881	84.2104	197.092	113.654	86.6939	200.348	698295.6	3178844	90.74		Cultivated land of kanjhawala
		180.4														
T. No-13	NA+03		0°00'00"	2670.48	212.905	96.1896	119.861	216.051	93.7061	121.04	214.747	698469.3	3178796	91.22		Cultivated land of Madan pur dabas
		245.41														
T. No-14	NA+03		0°00'00"	2915.89	214.52	125.549	55.1613	180.71	124.37	70.3591	194.729	698660.1	3178641	91.53		Cultivated land of Madan pur dabas
		183.63														
T. No-15	NB+06		43°43'21"RT	3099.52	151.81	128.469	-96.656	31.8131	113.271	-31.703	81.5679	698818.2	3178548	91.52		Cultivated land of Madan pur dabas
		119.99														
T. No-16	NC+14		43°15'13"RT	3219.51	88.06	216.646	488.066	704.712	151.693	297.334	449.027	698850.8	3178432	91.87		Cultivated land of Madan pur dabas
		56.13													**ROAD**	
T. No-17	BC+0		3°20'48"LT	3275.64	178.185	-431.936	153.194	-278.742	-241.204	151.919	-89.2847	698824.8	3178383	91.4		Cultivated land of Madan pur dabas
		300.24													**ROAD**	
T. No-18	BA+0		0°00'00"	3575.88	300.085	147.046	83.8429	230.889	148.321	111.259	259.58	698701.9	3178109	90.99		Residential colony Meer Vihar
		299.93													**ROAD,BUILDING**	
T. No-19	BA+0		0°00'00"	3875.81	309.545	216.087	159.933	376.02	188.671	159.786	348.457	698577.7	3177836	99.8		Residential colony Meer Vihar
		319.16													**11 KV LINE,ROAD,BUILDING ROAD**	
T. No-20	BB+0		0°36'19"RT	4194.97	307.54	159.227	155.111	314.338	159.374	152.146	311.519	698443.9	3177546	99.75		Residential colony Meer Vihar
		295.92													**ROAD,**	
T. No-21	BA+0		0°00'00"	4490.89	297.925	140.809	152.967	293.777	143.774	151.722	295.497	698316.9	3177279	98.81		Residential colony Meer Vihar

Tower No.	Tower Type	Span (m)	Angle of Deviation	Cum. Span (m)	Wind Span (m)	Wt. Span (Cold)			Wt. Span (Hot)			Easting	Northing	Elevation	Crossing	Remarks
						Left	Right	Total	Left	Right	Total					
		299.93													**ROAD,LT LINE**	
T. No-22	BA+0		0°00'00"	4790.82	310.33	146.963	149.205	296.168	148.208	153.833	302.04	698181	3177011	98.41		Residential colony Bhagya Vihar
		320.73													**2 No.ROAD**	
T. No-23	BA+0		0°00'00"	5111.55	287.39	171.525	139.076	310.6	166.897	134.079	300.976	698044.1	3176721	100		Residential colony Bhagya Vihar
		254.05														
T. No-24	BA+0		0°00'00"	5365.6	281.575	114.974	155.278	270.253	119.971	154.976	274.947	697938.4	3176490	98.64		Residential colony Bhagya Vihar
		309.1														
T. No-25	BA+0		0°00'00"	5674.7	301.7	153.822	145.85	299.671	154.124	146.389	300.513	697809.8	3176209	98.54		Cultivated land of Rani Kheda
		294.3														
T. No-26	BA+0		0°00'00"	5969	301.415	148.45	156.527	304.977	147.911	155.589	303.5	697683.3	3175943	98.71		Cultivated land of Rani Kheda
		308.53														
T. No-27	BA+0		0°00'00"	6277.53	310.61	152.003	138.779	290.782	152.941	146.063	299.004	697550.9	3175665	98.4		Cultivated land of Rani Kheda
		312.69													**ROAD**	
T. No-28	BC+3		0°33'36"RT	6590.22	248.665	173.911	83.542	257.453	166.627	87.1816	253.809	697416.7	3175382	97.84		Cultivated land of Rani Kheda and railway crossing
		184.64													**RAILWAY TRACK**	
T. No-29	BC+3		1°03'46"LT	6774.86	183.89	101.098	128.445	229.543	97.4584	113.155	210.614	697335.9	3175216	98.56		Mundka Industrial area
		183.14														
T. No-30	BC+0		0°06'40"RT	6958	204.705	54.6953	-129.81	-75.1156	69.9848	-29.0772	40.9076	697258.7	3175050	98.56		Mundka Industrial area
		226.27														
T. No-31	MONOPOLE		0°36'00"RT	7184.27	210.28	356.081	97.6084	453.689	255.347	97.4163	352.764	697163	3174845	98.95		
		194.29														
T. No-32	MONOPOLE		11°39'53"RT	7378.56	178.92	96.6816	466.888	563.569	96.8737	307.207	404.081	697079	3174670	98.91		Mundka Industrial area and NH No-10
		163.55													**METRO LINE,ROAD,11 KV LINE,DRAIN**	
T. No-32A	NB+0		24°13'16"LT	7542.11	153.355	-303.338	44.5343	-258.804	-143.657	55.7484	-87.9085	696979.9	3174540	97.96		Mundka Industrial area and NH No-10
		143.16														
T. No-32B	NB+0		12°07'42"RT	7685.27	163.015	98.6257	114.208	212.834	87.4116	104.766	192.177	696947.6	3174400	99.68		Mundka Industrial area
		182.87														
T. No-32C	NC+0		0°17'14"RT	7868.14	157.33	68.662	55.9881	124.65	78.1045	60.0959	138.2	696869.7	3174235	97.83		Mundka Industrial area and Bakarala village
		131.79														
T. No-33	NC+0		0°05'14"LT	7999.93	219.055	75.8019	157.716	233.518	71.6941	155.827	227.521	696813	3174116	98.41		Mundka Industrial area and Bakarala village
		306.32														
T. No-34	NC+0		0°36'01"RT	8306.25	302.01	148.604	127.375	275.979	150.493	136.279	286.772	696681.7	3173839	97.79		Mundka Industrial area
		297.7														
T. No-35	BA+0		0°00'00"	8603.95	301.135	170.325	149.846	320.171	161.421	150.857	312.278	696551.2	3173572	97.63		Near Barkarwala
		304.57														
T. No-36	BA+0		0°00'00"	8908.52	302.4	154.724	146.366	301.09	153.713	147.921	301.633	696419.1	3173297	97.96		Near Barkarwala
		300.23														
T. No-37	BA+0		0°00'00"	9208.75	298.65	153.864	146.489	300.353	152.309	147.337	299.647	696292	3173025	98.46		Near Barkarwala
		297.07														
T. No-38	BA+0		0°00'00"	9505.82	305.72	150.581	157.042	307.623	149.733	157.101	306.834	696162.1	3172758	98.73		Near Barkarwala
		314.37														
T. No-39	BA+0		0°00'00"	9820.19	308.185	157.328	151.075	308.403	157.269	151.044	308.312	696027.4	3172474	98.75		Near Barkarwala DDA Flats
		302														
T. No-40	BA+0		0°00'00"	10122.19	303.22	150.925	152.294	303.219	150.956	152.263	303.22	695897.3	3172201	98.74		Near Barkarwala DDA Flats
		304.44														
T. No-41	BA+0		0°00'00"	10426.63	303.48	152.146	133.699	285.845	152.177	140.98	293.157	695766.7	3171926	98.73		Near Barkarwala
		302.52													CANAL,ROAD	
T. No-42	BA+0		0°00'00"	10729.15	297.535	168.821	154.662	323.483	161.54	151.185	312.724	695638.2	3171653	101.09		Near Barkarwala, Adjacent to drain
		292.55														

Tower No.	Tower Type	Span (m)	Angle of Deviation	Cum. Span (m)	Wind Span (m)	Wt. Span (Cold)			Wt. Span (Hot)			Easting	Northing	Elevation	Crossing	Remarks
						Left	Right	Total	Left	Right	Total					
T. No-43	BA+0		0°00'00"	11021.7	302.11	137.888	150.346	288.234	141.365	152.622	293.987	695514.8	3171387	100		Situated on Dichaon Vill. Agriculture Land.
		311.67													NALA,ROAD,BOUNDARY	
T. No-44	BA+0		0°00'00"	11333.37	313.26	161.324	161.786	323.111	159.048	159.978	319.026	695376.3	3171108	100.76		Situated on Dichaon Vill. Agriculture Land.
		314.85													PUMP HOUSE,ROAD	
T. No-45	BA+0		0°00'00"	11648.22	312.05	153.064	164.961	318.025	154.872	160.676	315.548	695242.7	3170823	100.15		Situated on Dichaon Vill. Agriculture Land.
		309.25														
T. No-46	BA+0		0°00'00"	11957.47	307.86	144.289	143.833	288.122	148.574	147.731	296.306	695110.7	3170543	98.73		Situated on Dichaon Vill. Agriculture Land.
		306.47													CANAL,LT LINE	
T. No-47	BA+0		0°00'00"	12263.94	302.03	162.637	151.14	313.777	158.739	150.168	308.906	694978.4	3170267	100.01		Situated on Dichaon Vill. Agriculture Land.
		297.59													CART TRACK,LT LINE	
T. No-48	BA+0		0°00'00"	12561.53	266.95	146.45	143.304	289.754	147.422	132.876	280.298	694851.2	3169998	99.7		Situated on Dichaon Vill. Agriculture Land.
		236.31													LT LINE	
T. No-49	BC+0		0°23'01"LT	12797.84	187.255	93.0065	44.5043	137.511	103.434	54.7025	158.136	694748.8	3169785	97.06		Situated on Dichaon Vill. Agriculture Land.
		138.2													PUMP HOUSE,2 No.ROAD,NALA	
T. No-50	BC+0		0°00'55"LT	12936.04	188.945	93.6957	122.287	215.983	83.4975	121.274	204.772	694689.7	3169660	98.57		Situated on Dichaon Vill. Agriculture Land.
		239.69													2 No.ROAD	
T. No-51	BC+0		39°43'18"LT	13175.73	271.505	117.403	143.2	260.603	118.416	146.708	265.123	694587.3	3169443	98.31		Situated on Dichaon Vill. Agriculture Land.
		303.32													2 No.LT LINE	
T. No-52	BA+0		0°00'00"	13479.05	306.2	160.12	153.229	313.35	156.612	153.773	310.385	694662.8	3169150	99.45		Situated on Dichaon Vill. Agriculture Land.
		309.08													WELL,PUMP HOUSE	
T. No-53	BA+0		0°00'00"	13788.13	303.335	155.851	149.703	305.554	155.307	149.326	304.634	694739	3168850	99.63		Situated on Dichaon Vill. Agriculture Land.
		297.59													WELL,LT LINE	
T. No-54	BA+0		0°00'00"	14085.72	297.365	147.887	151.525	299.412	148.264	150.3	298.563	694812.6	3168562	99.51		Situated on Dichaon Vill. Agriculture Land.
		297.14														
T. No-55	BA+0		0°00'00"	14382.86	303.015	145.615	152.915	298.53	146.84	153.549	300.39	694885.6	3168274	99.12		Situated on Dichaon Vill. Agriculture Land.
		308.89													ROAD	
T. No-56	BA+0		0°00'00"	14691.75	297.605	155.975	142.846	298.821	155.341	142.976	298.317	694970	3167976	99.33		Situated on Laxmi Vihar commercial Plot.
		286.32														
T. No-57	BA+0		0°00'00"	14978.07	280.47	143.474	126.572	270.046	143.344	131.024	274.368	695038.6	3167698	99.37		Situated on Laxmi Vihar Brick factory commercial Plot.
		274.62														
T. No-58	BB+0		2°27'45"LT	15252.69	257.2	148.048	124.209	272.257	143.596	122.418	266.014	695107.2	3167433	100.68		Situated on Guru Nagar Colony Road .
		239.78													66 KV LINE,ROAD	
T. No-59	BA+0		0°00'00"	15492.47	241.87	115.571	128.439	244.011	117.362	125.761	243.123	695177	3167203	100.22		Situated on Neelkanth Enclave, Kabadi Commercial Plot.
		243.96													2 No.ROAD,BOUNDARY, LT LINE	
T. No-60	BC+0		14°49'18"RT	15736.43	140.425	115.521	158.184	273.705	118.199	100.243	218.443	695250.7	3166971	99.52		Situated on Neelkanth Enclave, Kabadi Commercial Plot.
		36.89														
GANTRY	GANTRY			15773.32	.....	-121.294	0	-121.294	-63.3534	0	-63.3534	695252.5	3166934	100.2		Gantry at 220kV Najafgarh Substation

TOWER SCHEDULE OF 220KV D/C BHAWANA-BHAWANA DSIIDC T TRANS. LINE

CLIENT: DELHI TRANSCO LIMITED

N K ENTERPRISES

220 KV D/C KANJHAWALA TO BAWANA TRANSMISSION LINE

Tower No.	Tower Type	Span (m)	Angle of Deviation	Sec. Length	Cum. Span (m)	Wind Span (m)	Wt. Span (Cold)			Wt. Span (Hot)			Easting	Northing	Elevation	Crossing	Remarks
							Left	Right	Total	Left	Right	Total					
GANTRY	GANTRY				0	....	0.00	66.57	66.57	0.00	53.69	53.69	695929	3179121	100.00		Gantry at 220kV S/s Kanjhawala
		71.01															
T. No-1	NC+03		0°00'00"	71.01	71.01	117	4.44	83.16	87.60	17.32	82.47	99.79	696000	3179120	99.05		Substation Premises
		163														BOUNDARY WALL	
T. No-2	NB+03		19°35'02"RT	163	234.01	192	79.84	99.47	179.32	80.53	104.00	184.53	696163	3179120	98.93		Khanjhawala Field & Industrial Area
		220.77														ROAD(Janakpuri- Najafgarh), CNG PUMP	
T. No-3	NA+03				454.78	219	121.30	121.06	242.35	116.77	116.05	232.82	696371	3179046	100.00		Khanjhawala Field & Industrial Area
		217.95														ROAD	
T. No-4	NA+03				672.73	223	96.89	114.98	211.87	101.90	114.78	216.68	696576	3178972	98.83		Cultivated Land of Khanjhawala
		228.98															
T. No-5	NC+03		32°55'13"LT	667.7	901.71	226	114.00	114.02	228.02	114.20	112.81	227.01	696792	3178896	98.78		Cultivated Land of Khanjhawala
		222.17														NALA,CANAL	
T. No-6	NB+03		5°33'27"LT	222.17	1123.88	235	108.15	120.26	228.41	109.36	121.73	231.10	697008	3178948	98.49		Cultivated Land of Khanjhawala
		247.62															
T. No-7	NA+03				1371.5	248	127.36	117.81	245.17	125.89	120.30	246.18	697242	3179029	98.88		Cultivated Land of Khanjhawala
		247.62															
T. No-8	NB+03		22°37'33"RT	495.24	1619.12	246	129.81	100.00	229.81	127.32	109.01	236.33	697476	3179110	99.54		Cultivated Land of Khanjhawala
		243.46														DRAIN	
T. No-9	NB+06		14°24'47"RT	243.46	1862.58	214	143.46	126.08	269.54	134.45	112.16	246.61	697719	3179095	98.89		Madanpur Dabas Village
		185															
T. No-10	NA+03				2047.58	194	58.92	109.05	167.97	72.84	105.93	178.77	697895	3179038	99.13		Madanpur Dabas Village
		203.03														ROAD,DRAIN	
T. No-11	NA+03				2250.61	205	93.98	107.20	201.17	97.10	105.76	202.86	698087	3178972	98.45		Madanpur Dabas Village
		207.45														11 KV LINE	
T. No-12	NB+03		12°03'16"RT	595.48	2458.06	210	100.25	113.53	213.79	101.69	110.41	212.10	698284	3178907	98.13		Madanpur Dabas Village
		211.99															
T. No-13	NA+03				2670.05	211	98.46	134.48	232.93	101.58	122.32	223.90	698467	3178800	97.42		Madanpur Dabas Village
		210.3															
T. No-14	NA+00				2880.35	162	75.82	-1.50	74.32	87.98	22.67	110.65	698652	3178700	97.68		Madanpur Dabas Village
		113.56															
T. No-15	NC+03		1°05'13"LT	535.85	2993.91	107	115.06	114.79	229.85	90.89	87.98	178.88	698751.9	3178646	97.62		Karala Village
		100.27															
T. No-16	NC+00		43°00'53"LT	100.27	3094.18	100	-14.52	22.55	8.02	12.29	33.87	46.16	698841	3178600	97.74		Karala Village
		99.72															
T. No-187	NC+00		50°12'57"LT	99.72	3193.9	76	77.17	-105.88	-28.70	65.85	-51.31	14.54	698937	3178627	98.95		Karala Village
		51.48															
T. No-188	BA+0				3245.38	179	157.36	151.71	309.07	102.79	152.53	255.32	698958	3178674	98.96		Karala Village
		307.38														ROAD	
T. No-189	BA+0				3552.76	304	155.67	145.64	301.31	154.85	147.78	302.62	699087	3178953	99.23		Karala Village
		301.58														ROAD	
T. No-190	BA+0				3854.34	299	155.94	162.77	318.71	153.80	156.86	310.67	699213	3179227	99.92		Village Majri
		297.05														ROAD,TEMPLE,BUILDING AREA	
T. No-191	BA+0				4151.39	289	134.28	127.35	261.63	140.19	132.80	272.98	699339	3179496	98.04		Village Majri
		280.98														ROAD,BUILDING	
T. No-192	BA+0				4432.37	299	153.63	159.33	312.96	148.18	158.83	307.01	699457	3179751	99.68		Near Shiva Nursery & Shilpa Gas Agency
		316.24														ROAD,NURSARY	
T. No-193	BA+0				4748.61	313	156.91	152.96	309.87	157.41	153.77	311.18	699589.8	3180038	99.51		Near Shiva Nursery & Shilpa Gas Agency

TOWER SCHEDULE OF 220KV D/C BHAWANA-BHAWANA DSIIDC T TRANS. LINE

Tower No.	Tower Type	Span (m)	Angle of Deviation	Sec. Length	Cum. Span (m)	Wind Span (m)	Wt. Span (Cold)			Wt. Span (Hot)			Easting	Northing	Elevation	Crossing	Remarks
							Left	Right	Total	Left	Right	Total					
		309.84														CART TRACK	
T. No-194	BA+0				5058.45	307	156.88	156.75	313.63	156.07	155.00	311.07	699709	3180324	99.78		Utsav Vihar
		305.08															
T. No-195	BA+0				5363.53	311	148.33	154.94	303.27	150.08	156.24	306.31	699839	3180600	99.21		Utsav Vihar
		316.14															
T. No-196	BA+0				5679.67	313	161.20	158.00	319.20	159.90	156.74	316.64	699973.7	3180886	99.65		Utsav Vihar
		309.9															
T. No-197	BA+0				5989.57	307	151.90	145.99	297.89	153.16	148.36	301.52	700100	3181169	99.23		Near Madhur Milan Vatika
		303.4															
T. No-198	BA+0				6292.97	302	157.41	150.13	307.54	155.04	150.13	305.17	700226	3181445	100.00		Cultivated Land of Karala
		300.26															
T. No-199	BA+0				6593.23	301	150.13	149.67	299.80	150.13	150.32	300.45	700351	3181718	100.00		Cultivated Land of Karala
		302.46															
T. No-200	BA+0				6895.69	300	152.79	149.48	302.28	152.14	149.30	301.44	700476.9	3181993	100.21		Cultivated Land of Karala
		298.06															
T. No-201	BA+0				7193.75	297	148.58	148.62	297.20	148.76	148.15	296.91	700601	3182264	100.15		Cultivated Land of Karala
		294.96															
T. No-202	BA+0				7488.71	299	146.34	150.99	297.32	146.81	151.05	297.86	700722	3182533	100.00		Cultivated Land of Karala
		302.27															
T. No-203	BB+0		0°00'00"		7790.98	284	151.28	134.04	285.33	151.22	133.55	284.77	700846	3182809	100.02		Sectional Tower
		265.71															
T. No-204	BA+0				8056.69	290	131.67	157.67	289.34	132.16	157.31	289.47	700955	3183051	99.88		Cultivated Land of Karala
		313.61														ROAD	
T. No-205	BA+0				8370.3	301	155.94	146.87	302.81	156.30	145.86	302.16	701083.7	3183337	99.76		Cultivated Land of Karala
		288.9														ROAD	
T. No-206	BA+0				8659.2	293	142.03	146.87	288.90	143.04	147.50	290.53	701181	3183609	99.45		Cultivated Land of Karala
		296.77															
T. No-207	BA+0				8955.97	300	149.90	152.98	302.88	149.27	152.45	301.73	701295	3183883	99.65		Cultivated Land of Barwala
		303.43															
T. No-208	BA+0				9259.4	302	150.45	153.50	303.96	150.98	152.36	303.33	701407	3184165	99.48		Cultivated Land of Barwala
		301.48															
T. No-209	BA+0				9560.88	304	147.98	149.20	297.17	149.12	150.87	299.99	701526	3184442	99.11		Cultivated Land of Barwala
		306.47															
T. No-210	BA+0				9867.35	304	157.27	153.46	310.74	155.60	152.44	308.04	701646	3184724	99.66		Cultivated Land of Barwala
		302.01															
T. No-211	BA+0				10169.36	300	148.55	145.24	293.78	149.57	146.93	296.49	701764	3185002	99.33		Near DSIDC Janta Flats of Bawana
		298.62															
T. No-212	BA+0				10467.98	301	153.38	151.27	304.65	151.69	151.27	302.96	701878	3185278	99.87		Near DSIDC Janta Flats of Bawana
		302.54															
T. No-213	BA+0				10770.52	305	151.27	152.44	303.71	151.27	152.83	304.10	701995	3185557	99.87		Near DSIDC Janta Flats of Bawana
		306.78															
T. No-214	BA+0				11077.3	216	154.34	116.56	270.91	153.95	94.26	248.21	702111	3185841	100.00		Near DSIDC Janta Flats of Bawana
		125.54															
T. No-215	NC+00		22°28'46"LT	8008.94	11202.84	189	8.98	125.02	133.99	31.28	125.42	156.71	702159	3185957	100.00		Near DSIDC Janta Flats of Bawana
		252														ROAD	
T. No-215A	NC+00		46°54'58"LT	252	11454.84	221	126.98	96.58	223.56	126.58	95.99	222.57	702159	3186209	100.11		Near 400kV S/s Bawana, DSIDC Industrial Area
		190.32															
T. No-215B	NC+00		23°59'48"RT	190.32	11645.16	176	93.74	39.70	133.44	94.33	56.77	151.10	702020	3186339	99.99		Near 400kV S/s Bawana, DSIDC Industrial Area
		161.77															
T. No-215C	NC+03		11°10'32"LT	161.77	11806.93	120	122.07	51.01	173.08	105.00	46.13	151.13	701957	3186488	99.95		Near 400kV S/s Bawana, DSIDC Industrial Area
		78.5														ROAD	
GANTRY	GANTRY			78.5	11885.43	.....	27.49	0.00	27.49	32.37	0.00	32.37	701913	3186553	99.51		Gantry at 220kV S/s Bawana

Physical Attributes

(Maps of the Transmission Line)

Name of The Transmission Line :- Bawana - DSIIDC Bawana.

End point of TL Grid S/Stn. Bawana.
Grid S/Stn. DSIIDC Bawana.

T-OFF:Nil
Length of Transmission Line(CKT.Km)= 5.577 km.
Date Of Commissioning : 1976, 1999, 2008.

Technical Attributes

1 Voltage : 220Kv
2 No of Circuits : Two
3 Circuit ID
4 Types Of Conductor - Single Zebra
5 Current Capacity(at 45°C)-736A
6 Types Of Insulator - Porcelain disc Insulators
7 No of Tower - Type wise - Total = 34(+02Nos Gantry)
- Tension - Type - 26
- Suspension - Type - 8

8 Type of ground wire used(OPGW) : GI Earth wire 19/2.5

Transmission Towers

Physical Attributes

1 Tower No = 34, Date of Commissioning : 1976, 1999 & 2008.

S. No.	Name of the220 kV Line	T.No.	Type	Span Length	Critical / Normal	Insulator String Type (Single/ Double	I - Strings		mid Span joint		Repair sleeve		Location
							Ckt I	Ckt II	Ckt I	Ckt II	Ckt I	Ckt II	
	Gantry Bawana		--			S/T H/W Fittings							Bawana industrial area, Sec. 05
				52					tø=01, bø=01				
1	Bawana - DSIIDC Bawana	213	C+3		Critical	S/T H/W Fittings		3					Bawana industrial area, Sec. 05

				122			--	--	tø=01, bø=01	--	--	--	
2	Bawana - DSIIDC Bawana	214	C+0		Normal	S/T H/W Fittings		3					Bawana industrial area, Sec. 05
				133			--	--	--	--	--	--	
3	Bawana - DSIIDC Bawana	215	B+3		Normal	S/T H/W Fittings							Bawana industrial area, Sec. 05
				167			--	--	--	--	--	--	
4	Bawana - DSIIDC Bawana	216	C+3		Normal	S/T H/W Fittings		3					Bawana industrial area, Sec. 05
				143			--	--	--	--	--	--	
5	Bawana - DSIIDC Bawana	217	C+6		Normal	S/T H/W Fittings	3						Bawana industrial area, Sec. 05
				150			--	--	--	mø=01	--	--	
6	Bawana - DSIIDC Bawana	218	C+6		Normal	S/T H/W Fittings		3					Bawana industrial area, Sec. 05
				190			--	--	tø=01, mø=01	--		bø=01	
7	Bawana - DSIIDC Bawana	219	A+0		Critical	S/S H/W Fittings							Bawana industrial area, Sec. 05
				300			--	--	mø=01, bø=01	--	--	--	
8	Bawana - DSIIDC Bawana	220	A+0		Critical	S/S H/W Fittings							Bawana industrial area, Sec. 05
				310			--	--	--	--	--	--	
9	Bawana - DSIIDC Bawana	221	A+0		Critical	S/S H/W Fittings							Bawana industrial area, Sec. 05
				310			--	--	tø=01	mø=01	--	--	
10	Bawana - DSIIDC Bawana	222	A+0		Critical	S/S H/W Fittings							Bawana industrial area, Sec. 05
				260			--	--	bø=01(ii)	tø=01, bø=01	--	--	
11	Bawana - DSIIDC Bawana	223	C+0		Critical	S/T H/W Fittings		3					vill. Holambikalan, Bawana
				60			--	--	--	--	--	--	
12	Bawana - DSIIDC Bawana	1	C+0		Normal	S/T H/W Fittings		3					vill. Holambikalan, Bawana
				60			--	--	--	--	--	--	
13	Bawana - DSIIDC Bawana	2	C+3		Normal	S/T H/W Fittings	3						vill. Holambikalan, Bawana
				190			--	--	--	--	--	--	
14	Bawana - DSIIDC Bawana	3	A+3		Normal	S/S H/W Fittings							Vill. Sannoth, Bawana
				210			--	--	--	--	--	--	
15	Bawana - DSIIDC Bawana	4	C+6		Normal	S/T H/W Fittings		3					Vill. Sannoth, Bawana
				80			--	--	--	--	--	--	
16	Bawana - DSIIDC Bawana	5	B+3		Normal	S/T H/W Fittings							Vill. Sannoth, Bawana
				160			--	--	--	--	--	--	
17	Bawana - DSIIDC Bawana	6	C+3		Normal	S/T H/W Fittings		3					Vill. Sannoth, Bawana

				160			--	--	--	--	--	--	
18	Bawana - DSIIDC Bawana	7	A+3		Normal	S/S H/W Fittings							Vill. Sannoth, Bawana
				140			--	--	--	--	--	--	
19	Bawana - DSIIDC Bawana	8	A+3		Normal	S/S H/W Fittings							Vill. Sannoth, Bawana
				160			--	--	--	--	--	--	
20	Bawana - DSIIDC Bawana	9	B+3		Normal	S/T H/W Fittings							Vill. Sannoth, Bawana
				120			--	--	--	--	--	--	
21	Bawana - DSIIDC Bawana	10	C+3		Normal	S/T H/W Fittings		3					Vill. Sannoth, Bawana
				150			--	--	--	--	--	--	
22	Bawana - DSIIDC Bawana	13	C+3		Normal	S/T H/W Fittings		3					Vill. Sannoth, Bawana
				190			--	--	--	--	--	--	
23	Bawana - DSIIDC Bawana	14	B+3		Normal	S/T H/W Fittings							JJ Colony, Bawana
				230			--	--	--	--	--	--	
24	Bawana - DSIIDC Bawana	15	B+3		Normal	S/T H/W Fittings							JJ Colony, Bawana
				230			--	--	--	--	--	--	
25	Bawana - DSIIDC Bawana	15 X	A+6		Normal	S/S H/W Fittings							JJ Colony, Bawana
				230			--	--	mø=01	--	--	--	
26	Bawana - DSIIDC Bawana	16	C+3		Normal	S/T H/W Fittings		3					JJ Colony, Bawana
				170			--	--	--	--	--	--	
27	Bawana - DSIIDC Bawana	17	C+3		Normal	S/T H/W Fittings	12						JJ Colony, Bawana
				60			--	--	--	--	--	--	
28	Bawana - DSIIDC Bawana	18 (G-I)			Normal	S/T H/W Fittings							JJ Colony, Bawana
				24			--	--	--	--	--	--	
29	Bawana - DSIIDC Bawana	19 (G-II)			Normal	S/T H/W Fittings							JJ Colony, Bawana
				16			--	--	--	--	--	--	
30	Bawana - DSIIDC Bawana	20	C+0		Normal	S/T H/W Fittings		3					JJ Colony, Bawana
				80			--	--	--	--	--	--	
31	Bawana - DSIIDC Bawana	21	B+6		Normal	S/T H/W Fittings							JJ Colony, Bawana
				70			--	--	--	--	--	--	
32	Bawana - DSIIDC Bawana	22	C+6		Normal	S/T H/W Fittings	12						JJ Colony, Bawana
				110			--	--	--	--	--	--	
33	Bawana - DSIIDC Bawana	23	B+6		Normal	S/T H/W Fittings							JJ Colony, Bawana
				200			--	--	--	--	--	--	
34	Bawana - DSIIDC Bawana	24	B+6		Normal	S/T H/W Fittings							JJ Colony, Bawana
				80			--	--	--	--	--	--	
35	Bawana - DSIIDC Bawana	25	C+6		Normal	S/T H/W Fittings		12					JJ Colony, Bawana
				240			--	--	--	--	--	--	
36	Bawana - DSIIDC Bawana	26	C+3		Normal	S/T H/W Fittings	3						JJ Colony, Bawana
				20			--	--	--	--	--	--	
	Gantry DSIIDC Bawana			5577									

220KV Gopalpur-Subzimandi

S No.	Tower No	Span Mtr	Type of tower	Tower classification Ckt - I & Ckt-II			Tower extn (Mtrs)	Tower Base	Distance
	G GPL			B-R	Y-Y	R-B		NB	
1	1	120	C	S-S	S-S	S-S	0	NB	120
2	2	222	B+6	S-S	S-S	S-S	6	NB	342
3	3	170	C+6	S-S	S-S	S-S	6	NB	512
4	4	65	B+3	S-S	S-S	S-S	3	NB	577
5	5	240	B+3	S-S	S-S	S-S	3	NB	817
6	6	216	C+6	S-S	S-S	S-S	6	NB	1033
7	7	280	C+14	S-S	S-S	S-S	14	NB	1313
8	8	184	C+6	S-S	S-S	S-S	6	NB	1497
9	9	240	C+14	S-S	S-S	S-S	14	NB	1737
10	10	200	C+14	S-S	D-D	D-D	14	NB	1937
11	11	216	B+6	S-D	D-D	D-D	6	NB	2153
12	12	200	B+3	S-S	S-S	S-S	3	NB	2353
13	13	210	B+3	S-S	S-S	S-S	3	NB	2563
14	14	206	B+3	S-S	S-S	S-S	3	NB	2769
15	15	250	B+6	S-S	S-S	S-S	6	NB	3019
16	16	270	B+6	S-S	S-S	S-S	6	NB	3289
17	17	250	C+6	S-S	S-S	S-S	6	NB	3539
18	18	250	B+6	S-S	S-S	S-S	6	NB	3789
19	19	230	B+6	S-S	S-S	S-S	6	NB	4019
20	20	190	B+6	S-S	S-S	S-S	6	NB	4209
21	21	150	C+6	S-S	S-S	S-S	6	NB	4359
22	22	210	C+6	S-S	S-S	S-S	6	NB	4569
23	23	220	C+6	S-S	S-S	S-S	6	NB	4789
24	24	210	C+6	S-S	S-S	S-S	6	NB	4999
25	25	240	B+6	S-S	S-S	S-S	6	NB	5239
26	26	230	B+6	S-S	S-S	S-S	6	NB	5469
27	27	220	C+14	S-S	S-S	S-S	14	NB	5689
28	28	210	C+6	S-S	S-S	S-S	6	NB	5899
29	29	230	B+6	S-S	S-S	S-S	6	NB	6129
30	30	170	B+6	S-S	S-S	S-S	6	NB	6299
31	31	210	C+3	S-S	S-S	S-S	3	NB	6509

32	32	90	B+3	S-S	S-S	S-S	3	NB	6599	
33	33	210	C+6	S-S	S-S	S-S	6	NB	6809	
34	34	220	C+6	S-S	S-S	S-S	6	NB	7029	
35	35	100	C+3				3	NB	7129	
	G.SBZ	110							7239	

Date of Energization :1986								
Total Line length : 7.239 Km								
Total tower : 35		Tension tower : 1-35			=35 Nos			
Pase position		Ckt-I		Top - B			Bottom-R	
		Ckt-II		Top - R			Bottom-B	
Eart wire - 19/2.5								
No of disc Tension-16								

Situation of bay at Gopal pur Ckt I-II — Bay No 9 & 10 — Left & Right side

Situation of bay at S Mandi Ckt -II — Bay No.1 & 2 — Right & Left side

Abstact of 220KV Lines

Name of feeder	Tens	Susp	T Towr	Length	Total Ckt Length
220KV Mandola-GPL	24	58	82	22.867	45.734
220 kV GPL- SOW	12	7	19	4.3	8.6
220KV Gopalpur- SBZ	35	0	35	7.239	14.478
Total	**71**	**65**	**136**	**34.406**	**68.812**

TOWER SCHEDULE OF 220KV D/C ROHINI - BHAWANA TRANS. LINE

CLIENT: DELHI TRANSCO LIMITED

N K ENTERPRISES

220 KV D/C GEETA COLONY TO PATPARGANJ TRANSMISSION LINE

S No.	Tower No.	Tower Type	Angle of Deviation (Deg)	Span (m)	Cum. Span (m)	Wind Span (m)	Wt. Span (Cold)			Wt. Span (Hot)			Easting	Northing	Elevation	Crossing	Remarks
							Left	Right	Total	Left	Right	Total					
1	GANTRY	GANTRY			0	....	0.00	65.81	65.81	0.00	46.49	46.49	721581	3171610	101.60		Gantry at 220kV S/s Geeta Colony
				19.7												Substation Boundary	
2	T No.355B	BC+0	104°34'43"LT		19.7	47.57	-46.11	44.85	-1.26	-26.79	42.39	15.60	721563	3171602	101.40		
				75.43													
3	T No.356	BA+00	0°00'00"		95.13	190.13	30.58	154.18	184.75	33.04	153.57	186.61	721610	3171543	101.19		
				304.82												Raja Ram Kohli Marg	
4	T No.357	BC+0	28°56'01"RT		399.95	310.68	150.64	161.67	312.32	151.25	160.50	311.75	721790	3171297	100.98		
				316.54													
5	T No.358	BA+00	0°00'00"		716.49	315.19	154.87	156.59	311.46	156.04	156.71	312.75	721830	3170983	100.56		
				313.84													
6	T No.359	BA+00	0°00'00"		1030.33	307.53	157.25	150.18	307.43	157.13	150.33	307.46	721853	3170670	100.60		
				301.21												Road & Boundary	
7	T No.360	BA+00	0°00'00"		1331.54	285.91	151.03	132.08	283.11	150.88	133.19	284.07	721880	3170370	100.65		
				270.6												Boundary & Road	
8	T No.361	BA+00	0°00'00"		1602.14	293.34	138.52	153.33	291.85	137.41	154.95	292.36	721898	3170100	100.99		
				316.07												Road , Fencing	Dargah & LT Line
9	T No.362	BA+00	0°00'00"		1918.21	303.29	162.74	151.60	314.34	161.12	149.41	310.53	721924	3169785	101.57		
				290.5													Park & Road
10	T No.363	BC+0	25°08'40"LT		2208.71	261.06	138.90	121.46	260.35	141.09	119.51	260.60	721962	3169497	100.85		
				231.62													LT Line, Road , Park &
11	T No.364	BC+0	1°07'13"LT		2440.33	263.98	110.16	141.76	251.93	112.11	143.97	256.09	722087	3169302	100.34		
				296.33													
12	T No.365	BC+0	0°00'00"		2736.66	261.68	154.57	135.88	290.44	152.36	128.15	280.51	722252	3169056	101.08		Lalita Park
				227.03												Fencing, 3 Nos. Road & Metro Line (Laxminagar to Yamuna Bank)	
13	T No.366	BC+0	15°06'11"LT		2963.69	151.13	91.15	20.92	112.07	98.88	26.68	125.56	722378	3168867	99.10		
				75.23												Park	
14	T No.367	BC+0	14°20'14"RT		3038.92	203.66	54.31	170.21	224.53	48.55	168.77	217.32	722435	3168818	99.59		Sakarpur Khas
				332.09												Road, Boundary & Park	
15	T No.368	BC+0	30°09'28"LT		3371.01	265.67	161.88	93.83	255.71	163.32	95.83	259.14	722623	3168544	99.05		
				199.24												Park & Boundary Wall	
16	T No.369	BC+0	0°52'40"LT		3570.25	223.44	105.41	110.05	215.46	103.41	114.80	218.22	722803	3168459	99.50		Nanakpura
				247.64												Nala, Railway Line	
17	T No.370	BC+0	37°48'26"LT		3817.89	245.82	137.59	64.21	201.80	132.84	84.16	217.00	723029	3168357	100.83		Ganesh Nagar
				244												Fencing, New Patparganj Road & Park	
18	T No.371	BC+6	11°49'26"LT		4061.89	245.24	179.79	190.23	370.02	159.84	167.10	326.94	723266	3168413	100.33		Ganesh Nagar
				246.48												Park, LT Line & Road	
19	T No.372	BC+0	21°45'41"LT		4308.37	154.02	56.25	70.35	126.60	79.38	56.68	136.07	723489	3168518	99.89		Ganesh Nagar
				61.55													
20	T No.373	BC+0	46°58'13"LT		4369.92	45.31	-8.80	11.01	2.21	4.87	12.23	17.09	723531	3168563	98.94		
				29.07												Substation Boundary	
21	GANTRY	GANTRY	0°00'00"		4398.99	....	18.06	0.00	18.06	16.84	0.00	16.84	723529	3168592	98.75		Gantry at 220kV S/s

CLIENT: DELHI TRANSCO LIMITED

N K ENTERPRISES

220 KV DC IP STN PATPARGANJ TRANSMISSION LINE

Tower No.	Tower Type	Span (m)	Angle of Deviation (Deg)	Cum. Span (m)	Wind Span (m)	Wt. Span (Cold)			Wt. Span (Hot)			Easting	Northing	Elevation	Crossing	Remarks
						Left	Right	Total	Left	Right	Total					
GANTRY	GANTRY			0	....	0.00	-0.40	-0.40	0.00	5.25	5.25	719861	3168612	101.28		GANTRY AT 220/66KV S/S INDRA PRASTHA
		26.44														
T.No.1	NC+00		1°24'07"RT	26.44	106	26.84	106.72	133.56	21.19	100.87	122.07	719878	3168632	101.47		D/E TOWER
		185.24													TEN SHED,BUILDING,NALA,ROA,RAILWAY X-ING,BOUNDARY WALL	
T.No.2	NC+00		48°43'08"RT	211.68	195	78.52	-456.23	-377.70	84.37	-224.76	-140.39	720003	3168769	100.31		
		204.04													ROAD	
T.No.3	JCT(S)		0°43'00"RT	415.72	539	660.27	448.09	1108.36	428.80	443.50	872.30	720207	3168766	99.88		
		874.03													2 No. ROAD,YAMUNA RIVER X-ING	
T.No.4	JCT(S)		2°17'58"LT	1289.75	614	425.94	502.24	928.18	430.53	367.40	797.93	721081	3168741	95.58		
		354.05													LT LINE,AGRICULTURE LAND,HUT,GARDEN AREA	
T.No.5	NC+00		13°06'48"RT	1643.8	470	-148.19	92.87	-55.32	-13.35	175.64	162.29	721435	3168745	95.46		
		584.96													2 No. CART TRACK	
T.No.6	JCT(S)		0°46'47"RT	2228.76	580	492.09	470.92	963.01	409.32	394.96	804.28	722006	3168620	96.3		
		575.45													CART TRACK, METRO X-ING,NOIDA LINK ROAD,FENCING WATER WORKS	
T.No.7	NB+06		8°39'30"RT	2804.21	442	104.53	-165.39	-60.86	180.49	-32.89	147.60	722566	3168488	94.5		
		308.33													PARK,LT LINE,BOUNDARY ,BUILDING	NEHRU ENCLAVE & SCHOOL
T.No.8	JCT(S)		0°11'58"LT	3112.54	279	473.72	570.11	1043.83	341.22	385.44	726.67	722852	3168373	93.24		
		249.49													RAILWAY X-ING,NALA,BUILDING	BLOCK D NEHRU ENCLAVE
T.No.9	NC+00		43°49'20"LT	3362.03	247	-320.62	122.93	-197.69	-135.95	122.55	-13.41	723084	3168281	94.91		
		244.01													PARK,BUILDING,NEW PATPARGANJ ROAD,	BLOCK - C AND D SOUTH BLOCK
T.No.10	NA+00			3606.04	261	121.08	147.48	268.56	121.46	143.77	265.24	723310	3168373	94.81		
		277.08													PATPARGANJ ROAD	MOTHER DAIRY
T.No.11	NC+00		36°51'24"LT	3883.12	186	129.60	46.36	175.96	133.31	46.66	179.96	723566	3168479	93.71		
		94.15														
T.No.12	NC+00			3977.27	68	47.79	29.30	77.09	47.49	25.66	73.16	723614	3168560	93.74		
		41.05	27°51'29"LT												SS BOUNDARY	
GANTRY	GANTRY			4018.32	.....	11.75	0.00	11.75	15.39	0.00	15.39	723616	3168601	93.58		GANTRY AT 220/66KV S/S

CLIENT: DELHI TRANSCO LIMITED

M/S N. K. ENTERPRISES

TOWER SCHEDULE OF 220KV D/C IP TO PRAGATI TRANS. LINE

S No.	Tower No.	Tower Type	Tower Base	Angle of Deviation	Sec.Lanth	Span (m)	Cum. Span (m)	Wind Span (m)	Wt. Span (Cold)			Wt. Span (Hot)			Easting	Northing	Elevation	Crossing	Remarks
									Left	Right	Total	Left	Right	Total					
1	GANTRY	GANTRY		0°00'00"	0		0	....	0.00	-576.85	-576.85	0.00	-371.98	-371.98	719884	3168520	100.00		220/132Kv Gantry at Ip S/s
						32.97													
2	T No.1	DC+6	Narrow Base	38°15'12"LT	32.97		32.97	90.34	609.82	178.00	787.82	404.95	142.04	546.99	719912	3168537	100.70		Inside IP Power House
						147.7												Road,Darin, Nali,Solar Plant	
3	T No.2	DC+0	Broad Base	38°38'33"RT	147.7		180.67	103.40	-30.30	29.55	-0.75	5.66	29.55	35.21	719964	3168675	100.70		Inside IP Power House
						59.1													
4	T No.3	DC+0	Broad Base	56°27'40"RT	59.1		239.77	105.66	29.55	68.19	97.74	29.55	70.92	100.47	720015	3168705	100.70		
						152.21												2Nos Pipe Line,Road	Along the Yamuna River
5	T No.4	DC+0	Broad Base	60°21'09"RT	152.21		391.98	226.80	84.02	156.30	240.33	81.29	154.37	235.65	720152	3168639	101.17		
						301.38													Along the Yamuna River ,Road
6	T No.5	DB+0	Broad Base	2°27'38"LT	301.38		693.36	234.50	145.08	83.19	228.27	147.01	83.40	230.42	720173	3168338	100.51		
						167.61													Along the Yamuna River ,Road
7	T No.6	DC+0	Broad Base	5°26'05"RT	167.61		860.97	135.84	84.42	52.04	136.45	84.21	52.04	136.24	720191	3168172	100.55		
						104.07													Along the Yamuna River ,Road
8	T No.7	DC+0	Broad Base	10°09'57"RT	104.07		965.04	180.04	52.04	121.80	173.83	52.04	123.94	175.97	720193	3168068	100.55		
						256.01												Nala,Delhi Metro,Boundry Wall,Road	Dwarka to Noida City Center
9	T No.8	DC+0		0°00'00"	256.01		1221.05	....	134.21	0.00	134.21	132.07	0.00	132.07	720152	3167815	101.17		Behind Pragati power house

		Delhi Transco Limited
	Name of Line :-	**220 KV Narela- Mandola**
	Suspension tower :-	**55**
	Tension tower :-	**18**
	Total No. of Tower :-	**73**
	Total Line Length :-	**20.601 KM**
	Year of commissioning :-	**1974 & 1992**

S.No.	Name of 220 KV Line	T. No.	Type of Tower	Span Length	Critical /Normal	insulator string type Single/Double	Location
1	220 KV Narela- Mandola line	1	C	275	Normal	S/T H/W Fitting	Near S/Stn.Mandola gantry
2	220 KV Narela- Mandola line	2	C	302	Normal	S/T H/W Fitting	Near S/Stn.Mandola gantry
3	220 KV Narela- Mandola line	3	A	304	Normal	S/S H/W Fitting	At Mandola
4	220 KV Narela- Mandola line	4	A	281	Normal	S/S H/W Fitting	At Mandola
5	220 KV Narela- Mandola line	5	A	310	Normal	S/S H/W Fitting	At Mandola
6	220 KV Narela- Mandola line	6	A	318	Normal	S/S H/W Fitting	At Alipur village
7	220 KV Narela- Mandola line	7	A	313	Normal	S/S H/W Fitting	At Alipur village
8	220 KV Narela- Mandola line	8	A	277	Normal	S/S H/W Fitting	At Alipur village
9	220 KV Narela- Mandola line	9	C	278	Normal	S/T H/W Fitting	At Alipur village
10	220 KV Narela- Mandola line	10	A	254	Normal	S/S H/W Fitting	At Alipur village
11	220 KV Narela- Mandola line	11	A	246	Normal	S/S H/W Fitting	At Alipur village
12	220 KV Narela- Mandola line	12	A	196	Normal	S/S H/W Fitting	At Alipur village
13	220 KV Narela- Mandola line	13	A	312	Normal	S/S H/W Fitting	Pachayra village
14	220 KV Narela- Mandola line	14	A	317	Normal	S/S H/W Fitting	Pachayra village
15	220 KV Narela- Mandola line	15	A	249	Normal	S/S H/W Fitting	Pachayra village
16	220 KV Narela- Mandola line	16	A	298	Normal	S/S H/W Fitting	Pachayra village
17	220 KV Narela- Mandola line	17	A	315	Normal	S/T H/W Fitting	Pachayra village
18	220 KV Narela- Mandola line	17A	C	278	Normal	S/T H/W Fitting	Pachayra village
19	220 KV Narela- Mandola line	18	C	311	Normal	S/T & D/T H/W Fitting	Pachayra village
20	220 KV Narela- Mandola line	19	A	555	**Critical**	D/S H/W Fitting	Jamuna crossing (JCT)
21	220 KV Narela- Mandola line	20	A	303	**Critical**	D/S H/W Fitting	Jamuna crossing (JCT)
22	220 KV Narela- Mandola line	21	C+3	252	Normal	D/T & S/T H/W Fitting	Jamuna Area
23	220 KV Narela- Mandola line	22	A+3	315	Normal	S/S H/W Fitting	Jamuna Area
24	220 KV Narela- Mandola line	23	A	307	Normal	S/S H/W Fitting	Pusta Road crossing
25	220 KV Narela- Mandola line	24	B+3	225	Normal	S/T H/W Fitting	Pusta Road crossing

26	220 KV Narela- Mandola line	25	A	266	Normal	S/S H/W Fitting	Ramjan pur Village
27	220 KV Narela- Mandola line	26	A	205	Normal	S/S H/W Fitting	Ramjan pur Village
28	220 KV Narela- Mandola line	27	A	312	Normal	S/S H/W Fitting	Ramjan pur Village
29	220 KV Narela- Mandola line	28	A+3	302	Normal	S/S H/W Fitting	Ramjan pur Village
30	220 KV Narela- Mandola line	29	A+3	315	Normal	S/S H/W Fitting	Ramjan pur Village
31	220 KV Narela- Mandola line	30	A+3	298	**Critical**	S/S H/W Fitting	Road crossing Hiranki
32	220 KV Narela- Mandola line	31	A+3	276	**Critical**	S/S H/W Fitting	Road crossing Hiranki
33	220 KV Narela- Mandola line	32	A	333	Normal	S/S H/W Fitting	Farmhouse Hiranki
34	220 KV Narela- Mandola line	33	A	130	Normal	S/S H/W Fitting	Farmhouse Hiranki
35	220 KV Narela- Mandola line	34	C+3	349	Normal	S/T H/W Fitting	Farmhouse Hiranki
36	220 KV Narela- Mandola line	35	C+3	195	Normal	S/T H/W Fitting	Parveen farmhouse bakhtawar pur road
37	220 KV Narela- Mandola line	36	C	305	Normal	S/T H/W Fitting	Bakhtawar pur
38	220 KV Narela- Mandola line	37	A	314	Normal	S/S H/W Fitting	Hanuman Mandir marg, bakhtawar pur
39	220 KV Narela- Mandola line	38	A	316	Normal	S/S H/W Fitting	Hanuman Mandir marg, bakhtawar pur
40	220 KV Narela- Mandola line	39	C	97	Normal	S/T H/W Fitting	Road crossing
41	220 KV Narela- Mandola line	40	C	218	**Critical**	S/S H/W Fitting	Road crossing, Bakhtawar pur
42	220 KV Narela- Mandola line	41	A	302	**Critical**	S/S H/W Fitting	Road crossing, Bakhtawar pur
43	220 KV Narela- Mandola line	42	A	308	**Critical**	S/S H/W Fitting	Road crossing, Bakhtawar pur
44	220 KV Narela- Mandola line	43	A	305	Normal	S/S H/W Fitting	Eden garden Bakoli
45	220 KV Narela- Mandola line	44	A	310	Normal	S/S H/W Fitting	Bakoli
46	220 KV Narela- Mandola line	45	A	277	Normal	S/S H/W Fitting	Bakoli
47	220 KV Narela- Mandola line	46	A	298	Normal	S/S H/W Fitting	Bakoli
48	220 KV Narela- Mandola line	47	A	293	Normal	S/S H/W Fitting	Bakoli
49	220 KV Narela- Mandola line	48	B	300	Normal	S/T H/W Fitting	Road crossing, Hamidpur
50	220 KV Narela- Mandola line	49	A	301	Normal	S/S H/W Fitting	Road crossing, Hamidpur
51	220 KV Narela- Mandola line	50	A	302	Normal	S/S H/W Fitting	Hamidpur
52	220 KV Narela- Mandola line	51	A	297	Normal	S/S H/W Fitting	Hamidpur
53	220 KV Narela- Mandola line	52	A	293	Normal	S/S H/W Fitting	Hamidpur
54	220 KV Narela- Mandola line	53	A	312	Normal	S/S H/W Fitting	400 kv Bawana line crossing, Hamidpur
55	220 KV Narela- Mandola line	54	A	310	Normal	S/S H/W Fitting	400 kv Bawana line crossing, Hamidpur
56	220 KV Narela- Mandola line	55	A	315	Normal	S/S H/W Fitting	Hamidpur, tajpur road
57	220 KV Narela- Mandola line	56	B	281	Normal	S/T H/W Fitting	Road crossing, Tajpur road
58	220 KV Narela- Mandola line	57	A	308	Normal	S/S H/W Fitting	Road crossing, Tajpur road
59	220 KV Narela- Mandola line	58	A	305	Normal	S/S H/W Fitting	Near The Jehan Banquet
60	220 KV Narela- Mandola line	59	A	295	**Critical**	D/S H/W Fitting	NH-1 Highway crossing

61	220 KV Narela- Mandola line	60	A	294	**Critical**	D/S H/W Fitting	NH-1 Highway crossing
62	220 KV Narela- Mandola line	61	A	292	Normal	S/S H/W Fitting	Forest area Narela
63	220 KV Narela- Mandola line	62	A	297	Normal	S/S H/W Fitting	Forest area Narela
64	220 KV Narela- Mandola line	63	A	290	Normal	S/S H/W Fitting	Forest area Narela
65	220 KV Narela- Mandola line	64	A	312	**Critical**	S/S H/W Fitting	Road crossing, Narela singhu border road
66	220 KV Narela- Mandola line	65	A	306	**Critical**	S/S H/W Fitting	Road crossing, Narela singhu border road
67	220 KV Narela- Mandola line	66	A	288	Normal	S/S H/W Fitting	Narela
68	220 KV Narela- Mandola line	67	A	306	Normal	S/S H/W Fitting	Narela
69	220 KV Narela- Mandola line	68	A	248	Normal	S/S H/W Fitting	Narela
70	220 KV Narela- Mandola line	69	A	284	Normal	S/S H/W Fitting	Near Nala, Narela
71	220 KV Narela- Mandola line	70	C	131	**Critical**	S/T & D/T	Road crossing, Narela pio maniyari road
72	220 KV Narela- Mandola line	71	C	106	**Critical**	D/T & S/T	Road crossing, Narela pio maniyari road
73	220 KV Narela- Mandola line	72	C	34	Normal	S/T H/W Fitting	Near Narela grid Gantry

Delhi Transco Limited

M/S N. K. Enterprises

PROJECT :220KV D/C DSIDC BHAWANA-NARELA TRANSMISSION LINE

S No.	Tower No.	Tower Type	Span (m)	Angle of Deviation	Sectional Length	Cum. Span (m)	Wind Span (m)	Wt. Span (Cold)			Wt. Span (Hot)			Easting	Northing	Elevation	Crossing	Remarks
								Left	Right	Total	Left	Right	Total					
0	Gantry	GANTRY		0°00'00"	0	0	....	0.00	-126.85	-126.85	0.00	-75.44	-75.44	700888	3187613	103.32		Gantry at ~~SOW Wazirabad~~
			73.55														Road, Boundary & Drain	DSIIDC Bawana
1	T No.1	DC+3		66°27'45"RT	73.55	73.55	126.64	200.40	95.22	295.62	148.99	93.54	242.53	700897	3187686	104.32		
			179.73														Road, Drain & House	
2	T No.2	DC+3		57°18'05"RT	179.73	253.28	170.90	84.51	89.38	173.88	86.19	86.75	172.94	701069	3187737	103.90		
			162.06														2 Nos. Houses & Drain	2 Nos. Road
3	T No.3	DA+3			162.06	415.34	167.32	72.68	81.38	154.06	75.31	82.92	158.23	701192	3187631	103.31		
			172.58														Water Logged Area	2 Nos. Road, Nala & Boundary
4	T No.4	DC+3		90°17'36"LT	172.58	587.92	118.49	91.20	45.37	136.57	89.66	41.23	130.89	701323	3187518	103.68		
			64.39														Road	Water Logged Area & Drain
5	T No.5	DB+3		2°18'04"LT	64.39	652.31	80.03	19.02	51.18	70.21	23.16	50.13	73.29	701364	3187567	103.31		
			95.66														Boundary & Drain	
6	T No.6	DC+3		30°09'32"LT	95.66	747.97	147.89	44.48	113.46	157.94	45.53	109.25	154.78	701424	3187643	103.17		
			200.12															
7	T No.7	DA+3			200.12	948.09	202.57	86.66	104.07	190.73	90.87	103.58	194.45	701452	3187841	102.00		
			205.01														Road & Drain	
8	T No.8	DC+3		89°40'40"RT	205.01	1153.1	119.45	100.94	294.35	395.28	101.43	207.18	308.61	701480	3188044	101.86		
			33.88															
	GANTRY	GANTRY			33.88	1186.98	34.09	-260.47	35.19	-225.27	-173.30	29.52	-143.78	701514	3188039	102.01		
			34.3														400kV Trans. Line	
	GANTRY	GANTRY			34.3	1221.28	35.64	-0.89	-52.20	-53.09	4.78	-29.99	-25.21	701548	3188035	101.74		
			36.97															
9	T No.9	DC+0		38°53'46"RT	36.97	1258.25	85.10	89.17	30.65	119.82	66.96	41.95	108.91	701584	3188030	101.63		
			133.22														2 Nos. Boundary & Nala	
10	T No.10	DC+3		95°21'30"LT	133.22	1391.47	95.82	102.57	27.64	130.21	91.27	28.13	119.41	701676	3187933	100.72		
			58.42															Boundary
11	T No.11	DB+3		0°43'32"RT	58.42	1449.89	123.27	30.78	72.36	103.14	30.29	79.18	109.47	701715	3187977	100.76		
			188.11															
12	T No.12	DB+3		5°17'56"RT	188.11	1638	205.19	115.75	103.19	218.93	108.93	105.68	214.61	701840	3188117	102.54		
			222.26															
13	T No.13	DB+6		1°28'29"LT	222.26	1860.26	221.60	119.07	131.32	250.40	116.58	124.77	241.35	702004	3188267	100.31		
			220.94														2 Nos. Nala, Boundary, Park & Cart Track	
14	T No.14	DA+3			220.94	2081.2	219.94	89.62	106.01	195.63	96.17	107.10	203.27	702162	3188421	101.30		
			218.94														2 Nos. Park	
15	T No.15	DB+3		6°56'32"RT	218.94	2300.14	181.57	112.93	75.12	188.05	111.84	74.17	186.01	702319	3188574	101.63		
			144.2														Park	Road
16	T No.16	DA+3			144.2	2444.34	156.78	69.08	88.19	157.27	70.03	87.09	157.12	702434	3188661	101.44		
			169.35														Park	Road
17	T No.17	DA+3			169.35	2613.69	170.27	81.16	46.22	127.38	82.26	58.59	140.85	702569	3188764	101.18		
			171.18														Park	Road
18	T No.18	DB+6		8°56'18"LT	171.18	2784.87	176.79	124.96	111.43	236.39	112.59	105.08	217.67	702705	3188867	101.12		
			182.4														2 Nos. Boundary, 11kV line, Road & Park	Road
19	T No.19	DB+6		3°21'58"RT	182.4	2967.27	161.84	70.97	111.20	182.17	77.32	98.45	175.78	702831	3188999	99.51		
			141.27															
20	T No.20	DC+3		9°05'19"LT	141.27	3108.54	98.65	30.07	78.75	108.82	42.82	62.81	105.62	702935	3189095	100.01		
			56.03															
21	T No.21	DC+3		50°49'19"LT	56.03	3164.57	94.35	-22.72	119.55	96.84	-6.78	102.83	96.05	702969	3189139	98.77		
			132.67															
22	T No.22	DA+0			132.67	3297.24	216.72	13.12	147.10	160.22	29.84	148.13	177.97	702940	3189269	98.69		
			300.76															

No.	Tower No.	Tower Type	Span (m)	Angle of Deviation	Sectional Length	Cum. Span (m)	Wind Span (m)	Wt. Span (Cold)			Wt. Span (Hot)			Easting	Northing	Elevation	Crossing	Remarks
								Left	Right	Total	Left	Right	Total					
23	T No.23	DA+0			300.76	3598	296.41	153.66	148.78	302.43	152.63	147.91	300.54	702874	3189562	99.12		
			292.06														Cart Track	Boundary
24	T No.24	DA+0			292.06	3890.06	298.48	143.28	152.29	295.58	144.15	152.34	296.49	702809	3189847	98.77		
			304.89														Nala & Temple	Boundary & Drain
25	T No.25	DA+0			304.89	4194.95	308.47	152.60	139.27	291.87	152.55	144.53	297.08	702742	3190144	98.79		
			312.04														Boundary wall & Boundary	Boundary & Drain
26	T No.26	DA+0			312.04	4506.99	311.42	172.77	143.67	316.44	167.51	147.36	314.86	702673	3190449	101.07		
			310.8														Drain & Plantation	
27	T No.27	DA+0			310.8	4817.79	263.71	167.13	-55.73	111.40	163.44	-4.19	159.26	702605	3190752	102.66		
			216.61														2 Nos. Plantation & Cart Track	
28	T No.28	DB+14		0°12'29"RT	216.61	5034.4	148.48	272.34	403.92	676.26	220.80	289.63	510.42	702557	3190963	104.16		
			80.35														Park, Power Line, Road & Divider/Park	
29	T No.29	DA+0		0°00'00"LT	80.35	5114.75	184.07	-323.57	147.80	-175.77	-209.28	146.57	-62.71	702540	3191041	105.41		
			287.79														2 Nos. Boundary Wall, Boundary, Cart Track, Houses, 2 Nos. Road, Temple, Tree & 11kV line	2 Nos. Tree, Park & Boundary
30	T No.30	DA+0			287.79	5402.54	296.23	139.99	165.43	305.42	141.22	161.31	302.53	702477	3191322	104.92		
			304.67														2 Nos. Tree	Tree
31	T No.31	DA+0			304.67	5707.21	305.75	139.24	139.21	278.46	143.36	143.68	287.03	702411	3191620	103.18		
			306.82														11kV line & 2 Tree	
32	T No.32	DA+0			306.82	6014.03	300.99	167.61	146.03	313.63	163.14	146.51	309.66	702344	3191919	105.08		
			295.16														2 Nos. Tree	
33	T No.33	DA+0			295.16	6309.19	300.31	149.13	147.25	296.39	148.65	148.97	297.62	702280	3192207	105.28		
			305.46														3 Nos. Tree. 11kV line & Road	2 Nos. Tree & Tubewell
34	T No.34	DA+0			305.46	6614.65	303.71	158.21	154.40	312.60	156.49	153.32	309.81	702214	3192506	106.01		
			301.96														3 Nos. Tree	2 Nos. Tree
35	T No.35	DA+0			301.96	6916.61	280.16	147.56	138.67	286.24	148.64	135.69	284.33	702149	3192800	105.56		
			258.36														5 Nos. Tree & Temple	Boundary
36	T No.36	DB+0			258.36	7174.97	289.71	119.69	162.53	282.22	122.67	161.90	284.57	702093	3193053	104.49		
			321.06														Boundary, Temple, LT line, Road, 11kV line, Drain & Boundary wall	Temple, 2 Nos. Houses, Tree Houses, School Agresh Public, Playground & 2 Nos. Tree
37	T No.37	DC+0		29°16'19"RT	321.06	7496.03	312.54	158.53	161.35	319.89	159.16	158.42	317.58	702023	3193366	104.21		
			304.01														2 Nos. boundary & Tree	3 Nos. Houses
38	T No.38	DA+3			304.01	7800.04	320.97	142.66	189.45	332.10	145.59	183.01	328.60	702111	3193657	99.97		
			337.92															
39	T No.39	DA+0			337.92	8137.96	319.87	148.47	150.60	299.07	154.91	150.70	305.61	702208	3193981	99.95		
			301.81														2 Nos. TubeWell, 3 Nos. Tree & Road	4 Nos. Tree
40	T No.40	DA+0			301.81	8439.77	305.60	151.21	153.06	304.27	151.11	153.57	304.69	702295	3194270	99.99		
			309.38															Road
41	T No.41	DC+0		42°55'04"RT	309.38	8749.15	304.16	156.32	128.92	285.24	155.81	135.38	291.18	702384	3194566	100.21		
			298.94														Tree	Tree
42	T No.42	DC+3		9°18'06"RT	298.94	9048.09	219.11	170.02	69.15	239.17	163.56	69.30	232.86	702642	3194717	99.89		
			139.28														Nala, 2 Nos. Cart Track, Railway line crossing (Delhi-Amritsar)(Pole No.27/34-Pole No. 28/1)	Tree
43	T No.43	DC+3		11°32'04"RT	139.28	9187.37	234.35	70.13	184.40	254.54	69.98	178.22	248.19	702772	3194767	99.92		
			329.42															
44	T No.44	DA+0			329.42	9516.79	315.07	145.02	148.23	293.24	151.20	148.90	300.10	703097	3194821	100.09		
			300.72														2 Nos. Road. LT line, 3 Nos. Houses & 2 Tree	4 Nos. Houses, 3 Nos. Tree & Tubewell
45	T No.45	DA+0			300.72	9817.51	296.27	152.49	162.01	314.50	151.82	156.95	308.77	703394	3194871	100.37		

No.	Tower No.	Tower Type	Span (m)	Angle of Deviation	Sectional Length	Cum. Span (m)	Wind Span (m)	Wt. Span (Cold)			Wt. Span (Hot)			Easting	Northing	Elevation	Crossing	Remarks
								Left	Right	Total	Left	Right	Total					
			291.81														Nala	2 Nos. Tree & Tube well
46	T No.46	DA+0			291.81	10109.32	287.36	129.80	134.24	264.04	134.86	136.50	271.37	703681	3194919	98.32		
			282.9														Tree & Nala	Tree
47	T No.47	DA+0			282.9	10392.22	294.37	148.66	155.62	304.28	146.40	154.77	301.17	703960	3194966	99.21		
			305.84														11kV line, Road & Tree	Boundary
48	T No.48	DA+0			305.84	10698.06	303.95	150.22	145.57	295.79	151.07	147.28	298.35	704262	3195016	98.85		
			302.06														Cart Track, Canal & 11kv line	Temple & Pump House
49	T No.49	DB+0		10°23'50"LT	302.06	11000.12	237.29	156.49	82.27	238.77	154.78	83.53	238.30	704560	3195066	99.57		
			172.52														2 Nos. Park, Road, Tree, Boundary wall, Boundary & LT line	2 Nos. Tree, Pump House, Overhead Tank
50	T No.50	DC+0		28°41'45"LT	172.52	11172.64	120.53	90.25	73.40	163.65	88.99	61.10	150.10	704722	3195125	99.87		
			68.53														Road, Boundarywall & Tree	
	GANTRY	GANTRY		0°00'00"	68.53	11241.17	....	-4.87	0.00	-4.87	7.43	0.00	7.43	704767	3195176	99.95		Gantry at ~~Gopalpur~~ Narela

Surveyed By	Submitted By	Checked By	Recommended By	Approved By
NKE	NKE	DTL	DTL	DTL

DELHI TRANSCO LTD

(A Government of NCT of Delhi Undertaking)

Bidding Documents

For

Package-I: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Package-II: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.**

Package-III: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Package-IV: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Volume – III

Bid Form, Attachments, GTP & Price Schedules

Tender No: T25R220472

VOLUME-III

Bid Form, Attachments, GTP & Price Schedules

SECTION-I: BID FORM

SECTION-II: ATTACHMENTS

SECTION-III: GUARATNTEED TECHNICAL PARTICULARS

SECTION-IV: PRICE SCHEDULE

SECTION-I

BID FORM

SECTION: I
BID FORMS

Bid Proposal Ref. No…… Date: ……

Name of Package:

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV Bamnauli-Najafgarh, Najafgarh-Tikrikalan - Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana D/C Transmission Line along with replacement of Associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

To,

Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi – 110002

Ladies and Gentlemen,

1.0 Having examined the Bidding Documents, including Amendment Nos. _____*(Insert Numbers)* dated …… the receipt of which is hereby acknowledged, we _____,offer to design, test, deliver, install and commission (including carrying out Performance & Guarantee Test) the Facilities under the above-named package in full Conformity with the said Bidding Documents for the sum of:

(_____)
(Amount in Words)
(_____)
(Amount in Figures)

or such other sums as may be determined in accordance with the terms and conditions of the Bidding Documents.

"Note: Being a Two Part tender, bidders are required to submit the Bid Forms in Part –I as well as in Part-II. However, the prices shall be quoted only in the Bid Form to be submitted with Price Bid Part -II."

2.0 ATTACHMENTS TO THE BID FORM

In line with the requirement of the Bidding Documents, we enclose herewith the following Attachments to the Bid Form:

(a)	Attachment 1	:	Bid Security in the form of ……* for a sum of ……. (amount in words and figures) initially valid for a period of two hundred Forty (240) days from the date set for opening of bids. *Please fill in the alternative chosen in line with

			23.3 Section-ITB, Vol.-I, of the Bidding Documents.
(b)	Attachment 2	:	A power of attorney duly authorized by a Notary Public indicating that the person(s) signing the bid have the authority to sign the bid and thus that the bid is binding upon us during the full period of its validity in accordance with the ITB Clause 24.
(c)	Attachment 3	:	The documentary evidence that we are eligible to bid in accordance with Clause 10.3 (c) & (d) of ITB are qualified to perform the contract if our bid is accepted. The qualification data has been furnished as per your format enclosed with the bidding documents.
(d)	Attachment 4	:	The details of all major items of services or supply which we propose subcontractor in case of award, giving details of the name and nationality of the proposed subcontractor/ sub-vendor for each item.
(e)	Attachment 5	:	The variation and deviations from the requirements of the Conditions of Contract as per ITB and other commercial conditions, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
(f)	Attachment 6	:	The variation and deviations from the requirements of the Important Conditions of Contract as per ITB, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
(g)	Attachment 7	:	The variation and deviations from the requirements of the Technical Deviation clauses mentioned in Volume-II, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
(h)	Attachment 8	:	Additional information submitted by the bidder, in your format enclosed with the Bidding Documents, including, inter alia, indicated therein, if any.
(i)	Attachment 9	:	Bought-out & Sub-contracted item listed with bidding documents.

(j)	Attachment 10	:	Work Completion Schedule.
(k)	Attachment 11	:	List of special tools & tackles listed with bidding documents.
(l)	Attachment 12	:	Information regarding ex-employees of DTL in our firm.
(m)	Attachment 13	:	Deleted
(n)	Attachment 14	:	Price Adjustment Data
(o)	Attachment 15	:	Guarantee Declaration (If applicable)
(p)	Attachment 16	:	Integrity Pact, in a separate envelope duly signed on each page by the person signing the bid.
(q)	Attachment 17	:	Deleted
(r)	Attachment 18	:	Checklist (Bidder shall submit the information regarding documents submitted by them in the offer as per the checklist provided in Attachment-18 of Sec: Attachments, Vol-III of bidding document. It shall be sole responsibility of bidder to provide the information based on the documents submitted by them.)
(s)	Attachment 19	:	Affidavit of Self certification regarding Minimum Local Content in line with PPP-MII order **and MoP Order, as applicable** (submission of Hard Copy in 'Original'), to be submitted on a non-judicial stamp paper of Rs. 100/-.
(t)	Attachment 20	:	Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with PPP-MII order and MoP Order, as applicable (submission of Hard Copy in 'Original') to be submitted on the letter head of the auditor/ cost accountant.
(u)	Attachment 21	:	Undertaking for not indulging in Corrupt & Fraudulent practice
(v)	Attachment 22	:	Certification by the Bidder as per DoE Order no-F.No.7/10/2021-PPD(1) dt 23.02.2023 in line with ITB Clause 1.2.2 (In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture)
(w)	Attachment 23	:	Details of complete type test report of all the equipment as per QR and in accordance with latest IEC / NIT in the prescribed format
(x)	Attachment 24	:	Indemnity Bond

3.0 Price Schedules

3.1	Schedule 1	:	Price break-up Plant and Equipment (including Mandatory Spares) to be supplied
	Schedule 2	:	Break-up of Local Transportation, Insurance and other Incidental Services
	Schedule 3	:	Price Breakup of Installation Charges
	Schedule 4	:	Grand summary of the quoted bid price.

3.2 We are aware that the Price Schedules do not generally give a full description of the Work to be performed under each item and we shall be deemed to have read the Technical Specifications and other sections of the Bidding Documents and Drawings to ascertain the full scope of Work included in each item while filling-in the rates and prices. We agree that the entered rates and prices shall be deemed to include for the full scope as aforesaid, including overheads and profit.

3.3 We declare that as specified in the clause 11.2 CC of the Bidding Documents prices quoted by us in the Price Schedules shall be Fixed and Firm during the execution of Contract.

3.4 We understand that in the price schedules, where there are errors between the total of the amounts given under the column for the price Breakdown and the amount given under the Total Price, the former shall prevail and the latter will be corrected accordingly. We further understand that where there are discrepancies between amounts stated in figures and amounts stated in words, the amount stated in words shall prevail. Similarly, any discrepancy in the total bid price and that of the summation of Schedule price (price indicated in a Schedule indicating the total of that schedule), the total bid price shall be corrected to reflect the actual summation of the Schedule prices.

3.5 We declare that items left blank in the Schedules will be deemed to have been included in other items. The TOTAL for each Schedule and the TOTAL of Grand Summary shall be deemed to be the total price for executing the Facilities and sections thereof in complete accordance with the Contract, whether or not each individual item has been priced.

4.0 We confirm that except as otherwise specifically provided our Bid Prices include all taxes, duties, levies and charges as may be assessed on us, our Sub Contractor/Sub-Vendor or their employees by all municipal, state or national government authorities in connection with the Facilities, in and outside of India.

4.1 Deleted

4.2 We further understand that notwithstanding 4.0 above, in case of award on us, you shall also bear and pay/reimburse to us, Taxes, Duties and Levies as per

GST rules in respect of transaction between you and us, imposed on the Plant & Equipment including Mandatory Spare Parts specified in Price Schedule to be incorporated into the Facilities; by the Indian Laws.

4.3 Deleted.

4.4 We confirm that we shall also get registered with the concerned Tax Authorities as per GST rules, in all the states where the project is located.

4.5 Deleted.

4.6 We confirm that TDS under the applicable laws shall be deducted by the Employer from the payments made to us and Employer shall issue TDS certificates in lieu of deductions so made.

5.0 CONSTRUCTION OF THE CONTRACT

5.1 We declare that we are making this offer on the basis of divisible Supply-cum-Erection Contract on a single source responsibility basis. The supply portion of the Contract will relate to the Supply of equipment and materials on the ex-works basis and the Erection portion will relate to transportation, storage, insurance, erection, testing and commissioning etc. of equipment/ materials as specified in the bidding documents. However, we have no objection in case Owner decides to split the above mentioned package into two separate Contracts-one Contract for Supply of all equipment on ex-works basis and second Contract for all services such as transportation & insurance, handling at site, storage, insurance, installation, testing and commissioning etc of equipment/materials as specified in the bidding documents.

We hereby declare that the award of two separate Contracts, will not, in any way, dilute our responsibility for successful completion of work and fulfillment of all obligations as per Bidding Documents and that both the Contracts will have a cross-fall breach clause i.e. a breach in one Contract will automatically be considered as a breach of the other Contract which will confer on the Owner the right to terminate the other Contract at our risk and cost and/or recover damages under any or both the Contracts.

6.0 PERFORMANCE GUARANTEE

We declare that the ratings and performance figures of the equipment to be furnished and erected by us are guaranteed. The Guaranteed particulars of different equipment are enclosed in Technical Data Sheets.

7.0 QUALIFICATION DATA

We confirm having submitted the Qualification Data in two Copies, as required by you in your Conditions of Contract in a separate envelope along with this Bid. Further we have filled in the information for qualification requirements in Attachment-3. In case you require any further information in this regard, we agree to furnish the same.

8.0 DEVIATIONS

8.1 We declare that the contract shall be executed strictly in accordance with the specifications and documents except for the variations and deviations, all of which have been detailed out exhaustively in the following Attachments, irrespective of whatsoever has been stated to the contrary elsewhere in our proposal.

(a)	Commercial Deviations Attachment	:	Attachment-5
(b)	Cost of withdrawal of deviation on Important/critical conditions Attachment	:	Attachment-6
(c)	Technical Deviations Attachment	:	Attachment-7

8.2 We confirm having noted Clause 11.2 of Section-ITB, Conditions of Contract, Volume-I, as per which Bid containing deviations from following provision relating to following critical clauses will be treated as non-responsive, as stated therein. :

(a)	Governing Laws	:	Clause 5, CC
(b)	Settlement of Disputes	:	Clause 6, CC
(c)	Taxes and Duties,	:	Clause 14, CC
(d)	Appendix 2 to the Form of Contract Agreement (Price Adjustment)	:	Clause No. 15 ITB
(e)	Bid Security	:	Clause 23.0, Section ITB Volume-I, conditions of contract
(f)	Contract Performance Guarantee	:	Clause 43.0, Section ITB, Volume-I, Conditions of Contract
(g)	Liquidated Damages & (Functional Guarantee)	:	Clause 28 & 28.5 CC
(h)	Defect Liability	:	Clause No. 27 CC
(i)	Price Basis and Payment	:	Clause No.12 CC and Clause 14 Section ITB
(j)	Completion Time	:	Section F&P Appendix-4
(k)	Patent Indemnity	:	Clause No.29, CC

8.2.1 We confirm that we have not taken any deviations / exceptions to above clauses.

8.3 Further, we agree that additional conditions, deviations, if any, found in the proposal documents other than those stated in attached Deviation Attachments (i.e., Attachment 5, 6 & 7), save that pertaining to any rebates offered, shall not be given effect to.

9.0 ADDITIONAL INFORMATION

We have included with this proposal additional information as listed in Attachment-8, We further confirm that such additional information do not imply any additional deviation beyond those covered in Attachment- 5, 6 & 7 and in case of any contradiction between these additional information and other provisions of Bid, the latter will prevail.

10.0 GUARANTEE DECLARATION

We guarantee that the equipment offered shall meet the rating and performance requirements stipulated in the specifications.

11.0 BOUGHT-OUT AND SUB-CONTRACTED ITEMS

We are furnishing herewith at Attachment-9, the detail of all major items of supply amounting to more than 10% of our bid price, which we propose subcontract giving detail of the name of sub-contractor / sub-vendor and quantity for each item.

12.0 WORK SCHEDULE

If this proposal is accepted by you, we agree to complete the entire scope of work as per the bidding documents, in accordance with schedule indicated in the proposal. We fully understand that the work completion schedule stipulated in this proposal is the essence of the Contract, if awarded. The completion schedule of the various major key phases of the work is indicated in Attachment-10.

13.0 SPECIAL TOOLS AND TACKLES

We have given a list of Special Tools and Tackles in Attachment-11 and prices thereof are included in his lumpsum bid price. We further agree that any items of special tools and tackles, though not included in the aforesaid list, but required for effective erection, testing and commissioning & operation of the equipment for subject Package shall also be furnished by us at no extra cost to you.

14.0 CONTRACT PERFORMANCE GUARANTEE

The successful Bidder shall be required to furnish to DTL a Contract Performance Guarantee (CPG) for the value of ten percent (10%) of total Contract Price as per conditions stipulated in Clause 43.0, Section-ITB and Clause 13.0, Section-CC, Conditions of Contract, Volume-I of the Bidding Documents, which shall be extended from time to time beyond the actual date of successful completion of warranty/ defect liability period, as may be required under the Contract. The Bid Security/ guarantee shall be kept valid by the successful Bidder till the CPG is accepted by DTL

15.0 INFORMATION REGARDING EX-EMPLOYEES OF DTL

We have furnished the details of Ex-employees of DTL, who had retired/resigned at the level of General Manager and above from DTL and subsequently have been employed by us, in Attachment-12.

16.0 CHECK LIST

We have included a checklist duly filled in Attachment-18

17.0 Deleted

18.0 We undertake, if our bid is accepted, to commence the work on Facilities immediately upon your Notification of Award to us, and to achieve Completion within the time stated in the Bidding Documents.

We agree to abide by this bid for a period of 180 days from the date fixed for opening of bids as stipulated in the Bidding Documents, and it shall remain binding upon us and may be accepted by you at any time before the expiration of that period.

19.0 We, hereby, declare that only the persons or firms interested in this proposal as principals are named herein and that no company, persons or firms other than mentioned herein have any interest in this proposal or in the Contract to be entered into, if we are awarded the Contract, and this proposal is made without any connection with any other persons, firm or party likewise submitting a proposal and that this proposal is in all respect for and in good faith, without collusion or fraud.

Dated this ..... day of ..... 20.....

Thanking you, we remain

Yours faithfully

…….....
(Signature of the authorized signatory[@])
(Printed Name).....
(Designation) .....
(Common Seal) .....

Date:……

Place.....

Business Address:

Name and Address of Principal Officer
([@] Written Power of Attorney of all signatories of bid to commit the bidder must be enclosed with the bid.)

SECTION: I
BID FORMS

Bid Proposal Ref. No…… Date: ……

Name of Package:

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

To,

Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi – 110002

Ladies and Gentlemen,

1.0 Having examined the Bidding Documents, including Amendment Nos. _____*(Insert Numbers)* dated …… the receipt of which is hereby acknowledged, we _____,offer to design, test, deliver, install and commission (including carrying out Performance & Guarantee Test) the Facilities under the above-named package in full Conformity with the said Bidding Documents for the sum of:

(_____)
(Amount in Words)
(_____)
(Amount in Figures)

or such other sums as may be determined in accordance with the terms and conditions of the Bidding Documents.

"Note: Being a Two Part tender, bidders are required to submit the Bid Forms in Part –I as well as in Part-II. However, the prices shall be quoted only in the Bid Form to be submitted with Price Bid Part -II."

2.0 ATTACHMENTS TO THE BID FORM

In line with the requirement of the Bidding Documents, we enclose herewith the following Attachments to the Bid Form:

(a)	Attachment 1	:	Bid Security in the form of ……* for a sum of ……. (amount in words and figures) initially valid for a period of two hundred Forty (240) days from the date set for opening of bids. *Please fill in the alternative chosen in line with 23.3 Section-ITB, Vol.-I, of the Bidding

			Documents.
(b)	Attachment 2	:	A power of attorney duly authorized by a Notary Public indicating that the person(s) signing the bid have the authority to sign the bid and thus that the bid is binding upon us during the full period of its validity in accordance with the ITB Clause 24.
(c)	Attachment 3	:	The documentary evidence that we are eligible to bid in accordance with Clause 10.3 (c) & (d) of ITB are qualified to perform the contract if our bid is accepted. The qualification data has been furnished as per your format enclosed with the bidding documents.
(d)	Attachment 4	:	The details of all major items of services or supply which we propose subcontractor in case of award, giving details of the name and nationality of the proposed subcontractor/ sub-vendor for each item.
(e)	Attachment 5	:	The variation and deviations from the requirements of the Conditions of Contract as per ITB and other commercial conditions, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
(f)	Attachment 6	:	The variation and deviations from the requirements of the Important Conditions of Contract as per ITB, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
(g)	Attachment 7	:	The variation and deviations from the requirements of the Technical Deviation clauses mentioned in Volume-II, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
(h)	Attachment 8	:	Additional information submitted by the bidder, in your format enclosed with the Bidding Documents, including, inter alia, indicated therein, if any.
(i)	Attachment 9	:	Bought-out & Sub-contracted item listed with bidding documents.
(j)	Attachment 10	:	Work Completion Schedule.

(k)	Attachment 11	:	List of special tools & tackles listed with bidding documents.
(l)	Attachment 12	:	Information regarding ex-employees of DTL in our firm.
(m)	Attachment 13	:	Deleted
(n)	Attachment 14	:	Price Adjustment Data
(o)	Attachment 15	:	Guarantee Declaration (If applicable)
(p)	Attachment 16	:	Integrity Pact, in a separate envelope duly signed on each page by the person signing the bid.
(q)	Attachment 17	:	Deleted
(r)	Attachment 18	:	Checklist (Bidder shall submit the information regarding documents submitted by them in the offer as per the checklist provided in Attachment-18 of Sec: Attachments, Vol-III of bidding document. It shall be sole responsibility of bidder to provide the information based on the documents submitted by them.)
(s)	Attachment 19	:	Affidavit of Self certification regarding Minimum Local Content in line with PPP-MII order **and MoP Order, as applicable** (submission of Hard Copy in 'Original'), to be submitted on a non-judicial stamp paper of Rs. 100/-.
(t)	Attachment 20	:	Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with PPP-MII order and MoP Order, as applicable (submission of Hard Copy in 'Original') to be submitted on the letter head of the auditor/ cost accountant.
(u)	Attachment 21	:	Undertaking for not indulging in Corrupt & Fraudulent practice
(v)	Attachment 22	:	Certification by the Bidder as per DoE Order no-F.No.7/10/2021-PPD(1) dt 23.02.2023 in line with ITB Clause 1.2.2 (In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture)
(w)	Attachment 23	:	Details of complete type test report of all the equipment as per QR and in accordance with latest IEC / NIT in the prescribed format
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3.0 Price Schedules

3.1	Schedule 1	:	Price break-up Plant and Equipment (including Mandatory Spares) to be supplied
	Schedule 2	:	Break-up of Local Transportation, Insurance and other Incidental Services
	Schedule 3	:	Price Breakup of Installation Charges
	Schedule 4	:	Grand summary of the quoted bid price.

3.2 We are aware that the Price Schedules do not generally give a full description of the Work to be performed under each item and we shall be deemed to have read the Technical Specifications and other sections of the Bidding Documents and Drawings to ascertain the full scope of Work included in each item while filling-in the rates and prices. We agree that the entered rates and prices shall be deemed to include for the full scope as aforesaid, including overheads and profit.

3.3 We declare that as specified in the clause 11.2 CC of the Bidding Documents prices quoted by us in the Price Schedules shall be Fixed and Firm during the execution of Contract.

3.4 We understand that in the price schedules, where there are errors between the total of the amounts given under the column for the price Breakdown and the amount given under the Total Price, the former shall prevail and the latter will be corrected accordingly. We further understand that where there are discrepancies between amounts stated in figures and amounts stated in words, the amount stated in words shall prevail. Similarly, any discrepancy in the total bid price and that of the summation of Schedule price (price indicated in a Schedule indicating the total of that schedule), the total bid price shall be corrected to reflect the actual summation of the Schedule prices.

3.5 We declare that items left blank in the Schedules will be deemed to have been included in other items. The TOTAL for each Schedule and the TOTAL of Grand Summary shall be deemed to be the total price for executing the Facilities and sections thereof in complete accordance with the Contract, whether or not each individual item has been priced.

4.0 We confirm that except as otherwise specifically provided our Bid Prices include all taxes, duties, levies and charges as may be assessed on us, our Sub Contractor/Sub-Vendor or their employees by all municipal, state or national government authorities in connection with the Facilities, in and outside of India.

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4.2 We further understand that notwithstanding 4.0 above, in case of award on us, you shall also bear and pay/reimburse to us, Taxes, Duties and Levies as per

GST rules in respect of transaction between you and us, imposed on the Plant & Equipment including Mandatory Spare Parts specified in Price Schedule to be incorporated into the Facilities; by the Indian Laws.

4.3 Deleted.

4.4 We confirm that we shall also get registered with the concerned Tax Authorities as per GST rules, in all the states where the project is located.

4.5 Deleted.

4.6 We confirm that TDS under the applicable laws shall be deducted by the Employer from the payments made to us and Employer shall issue TDS certificates in lieu of deductions so made.

5.0 CONSTRUCTION OF THE CONTRACT

5.1 We declare that we are making this offer on the basis of divisible Supply-cum-Erection Contract on a single source responsibility basis. The supply portion of the Contract will relate to the Supply of equipment and materials on the ex-works basis and the Erection portion will relate to transportation, storage, insurance, erection, testing and commissioning etc. of equipment/ materials as specified in the bidding documents. However, we have no objection in case Owner decides to split the above mentioned package into two separate Contracts-one Contract for Supply of all equipment on ex-works basis and second Contract for all services such as transportation & insurance, handling at site, storage, insurance, installation, testing and commissioning etc of equipment/materials as specified in the bidding documents.

We hereby declare that the award of two separate Contracts, will not, in any way, dilute our responsibility for successful completion of work and fulfillment of all obligations as per Bidding Documents and that both the Contracts will have a cross-fall breach clause i.e. a breach in one Contract will automatically be considered as a breach of the other Contract which will confer on the Owner the right to terminate the other Contract at our risk and cost and/or recover damages under any or both the Contracts.

6.0 PERFORMANCE GUARANTEE

We declare that the ratings and performance figures of the equipment to be furnished and erected by us are guaranteed. The Guaranteed particulars of different equipment are enclosed in Technical Data Sheets.

7.0 QUALIFICATION DATA

We confirm having submitted the Qualification Data in two Copies, as required by you in your Conditions of Contract in a separate envelope along with this Bid. Further we have filled in the information for qualification requirements in Attachment-3. In case you require any further information in this regard, we agree to furnish the same.

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(a)	Commercial Deviations Attachment	:	Attachment-5
(b)	Cost of withdrawal of deviation on Important/critical conditions Attachment	:	Attachment-6
(c)	Technical Deviations Attachment	:	Attachment-7

8.2 We confirm having noted Clause 11.2 of Section-ITB, Conditions of Contract, Volume-I, as per which Bid containing deviations from following provision relating to following critical clauses will be treated as non-responsive, as stated therein. :

(a)	Governing Laws	:	Clause 5, CC
(b)	Settlement of Disputes	:	Clause 6, CC
(c)	Taxes and Duties,	:	Clause 14, CC
(d)	Appendix 2 to the Form of Contract Agreement (Price Adjustment)	:	Clause No. 15 ITB
(e)	Bid Security	:	Clause 23.0, Section ITB Volume-I, conditions of contract
(f)	Contract Performance Guarantee	:	Clause 43.0, Section ITB, Volume-I, Conditions of Contract
(g)	Liquidated Damages & (Functional Guarantee)	:	Clause 28 & 28.5 CC
(h)	Defect Liability	:	Clause No. 27 CC
(i)	Price Basis and Payment	:	Clause No.12 CC and Clause 14 Section ITB
(j)	Completion Time	:	Section F&P Appendix-4
(k)	Patent Indemnity	:	Clause No.29, CC

8.2.1 We confirm that we have not taken any deviations / exceptions to above clauses.

8.3 Further, we agree that additional conditions, deviations, if any, found in the proposal documents other than those stated in attached Deviation Attachments (i.e., Attachment 5, 6 & 7), save that pertaining to any rebates offered, shall not be given effect to.

9.0 ADDITIONAL INFORMATION

We have included with this proposal additional information as listed in Attachment-8, We further confirm that such additional information do not imply any additional deviation beyond those covered in Attachment- 5, 6 & 7 and in case of any contradiction between these additional information and other provisions of Bid, the latter will prevail.

10.0 GUARANTEE DECLARATION

We guarantee that the equipment offered shall meet the rating and performance requirements stipulated in the specifications.

11.0 BOUGHT-OUT AND SUB-CONTRACTED ITEMS

We are furnishing herewith at Attachment-9, the detail of all major items of supply amounting to more than 10% of our bid price, which we propose subcontract giving detail of the name of sub-contractor / sub-vendor and quantity for each item.

12.0 WORK SCHEDULE

If this proposal is accepted by you, we agree to complete the entire scope of work as per the bidding documents, in accordance with schedule indicated in the proposal. We fully understand that the work completion schedule stipulated in this proposal is the essence of the Contract, if awarded. The completion schedule of the various major key phases of the work is indicated in Attachment-10.

13.0 SPECIAL TOOLS AND TACKLES

We have given a list of Special Tools and Tackles in Attachment-11 and prices thereof are included in his lumpsum bid price. We further agree that any items of special tools and tackles, though not included in the aforesaid list, but required for effective erection, testing and commissioning & operation of the equipment for subject Package shall also be furnished by us at no extra cost to you.

14.0 CONTRACT PERFORMANCE GUARANTEE

The successful Bidder shall be required to furnish to DTL a Contract Performance Guarantee (CPG) for the value of ten percent (10%) of total Contract Price as per conditions stipulated in Clause 43.0, Section-ITB and Clause 13.0, Section-CC, Conditions of Contract, Volume-I of the Bidding Documents, which shall be extended from time to time beyond the actual date of successful completion of warranty/ defect liability period, as may be required under the Contract. The Bid Security/ guarantee shall be kept valid by the successful Bidder till the CPG is accepted by DTL

15.0 INFORMATION REGARDING EX-EMPLOYEES OF DTL

We have furnished the details of Ex-employees of DTL, who had retired/resigned at the level of General Manager and above from DTL and subsequently have been employed by us, in Attachment-12.

16.0 CHECK LIST

We have included a checklist duly filled in Attachment-18

17.0 Deleted

18.0 We undertake, if our bid is accepted, to commence the work on Facilities immediately upon your Notification of Award to us, and to achieve Completion within the time stated in the Bidding Documents.

We agree to abide by this bid for a period of 180 days from the date fixed for opening of bids as stipulated in the Bidding Documents, and it shall remain binding upon us and may be accepted by you at any time before the expiration of that period.

19.0 We, hereby, declare that only the persons or firms interested in this proposal as principals are named herein and that no company, persons or firms other than mentioned herein have any interest in this proposal or in the Contract to be entered into, if we are awarded the Contract, and this proposal is made without any connection with any other persons, firm or party likewise submitting a proposal and that this proposal is in all respect for and in good faith, without collusion or fraud.

Dated this ..... day of ..... 20.....

Thanking you, we remain

Yours faithfully

…….....
(Signature of the authorized signatory[@])
(Printed Name).....
(Designation) .....
(Common Seal) .....

Date:……

Place.....

Business Address:

Name and Address of Principal Officer
([@] Written Power of Attorney of all signatories of bid to commit the bidder must be enclosed with the bid.)

SECTION: I
BID FORMS

Bid Proposal Ref. No…… Date: ……

Name of Package:

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

To,

Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi – 110002

Ladies and Gentlemen,

1.0 Having examined the Bidding Documents, including Amendment Nos. _____*(Insert Numbers)* dated …… the receipt of which is hereby acknowledged, we _____,offer to design, test, deliver, install and commission (including carrying out Performance & Guarantee Test) the Facilities under the above-named package in full Conformity with the said Bidding Documents for the sum of:

(_____)
(Amount in Words)
(_____)
(Amount in Figures)

or such other sums as may be determined in accordance with the terms and conditions of the Bidding Documents.

"Note: Being a Two Part tender, bidders are required to submit the Bid Forms in Part –I as well as in Part-II. However, the prices shall be quoted only in the Bid Form to be submitted with Price Bid Part -II."

2.0 ATTACHMENTS TO THE BID FORM

In line with the requirement of the Bidding Documents, we enclose herewith the following Attachments to the Bid Form:

(a)	Attachment 1	:	Bid Security in the form of ……* for a sum of ……. (amount in words and figures) initially valid for a period of two hundred Forty (240) days from the date set for opening of bids. *Please fill in the alternative chosen in line with 23.3 Section-ITB, Vol.-I, of the Bidding

			Documents.
(b)	Attachment 2	:	A power of attorney duly authorized by a Notary Public indicating that the person(s) signing the bid have the authority to sign the bid and thus that the bid is binding upon us during the full period of its validity in accordance with the ITB Clause 24.
(c)	Attachment 3	:	The documentary evidence that we are eligible to bid in accordance with Clause 10.3 (c) & (d) of ITB are qualified to perform the contract if our bid is accepted. The qualification data has been furnished as per your format enclosed with the bidding documents.
(d)	Attachment 4	:	The details of all major items of services or supply which we propose subcontractor in case of award, giving details of the name and nationality of the proposed subcontractor/ sub-vendor for each item.
(e)	Attachment 5	:	The variation and deviations from the requirements of the Conditions of Contract as per ITB and other commercial conditions, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
(f)	Attachment 6	:	The variation and deviations from the requirements of the Important Conditions of Contract as per ITB, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
(g)	Attachment 7	:	The variation and deviations from the requirements of the Technical Deviation clauses mentioned in Volume-II, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
(h)	Attachment 8	:	Additional information submitted by the bidder, in your format enclosed with the Bidding Documents, including, inter alia, indicated therein, if any.
(i)	Attachment 9	:	Bought-out & Sub-contracted item listed with bidding documents.
(j)	Attachment 10	:	Work Completion Schedule.

(k)	Attachment 11	:	List of special tools & tackles listed with bidding documents.
(l)	Attachment 12	:	Information regarding ex-employees of DTL in our firm.
(m)	Attachment 13	:	Deleted
(n)	Attachment 14	:	Price Adjustment Data
(o)	Attachment 15	:	Guarantee Declaration (If applicable)
(p)	Attachment 16	:	Integrity Pact, in a separate envelope duly signed on each page by the person signing the bid.
(q)	Attachment 17	:	Deleted
(r)	Attachment 18	:	Checklist (Bidder shall submit the information regarding documents submitted by them in the offer as per the checklist provided in Attachment-18 of Sec: Attachments, Vol-III of bidding document. It shall be sole responsibility of bidder to provide the information based on the documents submitted by them.)
(s)	Attachment 19	:	Affidavit of Self certification regarding Minimum Local Content in line with PPP-MII order **and MoP Order, as applicable** (submission of Hard Copy in 'Original'), to be submitted on a non-judicial stamp paper of Rs. 100/-.
(t)	Attachment 20	:	Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with PPP-MII order and MoP Order, as applicable (submission of Hard Copy in 'Original') to be submitted on the letter head of the auditor/ cost accountant.
(u)	Attachment 21	:	Undertaking for not indulging in Corrupt & Fraudulent practice
(v)	Attachment 22	:	Certification by the Bidder as per DoE Order no-F.No.7/10/2021-PPD(1) dt 23.02.2023 in line with ITB Clause 1.2.2 (In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture)
(w)	Attachment 23	:	Details of complete type test report of all the equipment as per QR and in accordance with latest IEC / NIT in the prescribed format
(x)	Attachment 24	:	Indemnity Bond

3.0 Price Schedules

3.1	Schedule 1	:	Price break-up Plant and Equipment (including Mandatory Spares) to be supplied
	Schedule 2	:	Break-up of Local Transportation, Insurance and other Incidental Services
	Schedule 3	:	Price Breakup of Installation Charges
	Schedule 4	:	Grand summary of the quoted bid price.

3.2 We are aware that the Price Schedules do not generally give a full description of the Work to be performed under each item and we shall be deemed to have read the Technical Specifications and other sections of the Bidding Documents and Drawings to ascertain the full scope of Work included in each item while filling-in the rates and prices. We agree that the entered rates and prices shall be deemed to include for the full scope as aforesaid, including overheads and profit.

3.3 We declare that as specified in the clause 11.2 CC of the Bidding Documents prices quoted by us in the Price Schedules shall be Fixed and Firm during the execution of Contract.

3.4 We understand that in the price schedules, where there are errors between the total of the amounts given under the column for the price Breakdown and the amount given under the Total Price, the former shall prevail and the latter will be corrected accordingly. We further understand that where there are discrepancies between amounts stated in figures and amounts stated in words, the amount stated in words shall prevail. Similarly, any discrepancy in the total bid price and that of the summation of Schedule price (price indicated in a Schedule indicating the total of that schedule), the total bid price shall be corrected to reflect the actual summation of the Schedule prices.

3.5 We declare that items left blank in the Schedules will be deemed to have been included in other items. The TOTAL for each Schedule and the TOTAL of Grand Summary shall be deemed to be the total price for executing the Facilities and sections thereof in complete accordance with the Contract, whether or not each individual item has been priced.

4.0 We confirm that except as otherwise specifically provided our Bid Prices include all taxes, duties, levies and charges as may be assessed on us, our Sub Contractor/Sub-Vendor or their employees by all municipal, state or national government authorities in connection with the Facilities, in and outside of India.

4.1 Deleted

4.2 We further understand that notwithstanding 4.0 above, in case of award on us, you shall also bear and pay/reimburse to us, Taxes, Duties and Levies as per

GST rules in respect of transaction between you and us, imposed on the Plant & Equipment including Mandatory Spare Parts specified in Price Schedule to be incorporated into the Facilities; by the Indian Laws.

4.3 Deleted.

4.4 We confirm that we shall also get registered with the concerned Tax Authorities as per GST rules, in all the states where the project is located.

4.5 Deleted.

4.6 We confirm that TDS under the applicable laws shall be deducted by the Employer from the payments made to us and Employer shall issue TDS certificates in lieu of deductions so made.

5.0 CONSTRUCTION OF THE CONTRACT

5.1 We declare that we are making this offer on the basis of divisible Supply-cum-Erection Contract on a single source responsibility basis. The supply portion of the Contract will relate to the Supply of equipment and materials on the ex-works basis and the Erection portion will relate to transportation, storage, insurance, erection, testing and commissioning etc. of equipment/ materials as specified in the bidding documents. However, we have no objection in case Owner decides to split the above mentioned package into two separate Contracts-one Contract for Supply of all equipment on ex-works basis and second Contract for all services such as transportation & insurance, handling at site, storage, insurance, installation, testing and commissioning etc of equipment/materials as specified in the bidding documents.

We hereby declare that the award of two separate Contracts, will not, in any way, dilute our responsibility for successful completion of work and fulfillment of all obligations as per Bidding Documents and that both the Contracts will have a cross-fall breach clause i.e. a breach in one Contract will automatically be considered as a breach of the other Contract which will confer on the Owner the right to terminate the other Contract at our risk and cost and/or recover damages under any or both the Contracts.

6.0 PERFORMANCE GUARANTEE

We declare that the ratings and performance figures of the equipment to be furnished and erected by us are guaranteed. The Guaranteed particulars of different equipment are enclosed in Technical Data Sheets.

7.0 QUALIFICATION DATA

We confirm having submitted the Qualification Data in two Copies, as required by you in your Conditions of Contract in a separate envelope along with this Bid. Further we have filled in the information for qualification requirements in Attachment-3. In case you require any further information in this regard, we agree to furnish the same.

8.0 DEVIATIONS

8.1 We declare that the contract shall be executed strictly in accordance with the specifications and documents except for the variations and deviations, all of which have been detailed out exhaustively in the following Attachments, irrespective of whatsoever has been stated to the contrary elsewhere in our proposal.

(a)	Commercial Deviations Attachment	:	Attachment-5
(b)	Cost of withdrawal of deviation on Important/critical conditions Attachment	:	Attachment-6
(c)	Technical Deviations Attachment	:	Attachment-7

8.2 We confirm having noted Clause 11.2 of Section-ITB, Conditions of Contract, Volume-I, as per which Bid containing deviations from following provision relating to following critical clauses will be treated as non-responsive, as stated therein. :

(a)	Governing Laws	:	Clause 5, CC
(b)	Settlement of Disputes	:	Clause 6, CC
(c)	Taxes and Duties,	:	Clause 14, CC
(d)	Appendix 2 to the Form of Contract Agreement (Price Adjustment)	:	Clause No. 15 ITB
(e)	Bid Security	:	Clause 23.0, Section ITB Volume-I, conditions of contract
(f)	Contract Performance Guarantee	:	Clause 43.0, Section ITB, Volume-I, Conditions of Contract
(g)	Liquidated Damages & (Functional Guarantee)	:	Clause 28 & 28.5 CC
(h)	Defect Liability	:	Clause No. 27 CC
(i)	Price Basis and Payment	:	Clause No.12 CC and Clause 14 Section ITB
(j)	Completion Time	:	Section F&P Appendix-4
(k)	Patent Indemnity	:	Clause No.29, CC

8.2.1 We confirm that we have not taken any deviations / exceptions to above clauses.

8.3 Further, we agree that additional conditions, deviations, if any, found in the proposal documents other than those stated in attached Deviation Attachments (i.e., Attachment 5, 6 & 7), save that pertaining to any rebates offered, shall not be given effect to.

9.0 ADDITIONAL INFORMATION

We have included with this proposal additional information as listed in Attachment-8, We further confirm that such additional information do not imply any additional deviation beyond those covered in Attachment- 5, 6 & 7 and in case of any contradiction between these additional information and other provisions of Bid, the latter will prevail.

10.0 GUARANTEE DECLARATION

We guarantee that the equipment offered shall meet the rating and performance requirements stipulated in the specifications.

11.0 BOUGHT-OUT AND SUB-CONTRACTED ITEMS

We are furnishing herewith at Attachment-9, the detail of all major items of supply amounting to more than 10% of our bid price, which we propose subcontract giving detail of the name of sub-contractor / sub-vendor and quantity for each item.

12.0 WORK SCHEDULE

If this proposal is accepted by you, we agree to complete the entire scope of work as per the bidding documents, in accordance with schedule indicated in the proposal. We fully understand that the work completion schedule stipulated in this proposal is the essence of the Contract, if awarded. The completion schedule of the various major key phases of the work is indicated in Attachment-10.

13.0 SPECIAL TOOLS AND TACKLES

We have given a list of Special Tools and Tackles in Attachment-11 and prices thereof are included in his lumpsum bid price. We further agree that any items of special tools and tackles, though not included in the aforesaid list, but required for effective erection, testing and commissioning & operation of the equipment for subject Package shall also be furnished by us at no extra cost to you.

14.0 CONTRACT PERFORMANCE GUARANTEE

The successful Bidder shall be required to furnish to DTL a Contract Performance Guarantee (CPG) for the value of ten percent (10%) of total Contract Price as per conditions stipulated in Clause 43.0, Section-ITB and Clause 13.0, Section-CC, Conditions of Contract, Volume-I of the Bidding Documents, which shall be extended from time to time beyond the actual date of successful completion of warranty/ defect liability period, as may be required under the Contract. The Bid Security/ guarantee shall be kept valid by the successful Bidder till the CPG is accepted by DTL

15.0 INFORMATION REGARDING EX-EMPLOYEES OF DTL

We have furnished the details of Ex-employees of DTL, who had retired/resigned at the level of General Manager and above from DTL and subsequently have been employed by us, in Attachment-12.

16.0 CHECK LIST

We have included a checklist duly filled in Attachment-18

17.0 Deleted

18.0 We undertake, if our bid is accepted, to commence the work on Facilities immediately upon your Notification of Award to us, and to achieve Completion within the time stated in the Bidding Documents.

We agree to abide by this bid for a period of 180 days from the date fixed for opening of bids as stipulated in the Bidding Documents, and it shall remain binding upon us and may be accepted by you at any time before the expiration of that period.

19.0 We, hereby, declare that only the persons or firms interested in this proposal as principals are named herein and that no company, persons or firms other than mentioned herein have any interest in this proposal or in the Contract to be entered into, if we are awarded the Contract, and this proposal is made without any connection with any other persons, firm or party likewise submitting a proposal and that this proposal is in all respect for and in good faith, without collusion or fraud.

Dated this ..... day of ..... 20.....

Thanking you, we remain

Yours faithfully

…….....
(Signature of the authorized signatory[@])
(Printed Name).....
(Designation) .....
(Common Seal) .....

Date:……

Place.....

Business Address:

Name and Address of Principal Officer
([@] Written Power of Attorney of all signatories of bid to commit the bidder must be enclosed with the bid.)

SECTION: I
BID FORMS

Bid Proposal Ref. No…… Date: ……

Name of Package:

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

To,

Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi – 110002

Ladies and Gentlemen,

1.0 Having examined the Bidding Documents, including Amendment Nos. _____*(Insert Numbers)* dated …… the receipt of which is hereby acknowledged, we _____,offer to design, test, deliver, install and commission (including carrying out Performance & Guarantee Test) the Facilities under the above-named package in full Conformity with the said Bidding Documents for the sum of:

(_____)
(Amount in Words)
(_____)
(Amount in Figures)

or such other sums as may be determined in accordance with the terms and conditions of the Bidding Documents.

"Note: Being a Two Part tender, bidders are required to submit the Bid Forms in Part –I as well as in Part-II. However, the prices shall be quoted only in the Bid Form to be submitted with Price Bid Part -II."

2.0 ATTACHMENTS TO THE BID FORM

In line with the requirement of the Bidding Documents, we enclose herewith the following Attachments to the Bid Form:

(a)	Attachment 1	:	Bid Security in the form of ……* for a sum of ……. (amount in words and figures) initially valid for a period of two hundred Forty (240) days from the date set for opening of bids. *Please fill in the alternative chosen in line with 23.3 Section-ITB, Vol.-I, of the Bidding

			Documents.
(b)	Attachment 2	:	A power of attorney duly authorized by a Notary Public indicating that the person(s) signing the bid have the authority to sign the bid and thus that the bid is binding upon us during the full period of its validity in accordance with the ITB Clause 24.
(c)	Attachment 3	:	The documentary evidence that we are eligible to bid in accordance with Clause 10.3 (c) & (d) of ITB are qualified to perform the contract if our bid is accepted. The qualification data has been furnished as per your format enclosed with the bidding documents.
(d)	Attachment 4	:	The details of all major items of services or supply which we propose subcontractor in case of award, giving details of the name and nationality of the proposed subcontractor/ sub-vendor for each item.
(e)	Attachment 5	:	The variation and deviations from the requirements of the Conditions of Contract as per ITB and other commercial conditions, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
(f)	Attachment 6	:	The variation and deviations from the requirements of the Important Conditions of Contract as per ITB, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
(g)	Attachment 7	:	The variation and deviations from the requirements of the Technical Deviation clauses mentioned in Volume-II, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.
(h)	Attachment 8	:	Additional information submitted by the bidder, in your format enclosed with the Bidding Documents, including, inter alia, indicated therein, if any.
(i)	Attachment 9	:	Bought-out & Sub-contracted item listed with bidding documents.
(j)	Attachment 10	:	Work Completion Schedule.

(k)	Attachment 11	:	List of special tools & tackles listed with bidding documents.
(l)	Attachment 12	:	Information regarding ex-employees of DTL in our firm.
(m)	Attachment 13	:	Deleted
(n)	Attachment 14	:	Price Adjustment Data
(o)	Attachment 15	:	Guarantee Declaration (If applicable)
(p)	Attachment 16	:	Integrity Pact, in a separate envelope duly signed on each page by the person signing the bid.
(q)	Attachment 17	:	Deleted
(r)	Attachment 18	:	Checklist (Bidder shall submit the information regarding documents submitted by them in the offer as per the checklist provided in Attachment-18 of Sec: Attachments, Vol-III of bidding document. It shall be sole responsibility of bidder to provide the information based on the documents submitted by them.)
(s)	Attachment 19	:	Affidavit of Self certification regarding Minimum Local Content in line with PPP-MII order **and MoP Order, as applicable** (submission of Hard Copy in 'Original'), to be submitted on a non-judicial stamp paper of Rs. 100/-.
(t)	Attachment 20	:	Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with PPP-MII order and MoP Order, as applicable (submission of Hard Copy in 'Original') to be submitted on the letter head of the auditor/ cost accountant.
(u)	Attachment 21	:	Undertaking for not indulging in Corrupt & Fraudulent practice
(v)	Attachment 22	:	Certification by the Bidder as per DoE Order no-F.No.7/10/2021-PPD(1) dt 23.02.2023 in line with ITB Clause 1.2.2 (In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture)
(w)	Attachment 23	:	Details of complete type test report of all the equipment as per QR and in accordance with latest IEC / NIT in the prescribed format
(x)	Attachment 24	:	Indemnity Bond

3.0 Price Schedules

3.1	Schedule 1	:	Price break-up Plant and Equipment (including Mandatory Spares) to be supplied
	Schedule 2	:	Break-up of Local Transportation, Insurance and other Incidental Services
	Schedule 3	:	Price Breakup of Installation Charges
	Schedule 4	:	Grand summary of the quoted bid price.

3.2 We are aware that the Price Schedules do not generally give a full description of the Work to be performed under each item and we shall be deemed to have read the Technical Specifications and other sections of the Bidding Documents and Drawings to ascertain the full scope of Work included in each item while filling-in the rates and prices. We agree that the entered rates and prices shall be deemed to include for the full scope as aforesaid, including overheads and profit.

3.3 We declare that as specified in the clause 11.2 CC of the Bidding Documents prices quoted by us in the Price Schedules shall be Fixed and Firm during the execution of Contract.

3.4 We understand that in the price schedules, where there are errors between the total of the amounts given under the column for the price Breakdown and the amount given under the Total Price, the former shall prevail and the latter will be corrected accordingly. We further understand that where there are discrepancies between amounts stated in figures and amounts stated in words, the amount stated in words shall prevail. Similarly, any discrepancy in the total bid price and that of the summation of Schedule price (price indicated in a Schedule indicating the total of that schedule), the total bid price shall be corrected to reflect the actual summation of the Schedule prices.

3.5 We declare that items left blank in the Schedules will be deemed to have been included in other items. The TOTAL for each Schedule and the TOTAL of Grand Summary shall be deemed to be the total price for executing the Facilities and sections thereof in complete accordance with the Contract, whether or not each individual item has been priced.

4.0 We confirm that except as otherwise specifically provided our Bid Prices include all taxes, duties, levies and charges as may be assessed on us, our Sub Contractor/Sub-Vendor or their employees by all municipal, state or national government authorities in connection with the Facilities, in and outside of India.

4.1 Deleted

4.2 We further understand that notwithstanding 4.0 above, in case of award on us, you shall also bear and pay/reimburse to us, Taxes, Duties and Levies as per

GST rules in respect of transaction between you and us, imposed on the Plant & Equipment including Mandatory Spare Parts specified in Price Schedule to be incorporated into the Facilities; by the Indian Laws.

4.3 Deleted.

4.4 We confirm that we shall also get registered with the concerned Tax Authorities as per GST rules, in all the states where the project is located.

4.5 Deleted.

4.6 We confirm that TDS under the applicable laws shall be deducted by the Employer from the payments made to us and Employer shall issue TDS certificates in lieu of deductions so made.

5.0 CONSTRUCTION OF THE CONTRACT

5.1 We declare that we are making this offer on the basis of divisible Supply-cum-Erection Contract on a single source responsibility basis. The supply portion of the Contract will relate to the Supply of equipment and materials on the ex-works basis and the Erection portion will relate to transportation, storage, insurance, erection, testing and commissioning etc. of equipment/ materials as specified in the bidding documents. However, we have no objection in case Owner decides to split the above mentioned package into two separate Contracts-one Contract for Supply of all equipment on ex-works basis and second Contract for all services such as transportation & insurance, handling at site, storage, insurance, installation, testing and commissioning etc of equipment/materials as specified in the bidding documents.

We hereby declare that the award of two separate Contracts, will not, in any way, dilute our responsibility for successful completion of work and fulfillment of all obligations as per Bidding Documents and that both the Contracts will have a cross-fall breach clause i.e. a breach in one Contract will automatically be considered as a breach of the other Contract which will confer on the Owner the right to terminate the other Contract at our risk and cost and/or recover damages under any or both the Contracts.

6.0 PERFORMANCE GUARANTEE

We declare that the ratings and performance figures of the equipment to be furnished and erected by us are guaranteed. The Guaranteed particulars of different equipment are enclosed in Technical Data Sheets.

7.0 QUALIFICATION DATA

We confirm having submitted the Qualification Data in two Copies, as required by you in your Conditions of Contract in a separate envelope along with this Bid. Further we have filled in the information for qualification requirements in Attachment-3. In case you require any further information in this regard, we agree to furnish the same.

8.0 DEVIATIONS

8.1 We declare that the contract shall be executed strictly in accordance with the specifications and documents except for the variations and deviations, all of which have been detailed out exhaustively in the following Attachments, irrespective of whatsoever has been stated to the contrary elsewhere in our proposal.

(a)	Commercial Deviations Attachment	:	Attachment-5
(b)	Cost of withdrawal of deviation on Important/critical conditions Attachment	:	Attachment-6
(c)	Technical Deviations Attachment	:	Attachment-7

8.2 We confirm having noted Clause 11.2 of Section-ITB, Conditions of Contract, Volume-I, as per which Bid containing deviations from following provision relating to following critical clauses will be treated as non-responsive, as stated therein. :

(a)	Governing Laws	:	Clause 5, CC
(b)	Settlement of Disputes	:	Clause 6, CC
(c)	Taxes and Duties,	:	Clause 14, CC
(d)	Appendix 2 to the Form of Contract Agreement (Price Adjustment)	:	Clause No. 15 ITB
(e)	Bid Security	:	Clause 23.0, Section ITB Volume-I, conditions of contract
(f)	Contract Performance Guarantee	:	Clause 43.0, Section ITB, Volume-I, Conditions of Contract
(g)	Liquidated Damages & (Functional Guarantee)	:	Clause 28 & 28.5 CC
(h)	Defect Liability	:	Clause No. 27 CC
(i)	Price Basis and Payment	:	Clause No.12 CC and Clause 14 Section ITB
(j)	Completion Time	:	Section F&P Appendix-4
(k)	Patent Indemnity	:	Clause No.29, CC

8.2.1 We confirm that we have not taken any deviations / exceptions to above clauses.

8.3 Further, we agree that additional conditions, deviations, if any, found in the proposal documents other than those stated in attached Deviation Attachments (i.e., Attachment 5, 6 & 7), save that pertaining to any rebates offered, shall not be given effect to.

9.0 ADDITIONAL INFORMATION

We have included with this proposal additional information as listed in Attachment-8, We further confirm that such additional information do not imply any additional deviation beyond those covered in Attachment- 5, 6 & 7 and in case of any contradiction between these additional information and other provisions of Bid, the latter will prevail.

10.0 GUARANTEE DECLARATION

We guarantee that the equipment offered shall meet the rating and performance requirements stipulated in the specifications.

11.0 BOUGHT-OUT AND SUB-CONTRACTED ITEMS

We are furnishing herewith at Attachment-9, the detail of all major items of supply amounting to more than 10% of our bid price, which we propose subcontract giving detail of the name of sub-contractor / sub-vendor and quantity for each item.

12.0 WORK SCHEDULE

If this proposal is accepted by you, we agree to complete the entire scope of work as per the bidding documents, in accordance with schedule indicated in the proposal. We fully understand that the work completion schedule stipulated in this proposal is the essence of the Contract, if awarded. The completion schedule of the various major key phases of the work is indicated in Attachment-10.

13.0 SPECIAL TOOLS AND TACKLES

We have given a list of Special Tools and Tackles in Attachment-11 and prices thereof are included in his lumpsum bid price. We further agree that any items of special tools and tackles, though not included in the aforesaid list, but required for effective erection, testing and commissioning & operation of the equipment for subject Package shall also be furnished by us at no extra cost to you.

14.0 CONTRACT PERFORMANCE GUARANTEE

The successful Bidder shall be required to furnish to DTL a Contract Performance Guarantee (CPG) for the value of ten percent (10%) of total Contract Price as per conditions stipulated in Clause 43.0, Section-ITB and Clause 13.0, Section-CC, Conditions of Contract, Volume-I of the Bidding Documents, which shall be extended from time to time beyond the actual date of successful completion of warranty/ defect liability period, as may be required under the Contract. The Bid Security/ guarantee shall be kept valid by the successful Bidder till the CPG is accepted by DTL

15.0 INFORMATION REGARDING EX-EMPLOYEES OF DTL

We have furnished the details of Ex-employees of DTL, who had retired/resigned at the level of General Manager and above from DTL and subsequently have been employed by us, in Attachment-12.

16.0 CHECK LIST

We have included a checklist duly filled in Attachment-18

17.0 Deleted

18.0 We undertake, if our bid is accepted, to commence the work on Facilities immediately upon your Notification of Award to us, and to achieve Completion within the time stated in the Bidding Documents.

We agree to abide by this bid for a period of 180 days from the date fixed for opening of bids as stipulated in the Bidding Documents, and it shall remain binding upon us and may be accepted by you at any time before the expiration of that period.

19.0 We, hereby, declare that only the persons or firms interested in this proposal as principals are named herein and that no company, persons or firms other than mentioned herein have any interest in this proposal or in the Contract to be entered into, if we are awarded the Contract, and this proposal is made without any connection with any other persons, firm or party likewise submitting a proposal and that this proposal is in all respect for and in good faith, without collusion or fraud.

Dated this ..... day of ..... 20.....

Thanking you, we remain

Yours faithfully

…….....
(Signature of the authorized signatory[@])
(Printed Name).....
(Designation) .....
(Common Seal) .....

Date:……

Place.....

Business Address:

Name and Address of Principal Officer
([@] Written Power of Attorney of all signatories of bid to commit the bidder must be enclosed with the bid.)

SECTION-II

ATTACHMENTS (PACKAGE-I)

ATTACHMENT - 1

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

(Bid Security Form)

Please Refer Volume I (Conditions of Contract), Section: Forms & Procedures

ATTACHMENT – 2

Tender No. T25R220472

Package-I: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

(Power of Attorney)

Please Refer Volume I (Conditions of Contract), Section : Forms & Procedures.

or

Bidders may use their own performa for furnishing the required information with bid.

ATTACHMENT-3

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(QUALIFYING REQUIREMENT DATA)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

*We have submitted bid as Individual Firm/

*We have submitted bid as Joint Venture/Consortium of following firms:

(* Strike-off whichever is not applicable)

(i) …….
(ii) …….
(iii) …….

*We wish to qualify through clause no. 1.1 (a) of Annexure-A (BDS) of Volume-I.
*We wish to qualify through clause no. 1.1 (b) of Annexure-A (BDS) of Volume-I
*We wish to qualify through clause no. 1.1 (c) of Annexure-A (BDS) of Volume-I
*We wish to qualify through clause no. 1.1 (d) of Annexure-A (BDS) of Volume-I

(* Strike-off whichever is not applicable)

*We wish to qualify for Manufacturing Experience through clause no. 2.1 (i) of Annexure-A (BDS) of Volume-I.
*We wish to qualify for Manufacturing Experience through clause no. 2.1 (ii) of Annexure-A (BDS) of Volume-I.
*We wish to qualify for Manufacturing Experience through clause no. 2.1 (iii) of Annexure-A (BDS) of Volume-I.

(* Strike-off whichever is not applicable)

In accordance with the QR specified in Annexure-A (BDS) of Volume I (relevant extracts have been brought out herein, however, in case of any discrepancy, Annexure-A (BDS) shall prevail, we are furnishing the following details/document in support of meeting the QR for HTLS Reconductoring Package.

1.0 The details / documents as listed below are furnished in the bid:

a) Copies of original documents defining the constitution or legal status, place of registration and principal place of business; written power of attorney of the signatory of the bid to commit the bidder;

b) The qualification and experience of key personnel proposed for carrying out the work:

c) Proposal for subcontracting elements of the supply of materials amounting to more than 10% of the Bid Price for each element;

d) Litigation History: Information regarding any current litigation in which the bidder is involved, the parties' concerned and disputed amount;

1.1 For Bids submitted by a Joint Venture/Consortium** of firms as partners shall comply with following requirements:

a) The bid shall include all the information listed in sub clause 1.0 (a) to 1.0 (d) above for each Joint Venture/Consortium partner.

b) The bid and in case of successful bid, the form of Agreement shall be signed so as to be legally binding on all partners as per the Performa in bidding documents.

[**To be submitted only in case of Joint Venture. Strike-off in case of individual firm.]

1.2 (i) HTLS Conductor Manufacturer shall furnish details / documents that it has adequate 220 kV HTLS Conductor design infrastructure and capacity and procedures including Quality Control.

(ii) Erector shall furnish details / documents that it has adequate erection facilities and capacity and procedures including Quality Control.

2.0 General Information

The information in this form is to be completed for individual firms and each Partner of a Joint Venture/Consortium.

Where the Bidder proposes to use named subcontractor(s) for critical components of the works or for work contents in excess of 10 percent of the bid price, the following information should also be furnished for the subcontractor(s)].

Sl. No.	Particulars	For Individual Firm	In case of Joint Venture/ Consortium			
			For Lead Partner	For Other Partner - 1	For Other Partner - 2	For Other Partner - 3
1.	Name of the Firm					
2.	Head Office/ Registered Office Address					
3.	Telephone					
4.	Fax					

Sl. No.	Particulars	For Individual Firm	In case of Joint Venture/ Consortium			
			For Lead Partner	For Other Partner - 1	For Other Partner - 2	For Other Partner - 3
5.	Contact Person					
6.	Place of Incorporation/ Registration					
7.	Year of Incorporation/ Registration					
8.	Authorized signatory of the bid					
9.	Whether copy of Power of Attorney of the signatory to commit the bidder is attached	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No
10.	Details/documentary evidence submitted in support of stated HTLS Conductor design infrastructure and erection facilities and capacity and procedures including quality control					

3.0 Eligible Bidders:

a) Manufacturer of Conductor having experience of manufacturing, supply, stringing, testing & commissioning of EHV transmission line Conductors as per the experience criteria mentioned for Manufacturing and ETC of Conductors as per clause 4.1 & 4.2 respectively.

OR

b) Manufacturer of Conductor having experience of manufacturing, supply of conductor as per criteria mentioned in clause 4.1 and erection is carried out through an erector meeting experience criteria as per clause 4.2. The bid shall include consent letter (as per format Annexure-D1, Section BDS-Vol. I) from the proposed erector.

OR

c) Erectors who have the experience as per the criteria mentioned in 4.2 below and supply HTLS Conductor from such manufacturer(s) who fulfills the criteria mentioned at 4.1 (i) or 4.1 (ii) below. The bid shall include consent letter (as per format Annexure-D2, Section BDS-Vol. I) from the proposed HTLS Conductor manufacturer.

In addition to the Contract Performance Guarantee to be furnished by the bidder, the bid shall also include a confirmation letter from the manufacturer, stating that the manufacturer shall furnish back up performance guarantee in the form of bank guarantee for a period of two (02) years for amount equivalent to 10 % of the Ex-works cost of the HTLS conductor for successful performance of HTLS conductor to be manufactured and supplied under the contract.

OR

(d) Joint venture/Consortium consisting of two or more partners including the lead partner meeting the following conditions:

(i) All the Partners of JV/Consortium shall meet collectively the requirement of Clause 4.1 & 4.2 below.

(ii) Each of the partners of the Joint venture/Consortium must meet the minimum qualifying requirements as mentioned in clause No. 4.1 or 4.2 below.

4.0 Technical Experience

4.1 Experience of Manufacturer: -

The bidder shall be a manufacturer of conductor for the last seven years. The Manufacturer's experience should include the following:

(i) The Indian Conductor Manufacturer should have manufactured, tested and supplied at least 33% of the estimated quantity (i.e. length of conductor in kms)of High Temperature Low Sag (except GAP type) conductor having a minimum thirty three (33) number of strands or minimum 150 sq. mm Aluminum cross section area of same technology as that of conductor being offered during last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originally scheduled date of bid opening.

OR

(ii) Indian Conductor manufacturer not meeting the requirement as stipulated above at clause 4.1(i), it can also participate provided such manufacturers have manufactured, tested and supplied at least one thousand (1000) km of ACSR/ AAAC/ ACAR/ AACSR conductor and ten (10) km of High Temperature Low Sag (HTLS except GAP type) conductor of same technology as that of conductor being offered and having a minimum thirty three (33)-number of strands or minimum 150 sq. mm Aluminum cross section area during last seven (7) years and the same should have been in satisfactory operation for a period of at least 01(one) year as on the originally scheduled date of bid opening.

OR

(iii) In case, the Bidder is an Indian Entity meeting the requirement stipulated in above clause at 4.1 (ii) except HTLS Conductor, but has established manufacturing and testing facilities in India and manufactured HTLS conductor having minimum thirty three (33)-number of strands or minimum 150 sq. mm Aluminum cross section area shall also be considered, provided the bidder meets the following requirements.

The bidder must have manufactured HTLS conductor based on the technological support of the Principal/Parent/Subsidiary/Sister concern[##]company or Collaborator (s) and the bidder should have conducted following type tests on HTLS conductor manufactured in Indian facilityas on the originally scheduled date of bid opening.

A) On complete Conductor

i) DC resistance test on stranded conductor
ii) UTS test on stranded conductor at ambient & at designed elevated temperature (minimum 150 Deg C design temperature).

B) On Conductor Strand/ Core

i) Heat resistance test on Aluminium Alloy strands (not applicable for annealed aluminium).
ii) Torsion and Elongation tests on core strands/ composite core.
iii) Breaking load test on core strands/composite core and Aluminium/ Aluminium Alloy strands

iv) Conductivity test on thermal resistant Aluminium / Aluminium Alloy strands.
v) Glass transition temperature test (For composite core only).
vi) Flexural Strength test (For composite core only).

Note: The tests indicated at B) above should have been carried out by the Bidder/Licensee on their own or by their supplier of aluminium alloy strands, core/core strands.

Provided further, that the Principal/Collaborator(s) Parent/Subsidiary/Sister concern company of the bidder meets the qualifying requirements as per clause 4.1 (i) mentioned above.

However, in case of clause 4.1(iii), the warranty obligations for additional period of two (2) years over and above the warranty period as specified in the bidding documents shall be applicable for which an amount of 10% of the Ex-works cost of the HTLS conductor in the form of BG shall be furnished by the bidder. This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the bidder.

Further, for 4.1(iii), the bidder shall also submit the following along with the bid:

(i) A legally enforceable undertaking (jointly with the Collaborator(s)/ parent /principal/subsidiary/sister concern[##]company to guarantee quality, timely supply, performance and warranty obligations as specified for the core/conductor.

(ii) A confirmation letter from the Collaborator(s)/parent/principal/subsidiary/sister concern[##]company stating that it shall furnish performance guarantee for an amount of 10 % (Ten percent) of the Ex-works cost of HTLS conductor to be supplied in this package. This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the bidder.

(iii) A valid collaboration agreement for technology transfer / license to design, manufacture, test and supply of 220kV or above voltage level HTLS conductor/core of same technology as that of the conductor/core being offered in this package in India.

Note: 1: If Principal/collaborator/sister concern conductor manufacturer company is a foreign entity then it should submit performance certificate from an end user located in a country other than the country where the product has been manufactured during last seven (7**) years and must be in satisfactory operation[#] for at least two (2) years as on the originally scheduled date of bid opening.

Note2: In case bidder is a holding company, the technical experience referred to in clause 4.1 above shall be of that holding company only (i.e. excluding its subsidiary/parent/group/sister concern[##]companies etc.). In case bidder is a subsidiary of a holding company, the technical experience referred to in clause 4.1 above shall be of that subsidiary company only (i.e. excluding its holding company).

4.2 Experience of Erector: -

(i) The erector should have completed stringing of HTLS conductor for transmission line of cumulative circuit kilometres of not less than 50% of the estimated circuit kilometres of 220kV or higher voltage class in India as a prime contractor/sub-contractor or as a partner in a Joint Venture+ within the last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originallyscheduled date of bid opening.

OR

(ii) The erectors who do not have experience for HTLS conductor stringing shall also be

considered if stringing have been completed for any type of conductor of 220kV or higher voltage transmission line for cumulative circuit kilometres of not less than 100 km as a prime contractor or as a partner in a Joint Venture+ within the last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originally scheduled date of bid opening.

However, the warranty obligations for additional period of two (2) years over and above the warranty period as specified in the bidding documents shall be applicable for which an amount of 5 % (Five percent) of the cost of the total Project value in the form of BG shall be furnished by the bidder.

This warranty obligation guarantee shall be in addition to the contract performance guarantee to be submitted by the bidder.

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

5.0 Financial Position

5.1 The bidder should have adequate financial capability to meet the following minimum criteria:

a) Net Worth requirement of QR

Net Worth for last three financial years should be positive. (Total assets less total liabilities shall be positive).

b) Minimum Average Annual Turnover (MAAT) requirement for the last three years of the bidder should not be less than;

MAAT = (Cost Estimate x 1.5/Completion period in years)

MAAT = Rs 62,75,92,937/-

(For the purpose of arriving at MAAT, total income, except non-recurring income e.g. Sale of fixed assets shall be considered).

Further the completion period for calculating MAAT shall be considered as 1 year even if the Contractual Completion period is less than 1 year.

c) Liquid Asset (LA) requirement of

LA = (Cost Estimate x 3/Completion period in months).

LA = Rs 10,45,98,823/-

(For the purpose of arriving at LA, Current Assets less Inventories and prepaid expenses shall be considered i.e. LA=Current Asset-Inventories-Prepaid Expenses)

Further, the Completion Period for calculating LA shall be considered as 12-month even if the Contractual Completion period is less than 12 months. The cost Estimate referred above shall include GST and other taxes & duties.

In case bidder is a holding company, financial position criteria referred to in clause 5.1 above shall be of that holding company only (i.e. excluding its subsidiary/group companies). In case bidder is a subsidiary of a holding company, financial position criteria referred to in clause 5.1 above shall be of that subsidiary company only (i.e. excluding its holding company).

In case bidder has established manufacturing facility in India and yet to complete three (3) financial years, the Net Worth and average of the turnover as per financial statement for completed financial years shall be considered for the purpose of compliance to the specified Net Worth and MAAT requirements.

Relaxation for Start-Ups^/ MSEs:

Start-Ups^/ MSEs, meeting the specified requirements at Para 5.1 (a) above in Financial Position shall also be considered qualified if they meet Eighty (80) % of the requirement specified at Para 5.1(b) & 5.1(c) above in Financial Position.

^ Start-Ups as defined by DIPP, applicable as on the originallyscheduled date of bid opening.

6.0 Techno-Commercial and Legal Arrangement of Joint Venture/Consortium:

The figures for each of the partners of the joint venture/consortium shall be added together to determine the bidder's compliance with the minimum qualifying criteria set out in Clause 5.1 (a), (b) & (c) above. However, in order for a joint venture to qualify, partners of the joint venture/consortium must meet the following minimum criteria:

(a) All the partners of the JV/Consortium shall meet individually the Financial Position criteria given at 5.1 (a) above.
(b) The lead partner shall meet, not less than 40% of the minimum criteria given at Para 5.1 (b) & (c) above.
(c) Each of the other partner(s) shall meet not less than 25% of the criteria given at 5.1(b) & (c) above.

In case of Joint Venture/consortium, the following conditions shall also apply:

i. The bid, and in case of successful bid, the specified Form of Agreement shall be signed so as to be legally binding on all partners (Form enclosed).

ii. Each of the Partners of the Joint Venture/consortium must meet the minimum qualifying requirements given under clause 4.1 or 4.2. However, all the partners of Joint Venture/consortium shall meet collectively, the requirements of Clauses 4.1 and 4.2 above.

iii. One of the partners shall be nominated as Lead Partner, and 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. Thus the lead partner shall be authorized to represent the joint venture/ consortium for the purpose of execution of the Contract. The payment shall be in the name of joint venture/ consortium. The authorization shall be evidenced by submitting a Power of Attorney signed by legally authorized signatory of all the partners as per bidding documents.

iv. All 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 of this

effect shall be included in the authorization mentioned under (iii) above as well as in the Bid Form and in the Contract Form (in case of a successful bid).

Agreement entered into by the Joint Venture/consortium partners shall be submitted with the bid.

7 .0 Financial & Capacity Requirements

Bidder shall be financially sound.

i) Bidder shall submit a certificate from their Banker(s) as per format indicating various fund based/non fund based limits sanctioned to the bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the originallyscheduled date of bid opening.
ii) Bidder shall submit a monthly cash flow projection for execution of the contract having regard to implementation schedule. Bidder should indicate how funding gap in each month is proposed to be met.
iii) Bidder shall submit the complete Annual reports together with Audited statement of accounts of the company for last five years.

In the event the Bidder (being a company registered/ incorporated outside India or otherwise) is not able to furnish the above information of its own (separate), being a subsidiary company and the accounts are being consolidated with their Group/ Holding/ Parent/sister concern## company, the Bidder should submit the balance sheet, income statement, other information as required, of its own (separate), (not of its Group/ Holding/ Parent/ sister concern## company) duly certified by:

i) Their statutory Auditor; or
ii) A Certified Public Accountant; or
iii) Their Company Secretary certifying that it is based on audited accounts, as the case may be.

Similarly, if the Bidder happens to be a Group / Holding / Parent company, the Bidder should submit the above information of its own (separate), exclusive of its Subsidiaries, duly certified by:

i) Their statutory Auditor; or
ii) A Certified Public Accountant; or
iii) Their Company Secretary certifying that it is based on audited accounts, as the case may be.

Format A: Format for the bidders in respect of clause 4.1:

(Lead partner in case of Joint Venture) [In case of Joint Venture bidder, the QR data of each of the other partner (in support of meeting the requirement Annexure-A, Section-BDS, Volume-I of the bidding documents] is also is to be furnished, as applicable, using this format

Name of the Bidder (as per 4.1 above) (Single Firm/Lead Partner/ Partner of a Joint Venture)		
1.	No. of years the bidder is a manufacturer of Conductor	Last _____ years.
2.	Name of Contract	
3.	Contract Reference No. & Date of Award	
4.	Name and Address of the Purchaser/Utility for whom the Contract was executed by bidder/Partner e-mail ID Telephone No. Fax No.	 _____ _____
5	Scope of work involved in the supply of ACSR/AAAC/ACAR/AACSR and High Temperature Low Sag (HTLS) Conductor having at least minimum thirty three (33) number of strands or minimum 150 sq. mm Aluminum cross section area of same technology as that of conductor being offered in the package) under the above Contract	□ Manufacture □Testing □ Supply - for the above Contract for Conductor. (*Tick only whichever is/are applicable*)
5.1	Total no. of Kms. of ACSR/AAAC/ACAR/AACSR and High Temperature Low Sag(HTLS) Conductor supplied in the above Contract No. of strands supplied in the Contract detailed above (Bidder to furnish details of only ACSR/AAAC/ACAR/AACSR and High Temperature Low Sag(HTLS) Conductor having at least same or more number of strands as that of the conductor being offered in the package supplied in the Contract)	_____ Kms. _____ Nos.
5.2	Date of completion of the above Contract	_____ (dd/mm/yyyy)
5.3	No. of years the above referred Conductor is in operation as on the date of bid opening	_____ years

5.4	Details of documents submitted in support of stated experience/Contract/ design, infrastructure and manufacturing facilities and capacity and procedures including quality control	

(Use separate sheet for each experience/ Contract)

Format B: Format for the Erector in respect of clause 4.2:

(Lead partner in case of Joint Venture) [In case of Joint Venture bidder, the QR data of each of the other partner (in support of meeting the requirement Annexure-A, Section-BDS, Volume-I of the bidding documents] is also is to be furnished, as applicable, using this format

Name of the Erector (as per 4.2 above) (Single Firm/Lead Partner/ Partner of a Joint Venture)		
1.	No. of years of experience of erector	Last _____ years.
2.	Name of Contract	
3.	Contract Reference No. & Date of Award	
4.	Name and Address of the Purchaser/Utility for whom the Contract was executed by Erector e-mail ID Telephone No. Fax No.	 _____ _____
5	Scope of work for carrying out stringing works under the above Contract	□ Stringing of HTLS Conductor □ Stringing of Other Conductor (Specify the type of Conductor) - for the above Contract for (*Tick only whichever is/are applicable*)
5.1	Total no. of Kms. of carrying out stringing works in the above Contract	_____ Kms. _____ Nos.
5.2	Date of completion of the above Contract	_____ (dd/mm/yyyy)
5.3	No. of years the above Line/Work is in operation as on the date of bid opening	_____ years

5.4	Details of documents submitted in support of stated experience/Contract and capacity and procedures including quality control	
5.5	To be qualified for award of contract, whether bidder has provided evidence to the satisfaction of the Owner of their capability and adequacy of resources to carry out the contract effectively.	□ Yes □ No

(Use separate sheet for each experience/ Contract)

8.0 The Bidder shall furnish documentary evidence in support of the qualifying requirement stipulated as above.

Date:.....

Place:...

(Signature)……..

(Printed Name)……...

(Common Seal)……

(Designation)……..

ATTACHMENT-4

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV Bamnauli-Najafgarh, Najafgarh-Tikrikalan - Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana D/C Transmission Line along with replacement of Associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

LIST OF APPROVED SUBCONTRACTORS

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Prior to award of Contract, the following details shall be completed indicating those sub-contractors proposed by the Bidder by Attachment to its bid that are approved by the Employer for engagement by the Contractor during the performance of the contract.

The following Subcontractors are approved for carrying out the item of the facilities indicated. Where more than one Subcontractor is listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. No Subcontractors shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

Item of Facilities	Approved Subcontractors	Nationality

ATTACHEMENT-5

Tender No. T25R220472

Package-I: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

(Commercial Deviations)

Dear Sirs,

The following are the Commercial Deviations and variations from and exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except for these deviations, the entire work shall be performed as per your specifications and documents.

S. No.	Volume/ Clause No.	Ref./Page No.	Details of Deviation	Reason/ Justification of Deviation	Withdrawal Price in Rupees

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-6

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(DEVIATIONS ON IMPORTANT CONDITIONS)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sirs,

Sub.: Deviation on Important Conditions along with their withdrawal price.

The following are the Deviations/variations/exceptions to the provisions of important conditions stipulated in Clause 11.2 of ITB, Conditions of Contract, Volume-I. We undertake to execute the contract in line with the provisions of bidding documents in respect of above said clauses in case DTL agree to pay us the withdrawal price indicated below against each such deviations/variations/exceptions.

Volume of bidding document	Section	Clause No.	Page No.	Statement of deviations/ variations/ exceptions	Withdrawal Price in Rupees

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-7

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

TECHNICAL DEVIATIONS

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sir,

The following are the Technical Deviations and variations from and exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except for these deviations, the entire work shall be performed as per your specifications and documents.

S. No.	Volume/ Clause No.	Ref./Page No.	Details of Deviation	Reason/ Justification of Deviation	Withdrawal Price in Rupees

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: 1. Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.
2. The deviations and variations, if any, shall be brought out separately for each of the equipment.

ATTACHMENT-8

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan- Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(Additional Information)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We have enclosed with our proposal the following additional information for the subject package.

Sl. No.	Brief description of Information	Ref. & Page No.

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-9

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(BOUGHT-OUT & SUB-CONTRACTED ITEMS)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We hereby furnish the details of the items/sub-assemblies; we propose to buy for the purpose of subject package.

Sl. No.	Item Description	Quantity Proposed be bought/Sub-contracted	Source of Supply

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-10

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan- Kanjhawala, Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(WORK COMPLETION SCHEDULE)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

We hereby declare that the following Work Completion Schedule shall be followed by us for the subject package.

Sl. No.	Description of Work	Period in Months (from the date of Award of Contract)
1.	Completion of detailed engineering a) Commencement b) Completion	
2.	Procurement of equipment & raw materials	
3.	Tests a) Commencement b) Completion	
4.	Manufacturing a) Commencement b) Completion	
5.	Shipments a) Commencement b) Completion	
6.	Establishment of site office	
7.	Receipt at final destination at site a) Commencement b) Completion	
8.	Erection a) Commencement b) Completion	
9.	Testing & Commissioning a) Commencement b) Completion	

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-11

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(LIST OF SPECIAL TOOLS & TACKLES)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We hereby furnish below the list of special tools & tackles for erection and commissioning of equipment for the subject package. The prices for these tools & tackles are already included in the lumpsum bid price.

Sl. No.	For Equipment	Item Description	Unit	Quantity

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-12

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(INFORMATION REGARDING EX-EMPLOYEES OF "DTL")

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We hereby furnish the details of Ex-Employees of DTL who had retired/resigned at the level of General Manager and above from DTL and subsequently have been employed by us.

Sl. No.	Name of Person with designation in DTL	Date of Retirement/ resignation from DTL	Date of joining and designation in our Organisation

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-14

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

(PRICE ADJUSTMENT DATA)

Refer BDS

ATTACHMENT-15

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(GUARANTEE DECLARATION)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sirs,

We declare that the equipment offered shall meet the rating and performance requirements stipulated in Technical specification for various equipment or indicated in Data requirement. Further the various parameter of the HTLS conductor, based on which average ohmic losses shall be evaluated in accordance with clause no. 1.10 of section-II of technical specification, Volume-II, are given herein below :

Further, the guaranteed AC resistance & Guaranteed Average Ohmic loss of the HTLS conductor, based on which differential price evaluation shall be evaluated in accordance with clause no. 1.3.2 of section-II of technical specification, Volume-II, are given herein below :

S.No	Guaranteed AC Resistance at 1200 A (in Ohm/Km) (Rac)	Guaranteed Average Ohmic loss (in KW) = 133488 x R_{ac}
1.		

Date:.....

Place:.....

(Signature).....

(Printed Name).....

(Designation).....

(Common Seal).....

ATTACHMENT-16

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

INTEGRITY PACT

Integrity Pact

Between

Delhi Transco Limited

having its Registered Office at Shakti Sadan, Kotla Road, New Delhi -110 002

herein after referred to as

"DTL"

and

_____

(Insert the name of the Sole Bidder/Lead Partner of Joint Venture)

having its Registered Office at _____

(Insert full Address)

_____

and

_____

(Insert the name of the Partner(s) of Joint Venture/agent, as applicable)

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

having its Registered Office at _____

(Insert full Address)

_____

Herein after referred to as

"The Bidder/Contractor"

Preamble

DTL intends to award, under laid-down organisation procedures, contract(s) for _____ Package

(Insert the name of the package)

and Specification Number _____DTL values full compliance with all relevant

(Insert Specification Number of the Package)

laws and regulations, and the principles of economical use of resources, and of fairness and transparency in its relations with its Bidders/Contractors.

In order to achieve these goals, DTL and the above named Bidder/Contractor enter into this agreement called **'Integrity Pact'** which will form a part of the bid.

It is hereby agreed by and between the parties as under:-

Section I – Commitments of DTL

(1) DTL commits itself to take all measures necessary to prevent corruption and to observe the following principles:

(a) No employee of DTL, personally or through family members or relative(s), will in connection with the tender, or the execution of the contract, demand, take a promise for or accept, for him/herself or third person, any material or other benefit which he/she is not legally entitled to.

(b) DTL will, during the tender process treat all Bidder(s) with equity and fairness. DTL will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or for the execution of contract.

(c) DTL will exclude form evaluation of Bids its such employee(s) who has any personnel interest in the Companies/Agencies participating in the Bidding/Tendering process.

The action stipulated in this Integrity Pact is without prejudice to any other Legal action that may follow in accordance with the provisions of the relevant law in force relating to any civil or criminal proceedings.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

(2) If Managing Director obtains information on the conduct of any employee of DTL which is a criminal offence under the relevant Anti-Corruption Laws of India or illegal under the Indian Contract Act or Indian Laws, or if there be a substantive suspicion in this regard, he will inform its Chief Vigilance Officer and in addition can initiate disciplinary actions under its Rules.

Section II – Commitments of the Bidder/Contractor

(1) The Bidder/Contractor commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

(a) The Bidder/Contractor will not, directly or through any other person or firm, offer, promise or give to DTL, or to any of DTL's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange an advantage during the tender process or the execution of the contract.

(b) The Bidder/Contractor will not enter into any illegal agreement or understanding, whether formal or informal with other Bidders/Contractors. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or actions to restrict competitiveness or to introduce cartelization in the bidding process.

(c) The Bidder/Contractor will not commit any criminal offence under the relevant Anti-Corruption Laws of India, further, the Bidder/Contractor will not use for illegitimate purposes or for purposes of restrictive competition or personal gain, or pass on to others, any information provided by DTL as part of the business relationship, regarding plans, technical proposals and business details, including information of any type contained or transmitted electronically.

(d) The Bidder/Contractor of foreign origin shall disclose the name and address of the Agents/representatives in India, if any, involved directly or indirectly in the Bidding. Similarly, the Bidder/Contractor of Indian Nationality shall furnish the name and address of the foreign principals, if any, involved directly or indirectly in the bidding.

(e) The Bidder/Contractor will, when presenting his bid, disclose any and all payments he has made, or committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and/or with the execution of the contract.

(f) The Bidder/Contractor will not misrepresent facts or furnish false/forged documents/information in order to influence the bidding process or the execution of the contract to the detriment of DTL.

(2) The Bidder/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

Section III – Disqualification from tender process and exclusion from future contracts

(1) If the bidder, before contract award, has committed a serious transgression through a violation of Section II or in any other form such as to put his reliability or credibility as Bidder into question, DTL may disqualify the Bidder from the tender process or terminate the contract, if already signed, for such reason.

(2) If the Bidder/Contractor has committed a serious transgression through a violation of Section II such as to put his reliability or credibility into question, DTL may after following due procedures also exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder/Contractor and the amount of the damage. The exclusion will be imposed for a minimum of 12 months and maximum of 3 years and it has to be decided by the Competent authority.

(3) If the Bidder/Contractor can prove that he has restored/Recouped the damage caused by him and has installed a suitable corruption prevention system, DTL may revoke the exclusion prematurely with the approval of Competent Authority.

Section IV – Liability for violation of Integrity Pact

(1) If DTL has disqualified the Bidder from the tender process prior to the award under Section III, DTL may forfeit the Bank Guarantee under the Bid.

(2) If DTL has terminated the contract under Section III, DTL may forfeit the Contract Performance Guarantee of this contract besides resorting to other remedies under the contract.

Section V – Previous Transgression

(1) The Bidder shall declare in his Bid that no previous transgressions occurred in the last 3 years with any other Public Sector Undertaking or Government Department that could justify his exclusion from the tender process.

(2) If the bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section VI – Equal treatment to all Bidders/Contractors

(1) DTL will enter into agreements with identical conditions as this one with all Bidders.

(2) DTL will disqualify from the tender process any bidder who does not sign this Pact or violate its provisions.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

Section VII – Punitive Action against violating Bidders/Contractors

If DTL obtains knowledge of conduct of a Bidder or a Contractor or his subcontractor or of an employee or a representative or an associate of a Bidder or Contractor or his Subcontractor which constitutes corruption, or if DTL has substantive suspicion in this regard, DTL will inform the Chief Vigilance Officer (CVO).

(*)Section VIII – Independent External Monitor/Monitors

(1) DTL has appointed a panel of Independent External Monitors (IEMs) for this Pact with the approval of Central Vigilance Commission (CVC), Government of India, out of which one of the IEMs has been indicated in the NIT.

(2) The IEM is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement. He has right of access to all project documentation. The IEM may examine any complaint received by him and submit a report to Managing Director, DTL at the earliest. He may also submit a report directly to the CVO and the CVC, in case of suspicion of serious irregularities attracting the provisions of the PC Act. However, for ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter shall be referred to the full panel of IEMs, who would examine the records, conduct the investigations and submit report to Managing Director, DTL, giving joint findings.

(3) The IEM is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Managing Director, DTL.

(4) The Bidder(s)/Contractor(s) accepts that the IEM has the right to access without restriction to all documentation of DTL related to this contract including that provided by the Contractor/Bidder. The Bidder/Contractor will also grant the IEM, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his documentation. The same is applicable to Subcontractors. The IEM is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s)/Sub-Contractor(s) with confidentiality.

(5) DTL will provide to the IEM information as sought by him which could have an impact on the contractual relations between DTL and the Bidder/Contractor related to this contract.

(6) As soon as the IEM notices, or believes to notice, a violation of this agreement, he will so inform the Managing director, DTL and request the Managing Director, DTL to discontinue or take corrective action, or to take other relevant action. The IEM can in this regard submit non-binding recommendations. Beyond this, the IEM has no right

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the IEM shall give an opportunity to DTL and the Bidder/Contractor, as deemed fit, to present its case before making its recommendations to DTL.

(7) The IEM will submit a written report to the Managing Director, DTL within 8 to 10 weeks from the date of reference or intimation to him by DTL and should the occasion arise, submit proposals for correcting problematic situations.

(8) If the IEM has reported to the Managing Director, DTL a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Managing Director, DTL has not, within the reasonable time taken visible action to proceed against such offence or reported it to the CVO, the Monitor may also transmit this information directly to the CVC, Government of India.

(9) The word '**IEM**' would include both singular and plural.

(*) This Section shall be applicable for only those packages wherein the IEMs have been identified in Section – I: Invitation for Bids and/or Clause 9 in Section –III : Conditions of Contract, Volume-I of the bidding documents.

Section IX – Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor after the closure of the contract and for all other Bidder's six month after the contract has been awarded.

Section X – Other Provisions

(1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the establishment of DTL. The Arbitration clause provided in the main tender document/contract shall not be applicable for any issue/dispute arising under Integrity Pact.

(2) Changes and supplements as well as termination notices need to be made in writing.

(3) If the Contractor is a partnership firm or a consortium or Joint Venture, this agreement must be signed by all partners, consortium members and Joint Venture partners.

(4) Nothing in this agreement shall affect the right of the parties available under the General conditions of Contract (CC/GCC) and Special Conditions of Contract (SCC).

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

(5) Views expressed or suggestions/submissions made by the parties and the recommendations of the CVO/IEM[#] in respect of the violation of this agreement, shall not be relied on or introduced as evidence in the arbitral or judicial proceedings (arising out of the arbitral proceedings) by the parties in connection with the disputes/differences arising out of the subject contract.

CVO shall be applicable for packages wherein IEM are not identified in Section IFB/BDS of Condition of Contract, Volume-I. IEM shall be applicable for packages wherein IEM are identified in Section IFB/BDSof Condition of Contract. Volume-I

(6) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(Office Seal)

Name :_____

Designation: _____

Witness 1 :_____

(Name &Address)_____

_____

_____

Witness 2 :_____

(Name &Address)_____

_____

_____

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

Name : _____

Designation: _____

Witness 1 :_____

(Name & Address)_____

_____

_____

Witness 2 :_____

(Name & Address)_____

_____

_____

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(Office Seal)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

ATTACHMENT-18

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(CHECK LIST)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We have enclosed with our proposal the following additional information for the subject package.

	Particulars	
Bid Validity	Whether Bid is valid is as stipulated in ITB from the date of bid opening.	Yes/No
Bid Security amount	Whether Bid security amount and form is enclosed as per ITB.	Yes/No
Bid Security Validity	Whether bid security is valid for a period as stipulated in ITB.	Yes/No
Bid Signatory	Power of Attorney of Signatory of Bid as per Section ITB	Yes/No
	Technical Specification	
1.	Is the material offered according to the specifications required by the purchaser, if not, please state the deviation from the same and deviation statement thereof	Yes/No
2	Have you submitted copies of Type Test Certificates in physical form in respect of material offered?	Yes/No
3	Have you submitted dimension drawings leaflets, descriptive and illustrative catalogues in physical form (if necessary)?	Yes/No
4	Whether product conforms to relevant ISS and our technical particulars?	Yes/No
5	Have you submitted in physical form (i) the copy of NIT duly signed & stamped on each page ,(ii) copies of past supplies and (iii)	Yes/No

	performance certificates?	
6	Whether testing facilities as per IS for conducting various tests are available with you?	Yes/No
	Terms and Condition	
1.	Do you agree to all clauses of General Conditions of our tender documents?	Yes/No
2	If you do not agree to any/all the clauses, please state clearly the clause which you do not agree and state the modification in respect of clauses of which you do not agree.	Yes/No
3	Do you agree to furnish security deposit if order is placed with you?	Yes/No
4	Whether agreeable to DTL's liquidate damages clause for late completion of work.?	Yes/No
5	Are you agreeable to inspection clause?	Yes/No
6	Any further particulars not otherwise covered in the tender specifications submitted physically?	Yes/No
7	Quantity offered against each item be quoted. Are you prepared to accept order for bigger quantity as per NIT ?	Yes/No
Part-I	**Techno-commercial Bid**	
a)	Whether undertaking for corrupt & fraudulent practice signed and submitted.	Yes/No
b)	Whether Bid form duly completed, signed and submitted.	Yes/No
c)	Whether following Attachments submitted:	Yes/No
d)	Attachment 1 :"Bid security".	Yes/No
e)	Attachment 2: "Power of Attorney".	Yes/No
f)	Attachment 3: "Qualifying Requirement Data".	Yes/No
g)	Attachment 4: "List of approved Subcontractors".	Yes/No
h)	Attachment 5: "Commercial Deviations".	Yes/No
i)	Attachment 6: "Deviations on important Conditions".	Yes/No
j)	Attachment 7: "Technical Deviations".	Yes/No
k)	Attachment 8: "Additional Information".	Yes/No
l)	Attachment 9: "Bought Out and Sub-contracted items"	Yes/No
m)	Attachment 10: "Work completion schedule" .	Yes/No
n)	Attachment 11: "List of Special Tools and Tackles" .	Yes/No
o)	Attachment 12: "Information regarding ex-employees of Employer in Bidder's firm".	Yes/No
p)	Attachment 14:"Price Adjustment Data."	Yes/No
q)	Attachment 15: "Guarantee Declaration".	Yes/No
r)	Attachment 16: "Integrity Pact".	Yes/No
s)	Attachment 18: "Check list".	Yes/No

t)	Attachment 19: Affidavit of Self certification regarding Minimum Local Content in line with PPP-MII order **and MoP Order, as applicable** (submission of Hard Copy in 'Original'), to be submitted on a non-judicial stamp paper of Rs. 100/-.	Yes/No
u)	Attachment 20: Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with PPP-MII order and **MoP Order, as applicable** (submission of Hard Copy in 'Original') to be submitted on the letter head of the auditor/ cost accountant.	Yes/No
v)	Attachment 21: Undertaking for not indulging in Corrupt & Fraudulent practice	Yes/No
w)	Attachment 22: Certification by the Bidder as per DoE Order no-F.No.7/10/2021-PPD(1) dt 23.02.2023 in line with ITB Clause 1.2.2 (In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture)	Yes/No
x)	Attachment no 23: Details of complete type test report of all the equipment as per QR and in accordance with latest IEC / NIT in the prescribed format	Yes/No
y)	Attachment no 24: Indemnity Bond	Yes/No
Part-II	Price Bid	
a)	Whether Price Bid submitted.	Yes/No
b)	Whether Bid form duly completed, signed and submitted.	Yes/No
c)	Whether following Price Schedules submitted:	Yes/No
d)	Schedule 1: " Price break-up Plant and Equipment (including Mandatory Spares) to be supplied."	Yes/No
e)	Schedule 2: "Break-up of Local Transportation, Insurance and other Incidental Services."	Yes/No
f)	Schedule 3: "Price Breakup of Installation Charges."	Yes/No
g)	Schedule 4: "Grand summary of the quoted bid price."	Yes/No
Tender Document/NIT	Whether Tender document along with all amendments duly signed & stamped on each page submitted.	Yes/No

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

Note: **(i)** Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Attachment.

(ii) Replies against each item should be complete without any ambiguity. Terms such as refer covering letter etc. shall not be acceptable unless the replies/ information are specific and complete

ATTACHMENT-19

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV Bamnauli-Najafgarh, Najafgarh-Tikrikalan - Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana D/C Transmission Line along with replacement of Associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Format for Affidavit of Self certification regarding Local Content in line with PPP-MII order dated 15/06/2017, its revision dated **16/09/2020**& their latest amendments thereof **and MoP Order dated 16/11/2021** & their latest amendments thereof, as applicable, to be provided on a non-judicial stamp paper of Rs. 100/-.

Date:

I _____S/o, D/o, W/o, _____Resident of_____ hereby solemnly affirm and declare as under:

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Order, 2017 of Government of India issued vide Notification No:P-45021/2/2017 -BE-II dated 15/06/2017, its revision dated **16/09/2020**& their latest amendments thereof, (hereinafter **PPP-MII order**), and 'Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content)' order **dated 16/11/2021** & their latest amendments thereof, issued by Ministry of Power (hereinafter **MoP order**) and **any subsequent modifications/ Amendments, if any** and

That the information furnished hereinafter is correct to the best of my knowledge and belief and I undertake to produce relevant records before the procuring entity/DTL or any other Government authority for the purpose of assessing the local content of goods/services/works supplied by me for **Turnkey Package (Insert the name of Package and Tender no.)**.

That the local content for all inputs which constitute the said goods/services/works has been verified by me and I am responsible for the correctness of the claims made therein.

That the 'Local Content 'as defined in the PPP-MII order and MoP order in the goods/services/works supplied by me for Turnkey Package (Insert the name of Package and Tender no.) is …… percent (%).

That the goods/services/works supplied by me for **Turnkey Package (Insert the name of Package and Tender no.)** meet the 'Local Content' requirement as defined in the PPP-MII order **and MoP order for 'Class –I local supplier'**.

That the value addition for the purpose of meeting the 'Local Content 'has been made by me at …… (*Enter the details of the location(s) at which value addition is made)*.

That in the event of the local content of the goods/services/works mentioned herein is found to be incorrect and not meeting the prescribed Local Content criteria, based on the assessment of procuring agency (ies)/DTL/Government Authorities for the purpose of assessing the local content, action shall be taken against me in line with the PPP-MII order, **MoP order** and provisions of the Integrity pact/ Bidding Documents.

I agree to maintain the following information in the Company's record for a period of 8 years and shall make this available for verification to any statutory authority.

i Name and details of the Local Supplier
(Registered Office, Manufacturing unit location, nature of legal entity)

ii. Date on which this certificate is issued

iii. Goods/services/works for which the certificate is produced

iv. Procuring entity to whom the certificate is furnished

v. Percentage of local content claimed and whether it meets the Local Content prescribed for **'Class –I local supplier'**

vi. Name and contact details of the unit of the Local Supplier (s)

vii. Sale Price of the product

viii Ex-Factory Price of the product

ix. Freight, insurance and handling

x. Total Bill of Material

xi List and total cost value of input used to manufacture the Goods/to provide services/in construction of works

xii. List and total cost of input which are domestically sourced. Value addition certificates from suppliers, if the input is not in-house to be attached

xiii. List and cost of inputs which are imported, directly or indirectly

For and on behalf of…… (Name of firm/entity)
Authorized signatory (To be duly authorized by the Board of Directors)
<Insert Name, Designation and Contact No.>

ATTACHMENT-20

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with **PPP-MII order** dated 15/06/2017, its revision dated **16/09/2020** & their latest amendments thereof, **and MoP order** dated **16/11/2021** & their latest amendments thereof, as applicable *[to be submitted on the letter head of the issuer.]*

Dear Sir,

We have read and understood the provisions of "Public Procurement (Preference to Make in India) Order, 2017" dated 15/06/2017, its revision dated **16/09/2020** & their latest amendments thereof[hereinafter, "PPP-MII Order"] issued by Department for promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India, and 'Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content)' order dated **16/11/2021** & their latest amendments thereof issued by Ministry of Power [hereinafter, "MoP order"] and **any subsequent modifications/ Amendments, if any**.

In line with the provisions of the PPP-MII Order **and MoP Order**, M/s. ……*[Enter the name of the Bidder] [*hereinafter, **"Class-I Local Supplier***]* have submitted an Affidavit of self-certification to M/s. Delhi Transco Limited [hereinafter, DTL] regarding Local Content in Goods/Services/Works to be supplied by the **"Class-I Local Supplier"** for **Turnkey Package (Insert the name of Package and Tender No.)**, wherein they have agreed to abide by the terms and conditions of the PPP-MII Order **and MoP Order**.

Further, in line with the PPP-MII Order, the statutory auditor or cost auditor of the company shall provide a certificate giving the percentage of Local Content in the Goods/Service/Works to be supplied by the **"Class-I Local Supplier"** for **Turnkey Package (Insert the name of Package and Tender No.)**.

Accordingly, we, the Statutory Auditor(s) / Cost auditor of the **"Class-I Local Supplier"**, certify that the Local Content as defined under the PPP-MII **and MoP Order**, in the Goods/Service/Works to be supplied by the **"Class-I Local Supplier"** for **Turnkey Package (Insert the name of Package and Tender No.)** is …….. Percentage [*specify the percentage of Local content*].

For and on behalf of, Date:

<<Statutory Auditor's/Cost auditor's attestation>>
Firm Reg No. Membership No.

Note: This is a guiding format. In case the bidder submits the certificate in a format different from the above, the same may be considered provided it meets the intent and purpose, as may be ascertained by DTL.

ATTACHMENT-21

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

UNDERTAKING FOR NOT INDULGING IN CORRUPT & FRAUDULENT PRACTICE

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We declare that all the documents submitted or would be submitted by us in this tender are/would be genuine, and in case any discrepancy is found in the declaration/documents submitted by us at any stage, action can be taken against us as deemed fit by DTL.

We further declare that in the submission of this tender no agent, middleman or any intermediary has been, or will be engaged to provide any services, or any other item of work related to the award and performance of this contract. We further confirm and declare that no agency commission or any payment which may be construed as an agency commission has been, or will be, paid and that the tender price does not include any such amount.

We acknowledge the right of the employer, if he finds to the contrary, to declare, our tender to be non-compliant and if the contract has been awarded to declare the contract null and void.

STAMP & SIGNATURE OF AUTHORISED SIGNATORY

ATTACHMENT-22

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Certification by the Bidder as per order no. F.No.7/10/2021-PPD(1) dated **23/02/2023** issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India (DoE Order) in line with ITB Clause 1.2.2

(In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture)

Dear Sir,

We have read and understood the provisions of Order no.F.No.7/10/2021-PPD(1)(Order Public Procurement no.4) dated **23/02/2023** regarding "Restriction under Rule 144(xi) of General Financial Rules" issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India [hereinafter collectively "**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 not from such a country or, if from such a country, has been registered with the Competent Authority and will not subcontract any work to a subcontractor/sub vendor from such countries unless such subcontractor/sub vendor fulfils all requirement in this regard and is eligible to be considered. [*Where applicable, evidence of* ***valid registration by the Competent Authority shall be attached***.]

We also undertake to comply the above said DoE order dt. 23.02.2023 and **any subsequent modifications/ Amendments, if any**.

We further declare that any misrepresentation or submission of false/forged document/information in this regard this would be ground for immediate termination and further legal action in accordance with law.

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

ATTACHMENT-23

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder has to submit details of complete type test report of all the equipment as per QR and in accordance with latest IEC / NIT in the below format

S. No.	Equipment	IEC Clause Ref.	Type of test	Type Test Description/
				a) Manufacturer b) Model no. test conducted on c) Report No.: d) Lab. Name: e) Date of Test: f) Date of Issue: g) IEC: h) Ref Page

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

ATTACHMENT-24

Tender No. T25R220472

Package-I: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan-Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(INDEMNITY BOND)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sir,

One set of Indemnity Bond on non judicial stamp paper of Rs 100/-, duly signed by our authorized representative and stamped is annexed herewith for loss caused in case of legal proceedings w.r.t Infringement of Patent.

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

INDEMNITY BOND

By this bond M/s ___*(Company Name)*_____ having its registered office at __(*Address*)_____ hereinafter referred to as 'Bidder' binds himself to pay to Delhi Transco Limited (DTL) hereinafter referred to as 'Principal', the sum as determined by DTL as a consequence of infringement of patent by _*(Company Name),* in the event any legal proceedings initiated or otherwise with respect to violation of the patent against DTL and/or the usage of product which infringes the patent in relation to the tender for Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV Bamnauli-Najafgarh, Najafgarh-Tikrikalan - Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana D/C Transmission Line along with replacement of Associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis against Tender No T25R220472.

In witness whereof the Bidder put his hand on this _____ day of _____, 2026.

BIDDER

WITNESSES: -

1.

2.

SECTION-II

ATTACHMENTS (PACKAGE-II)

ATTACHMENT - 1

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

(Bid Security Form)

Please Refer Volume I (Conditions of Contract), Section: Forms & Procedures

ATTACHMENT – 2

Tender No. T25R220472

Package-II: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.**

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

(Power of Attorney)

Please Refer Volume I (Conditions of Contract), Section : Forms & Procedures.

or

Bidders may use their own performa for furnishing the required information with bid.

ATTACHMENT-3

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(QUALIFYING REQUIREMENT DATA)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

*We have submitted bid as Individual Firm/

*We have submitted bid as Joint Venture/Consortium of following firms:

(* Strike-off whichever is not applicable)

(i) …….
(ii) …….
(iii) …….

*We wish to qualify through clause no. 1.1 (a) of Annexure-A (BDS) of Volume-I.
*We wish to qualify through clause no. 1.1 (b) of Annexure-A (BDS) of Volume-I
*We wish to qualify through clause no. 1.1 (c) of Annexure-A (BDS) of Volume-I
*We wish to qualify through clause no. 1.1 (d) of Annexure-A (BDS) of Volume-I

(* Strike-off whichever is not applicable)

*We wish to qualify for Manufacturing Experience through clause no. 2.1 (i) of Annexure-A (BDS) of Volume-I.
*We wish to qualify for Manufacturing Experience through clause no. 2.1 (ii) of Annexure-A (BDS) of Volume-I.
*We wish to qualify for Manufacturing Experience through clause no. 2.1 (iii) of Annexure-A (BDS) of Volume-I.

(* Strike-off whichever is not applicable)

In accordance with the QR specified in Annexure-A (BDS) of Volume I (relevant extracts have been brought out herein, however, in case of any discrepancy, Annexure-A (BDS) shall prevail, we are furnishing the following details/document in support of meeting the QR for HTLS Reconductoring Package.

1.0 The details / documents as listed below are furnished in the bid :

a) Copies of original documents defining the constitution or legal status, place of registration and principal place of business; written power of attorney of the signatory of the bid to commit the bidder;

b) The qualification and experience of key personnel proposed for carrying out the work:

c) Proposal for subcontracting elements of the supply of materials amounting to more than 10% of the Bid Price for each element;

d) Litigation History : Information regarding any current litigation in which the bidder is involved, the parties' concerned and disputed amount;

1.1 For Bids submitted by a Joint Venture/Consortium** of firms as partners shall comply with following requirements:

a) The bid shall include all the information listed in sub clause 1.0 (a) to 1.0 (d) above for each Joint Venture/Consortium partner.

b) The bid and in case of successful bid, the form of Agreement shall be signed so as to be legally binding on all partners as per the Performa in bidding documents.

[**To be submitted only in case of Joint Venture. Strike-off in case of individual firm.]

1.2 (i) HTLS Conductor Manufacturer shall furnish details / documents that it has adequate 220 kV HTLS Conductor design infrastructure and capacity and procedures including Quality Control.

(ii) Erector shall furnish details / documents that it has adequate erection facilities and capacity and procedures including Quality Control.

2.0 **General Information**

The information in this form is to be completed for individual firms and each Partner of a Joint Venture/Consortium.

Where the Bidder proposes to use named subcontractor(s) for critical components of the works or for work contents in excess of 10 percent of the bid price, the following information should also be furnished for the subcontractor(s)].

Sl. No.	Particulars	For Individual Firm	In case of Joint Venture/ Consortium			
			For Lead Partner	For Other Partner - 1	For Other Partner - 2	For Other Partner - 3
1.	Name of the Firm					
2.	Head Office/ Registered Office Address					
3.	Telephone					
4.	Fax					
5.	Contact Person					

Sl. No.	Particulars	For Individual Firm	In case of Joint Venture/ Consortium			
			For Lead Partner	For Other Partner - 1	For Other Partner - 2	For Other Partner - 3
6.	Place of Incorporation/ Registration					
7.	Year of Incorporation/ Registration					
8.	Authorized signatory of the bid					
9.	Whether copy of Power of Attorney of the signatory to commit the bidder is attached	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No
10.	Details/documentary evidence submitted in support of stated HTLS Conductor design infrastructure and erection facilities and capacity and procedures including quality control					

3.0 Eligible Bidders:

a) Manufacturer of Conductor having experience of manufacturing, supply, stringing, testing & commissioning of EHV transmission line Conductors as per the experience criteria mentioned for Manufacturing and ETC of Conductors as per clause 4.1 & 4.2 respectively.

OR

b) Manufacturer of Conductor having experience of manufacturing, supply of conductor as per criteria mentioned in clause 4.1 and erection is carried out through an erector meeting experience criteria as per clause 4.2. The bid shall include consent letter (as per format Annexure-D1, Section BDS-Vol. I) from the proposed erector.

OR

c) Erectors who have the experience as per the criteria mentioned in 4.2 below and supply HTLS Conductor from such manufacturer(s) who fulfills the criteria mentioned at 4.1 (i) or 4.1 (ii) below. The bid shall include consent letter (as per format Annexure-D2, Section BDS-Vol. I) from the proposed HTLS Conductor manufacturer.

In addition to the Contract Performance Guarantee to be furnished by the bidder, the bid shall also include a confirmation letter from the manufacturer, stating that the manufacturer shall furnish back up performance guarantee in the form of bank guarantee for a period of two (02) years for amount equivalent to 10 % of the Ex-works cost of the HTLS conductor for successful performance of HTLS conductor to be manufactured and supplied under the contract.

OR

(d) Joint venture/Consortium consisting of two or more partners including the lead partner meeting the following conditions:

(i) All the Partners of JV/Consortium shall meet collectively the requirement of Clause 4.1 & 4.2 below.

(ii) Each of the partners of the Joint venture/Consortium must meet the minimum qualifying requirements as mentioned in clause No. 4.1 or 4.2 below.

4.0 Technical Experience

4.1 Experience of Manufacturer:-

The bidder shall be a manufacturer of conductor for the last seven years. The Manufacturer's experience should include the following:

(i) The Indian Conductor Manufacturer should have manufactured, tested and supplied at least 33% of the estimated quantity (i.e. length of conductor in kms)of High Temperature Low Sag (except GAP type) conductor having a minimum thirty three (33) number of strands or minimum 150 sq. mm Aluminum cross section area of same technology as that of conductor being offered during last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originally scheduled date of bid opening.

OR

(ii) Indian Conductor manufacturer not meeting the requirement as stipulated above at clause 4.1(i), it can also participate provided such manufacturers have manufactured, tested and supplied at least one thousand (1000) km of ACSR/ AAAC/ ACAR/ AACSR conductor and ten (10) km of High Temperature Low Sag (HTLS except GAP type) conductor of same technology as that of conductor being offered and having a minimum thirty three (33)-number of strands or minimum 150 sq. mm Aluminum cross section area during last seven (7) years and the same should have been in satisfactory operation for a period of at least 01(one) year as on the originally scheduled date of bid opening.

OR

(iii) In case, the Bidder is an Indian Entity meeting the requirement stipulated in above clause at 4.1 (ii) except HTLS Conductor, but has established manufacturing and testing facilities in India and manufactured HTLS conductor having minimum thirty three (33)-number of strands or minimum 150 sq. mm Aluminum cross section area shall also be considered, provided the bidder meets the following requirements.

The bidder must have manufactured HTLS conductor based on the technological support of the Principal/Parent/Subsidiary/Sister concern[##]company or Collaborator (s) and the bidder should have conducted following type tests on HTLS conductor manufactured in Indian facilityas on the originally scheduled date of bid opening.

A) On complete Conductor

i) DC resistance test on stranded conductor
ii) UTS test on stranded conductor at ambient & at designed elevated temperature (minimum 150 Deg C design temperature).

B) On Conductor Strand/ Core

i) Heat resistance test on Aluminium Alloy strands (not applicable for annealed aluminium).
ii) Torsion and Elongation tests on core strands/ composite core.
iii) Breaking load test on core strands/composite core and Aluminium/ Aluminium Alloy strands
iv) Conductivity test on thermal resistant Aluminium / Aluminium Alloy strands.

v) Glass transition temperature test (For composite core only).
vi) Flexural Strength test (For composite core only).

Note: The tests indicated at B) above should have been carried out by the Bidder/Licensee on their own or by their supplier of aluminium alloy strands, core/core strands.

Provided further, that the Principal/Collaborator(s) Parent/Subsidiary/Sister concern company of the bidder meets the qualifying requirements as per clause 4.1 (i) mentioned above.

However, in case of clause 4.1(iii) ,the warranty obligations for additional period of two (2) years over and above the warranty period as specified in the bidding documents shall be applicable for which an amount of 10% of the Ex-works cost of the HTLS conductor in the form of BG shall be furnished by the bidder. This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the bidder.

Further, for 4.1(iii), the bidder shall also submit the following along with the bid:

(i) A legally enforceable undertaking (jointly with the Collaborator(s)/ parent /principal/subsidiary/sister concern[##]company to guarantee quality, timely supply, performance and warranty obligations as specified for the core/conductor.

(ii) A confirmation letter from the Collaborator(s)/parent/principal/subsidiary/sister concern[##]company stating that it shall furnish performance guarantee for an amount of 10 % (Ten percent) of the Ex-works cost of HTLS conductor to be supplied in this package. This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the bidder.

(iii) A valid collaboration agreement for technology transfer / license to design, manufacture, test and supply of 220kV or above voltage level HTLS conductor/core of same technology as that of the conductor/core being offered in this package in India.

Note: 1: If Principal/collaborator/sister concern conductor manufacturer company is a foreign entity then it should submit performance certificate from an end user located in a country other than the country where the product has been manufactured during last seven (7**) years and must be in satisfactory operation[#] for at least two (2) years as on the originally scheduled date of bid opening.

Note2: In case bidder is a holding company, the technical experience referred to in clause 4.1 above shall be of that holding company only (i.e. excluding its subsidiary/parent/group/sister concern[##]companies etc.). In case bidder is a subsidiary of a holding company, the technical experience referred to in clause 4.1 above shall be of that subsidiary company only (i.e. excluding its holding company).

4.2 Experience of Erector:-

(i) The erector should have completed stringing of HTLS conductor for transmission line of cumulative circuit kilometres of not less than 50% of the estimated circuit kilometres of 220kV or higher voltage class in India as a prime contractor/sub-contractor or as a partner in a Joint Venture+ within the last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originallyscheduled date of bid opening.

OR

(ii) The erectors who do not have experience for HTLS conductor stringing shall also be considered if stringing have been completed for any type of conductor of 220kV or

higher voltage transmission line for cumulative circuit kilometres of not less than 100 km as a prime contractor or as a partner in a Joint Venture+ within the last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originally scheduled date of bid opening.

However, the warranty obligations for additional period of two (2) years over and above the warranty period as specified in the bidding documents shall be applicable for which an amount of 5 % (Five percent) of the cost of the total Project value in the form of BG shall be furnished by the bidder.

This warranty obligation guarantee shall be in addition to the contract performance guarantee to be submitted by the bidder.

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

5.0 Financial Position

5.1 The bidder should have adequate financial capability to meet the following minimum criteria:

a) Net Worth requirement of QR

Net Worth for last three financial years should be positive. (Total assets less total liabilities shall be positive) .

b) Minimum Average Annual Turnover (MAAT) requirement for the last three years of the bidder should not be less than;

MAAT = (Cost Estimate x 1.5/Completion period in years)

MAAT = Rs 17,41,80,187/-

(For the purpose of arriving at MAAT, total income, except non-recurring income e.g. Sale of fixed assets shall be considered).

Further the completion period for calculating MAAT shall be considered as 1 year even if the Contractual Completion period is less than 1 year.

c) Liquid Asset (LA) requirement of

LA = (Cost Estimate x 3/Completion period in months).

LA = Rs 2,90,30,031/-

(For the purpose of arriving at LA, Current Assets less Inventories and prepaid expenses shall be considered i.e. LA=Current Asset-Inventories-Prepaid Expenses)

Further, the Completion Period for calculating LA shall be considered as 12 months even if the Contractual Completion period is less than 12 months. The cost Estimate referred above shall include GST and other taxes & duties.

In case bidder is a holding company, financial position criteria referred to in clause 5.1 above shall be of that holding company only (i.e. excluding its subsidiary/group companies). In case bidder is a subsidiary of a holding company, financial position criteria referred to in clause 5.1 above shall be of that subsidiary company only (i.e. excluding its holding company).

In case bidder has established manufacturing facility in India and yet to complete three (3) financial years, the Net Worth and average of the turnover as per financial statement for completed financial years shall be considered for the purpose of compliance to the specified Net Worth and MAAT requirements.

Relaxation for Start-Ups^/ MSEs:

Start-Ups^/ MSEs, meeting the specified requirements at Para 5.1 (a) above in Financial Position shall also be considered qualified if they meet Eighty (80) % of the requirement specified at Para 5.1(b) & 5.1(c) above in Financial Position.

^ Start-Ups as defined by DIPP, applicable as on the originallyscheduled date of bid opening.

6.0 Techno-Commercial and Legal Arrangement of Joint Venture/Consortium:

The figures for each of the partners of the joint venture/consortium shall be added together to determine the bidder's compliance with the minimum qualifying criteria set out in Clause 5.1 (a), (b) & (c) above. However, in order for a joint venture to qualify, partners of the joint venture/consortium must meet the following minimum criteria:

(a) All the partners of the JV/Consortium shall meet individually the Financial Position criteria given at 5.1 (a) above.
(b) The lead partner shall meet, not less than 40% of the minimum criteria given at Para 5.1 (b) & (c) above.
(c) Each of the other partner(s) shall meet not less than 25% of the criteria given at 5.1(b) & (c) above.

In case of Joint Venture/consortium, the following conditions shall also apply:

i. The bid, and in case of successful bid, the specified Form of Agreement shall be signed so as to be legally binding on all partners (Form enclosed).

ii. Each of the Partners of the Joint Venture/consortium must meet the minimum qualifying requirements given under clause 4.1 or 4.2. However, all the partners of Joint Venture/consortium shall meet collectively, the requirements of Clauses 4.1 and 4.2 above.

iii. One of the partners shall be nominated as Lead Partner, and 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. Thus the lead partner shall be authorized to represent the joint venture/ consortium for the purpose of execution of the Contract. The payment shall be in the name of joint venture/ consortium. The authorization shall be evidenced by submitting a Power of Attorney signed by legally authorized signatory of all the partners as per bidding documents.

iv. All 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 of this

effect shall be included in the authorization mentioned under (iii) above as well as in the Bid Form and in the Contract Form (in case of a successful bid).

Agreement entered into by the Joint Venture/consortium partners shall be submitted with the bid.

7 .0 Financial & Capacity Requirements

Bidder shall be financially sound.

i) Bidder shall submit a certificate from their Banker(s) as per format indicating various fund based/non fund based limits sanctioned to the bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the originallyscheduled date of bid opening.
ii) Bidder shall submit a monthly cash flow projection for execution of the contract having regard to implementation schedule. Bidder should indicate how funding gap in each month is proposed to be met.
iii) Bidder shall submit the complete Annual reports together with Audited statement of accounts of the company for last five years.

In the event the Bidder (being a company registered/ incorporated outside India or otherwise) is not able to furnish the above information of its own (separate), being a subsidiary company and the accounts are being consolidated with their Group/ Holding/ Parent/sister concern## company, the Bidder should submit the balance sheet, income statement, other information as required, of its own (separate), (not of its Group/ Holding/ Parent/ sister concern## company) duly certified by:

i) Their statutory Auditor; or
ii) A Certified Public Accountant; or
iii) Their Company Secretary certifying that it is based on audited accounts, as the case may be.

Similarly, if the Bidder happens to be a Group / Holding / Parent company, the Bidder should submit the above information of its own (separate), exclusive of its Subsidiaries, duly certified by:

i) Their statutory Auditor; or
ii) A Certified Public Accountant; or
iii) Their Company Secretary certifying that it is based on audited accounts, as the case may be.

Format A: Format for the bidders in respect of clause 4.1:

(Lead partner in case of Joint Venture) [In case of Joint Venture bidder, the QR data of each of the other partner (in support of meeting the requirement Annexure-A, Section-BDS, Volume-I of the bidding documents] is also is to be furnished, as applicable, using this format

Name of the Bidder (as per 4.1 above) (Single Firm/Lead Partner/ Partner of a Joint Venture)		
1.	No. of years the bidder is a manufacturer of Conductor	Last _____ years.
2.	Name of Contract	
3.	Contract Reference No. & Date of Award	
4.	Name and Address of the Purchaser/Utility for whom the Contract was executed by bidder/Partner e-mail ID Telephone No. Fax No.	 _____ _____
5	Scope of work involved in the supply of ACSR/AAAC/ACAR/AACSR and High Temperature Low Sag (HTLS) Conductor having at least minimum thirty three (33) number of strands or minimum 150 sq. mm Aluminum cross section area of same technology as that of conductor being offered in the package) under the above Contract	□ Manufacture □Testing □ Supply - for the above Contract for Conductor. (*Tick only whichever is/are applicable*)
5.1	Total no. of Kms. of ACSR/AAAC/ACAR/AACSR and High Temperature Low Sag(HTLS) Conductor supplied in the above Contract No. of strands supplied in the Contract detailed above (Bidder to furnish details of only ACSR/AAAC/ACAR/AACSR and High Temperature Low Sag(HTLS) Conductor having at least same or more number of strands as that of the conductor being offered in the package supplied in the Contract)	_____ Kms. _____ Nos.
5.2	Date of completion of the above Contract	_____ (dd/mm/yyyy)
5.3	No. of years the above referred Conductor is in operation as on the date of bid opening	_____ years

5.4	Details of documents submitted in support of stated experience/Contract/ design, infrastructure and manufacturing facilities and capacity and procedures including quality control	

(Use separate sheet for each experience/ Contract)

Format B: Format for the Erector in respect of clause 4.2:

(Lead partner in case of Joint Venture) [In case of Joint Venture bidder, the QR data of each of the other partner (in support of meeting the requirement Annexure-A, Section-BDS, Volume-I of the bidding documents] is also is to be furnished, as applicable, using this format

Name of the Erector (as per 4.2 above) (Single Firm/Lead Partner/ Partner of a Joint Venture)		
1.	No. of years of experience of erector	Last _____ years.
2.	Name of Contract	
3.	Contract Reference No. & Date of Award	
4.	Name and Address of the Purchaser/Utility for whom the Contract was executed by Erector e-mail ID Telephone No. Fax No.	 _____ _____
5	Scope of work for carrying out stringing works under the above Contract	□ Stringing of HTLS Conductor □ Stringing of Other Conductor (Specify the type of Conductor) - for the above Contract for (*Tick only whichever is/are applicable*)
5.1	Total no. of Kms. of carrying out stringing works in the above Contract	_____ Kms. _____ Nos.
5.2	Date of completion of the above Contract	_____ (dd/mm/yyyy)
5.3	No. of years the above Line/Work is in operation as on the date of bid opening	_____ years

5.4	Details of documents submitted in support of stated experience/Contract and capacity and procedures including quality control	
5.5	To be qualified for award of contract, whether bidder has provided evidence to the satisfaction of the Owner of their capability and adequacy of resources to carry out the contract effectively.	□ Yes □ No

(Use separate sheet for each experience/ Contract)

8.0 The Bidder shall furnish documentary evidence in support of the qualifying requirement stipulated as above.

Date:.....

Place:...

(Signature)……..

(Printed Name)……...

(Common Seal)……

(Designation)……..

ATTACHMENT-4

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

LIST OF APPROVED SUBCONTRACTORS

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Prior to award of Contract, the following details shall be completed indicating those sub-contractors proposed by the Bidder by Attachment to its bid that are approved by the Employer for engagement by the Contractor during the performance of the contract.

The following Subcontractors are approved for carrying out the item of the facilities indicated. Where more than one Subcontractor is listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. No Subcontractors shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

Item of Facilities	Approved Subcontractors	Nationality

ATTACHEMENT-5

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

(Commercial Deviations)

Dear Sirs,

The following are the Commercial Deviations and variations from and exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except for these deviations, the entire work shall be performed as per your specifications and documents.

S.No.	Volume/Clause No.	Ref./Page No.	Details of Deviation	Reason/ Justification of Deviation	Withdrawal Price in Rupees

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-6

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(DEVIATIONS ON IMPORTANT CONDITIONS)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sirs,

Sub. : Deviation on Important Conditions along with their withdrawal price.

The following are the Deviations/variations/exceptions to the provisions of important conditions stipulated in Clause 11.2 of ITB, Conditions of Contract, Volume-I. We undertake to execute the contract in line with the provisions of bidding documents in respect of above said clauses in case DTL agree to pay us the withdrawal price indicated below against each such deviations/variations/exceptions.

Volume of bidding document	Section	Clause No.	Page No.	Statement of deviations/ variations/ exceptions	Withdrawal Price in Rupees

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-7

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

TECHNICAL DEVIATIONS

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sir,

The following are the Technical Deviations and variations from and exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except for these deviations, the entire work shall be performed as per your specifications and documents.

S.No.	Volume/Clause No.	Ref./Page No.	Details of Deviation	Reason/ Justification of Deviation	Withdrawal Price in Rupees

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: 1. Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.
2. The deviations and variations, if any, shall be brought out separately for each of the equipment.

ATTACHMENT-8

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(Additional Information)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We have enclosed with our proposal the following additional information for the subject package.

Sl. No.	Brief description of Information	Ref. & Page No.

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-9

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(BOUGHT-OUT & SUB-CONTRACTED ITEMS)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We hereby furnish the details of the items/sub-assemblies; we propose to buy for the purpose of subject package.

Sl. No.	Item Description	Quantity Proposed be bought/Sub-contracted	Source of Supply

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-10

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(WORK COMPLETION SCHEDULE)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

We hereby declare that the following Work Completion Schedule shall be followed by us for the subject package.

Sl. No.	Description of Work	Period in Months (from the date of Award of Contract)
1.	Completion of detailed engineering a) Commencement b) Completion	
2.	Procurement of equipment & raw materials	
3.	Tests a) Commencement b) Completion	
4.	Manufacturing a) Commencement b) Completion	
5.	Shipments a) Commencement b) Completion	
6.	Establishment of site office	
7.	Receipt at final destination at site a) Commencement b) Completion	
8.	Erection a) Commencement b) Completion	
9.	Testing & Commissioning a) Commencement b) Completion	

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-11

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(LIST OF SPECIAL TOOLS & TACKLES)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We hereby furnish below the list of special tools & tackles for erection and commissioning of equipment for the subject package. The prices for these tools & tackles are already included in the lumpsum bid price.

Sl. No.	For Equipment	Item Description	Unit	Quantity

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-12

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(INFORMATION REGARDING EX-EMPLOYEES OF "DTL")

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We hereby furnish the details of Ex-Employees of DTL who had retired/resigned at the level of General Manager and above from DTL and subsequently have been employed by us.

Sl. No.	Name of Person with designation in DTL	Date of Retirement/ resignation from DTL	Date of joining and designation in our Organisation

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-14

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

(PRICE ADJUSTMENT DATA)

Refer BDS

ATTACHMENT-15

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(GUARANTEE DECLARATION)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sirs,

We declare that the equipment offered shall meet the rating and performance requirements stipulated in Technical specification for various equipment or indicated in Data requirement. Further the various parameter of the HTLS conductor, based on which average ohmic losses shall be evaluated in accordance with clause no. 1.10 of section-II of technical specification, Volume-II, are given herein below:

Further, the guaranteed AC resistance & Guaranteed Average Ohmic loss of the HTLS conductor, based on which differential price evaluation shall be evaluated in accordance with clause no. 1.3.2 of section-II of technical specification, Volume-II, are given herein below :

S.No	Guaranteed AC Resistance at 1200 A (in Ohm/Km) (Rac)	Guaranteed Average Ohmic loss (in KW) = 21168 x R_{ac}
1.		

Date:.....

Place:.....

(Signature).....…….....……..

(Printed Name).....……

(Designation).....…….....

(Common Seal).…….....

ATTACHMENT-16

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

INTEGRITY PACT

Integrity Pact

Between

Delhi Transco Limited

having its Registered Office at Shakti Sadan, Kotla Road, New Delhi -110 002

herein after referred to as

"DTL"

and

_____

(Insert the name of the Sole Bidder/Lead Partner of Joint Venture)

having its Registered Office at _____

(Insert full Address)

_____

and

_____

(Insert the name of the Partner(s) of Joint Venture/agent, as applicable)

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

having its Registered Office at _____

(Insert full Address)

_____

Herein after referred to as

"The Bidder/Contractor"

Preamble

DTL intends to award, under laid-down organisation procedures, contract(s) for _____ Package

(Insert the name of the package)

and Specification Number _____DTL values full compliance with all relevant

(Insert Specification Number of the Package)

laws and regulations, and the principles of economical use of resources, and of fairness and transparency in its relations with its Bidders/Contractors.

In order to achieve these goals, DTL and the above named Bidder/Contractor enter into this agreement called **'Integrity Pact'** which will form a part of the bid.

It is hereby agreed by and between the parties as under:-

Section I – Commitments of DTL

(1) DTL commits itself to take all measures necessary to prevent corruption and to observe the following principles:

(a) No employee of DTL, personally or through family members or relative(s), will in connection with the tender, or the execution of the contract, demand, take a promise for or accept, for him/herself or third person, any material or other benefit which he/she is not legally entitled to.

(b) DTL will, during the tender process treat all Bidder(s) with equity and fairness. DTL will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or for the execution of contract.

(c) DTL will exclude form evaluation of Bids its such employee(s) who has any personnel interest in the Companies/Agencies participating in the Bidding/Tendering process.

The action stipulated in this Integrity Pact is without prejudice to any other Legal action that may follow in accordance with the provisions of the relevant law in force relating to any civil or criminal proceedings.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

(2) If Managing Director obtains information on the conduct of any employee of DTL which is a criminal offence under the relevant Anti-Corruption Laws of India or illegal under the Indian Contract Act or Indian Laws, or if there be a substantive suspicion in this regard, he will inform its Chief Vigilance Officer and in addition can initiate disciplinary actions under its Rules.

Section II – Commitments of the Bidder/Contractor

(1) The Bidder/Contractor commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

(a) The Bidder/Contractor will not, directly or through any other person or firm, offer, promise or give to DTL, or to any of DTL's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange an advantage during the tender process or the execution of the contract.

(b) The Bidder/Contractor will not enter into any illegal agreement or understanding, whether formal or informal with other Bidders/Contractors. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or actions to restrict competitiveness or to introduce cartelization in the bidding process.

(c) The Bidder/Contractor will not commit any criminal offence under the relevant Anti-Corruption Laws of India, further, the Bidder/Contractor will not use for illegitimate purposes or for purposes of restrictive competition or personal gain, or pass on to others, any information provided by DTL as part of the business relationship, regarding plans, technical proposals and business details, including information of any type contained or transmitted electronically.

(d) The Bidder/Contractor of foreign origin shall disclose the name and address of the Agents/representatives in India, if any, involved directly or indirectly in the Bidding. Similarly, the Bidder/Contractor of Indian Nationality shall furnish the name and address of the foreign principals, if any, involved directly or indirectly in the bidding.

(e) The Bidder/Contractor will, when presenting his bid, disclose any and all payments he has made, or committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and/or with the execution of the contract.

(f) The Bidder/Contractor will not misrepresent facts or furnish false/forged documents/information in order to influence the bidding process or the execution of the contract to the detriment of DTL.

(2) The Bidder/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

Section III – Disqualification from tender process and exclusion from future contracts

(1) If the bidder, before contract award, has committed a serious transgression through a violation of Section II or in any other form such as to put his reliability or credibility as Bidder into question, DTL may disqualify the Bidder from the tender process or terminate the contract, if already signed, for such reason.

(2) If the Bidder/Contractor has committed a serious transgression through a violation of Section II such as to put his reliability or credibility into question, DTL may after following due procedures also exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder/Contractor and the amount of the damage. The exclusion will be imposed for a minimum of 12 months and maximum of 3 years and it has to be decided by the Competent authority.

(3) If the Bidder/Contractor can prove that he has restored/Recouped the damage caused by him and has installed a suitable corruption prevention system, DTL may revoke the exclusion prematurely with the approval of Competent Authority.

Section IV – Liability for violation of Integrity Pact

(1) If DTL has disqualified the Bidder from the tender process prior to the award under Section III, DTL may forfeit the Bank Guarantee under the Bid.

(2) If DTL has terminated the contract under Section III, DTL may forfeit the Contract Performance Guarantee of this contract besides resorting to other remedies under the contract.

Section V – Previous Transgression

(1) The Bidder shall declare in his Bid that no previous transgressions occurred in the last 3 years with any other Public Sector Undertaking or Government Department that could justify his exclusion from the tender process.

(2) If the bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section VI – Equal treatment to all Bidders/Contractors

(1) DTL will enter into agreements with identical conditions as this one with all Bidders.

(2) DTL will disqualify from the tender process any bidder who does not sign this Pact or violate its provisions.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

Section VII – Punitive Action against violating Bidders/Contractors

If DTL obtains knowledge of conduct of a Bidder or a Contractor or his subcontractor or of an employee or a representative or an associate of a Bidder or Contractor or his Subcontractor which constitutes corruption, or if DTL has substantive suspicion in this regard, DTL will inform the Chief Vigilance Officer (CVO).

(*)Section VIII – Independent External Monitor/Monitors

(1) DTL has appointed a panel of Independent External Monitors (IEMs) for this Pact with the approval of Central Vigilance Commission (CVC), Government of India, out of which one of the IEMs has been indicated in the NIT.

(2) The IEM is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement. He has right of access to all project documentation. The IEM may examine any complaint received by him and submit a report to Managing Director, DTL at the earliest. He may also submit a report directly to the CVO and the CVC, in case of suspicion of serious irregularities attracting the provisions of the PC Act. However, for ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter shall be referred to the full panel of IEMs, who would examine the records, conduct the investigations and submit report to Managing Director, DTL, giving joint findings.

(3) The IEM is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Managing Director, DTL.

(4) The Bidder(s)/Contractor(s) accepts that the IEM has the right to access without restriction to all documentation of DTL related to this contract including that provided by the Contractor/Bidder. The Bidder/Contractor will also grant the IEM, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his documentation. The same is applicable to Subcontractors. The IEM is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s)/Sub-Contractor(s) with confidentiality.

(5) DTL will provide to the IEM information as sought by him which could have an impact on the contractual relations between DTL and the Bidder/Contractor related to this contract.

(6) As soon as the IEM notices, or believes to notice, a violation of this agreement, he will so inform the Managing director, DTL and request the Managing Director, DTL to discontinue or take corrective action, or to take other relevant action. The IEM can in this regard submit non-binding recommendations. Beyond this, the IEM has no right

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the IEM shall give an opportunity to DTL and the Bidder/Contractor, as deemed fit, to present its case before making its recommendations to DTL.

(7) The IEM will submit a written report to the Managing Director, DTL within 8 to 10 weeks from the date of reference or intimation to him by DTL and should the occasion arise, submit proposals for correcting problematic situations.

(8) If the IEM has reported to the Managing Director, DTL a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Managing Director, DTL has not, within the reasonable time taken visible action to proceed against such offence or reported it to the CVO, the Monitor may also transmit this information directly to the CVC, Government of India.

(9) The word '**IEM**' would include both singular and plural.

(*) This Section shall be applicable for only those packages wherein the IEMs have been identified in Section – I: Invitation for Bids and/or Clause 9 in Section –III : Conditions of Contract, Volume-I of the bidding documents.

Section IX – Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor after the closure of the contract and for all other Bidder's six month after the contract has been awarded.

Section X – Other Provisions

(1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the establishment of DTL. The Arbitration clause provided in the main tender document/contract shall not be applicable for any issue/dispute arising under Integrity Pact.

(2) Changes and supplements as well as termination notices need to be made in writing.

(3) If the Contractor is a partnership firm or a consortium or Joint Venture, this agreement must be signed by all partners, consortium members and Joint Venture partners.

(4) Nothing in this agreement shall affect the right of the parties available under the General conditions of Contract (CC/GCC) and Special Conditions of Contract (SCC).

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

(5) Views expressed or suggestions/submissions made by the parties and the recommendations of the CVO/IEM[#] in respect of the violation of this agreement, shall not be relied on or introduced as evidence in the arbitral or judicial proceedings (arising out of the arbitral proceedings) by the parties in connection with the disputes/differences arising out of the subject contract.

CVO shall be applicable for packages wherein IEM are not identified in Section IFB/BDS of Condition of Contract, Volume-I. IEM shall be applicable for packages wherein IEM are identified in Section IFB/BDSof Condition of Contract. Volume-I

(6) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(Office Seal)

Name :_____

Designation: _____

Witness 1 :_____

(Name &Address)_____

_____

_____

Witness 2 :_____

(Name &Address)_____

_____

_____

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

Name : _____

Designation: _____

Witness 1 :_____

(Name & Address)_____

_____

_____

Witness 2 :_____

(Name & Address)_____

_____

_____

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(Office Seal)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

ATTACHMENT-18

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(CHECK LIST)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We have enclosed with our proposal the following additional information for the subject package.

	Particulars	
Bid Validity	Whether Bid is valid is as stipulated in ITB from the date of bid opening.	Yes/No
Bid Security amount	Whether Bid security amount and form is enclosed as per ITB.	Yes/No
Bid Security Validity	Whether bid security is valid for a period as stipulated in ITB.	Yes/No
Bid Signatory	Power of Attorney of Signatory of Bid as per Section ITB	Yes/No
	Technical Specification	
1.	Is the material offered according to the specifications required by the purchaser, if not, please state the deviation from the same and deviation statement thereof	Yes/No
2	Have you submitted copies of Type Test Certificates in physical form in respect of material offered?	Yes/No
3	Have you submitted dimension drawings leaflets, descriptive and illustrative catalogues in physical form (if necessary)?	Yes/No
4	Whether product conforms to relevant ISS and our technical particulars?	Yes/No
5	Have you submitted in physical form (i) the copy of NIT duly signed & stamped on each page ,(ii) copies of past supplies and (iii) performance certificates?	Yes/No

6	Whether testing facilities as per IS for conducting various tests are available with you?	Yes/No
	Terms and Condition	
1.	Do you agree to all clauses of General Conditions of our tender documents?	Yes/No
2	If you do not agree to any/all the clauses, please state clearly the clause which you do not agree and state the modification in respect of clauses of which you do not agree.	Yes/No
3	Do you agree to furnish security deposit if order is placed with you?	Yes/No
4	Whether agreeable to DTL's liquidate damages clause for late completion of work.?	Yes/No
5	Are you agreeable to inspection clause?	Yes/No
6	Any further particulars not otherwise covered in the tender specifications submitted physically?	Yes/No
7	Quantity offered against each item be quoted. Are you prepared to accept order for bigger quantity as per NIT ?	Yes/No
Part-I	**Techno-commercial Bid**	
a)	Whether undertaking for corrupt & fraudulent practice signed and submitted.	Yes/No
b)	Whether Bid form duly completed, signed and submitted.	Yes/No
c)	Whether following Attachments submitted:	Yes/No
d)	Attachment 1 :"Bid security".	Yes/No
e)	Attachment 2: "Power of Attorney".	Yes/No
f)	Attachment 3: "Qualifying Requirement Data".	Yes/No
g)	Attachment 4: "List of approved Subcontractors".	Yes/No
h)	Attachment 5: "Commercial Deviations".	Yes/No
i)	Attachment 6: "Deviations on important Conditions".	Yes/No
j)	Attachment 7: "Technical Deviations".	Yes/No
k)	Attachment 8: "Additional Information".	Yes/No
l)	Attachment 9: "Bought Out and Sub-contracted items"	Yes/No
m)	Attachment 10: "Work completion schedule" .	Yes/No
n)	Attachment 11: "List of Special Tools and Tackles" .	Yes/No
o)	Attachment 12: "Information regarding ex-employees of Employer in Bidder's firm".	Yes/No
p)	Attachment 14:"Price Adjustment Data."	Yes/No
q)	Attachment 15: "Guarantee Declaration".	Yes/No
r)	Attachment 16: "Integrity Pact".	Yes/No
s)	Attachment 18: "Check list".	Yes/No
t)	Attachment 19: Affidavit of Self certification regarding Minimum Local Content in line with PPP-MII order **and MoP Order, as applicable**	Yes/No

	(submission of Hard Copy in 'Original'), to be submitted on a non-judicial stamp paper of Rs. 100/-.	
u)	Attachment 20: Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with PPP-MII order and **MoP Order, as applicable** (submission of Hard Copy in 'Original') to be submitted on the letter head of the auditor/ cost accountant.	Yes/No
v)	Attachment 21: Undertaking for not indulging in Corrupt & Fraudulent practice	Yes/No
w)	Attachment 22: Certification by the Bidder as per DoE Order no-F.No.7/10/2021-PPD(1) dt 23.02.2023 in line with ITB Clause 1.2.2 (In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture)	Yes/No
x)	Attachment no 23: Details of complete type test report of all the equipment as per QR and in accordance with latest IEC / NIT in the prescribed format	Yes/No
y)	Attachment no 24: Indemnity Bond	Yes/No
Part-II	Price Bid	
a)	Whether Price Bid submitted.	Yes/No
b)	Whether Bid form duly completed, signed and submitted.	Yes/No
c)	Whether following Price Schedules submitted:	Yes/No
d)	Schedule 1: " Price break-up Plant and Equipment (including Mandatory Spares) to be supplied."	Yes/No
e)	Schedule 2: "Break-up of Local Transportation, Insurance and other Incidental Services."	Yes/No
f)	Schedule 3: "Price Breakup of Installation Charges."	Yes/No
g)	Schedule 4: "Grand summary of the quoted bid price."	Yes/No
Tender Document/NIT	Whether Tender document along with all amendments duly signed & stamped on each page submitted.	Yes/No

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

Note: **(i)** Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Attachment.

(ii) Replies against each item should be complete without any ambiguity. Terms such as refer covering letter etc. shall not be acceptable unless the replies/ information are specific and complete

ATTACHMENT-19

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

Format for Affidavit of Self certification regarding Local Content in line with PPP-MII order dated 15/06/2017, its revision dated **16/09/2020**& their latest amendments thereof **and MoP Order dated 16/11/2021** & their latest amendments thereof, as applicable, to be provided on a non-judicial stamp paper of Rs. 100/-.

Date:

I _____S/o, D/o, W/o, _____Resident of_____ hereby solemnly affirm and declare as under:

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Order, 2017 of Government of India issued vide Notification No:P-45021/2/2017 -BE-II dated 15/06/2017, its revision dated **16/09/2020**& their latest amendments thereof, (hereinafter **PPP-MII order**), and 'Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content)' order **dated 16/11/2021** & their latest amendments thereof, issued by Ministry of Power (hereinafter **MoP order**) and **any subsequent modifications/ Amendments, if any** and

That the information furnished hereinafter is correct to the best of my knowledge and belief and I undertake to produce relevant records before the procuring entity/DTL or any other Government authority for the purpose of assessing the local content of goods/services/works supplied by me for **Turnkey Package (Insert the name of Package and Tender no.)**.

That the local content for all inputs which constitute the said goods/services/works has been verified by me and I am responsible for the correctness of the claims made therein.

That the 'Local Content 'as defined in the PPP-MII order and MoP order in the goods/services/works supplied by me for Turnkey Package (Insert the name of Package and Tender no.) is …… percent (%).

That the goods/services/works supplied by me for **Turnkey Package (Insert the name of Package and Tender no.)** meet the 'Local Content' requirement as defined in the PPP-MII order **and MoP order for 'Class –I local supplier'**.

That the value addition for the purpose of meeting the 'Local Content 'has been made by me at …… (*Enter the details of the location(s) at which value addition is made).*

That in the event of the local content of the goods/services/works mentioned herein is found to be incorrect and not meeting the prescribed Local Content criteria, based on the assessment of procuring agency (ies)/DTL/Government Authorities for the purpose of assessing the local content, action shall be taken against me in line with the PPP-MII order, **MoP order** and provisions of the Integrity pact/ Bidding Documents.

I agree to maintain the following information in the Company's record for a period of 8 years and shall make this available for verification to any statutory authority.

i Name and details of the Local Supplier
(Registered Office, Manufacturing unit location, nature of legal entity)

ii. Date on which this certificate is issued

iii. Goods/services/works for which the certificate is produced

iv. Procuring entity to whom the certificate is furnished

v. Percentage of local content claimed and whether it meets the Local Content prescribed for **'Class –I local supplier'**

vi. Name and contact details of the unit of the Local Supplier (s)

vii. Sale Price of the product

viii Ex-Factory Price of the product

ix. Freight, insurance and handling

x. Total Bill of Material

xi List and total cost value of input used to manufacture the Goods/to provide services/in construction of works

xii. List and total cost of input which are domestically sourced. Value addition certificates from suppliers, if the input is not in-house to be attached

xiii. List and cost of inputs which are imported, directly or indirectly

For and on behalf of…… (Name of firm/entity)
Authorized signatory (To be duly authorized by the Board of Directors)
<Insert Name, Designation and Contact No.>

ATTACHMENT-20

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with **PPP-MII order** dated 15/06/2017, its revision dated **16/09/2020** & their latest amendments thereof, **and MoP order** dated **16/11/2021** & their latest amendments thereof, as applicable *[to be submitted on the letter head of the issuer.]*

Dear Sir,

We have read and understood the provisions of "Public Procurement (Preference to Make in India) Order, 2017" dated 15/06/2017, its revision dated **16/09/2020** & their latest amendments thereof[hereinafter, "PPP-MII Order"] issued by Department for promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India, and 'Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content)' order dated **16/11/2021** & their latest amendments thereof issued by Ministry of Power [hereinafter, "MoP order"] and **any subsequent modifications/ Amendments, if any**.

In line with the provisions of the PPP-MII Order **and MoP Order**, M/s. ……*[Enter the name of the Bidder] [*hereinafter, **"Class-I Local Supplier***]* have submitted an Affidavit of self-certification to M/s. Delhi Transco Limited [hereinafter, DTL] regarding Local Content in Goods/Services/Works to be supplied by the **"Class-I Local Supplier"** for **Turnkey Package (Insert the name of Package and Tender No.)**, wherein they have agreed to abide by the terms and conditions of the PPP-MII Order **and MoP Order**.

Further, in line with the PPP-MII Order, the statutory auditor or cost auditor of the company shall provide a certificate giving the percentage of Local Content in the Goods/Service/Works to be supplied by the **"Class-I Local Supplier"** for **Turnkey Package (Insert the name of Package and Tender No.)**.

Accordingly, we, the Statutory Auditor(s) / Cost auditor of the **"Class-I Local Supplier"**, certify that the Local Content as defined under the PPP-MII **and MoP Order**, in the Goods/Service/Works to be supplied by the **"Class-I Local Supplier"** for **Turnkey Package (Insert the name of Package and Tender No.)** is …….. Percentage [*specify the percentage of Local content*].

For and on behalf of, Date:

<<Statutory Auditor's/Cost auditor's attestation>>
Firm Reg No. Membership No.

Note: This is a guiding format. In case the bidder submits the certificate in a format different from the above, the same may be considered provided it meets the intent and purpose, as may be ascertained by DTL.

ATTACHMENT-21

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

UNDERTAKING FOR NOT INDULGING IN CORRUPT & FRAUDULENT PRACTICE

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We declare that all the documents submitted or would be submitted by us in this tender are/would be genuine, and in case any discrepancy is found in the declaration/documents submitted by us at any stage, action can be taken against us as deemed fit by DTL.

We further declare that in the submission of this tender no agent, middleman or any intermediary has been, or will be engaged to provide any services, or any other item of work related to the award and performance of this contract. We further confirm and declare that no agency commission or any payment which may be construed as an agency commission has been, or will be, paid and that the tender price does not include any such amount.

We acknowledge the right of the employer, if he finds to the contrary, to declare, our tender to be non-compliant and if the contract has been awarded to declare the contract null and void.

STAMP & SIGNATURE OF AUTHORISED SIGNATORY

ATTACHMENT-22

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

Certification by the Bidder as per order no. F.No.7/10/2021-PPD(1) dated **23/02/2023** issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India (DoE Order) in line with ITB Clause 1.2.2

(In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture)

Dear Sir,

We have read and understood the provisions of Order no.F.No.7/10/2021-PPD(1)(Order Public Procurement no.4) dated **23/02/2023** regarding "Restriction under Rule 144(xi) of General Financial Rules" issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India [hereinafter collectively "**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 not from such a country or, if from such a country, has been registered with the Competent Authority and will not subcontract any work to a subcontractor/sub vendor from such countries unless such subcontractor/sub vendor fulfils all requirement in this regard and is eligible to be considered. [*Where applicable, evidence of* ***valid registration by the Competent Authority shall be attached***.]

We also undertake to comply the above said DoE order dt. 23.02.2023 and **any subsequent modifications/ Amendments, if any**.

We further declare that any misrepresentation or submission of false/forged document/information in this regard this would be ground for immediate termination and further legal action in accordance with law.

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

ATTACHMENT-23

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

Bidder has to submit details of complete type test report of all the equipment as per QR and in accordance with latest IEC / NIT in the below format

S. No.	Equipment	IEC Clause Ref.	Type of test	Type Test Description/
				a) Manufacturer b) Model no. test conducted on c) Report No.: d) Lab. Name: e) Date of Test: f) Date of Issue: g) IEC: h) Ref Page

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

ATTACHMENT-24

Tender No. T25R220472

Package-II: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(INDEMNITY BOND)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sir,

One set of Indemnity Bond on non judicial stamp paper of Rs 100/-, duly signed by our authorized representative and stamped is annexed herewith for loss caused in case of legal proceedings w.r.t Infringement of Patent.

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

INDEMNITY BOND

By this bond M/s ___*(Company Name)*_____ having its registered office at __(*Address*)_____ hereinafter referred to as 'Bidder' binds himself to pay to Delhi Transco Limited (DTL) hereinafter referred to as 'Principal', the sum as determined by DTL as a consequence of infringement of patent by _*(Company Name),* in the event any legal proceedings initiated or otherwise with respect to violation of the patent against DTL and/or the usage of product which infringes the patent in relation to the tender for Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur-Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis. against Tender No T25R220472.

In witness whereof the Bidder put his hand on this _____ day of _____, 2026.

BIDDER

WITNESSES:-

1.

2.

SECTION-II

ATTACHMENTS (PACKAGE-III)

ATTACHMENT - 1

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

(Bid Security Form)

Please Refer Volume I (Conditions of Contract), Section: Forms & Procedures

ATTACHMENT – 2

Tender No. T25R220472

Package-III: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

(Power of Attorney)

Please Refer Volume I (Conditions of Contract), Section : Forms & Procedures.

or

Bidders may use their own performa for furnishing the required information with bid.

ATTACHMENT-3

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(QUALIFYING REQUIREMENT DATA)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

*We have submitted bid as Individual Firm/

*We have submitted bid as Joint Venture/Consortium of following firms:

(* Strike-off whichever is not applicable)

(i) …….
(ii) …….
(iii) …….

*We wish to qualify through clause no. 1.1 (a) of Annexure-A (BDS) of Volume-I.
*We wish to qualify through clause no. 1.1 (b) of Annexure-A (BDS) of Volume-I
*We wish to qualify through clause no. 1.1 (c) of Annexure-A (BDS) of Volume-I
*We wish to qualify through clause no. 1.1 (d) of Annexure-A (BDS) of Volume-I

(* Strike-off whichever is not applicable)

*We wish to qualify for Manufacturing Experience through clause no. 2.1 (i) of Annexure-A (BDS) of Volume-I.
*We wish to qualify for Manufacturing Experience through clause no. 2.1 (ii) of Annexure-A (BDS) of Volume-I.
*We wish to qualify for Manufacturing Experience through clause no. 2.1 (iii) of Annexure-A (BDS) of Volume-I.

(* Strike-off whichever is not applicable)

In accordance with the QR specified in Annexure-A (BDS) of Volume I (relevant extracts have been brought out herein, however, in case of any discrepancy, Annexure-A (BDS) shall prevail, we are furnishing the following details/document in support of meeting the QR for HTLS Reconductoring Package.

1.0 The details / documents as listed below are furnished in the bid :

a) Copies of original documents defining the constitution or legal status, place of registration and principal place of business; written power of attorney of the signatory of the bid to commit the bidder;

b) The qualification and experience of key personnel proposed for carrying out the work:

c) Proposal for subcontracting elements of the supply of materials amounting to more than 10% of the Bid Price for each element;

d) Litigation History : Information regarding any current litigation in which the bidder is involved, the parties' concerned and disputed amount;

1.1 For Bids submitted by a Joint Venture/Consortium** of firms as partners shall comply with following requirements:

a) The bid shall include all the information listed in sub clause 1.0 (a) to 1.0 (d) above for each Joint Venture/Consortium partner.

b) The bid and in case of successful bid, the form of Agreement shall be signed so as to be legally binding on all partners as per the Performa in bidding documents.

[**To be submitted only in case of Joint Venture. Strike-off in case of individual firm.]

1.2 (i) HTLS Conductor Manufacturer shall furnish details / documents that it has adequate 220 kV HTLS Conductor design infrastructure and capacity and procedures including Quality Control.

(ii) Erector shall furnish details / documents that it has adequate erection facilities and capacity and procedures including Quality Control.

2.0 **General Information**

The information in this form is to be completed for individual firms and each Partner of a Joint Venture/Consortium.

Where the Bidder proposes to use named subcontractor(s) for critical components of the works or for work contents in excess of 10 percent of the bid price, the following information should also be furnished for the subcontractor(s)].

Sl. No.	Particulars	For Individual Firm	In case of Joint Venture/ Consortium			
			For Lead Partner	For Other Partner - 1	For Other Partner - 2	For Other Partner - 3
1.	Name of the Firm					
2.	Head Office/ Registered Office Address					
3.	Telephone					
4.	Fax					
5.	Contact Person					

Sl. No.	Particulars	For Individual Firm	In case of Joint Venture/ Consortium			
			For Lead Partner	For Other Partner - 1	For Other Partner - 2	For Other Partner - 3
6.	Place of Incorporation/ Registration					
7.	Year of Incorporation/ Registration					
8.	Authorized signatory of the bid					
9.	Whether copy of Power of Attorney of the signatory to commit the bidder is attached	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No
10.	Details/documentary evidence submitted in support of stated HTLS Conductor design infrastructure and erection facilities and capacity and procedures including quality control					

3.0 Eligible Bidders:

a) Manufacturer of Conductor having experience of manufacturing, supply, stringing, testing & commissioning of EHV transmission line Conductors as per the experience criteria mentioned for Manufacturing and ETC of Conductors as per clause 4.1 & 4.2 respectively.

OR

b) Manufacturer of Conductor having experience of manufacturing, supply of conductor as per criteria mentioned in clause 4.1 and erection is carried out through an erector meeting experience criteria as per clause 4.2. The bid shall include consent letter (as per format Annexure-D1, Section BDS-Vol. I) from the proposed erector.

OR

c) Erectors who have the experience as per the criteria mentioned in 4.2 below and supply HTLS Conductor from such manufacturer(s) who fulfills the criteria mentioned at 4.1 (i) or 4.1 (ii) below. The bid shall include consent letter (as per format Annexure-D2, Section BDS-Vol. I) from the proposed HTLS Conductor manufacturer.

In addition to the Contract Performance Guarantee to be furnished by the bidder, the bid shall also include a confirmation letter from the manufacturer, stating that the manufacturer shall furnish back up performance guarantee in the form of bank guarantee for a period of two (02) years for amount equivalent to 10 % of the Ex-works cost of the HTLS conductor for successful performance of HTLS conductor to be manufactured and supplied under the contract.

OR

(d) Joint venture/Consortium consisting of two or more partners including the lead partner meeting the following conditions:

(i) All the Partners of JV/Consortium shall meet collectively the requirement of Clause 4.1 & 4.2 below.

(ii) Each of the partners of the Joint venture/Consortium must meet the minimum qualifying requirements as mentioned in clause No. 4.1 or 4.2 below.

4.0 Technical Experience

4.1 Experience of Manufacturer:-

The bidder shall be a manufacturer of conductor for the last seven years. The Manufacturer's experience should include the following:

(i) The Indian Conductor Manufacturer should have manufactured, tested and supplied at least 33% of the estimated quantity (i.e. length of conductor in kms)of High Temperature Low Sag (except GAP type) conductor having a minimum thirty three (33) number of strands or minimum 150 sq. mm Aluminum cross section area of same technology as that of conductor being offered during last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originally scheduled date of bid opening.

OR

(ii) Indian Conductor manufacturer not meeting the requirement as stipulated above at clause 4.1(i), it can also participate provided such manufacturers have manufactured, tested and supplied at least one thousand (1000) km of ACSR/ AAAC/ ACAR/ AACSR conductor and ten (10) km of High Temperature Low Sag (HTLS except GAP type) conductor of same technology as that of conductor being offered and having a minimum thirty three (33)-number of strands or minimum 150 sq. mm Aluminum cross section area during last seven (7) years and the same should have been in satisfactory operation for a period of at least 01(one) year as on the originally scheduled date of bid opening.

OR

(iii) In case, the Bidder is an Indian Entity meeting the requirement stipulated in above clause at 4.1 (ii) except HTLS Conductor, but has established manufacturing and testing facilities in India and manufactured HTLS conductor having minimum thirty three (33)-number of strands or minimum 150 sq. mm Aluminum cross section area shall also be considered, provided the bidder meets the following requirements.

The bidder must have manufactured HTLS conductor based on the technological support of the Principal/Parent/Subsidiary/Sister concern[##]company or Collaborator (s) and the bidder should have conducted following type tests on HTLS conductor manufactured in Indian facilityas on the originally scheduled date of bid opening.

A) On complete Conductor

i) DC resistance test on stranded conductor
ii) UTS test on stranded conductor at ambient & at designed elevated temperature (minimum 150 Deg C design temperature).

B) On Conductor Strand/ Core

i) Heat resistance test on Aluminium Alloy strands (not applicable for annealed aluminium).
ii) Torsion and Elongation tests on core strands/ composite core.
iii) Breaking load test on core strands/composite core and Aluminium/ Aluminium Alloy strands
iv) Conductivity test on thermal resistant Aluminium / Aluminium Alloy strands.

v) Glass transition temperature test (For composite core only).
vi) Flexural Strength test (For composite core only).

Note: The tests indicated at B) above should have been carried out by the Bidder/Licensee on their own or by their supplier of aluminium alloy strands, core/core strands.

Provided further, that the Principal/Collaborator(s) Parent/Subsidiary/Sister concern company of the bidder meets the qualifying requirements as per clause 4.1 (i) mentioned above.

However, in case of clause 4.1(iii) ,the warranty obligations for additional period of two (2) years over and above the warranty period as specified in the bidding documents shall be applicable for which an amount of 10% of the Ex-works cost of the HTLS conductor in the form of BG shall be furnished by the bidder. This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the bidder.

Further, for 4.1(iii), the bidder shall also submit the following along with the bid:

(i) A legally enforceable undertaking (jointly with the Collaborator(s)/ parent /principal/subsidiary/sister concern[##]company to guarantee quality, timely supply, performance and warranty obligations as specified for the core/conductor.

(ii) A confirmation letter from the Collaborator(s)/parent/principal/subsidiary/sister concern[##]company stating that it shall furnish performance guarantee for an amount of 10 % (Ten percent) of the Ex-works cost of HTLS conductor to be supplied in this package. This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the bidder.

(iii) A valid collaboration agreement for technology transfer / license to design, manufacture, test and supply of 220kV or above voltage level HTLS conductor/core of same technology as that of the conductor/core being offered in this package in India.

Note: 1: If Principal/collaborator/sister concern conductor manufacturer company is a foreign entity then it should submit performance certificate from an end user located in a country other than the country where the product has been manufactured during last seven (7**) years and must be in satisfactory operation[#] for at least two (2) years as on the originally scheduled date of bid opening.

Note2: In case bidder is a holding company, the technical experience referred to in clause 4.1 above shall be of that holding company only (i.e. excluding its subsidiary/parent/group/sister concern[##]companies etc.). In case bidder is a subsidiary of a holding company, the technical experience referred to in clause 4.1 above shall be of that subsidiary company only (i.e. excluding its holding company).

4.2 Experience of Erector:-

(i) The erector should have completed stringing of HTLS conductor for transmission line of cumulative circuit kilometres of not less than 50% of the estimated circuit kilometres of 220kV or higher voltage class in India as a prime contractor/sub-contractor or as a partner in a Joint Venture+ within the last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originallyscheduled date of bid opening.

OR

(ii) The erectors who do not have experience for HTLS conductor stringing shall also be considered if stringing have been completed for any type of conductor of 220kV or

higher voltage transmission line for cumulative circuit kilometres of not less than 100 km as a prime contractor or as a partner in a Joint Venture+ within the last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originally scheduled date of bid opening.

However, the warranty obligations for additional period of two (2) years over and above the warranty period as specified in the bidding documents shall be applicable for which an amount of 5 % (Five percent) of the cost of the total Project value in the form of BG shall be furnished by the bidder.

This warranty obligation guarantee shall be in addition to the contract performance guarantee to be submitted by the bidder.

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

5.0 Financial Position

5.1 The bidder should have adequate financial capability to meet the following minimum criteria:

a) Net Worth requirement of QR

Net Worth for last three financial years should be positive. (Total assets less total liabilities shall be positive) .

b) Minimum Average Annual Turnover (MAAT) requirement for the last three years of the bidder should not be less than;

MAAT = (Cost Estimate x 1.5/Completion period in years)

MAAT = Rs 19,75,26,451/-

(For the purpose of arriving at MAAT, total income, except non-recurring income e.g. Sale of fixed assets shall be considered).

Further the completion period for calculating MAAT shall be considered as 1 year even if the Contractual Completion period is less than 1 year.

c) Liquid Asset (LA) requirement of

LA = (Cost Estimate x 3/Completion period in months).

LA = Rs 3,29,21,075 /-

(For the purpose of arriving at LA, Current Assets less Inventories and prepaid expenses shall be considered i.e. LA=Current Asset-Inventories-Prepaid Expenses)

Further, the Completion Period for calculating LA shall be considered as 12 months even if the Contractual Completion period is less than 12 months. The cost Estimate referred above shall include GST and other taxes & duties.

In case bidder is a holding company, financial position criteria referred to in clause 5.1 above shall be of that holding company only (i.e. excluding its subsidiary/group companies). In case bidder is a subsidiary of a holding company, financial position criteria referred to in clause 5.1 above shall be of that subsidiary company only (i.e. excluding its holding company).

In case bidder has established manufacturing facility in India and yet to complete three (3) financial years, the Net Worth and average of the turnover as per financial statement for completed financial years shall be considered for the purpose of compliance to the specified Net Worth and MAAT requirements.

Relaxation for Start-Ups^/ MSEs:

Start-Ups^/ MSEs, meeting the specified requirements at Para 5.1 (a) above in Financial Position shall also be considered qualified if they meet Eighty (80) % of the requirement specified at Para 5.1(b) & 5.1(c) above in Financial Position.

^ Start-Ups as defined by DIPP, applicable as on the originallyscheduled date of bid opening.

6.0 Techno-Commercial and Legal Arrangement of Joint Venture/Consortium:

The figures for each of the partners of the joint venture/consortium shall be added together to determine the bidder's compliance with the minimum qualifying criteria set out in Clause 5.1 (a), (b) & (c) above. However, in order for a joint venture to qualify, partners of the joint venture/consortium must meet the following minimum criteria:

(a) All the partners of the JV/Consortium shall meet individually the Financial Position criteria given at 5.1 (a) above.
(b) The lead partner shall meet, not less than 40% of the minimum criteria given at Para 5.1 (b) & (c) above.
(c) Each of the other partner(s) shall meet not less than 25% of the criteria given at 5.1(b) & (c) above.

In case of Joint Venture/consortium, the following conditions shall also apply:

i. The bid, and in case of successful bid, the specified Form of Agreement shall be signed so as to be legally binding on all partners (Form enclosed).

ii. Each of the Partners of the Joint Venture/consortium must meet the minimum qualifying requirements given under clause 4.1 or 4.2. However, all the partners of Joint Venture/consortium shall meet collectively, the requirements of Clauses 4.1 and 4.2 above.

iii. One of the partners shall be nominated as Lead Partner, and 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. Thus the lead partner shall be authorized to represent the joint venture/ consortium for the purpose of execution of the Contract. The payment shall be in the name of joint venture/ consortium. The authorization shall be evidenced by submitting a Power of Attorney signed by legally authorized signatory of all the partners as per bidding documents.

iv. All 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 of this

effect shall be included in the authorization mentioned under (iii) above as well as in the Bid Form and in the Contract Form (in case of a successful bid).

Agreement entered into by the Joint Venture/consortium partners shall be submitted with the bid.

7 .0 Financial & Capacity Requirements

Bidder shall be financially sound.

i) Bidder shall submit a certificate from their Banker(s) as per format indicating various fund based/non fund based limits sanctioned to the bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the originallyscheduled date of bid opening.
ii) Bidder shall submit a monthly cash flow projection for execution of the contract having regard to implementation schedule. Bidder should indicate how funding gap in each month is proposed to be met.
iii) Bidder shall submit the complete Annual reports together with Audited statement of accounts of the company for last five years.

In the event the Bidder (being a company registered/ incorporated outside India or otherwise) is not able to furnish the above information of its own (separate), being a subsidiary company and the accounts are being consolidated with their Group/ Holding/ Parent/sister concern## company, the Bidder should submit the balance sheet, income statement, other information as required, of its own (separate), (not of its Group/ Holding/ Parent/ sister concern## company) duly certified by:

i) Their statutory Auditor; or
ii) A Certified Public Accountant; or
iii) Their Company Secretary certifying that it is based on audited accounts, as the case may be.

Similarly, if the Bidder happens to be a Group / Holding / Parent company, the Bidder should submit the above information of its own (separate), exclusive of its Subsidiaries, duly certified by:

i) Their statutory Auditor; or
ii) A Certified Public Accountant; or
iii) Their Company Secretary certifying that it is based on audited accounts, as the case may be.

Format A: Format for the bidders in respect of clause 4.1:

(Lead partner in case of Joint Venture) [In case of Joint Venture bidder, the QR data of each of the other partner (in support of meeting the requirement Annexure-A, Section-BDS, Volume-I of the bidding documents] is also is to be furnished, as applicable, using this format

Name of the Bidder (as per 4.1 above) (Single Firm/Lead Partner/ Partner of a Joint Venture)		
1.	No. of years the bidder is a manufacturer of Conductor	Last _____ years.
2.	Name of Contract	
3.	Contract Reference No. & Date of Award	
4.	Name and Address of the Purchaser/Utility for whom the Contract was executed by bidder/Partner e-mail ID Telephone No. Fax No.	 _____ _____
5	Scope of work involved in the supply of ACSR/AAAC/ACAR/AACSR and High Temperature Low Sag (HTLS) Conductor having at least minimum thirty three (33) number of strands or minimum 150 sq. mm Aluminum cross section area of same technology as that of conductor being offered in the package) under the above Contract	□ Manufacture □Testing □ Supply - for the above Contract for Conductor. (*Tick only whichever is/are applicable*)
5.1	Total no. of Kms. of ACSR/AAAC/ACAR/AACSR and High Temperature Low Sag(HTLS) Conductor supplied in the above Contract No. of strands supplied in the Contract detailed above (Bidder to furnish details of only ACSR/AAAC/ACAR/AACSR and High Temperature Low Sag(HTLS) Conductor having at least same or more number of strands as that of the conductor being offered in the package supplied in the Contract)	_____ Kms. _____ Nos.
5.2	Date of completion of the above Contract	_____ (dd/mm/yyyy)
5.3	No. of years the above referred Conductor is in operation as on the date of bid opening	_____ years

5.4	Details of documents submitted in support of stated experience/Contract/ design, infrastructure and manufacturing facilities and capacity and procedures including quality control	

(Use separate sheet for each experience/ Contract)

Format B: Format for the Erector in respect of clause 4.2:

(Lead partner in case of Joint Venture) [In case of Joint Venture bidder, the QR data of each of the other partner (in support of meeting the requirement Annexure-A, Section-BDS, Volume-I of the bidding documents] is also is to be furnished, as applicable, using this format

Name of the Erector (as per 4.2 above) (Single Firm/Lead Partner/ Partner of a Joint Venture)		
1.	No. of years of experience of erector	Last _____ years.
2.	Name of Contract	
3.	Contract Reference No. & Date of Award	
4.	Name and Address of the Purchaser/Utility for whom the Contract was executed by Erector e-mail ID Telephone No. Fax No.	 _____ _____
5	Scope of work for carrying out stringing works under the above Contract	□ Stringing of HTLS Conductor □ Stringing of Other Conductor (Specify the type of Conductor) - for the above Contract for (*Tick only whichever is/are applicable*)
5.1	Total no. of Kms. of carrying out stringing works in the above Contract	_____ Kms. _____ Nos.
5.2	Date of completion of the above Contract	_____ (dd/mm/yyyy)
5.3	No. of years the above Line/Work is in operation as on the date of bid opening	_____ years

5.4	Details of documents submitted in support of stated experience/Contract and capacity and procedures including quality control	
5.5	To be qualified for award of contract, whether bidder has provided evidence to the satisfaction of the Owner of their capability and adequacy of resources to carry out the contract effectively.	□ Yes □ No

(Use separate sheet for each experience/ Contract)

8.0 The Bidder shall furnish documentary evidence in support of the qualifying requirement stipulated as above.

Date:.....

Place:...

(Signature)……..

(Printed Name)……...

(Common Seal)……

(Designation)……..

ATTACHMENT-4

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

LIST OF APPROVED SUBCONTRACTORS

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Prior to award of Contract, the following details shall be completed indicating those sub-contractors proposed by the Bidder by Attachment to its bid that are approved by the Employer for engagement by the Contractor during the performance of the contract.

The following Subcontractors are approved for carrying out the item of the facilities indicated. Where more than one Subcontractor is listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. No Subcontractors shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

Item of Facilities	Approved Subcontractors	Nationality

ATTACHEMENT-5

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

(Commercial Deviations)

Dear Sirs,

The following are the Commercial Deviations and variations from and exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except for these deviations, the entire work shall be performed as per your specifications and documents.

S.No.	Volume/Clause No.	Ref./Page No.	Details of Deviation	Reason/ Justification of Deviation	Withdrawal Price in Rupees

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-6

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(DEVIATIONS ON IMPORTANT CONDITIONS)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sirs,

Sub.: Deviation on Important Conditions along with their withdrawal price.

The following are the Deviations/variations/exceptions to the provisions of important conditions stipulated in Clause 11.2 of ITB, Conditions of Contract, Volume-I. We undertake to execute the contract in line with the provisions of bidding documents in respect of above said clauses in case DTL agree to pay us the withdrawal price indicated below against each such deviations/variations/exceptions.

Volume of bidding document	Section	Clause No.	Page No.	Statement of deviations/ variations/ exceptions	Withdrawal Price in Rupees

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-7

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

TECHNICAL DEVIATIONS

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sir,

The following are the Technical Deviations and variations from and exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except for these deviations, the entire work shall be performed as per your specifications and documents.

S.No.	Volume/Clause No.	Ref./Page No.	Details of Deviation	Reason/ Justification of Deviation	Withdrawal Price in Rupees

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: 1. Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.
2. The deviations and variations, if any, shall be brought out separately for each of the equipment.

ATTACHMENT-8

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(Additional Information)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We have enclosed with our proposal the following additional information for the subject package.

Sl. No.	Brief description of Information	Ref. & Page No.

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-9

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(BOUGHT-OUT & SUB-CONTRACTED ITEMS)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We hereby furnish the details of the items/sub-assemblies; we propose to buy for the purpose of subject package.

Sl. No.	Item Description	Quantity Proposed be bought/Sub-contracted	Source of Supply

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-10

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(WORK COMPLETION SCHEDULE)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

We hereby declare that the following Work Completion Schedule shall be followed by us for the subject package.

Sl. No.	Description of Work	Period in Months (from the date of Award of Contract)
1.	Completion of detailed engineering a) Commencement b) Completion	
2.	Procurement of equipment & raw materials	
3.	Tests a) Commencement b) Completion	
4.	Manufacturing a) Commencement b) Completion	
5.	Shipments a) Commencement b) Completion	
6.	Establishment of site office	
7.	Receipt at final destination at site a) Commencement b) Completion	
8.	Erection a) Commencement b) Completion	
9.	Testing & Commissioning a) Commencement b) Completion	

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-11

Tender No. T25R220472

Package-III: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

(LIST OF SPECIAL TOOLS & TACKLES)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We hereby furnish below the list of special tools & tackles for erection and commissioning of equipment for the subject package. The prices for these tools & tackles are already included in the lumpsum bid price.

Sl. No.	For Equipment	Item Description	Unit	Quantity

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-12

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(INFORMATION REGARDING EX-EMPLOYEES OF "DTL")

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We hereby furnish the details of Ex-Employees of DTL who had retired/resigned at the level of General Manager and above from DTL and subsequently have been employed by us.

Sl. No.	Name of Person with designation in DTL	Date of Retirement/ resignation from DTL	Date of joining and designation in our Organisation

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-14

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

(PRICE ADJUSTMENT DATA)

Refer BDS

ATTACHMENT-15

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(GUARANTEE DECLARATION)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sirs,

We declare that the equipment offered shall meet the rating and performance requirements stipulated in Technical specification for various equipment or indicated in Data requirement. Further the various parameter of the HTLS conductor, based on which average ohmic losses shall be evaluated in accordance with clause no. 1.10 of section-II of technical specification, Volume-II, are given herein below :

Further, the guaranteed AC resistance & Guaranteed Average Ohmic loss of the HTLS conductor, based on which differential price evaluation shall be evaluated in accordance with clause no. 1.3.2 of section-II of technical specification, Volume-II, are given herein below :

S.No	Guaranteed AC Resistance at 1200 A (in Ohm/Km) (Rac)	Guaranteed Average Ohmic loss (in KW) = 34473.6 x R_{ac}
1.		

Date:.....

Place:.....

(Signature).....

(Printed Name).....

(Designation).....

(Common Seal).....

ATTACHMENT-16

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

INTEGRITY PACT

Integrity Pact

Between

Delhi Transco Limited

having its Registered Office at Shakti Sadan, Kotla Road, New Delhi -110 002

herein after referred to as

"DTL"

and

_____

(Insert the name of the Sole Bidder/Lead Partner of Joint Venture)

having its Registered Office at _____

(Insert full Address)

_____

and

_____

(Insert the name of the Partner(s) of Joint Venture/agent, as applicable)

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

having its Registered Office at _____

(Insert full Address)

_____

Herein after referred to as

"The Bidder/Contractor"

Preamble

DTL intends to award, under laid-down organisation procedures, contract(s) for _____ Package

(Insert the name of the package)

and Specification Number _____DTL values full compliance with all relevant

(Insert Specification Number of the Package)

laws and regulations, and the principles of economical use of resources, and of fairness and transparency in its relations with its Bidders/Contractors.

In order to achieve these goals, DTL and the above named Bidder/Contractor enter into this agreement called **'Integrity Pact'** which will form a part of the bid.

It is hereby agreed by and between the parties as under:-

Section I – Commitments of DTL

(1) DTL commits itself to take all measures necessary to prevent corruption and to observe the following principles:

(a) No employee of DTL, personally or through family members or relative(s), will in connection with the tender, or the execution of the contract, demand, take a promise for or accept, for him/herself or third person, any material or other benefit which he/she is not legally entitled to.

(b) DTL will, during the tender process treat all Bidder(s) with equity and fairness. DTL will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or for the execution of contract.

(c) DTL will exclude form evaluation of Bids its such employee(s) who has any personnel interest in the Companies/Agencies participating in the Bidding/Tendering process.

The action stipulated in this Integrity Pact is without prejudice to any other Legal action that may follow in accordance with the provisions of the relevant law in force relating to any civil or criminal proceedings.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

(2) If Managing Director obtains information on the conduct of any employee of DTL which is a criminal offence under the relevant Anti-Corruption Laws of India or illegal under the Indian Contract Act or Indian Laws, or if there be a substantive suspicion in this regard, he will inform its Chief Vigilance Officer and in addition can initiate disciplinary actions under its Rules.

Section II – Commitments of the Bidder/Contractor

(1) The Bidder/Contractor commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

(a) The Bidder/Contractor will not, directly or through any other person or firm, offer, promise or give to DTL, or to any of DTL's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange an advantage during the tender process or the execution of the contract.

(b) The Bidder/Contractor will not enter into any illegal agreement or understanding, whether formal or informal with other Bidders/Contractors. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or actions to restrict competitiveness or to introduce cartelization in the bidding process.

(c) The Bidder/Contractor will not commit any criminal offence under the relevant Anti-Corruption Laws of India, further, the Bidder/Contractor will not use for illegitimate purposes or for purposes of restrictive competition or personal gain, or pass on to others, any information provided by DTL as part of the business relationship, regarding plans, technical proposals and business details, including information of any type contained or transmitted electronically.

(d) The Bidder/Contractor of foreign origin shall disclose the name and address of the Agents/representatives in India, if any, involved directly or indirectly in the Bidding. Similarly, the Bidder/Contractor of Indian Nationality shall furnish the name and address of the foreign principals, if any, involved directly or indirectly in the bidding.

(e) The Bidder/Contractor will, when presenting his bid, disclose any and all payments he has made, or committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and/or with the execution of the contract.

(f) The Bidder/Contractor will not misrepresent facts or furnish false/forged documents/information in order to influence the bidding process or the execution of the contract to the detriment of DTL.

(2) The Bidder/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

Section III – Disqualification from tender process and exclusion from future contracts

(1) If the bidder, before contract award, has committed a serious transgression through a violation of Section II or in any other form such as to put his reliability or credibility as Bidder into question, DTL may disqualify the Bidder from the tender process or terminate the contract, if already signed, for such reason.

(2) If the Bidder/Contractor has committed a serious transgression through a violation of Section II such as to put his reliability or credibility into question, DTL may after following due procedures also exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder/Contractor and the amount of the damage. The exclusion will be imposed for a minimum of 12 months and maximum of 3 years and it has to be decided by the Competent authority.

(3) If the Bidder/Contractor can prove that he has restored/Recouped the damage caused by him and has installed a suitable corruption prevention system, DTL may revoke the exclusion prematurely with the approval of Competent Authority.

Section IV – Liability for violation of Integrity Pact

(1) If DTL has disqualified the Bidder from the tender process prior to the award under Section III, DTL may forfeit the Bank Guarantee under the Bid.

(2) If DTL has terminated the contract under Section III, DTL may forfeit the Contract Performance Guarantee of this contract besides resorting to other remedies under the contract.

Section V – Previous Transgression

(1) The Bidder shall declare in his Bid that no previous transgressions occurred in the last 3 years with any other Public Sector Undertaking or Government Department that could justify his exclusion from the tender process.

(2) If the bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section VI – Equal treatment to all Bidders/Contractors

(1) DTL will enter into agreements with identical conditions as this one with all Bidders.

(2) DTL will disqualify from the tender process any bidder who does not sign this Pact or violate its provisions.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

Section VII – Punitive Action against violating Bidders/Contractors

If DTL obtains knowledge of conduct of a Bidder or a Contractor or his subcontractor or of an employee or a representative or an associate of a Bidder or Contractor or his Subcontractor which constitutes corruption, or if DTL has substantive suspicion in this regard, DTL will inform the Chief Vigilance Officer (CVO).

(*)Section VIII – Independent External Monitor/Monitors

(1) DTL has appointed a panel of Independent External Monitors (IEMs) for this Pact with the approval of Central Vigilance Commission (CVC), Government of India, out of which one of the IEMs has been indicated in the NIT.

(2) The IEM is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement. He has right of access to all project documentation. The IEM may examine any complaint received by him and submit a report to Managing Director, DTL at the earliest. He may also submit a report directly to the CVO and the CVC, in case of suspicion of serious irregularities attracting the provisions of the PC Act. However, for ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter shall be referred to the full panel of IEMs, who would examine the records, conduct the investigations and submit report to Managing Director, DTL, giving joint findings.

(3) The IEM is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Managing Director, DTL.

(4) The Bidder(s)/Contractor(s) accepts that the IEM has the right to access without restriction to all documentation of DTL related to this contract including that provided by the Contractor/Bidder. The Bidder/Contractor will also grant the IEM, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his documentation. The same is applicable to Subcontractors. The IEM is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s)/Sub-Contractor(s) with confidentiality.

(5) DTL will provide to the IEM information as sought by him which could have an impact on the contractual relations between DTL and the Bidder/Contractor related to this contract.

(6) As soon as the IEM notices, or believes to notice, a violation of this agreement, he will so inform the Managing director, DTL and request the Managing Director, DTL to discontinue or take corrective action, or to take other relevant action. The IEM can in this regard submit non-binding recommendations. Beyond this, the IEM has no right

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the IEM shall give an opportunity to DTL and the Bidder/Contractor, as deemed fit, to present its case before making its recommendations to DTL.

(7) The IEM will submit a written report to the Managing Director, DTL within 8 to 10 weeks from the date of reference or intimation to him by DTL and should the occasion arise, submit proposals for correcting problematic situations.

(8) If the IEM has reported to the Managing Director, DTL a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Managing Director, DTL has not, within the reasonable time taken visible action to proceed against such offence or reported it to the CVO, the Monitor may also transmit this information directly to the CVC, Government of India.

(9) The word '**IEM**' would include both singular and plural.

(*) This Section shall be applicable for only those packages wherein the IEMs have been identified in Section – I: Invitation for Bids and/or Clause 9 in Section –III : Conditions of Contract, Volume-I of the bidding documents.

Section IX – Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor after the closure of the contract and for all other Bidder's six month after the contract has been awarded.

Section X – Other Provisions

(1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the establishment of DTL. The Arbitration clause provided in the main tender document/contract shall not be applicable for any issue/dispute arising under Integrity Pact.

(2) Changes and supplements as well as termination notices need to be made in writing.

(3) If the Contractor is a partnership firm or a consortium or Joint Venture, this agreement must be signed by all partners, consortium members and Joint Venture partners.

(4) Nothing in this agreement shall affect the right of the parties available under the General conditions of Contract (CC/GCC) and Special Conditions of Contract (SCC).

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

(5) Views expressed or suggestions/submissions made by the parties and the recommendations of the CVO/IEM[#] in respect of the violation of this agreement, shall not be relied on or introduced as evidence in the arbitral or judicial proceedings (arising out of the arbitral proceedings) by the parties in connection with the disputes/differences arising out of the subject contract.

CVO shall be applicable for packages wherein IEM are not identified in Section IFB/BDS of Condition of Contract, Volume-I. IEM shall be applicable for packages wherein IEM are identified in Section IFB/BDSof Condition of Contract. Volume-I

(6) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(Office Seal)

Name :_____

Designation: _____

Witness 1 :_____

(Name &Address)_____

_____

_____

Witness 2 :_____

(Name &Address)_____

_____

_____

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

Name : _____

Designation: _____

Witness 1 :_____

(Name & Address)_____

_____

_____

Witness 2 :_____

(Name & Address)_____

_____

_____

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(Office Seal)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

ATTACHMENT-18

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(CHECK LIST)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We have enclosed with our proposal the following additional information for the subject package.

	Particulars	
Bid Validity	Whether Bid is valid is as stipulated in ITB from the date of bid opening.	Yes/No
Bid Security amount	Whether Bid security amount and form is enclosed as per ITB.	Yes/No
Bid Security Validity	Whether bid security is valid for a period as stipulated in ITB.	Yes/No
Bid Signatory	Power of Attorney of Signatory of Bid as per Section ITB	Yes/No
	Technical Specification	
1.	Is the material offered according to the specifications required by the purchaser, if not, please state the deviation from the same and deviation statement thereof	Yes/No
2	Have you submitted copies of Type Test Certificates in physical form in respect of material offered?	Yes/No
3	Have you submitted dimension drawings leaflets, descriptive and illustrative catalogues in physical form (if necessary)?	Yes/No
4	Whether product conforms to relevant ISS and our technical particulars?	Yes/No
5	Have you submitted in physical form (i) the copy of NIT duly signed & stamped on each page ,(ii) copies of past supplies and (iii) performance certificates?	Yes/No

6	Whether testing facilities as per IS for conducting various tests are available with you?	Yes/No
	Terms and Condition	
1.	Do you agree to all clauses of General Conditions of our tender documents?	Yes/No
2	If you do not agree to any/all the clauses, please state clearly the clause which you do not agree and state the modification in respect of clauses of which you do not agree.	Yes/No
3	Do you agree to furnish security deposit if order is placed with you?	Yes/No
4	Whether agreeable to DTL's liquidate damages clause for late completion of work.?	Yes/No
5	Are you agreeable to inspection clause?	Yes/No
6	Any further particulars not otherwise covered in the tender specifications submitted physically?	Yes/No
7	Quantity offered against each item be quoted. Are you prepared to accept order for bigger quantity as per NIT ?	Yes/No
Part-I	**Techno-commercial Bid**	
a)	Whether undertaking for corrupt & fraudulent practice signed and submitted.	Yes/No
b)	Whether Bid form duly completed, signed and submitted.	Yes/No
c)	Whether following Attachments submitted:	Yes/No
d)	Attachment 1 :"Bid security".	Yes/No
e)	Attachment 2: "Power of Attorney".	Yes/No
f)	Attachment 3: "Qualifying Requirement Data".	Yes/No
g)	Attachment 4: "List of approved Subcontractors".	Yes/No
h)	Attachment 5: "Commercial Deviations".	Yes/No
i)	Attachment 6: "Deviations on important Conditions".	Yes/No
j)	Attachment 7: "Technical Deviations".	Yes/No
k)	Attachment 8: "Additional Information".	Yes/No
l)	Attachment 9: "Bought Out and Sub-contracted items"	Yes/No
m)	Attachment 10: "Work completion schedule" .	Yes/No
n)	Attachment 11: "List of Special Tools and Tackles" .	Yes/No
o)	Attachment 12: "Information regarding ex-employees of Employer in Bidder's firm".	Yes/No
p)	Attachment 14:"Price Adjustment Data."	Yes/No
q)	Attachment 15: "Guarantee Declaration".	Yes/No
r)	Attachment 16: "Integrity Pact".	Yes/No
s)	Attachment 18: "Check list".	Yes/No
t)	Attachment 19: Affidavit of Self certification regarding Minimum	Yes/No

	Local Content in line with PPP-MII order **and MoP Order, as applicable** (submission of Hard Copy in 'Original'), to be submitted on a non-judicial stamp paper of Rs. 100/-.	
u)	Attachment 20: Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with PPP-MII order and **MoP Order, as applicable** (submission of Hard Copy in 'Original') to be submitted on the letter head of the auditor/ cost accountant.	Yes/No
v)	Attachment 21: Undertaking for not indulging in Corrupt & Fraudulent practice	Yes/No
w)	Attachment 22: Certification by the Bidder as per DoE Order no-F.No.7/10/2021-PPD(1) dt 23.02.2023 in line with ITB Clause 1.2.2 (In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture)	Yes/No
x)	Attachment no 23: Details of complete type test report of all the equipment as per QR and in accordance with latest IEC / NIT in the prescribed format	Yes/No
y)	Attachment no 24: Indemnity Bond	Yes/No
Part-II	Price Bid	
a)	Whether Price Bid submitted.	Yes/No
b)	Whether Bid form duly completed, signed and submitted.	Yes/No
c)	Whether following Price Schedules submitted:	Yes/No
d)	Schedule 1: " Price break-up Plant and Equipment (including Mandatory Spares) to be supplied."	Yes/No
e)	Schedule 2: "Break-up of Local Transportation, Insurance and other Incidental Services."	Yes/No
f)	Schedule 3: "Price Breakup of Installation Charges."	Yes/No
g)	Schedule 4: "Grand summary of the quoted bid price."	Yes/No
Tender Document/NIT	Whether Tender document along with all amendments duly signed & stamped on each page submitted.	Yes/No

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

Note: **(i)** Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Attachment.

(ii) Replies against each item should be complete without any ambiguity. Terms such as refer covering letter etc. shall not be acceptable unless the replies/ information are specific and complete

ATTACHMENT-19

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Format for Affidavit of Self certification regarding Local Content in line with PPP-MII order dated 15/06/2017, its revision dated **16/09/2020**& their latest amendments thereof **and MoP Order dated 16/11/2021** & their latest amendments thereof, as applicable, to be provided on a non-judicial stamp paper of Rs. 100/-.

Date:

I _____S/o, D/o, W/o, _____Resident of_____ hereby solemnly affirm and declare as under:

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Order, 2017 of Government of India issued vide Notification No:P-45021/2/2017 -BE-II dated 15/06/2017, its revision dated **16/09/2020**& their latest amendments thereof, (hereinafter **PPP-MII order**), and 'Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content)' order **dated 16/11/2021** & their latest amendments thereof, issued by Ministry of Power (hereinafter **MoP order**) and **any subsequent modifications/ Amendments, if any** and

That the information furnished hereinafter is correct to the best of my knowledge and belief and I undertake to produce relevant records before the procuring entity/DTL or any other Government authority for the purpose of assessing the local content of goods/services/works supplied by me for **Turnkey Package (Insert the name of Package and Tender no.)**.

That the local content for all inputs which constitute the said goods/services/works has been verified by me and I am responsible for the correctness of the claims made therein.

That the 'Local Content 'as defined in the PPP-MII order and MoP order in the goods/services/works supplied by me for Turnkey Package (Insert the name of Package and Tender no.) is …… percent (%).

That the goods/services/works supplied by me for **Turnkey Package (Insert the name of Package and Tender no.)** meet the 'Local Content' requirement as defined in the PPP-MII order **and MoP order for 'Class –I local supplier'**.

That the value addition for the purpose of meeting the 'Local Content 'has been made by me at …… (*Enter the details of the location(s) at which value addition is made)*.

That in the event of the local content of the goods/services/works mentioned herein is found to be incorrect and not meeting the prescribed Local Content criteria, based on the assessment of procuring agency (ies)/DTL/Government Authorities for the purpose of assessing the local content, action shall be taken against me in line with the PPP-MII order, **MoP order** and provisions of the Integrity pact/ Bidding Documents.

I agree to maintain the following information in the Company's record for a period of 8 years and shall make this available for verification to any statutory authority.

i Name and details of the Local Supplier
(Registered Office, Manufacturing unit location, nature of legal entity)

ii. Date on which this certificate is issued

iii. Goods/services/works for which the certificate is produced

iv. Procuring entity to whom the certificate is furnished

v. Percentage of local content claimed and whether it meets the Local Content prescribed for **'Class –I local supplier'**

vi. Name and contact details of the unit of the Local Supplier (s)

vii. Sale Price of the product

viii Ex-Factory Price of the product

ix. Freight, insurance and handling

x. Total Bill of Material

xi List and total cost value of input used to manufacture the Goods/to provide services/in construction of works

xii. List and total cost of input which are domestically sourced. Value addition certificates from suppliers, if the input is not in-house to be attached

xiii. List and cost of inputs which are imported, directly or indirectly

For and on behalf of…… (Name of firm/entity)
Authorized signatory (To be duly authorized by the Board of Directors)
<Insert Name, Designation and Contact No.>

ATTACHMENT-20

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with **PPP-MII order** dated 15/06/2017, its revision dated **16/09/2020** & their latest amendments thereof, **and MoP order** dated **16/11/2021** & their latest amendments thereof, as applicable *[to be submitted on the letter head of the issuer.]*

Dear Sir,

We have read and understood the provisions of "Public Procurement (Preference to Make in India) Order, 2017" dated 15/06/2017, its revision dated **16/09/2020** & their latest amendments thereof[hereinafter, "PPP-MII Order"] issued by Department for promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India, and 'Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content)' order dated **16/11/2021** & their latest amendments thereof issued by Ministry of Power [hereinafter, "MoP order"] and **any subsequent modifications/ Amendments, if any**.

In line with the provisions of the PPP-MII Order **and MoP Order**, M/s. ……*[Enter the name of the Bidder] [*hereinafter, **"Class-I Local Supplier***]* have submitted an Affidavit of self-certification to M/s. Delhi Transco Limited [hereinafter, DTL] regarding Local Content in Goods/Services/Works to be supplied by the **"Class-I Local Supplier"** for **Turnkey Package (Insert the name of Package and Tender No.)**, wherein they have agreed to abide by the terms and conditions of the PPP-MII Order **and MoP Order**.

Further, in line with the PPP-MII Order, the statutory auditor or cost auditor of the company shall provide a certificate giving the percentage of Local Content in the Goods/Service/Works to be supplied by the **"Class-I Local Supplier"** for **Turnkey Package (Insert the name of Package and Tender No.)**.

Accordingly, we, the Statutory Auditor(s) / Cost auditor of the **"Class-I Local Supplier"**, certify that the Local Content as defined under the PPP-MII **and MoP Order**, in the Goods/Service/Works to be supplied by the **"Class-I Local Supplier"** for **Turnkey Package (Insert the name of Package and Tender No.)** is …….. Percentage [*specify the percentage of Local content*].

For and on behalf of, Date:

<<Statutory Auditor's/Cost auditor's attestation>>
Firm Reg No. Membership No.

Note: This is a guiding format. In case the bidder submits the certificate in a format different from the above, the same may be considered provided it meets the intent and purpose, as may be ascertained by DTL.

ATTACHMENT-21

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

UNDERTAKING FOR NOT INDULGING IN CORRUPT & FRAUDULENT PRACTICE

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We declare that all the documents submitted or would be submitted by us in this tender are/would be genuine, and in case any discrepancy is found in the declaration/documents submitted by us at any stage, action can be taken against us as deemed fit by DTL.

We further declare that in the submission of this tender no agent, middleman or any intermediary has been, or will be engaged to provide any services, or any other item of work related to the award and performance of this contract. We further confirm and declare that no agency commission or any payment which may be construed as an agency commission has been, or will be, paid and that the tender price does not include any such amount.

We acknowledge the right of the employer, if he finds to the contrary, to declare, our tender to be non-compliant and if the contract has been awarded to declare the contract null and void.

STAMP & SIGNATURE OF AUTHORISED SIGNATORY

ATTACHMENT-22

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Certification by the Bidder as per order no. F.No.7/10/2021-PPD(1) dated **23/02/2023** issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India (DoE Order) in line with ITB Clause 1.2.2

(In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture)

Dear Sir,

We have read and understood the provisions of Order no.F.No.7/10/2021-PPD(1)(Order Public Procurement no.4) dated **23/02/2023** regarding "Restriction under Rule 144(xi) of General Financial Rules" issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India [hereinafter collectively "**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 not from such a country or, if from such a country, has been registered with the Competent Authority and will not subcontract any work to a subcontractor/sub vendor from such countries unless such subcontractor/sub vendor fulfils all requirement in this regard and is eligible to be considered. [*Where applicable, evidence of* ***valid registration by the Competent Authority shall be attached***.]

We also undertake to comply the above said DoE order dt. 23.02.2023 and **any subsequent modifications/ Amendments, if any**.

We further declare that any misrepresentation or submission of false/forged document/information in this regard this would be ground for immediate termination and further legal action in accordance with law.

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

ATTACHMENT-23

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder has to submit details of complete type test report of all the equipment as per QR and in accordance with latest IEC / NIT in the below format

S. No.	Equipment	IEC Clause Ref.	Type of test	Type Test Description/
				a) Manufacturer b) Model no. test conducted on c) Report No.: d) Lab. Name: e) Date of Test: f) Date of Issue: g) IEC: h) Ref Page

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

ATTACHMENT-24

Tender No. T25R220472

Package-III: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(INDEMNITY BOND)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sir,

One set of Indemnity Bond on non judicial stamp paper of Rs 100/-, duly signed by our authorized representative and stamped is annexed herewith for loss caused in case of legal proceedings w.r.t Infringement of Patent .

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

INDEMNITY BOND

By this bond M/s ___*(Company Name)*_____ having its registered office at __(*Address*)_____ hereinafter referred to as 'Bidder' binds himself to pay to Delhi Transco Limited (DTL) hereinafter referred to as 'Principal', the sum as determined by DTL as a consequence of infringement of patent by _*(Company Name),* in the event any legal proceedings initiated or otherwise with respect to violation of the patent against DTL and/or the usage of product which infringes the patent in relation to the tender for Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony - Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis against Tender No T25R220472.

In witness whereof the Bidder put his hand on this _____ day of _____, 2026.

BIDDER

WITNESSES:-

1.

2.

SECTION-II

ATTACHMENTS (PACKAGE-IV)

ATTACHMENT - 1

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

(Bid Security Form)

Please Refer Volume I (Conditions of Contract), Section: Forms & Procedures

ATTACHMENT – 2

Tender No. T25R220472

Package-IV: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

(Power of Attorney)

Please Refer Volume I (Conditions of Contract), Section : Forms & Procedures.

or

Bidders may use their own performa for furnishing the required information with bid.

ATTACHMENT-3

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(QUALIFYING REQUIREMENT DATA)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

*We have submitted bid as Individual Firm/

*We have submitted bid as Joint Venture/Consortium of following firms:

(* Strike-off whichever is not applicable)

(i) …….
(ii) …….
(iii) …….

*We wish to qualify through clause no. 1.1 (a) of Annexure-A (BDS) of Volume-I.
*We wish to qualify through clause no. 1.1 (b) of Annexure-A (BDS) of Volume-I
*We wish to qualify through clause no. 1.1 (c) of Annexure-A (BDS) of Volume-I
*We wish to qualify through clause no. 1.1 (d) of Annexure-A (BDS) of Volume-I

(* Strike-off whichever is not applicable)

*We wish to qualify for Manufacturing Experience through clause no. 2.1 (i) of Annexure-A (BDS) of Volume-I.
*We wish to qualify for Manufacturing Experience through clause no. 2.1 (ii) of Annexure-A (BDS) of Volume-I.
*We wish to qualify for Manufacturing Experience through clause no. 2.1 (iii) of Annexure-A (BDS) of Volume-I.

(* Strike-off whichever is not applicable)

In accordance with the QR specified in Annexure-A (BDS) of Volume I (relevant extracts have been brought out herein, however, in case of any discrepancy, Annexure-A (BDS) shall prevail, we are furnishing the following details/document in support of meeting the QR for HTLS Reconductoring Package.

1.0 The details / documents as listed below are furnished in the bid :

a) Copies of original documents defining the constitution or legal status, place of registration and principal place of business; written power of attorney of the signatory of the bid to commit the bidder;

b) The qualification and experience of key personnel proposed for carrying out the work:

c) Proposal for subcontracting elements of the supply of materials amounting to more than 10% of the Bid Price for each element;

d) Litigation History : Information regarding any current litigation in which the bidder is involved, the parties' concerned and disputed amount;

1.1 For Bids submitted by a Joint Venture/Consortium** of firms as partners shall comply with following requirements:

a) The bid shall include all the information listed in sub clause 1.0 (a) to 1.0 (d) above for each Joint Venture/Consortium partner.

b) The bid and in case of successful bid, the form of Agreement shall be signed so as to be legally binding on all partners as per the Performa in bidding documents.

[**To be submitted only in case of Joint Venture. Strike-off in case of individual firm.]

1.2 (i) HTLS Conductor Manufacturer shall furnish details / documents that it has adequate 220 kV HTLS Conductor design infrastructure and capacity and procedures including Quality Control.

(ii) Erector shall furnish details / documents that it has adequate erection facilities and capacity and procedures including Quality Control.

2.0 **General Information**

The information in this form is to be completed for individual firms and each Partner of a Joint Venture/Consortium.

Where the Bidder proposes to use named subcontractor(s) for critical components of the works or for work contents in excess of 10 percent of the bid price, the following information should also be furnished for the subcontractor(s)].

Sl. No.	Particulars	For Individual Firm	In case of Joint Venture/ Consortium			
			For Lead Partner	For Other Partner - 1	For Other Partner - 2	For Other Partner - 3
1.	Name of the Firm					
2.	Head Office/ Registered Office Address					
3.	Telephone					
4.	Fax					
5.	Contact Person					

Sl. No.	Particulars	For Individual Firm	In case of Joint Venture/ Consortium			
			For Lead Partner	For Other Partner - 1	For Other Partner - 2	For Other Partner - 3
6.	Place of Incorporation/ Registration					
7.	Year of Incorporation/ Registration					
8.	Authorized signatory of the bid					
9.	Whether copy of Power of Attorney of the signatory to commit the bidder is attached	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No
10.	Details/documentary evidence submitted in support of stated HTLS Conductor design infrastructure and erection facilities and capacity and procedures including quality control					

3.0 Eligible Bidders:

a) Manufacturer of Conductor having experience of manufacturing, supply, stringing, testing & commissioning of EHV transmission line Conductors as per the experience criteria mentioned for Manufacturing and ETC of Conductors as per clause 4.1 & 4.2 respectively.

OR

b) Manufacturer of Conductor having experience of manufacturing, supply of conductor as per criteria mentioned in clause 4.1 and erection is carried out through an erector meeting experience criteria as per clause 4.2. The bid shall include consent letter (as per format Annexure-D1, Section BDS-Vol. I) from the proposed erector.

OR

c) Erectors who have the experience as per the criteria mentioned in 4.2 below and supply HTLS Conductor from such manufacturer(s) who fulfills the criteria mentioned at 4.1 (i) or 4.1 (ii) below. The bid shall include consent letter (as per format Annexure-D2, Section BDS-Vol. I) from the proposed HTLS Conductor manufacturer.

In addition to the Contract Performance Guarantee to be furnished by the bidder, the bid shall also include a confirmation letter from the manufacturer, stating that the manufacturer shall furnish back up performance guarantee in the form of bank guarantee for a period of two (02) years for amount equivalent to 10 % of the Ex-works cost of the HTLS conductor for successful performance of HTLS conductor to be manufactured and supplied under the contract.

OR

(d) Joint venture/Consortium consisting of two or more partners including the lead partner meeting the following conditions:

(i) All the Partners of JV/Consortium shall meet collectively the requirement of Clause 4.1 & 4.2 below.

(ii) Each of the partners of the Joint venture/Consortium must meet the minimum qualifying requirements as mentioned in clause No. 4.1 or 4.2 below.

4.0 Technical Experience

4.1 Experience of Manufacturer:-

The bidder shall be a manufacturer of conductor for the last seven years. The Manufacturer's experience should include the following:

(i) The Indian Conductor Manufacturer should have manufactured, tested and supplied at least 33% of the estimated quantity (i.e. length of conductor in kms)of High Temperature Low Sag (except GAP type) conductor having a minimum thirty three (33) number of strands or minimum 150 sq. mm Aluminum cross section area of same technology as that of conductor being offered during last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originally scheduled date of bid opening.

OR

(ii) Indian Conductor manufacturer not meeting the requirement as stipulated above at clause 4.1(i), it can also participate provided such manufacturers have manufactured, tested and supplied at least one thousand (1000) km of ACSR/ AAAC/ ACAR/ AACSR conductor and ten (10) km of High Temperature Low Sag (HTLS except GAP type) conductor of same technology as that of conductor being offered and having a minimum thirty three (33)-number of strands or minimum 150 sq. mm Aluminum cross section area during last seven (7) years and the same should have been in satisfactory operation for a period of at least 01(one) year as on the originally scheduled date of bid opening.

OR

(iii) In case, the Bidder is an Indian Entity meeting the requirement stipulated in above clause at 4.1 (ii) except HTLS Conductor, but has established manufacturing and testing facilities in India and manufactured HTLS conductor having minimum thirty three (33)-number of strands or minimum 150 sq. mm Aluminum cross section area shall also be considered, provided the bidder meets the following requirements.

The bidder must have manufactured HTLS conductor based on the technological support of the Principal/Parent/Subsidiary/Sister concern[##]company or Collaborator (s) and the bidder should have conducted following type tests on HTLS conductor manufactured in Indian facilityas on the originally scheduled date of bid opening.

A) On complete Conductor

i) DC resistance test on stranded conductor
ii) UTS test on stranded conductor at ambient & at designed elevated temperature (minimum 150 Deg C design temperature).

B) On Conductor Strand/ Core

i) Heat resistance test on Aluminium Alloy strands (not applicable for annealed aluminium).
ii) Torsion and Elongation tests on core strands/ composite core.
iii) Breaking load test on core strands/composite core and Aluminium/ Aluminium Alloy strands
iv) Conductivity test on thermal resistant Aluminium / Aluminium Alloy strands.

v) Glass transition temperature test (For composite core only).
vi) Flexural Strength test (For composite core only).

Note: The tests indicated at B) above should have been carried out by the Bidder/Licensee on their own or by their supplier of aluminium alloy strands, core/core strands.

Provided further, that the Principal/Collaborator(s) Parent/Subsidiary/Sister concern company of the bidder meets the qualifying requirements as per clause 4.1 (i) mentioned above.

However, in case of clause 4.1(iii) ,the warranty obligations for additional period of two (2) years over and above the warranty period as specified in the bidding documents shall be applicable for which an amount of 10% of the Ex-works cost of the HTLS conductor in the form of BG shall be furnished by the bidder. This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the bidder.

Further, for 4.1(iii), the bidder shall also submit the following along with the bid:

(i) A legally enforceable undertaking (jointly with the Collaborator(s)/ parent /principal/subsidiary/sister concern[##]company to guarantee quality, timely supply, performance and warranty obligations as specified for the core/conductor.

(ii) A confirmation letter from the Collaborator(s)/parent/principal/subsidiary/sister concern[##]company stating that it shall furnish performance guarantee for an amount of 10 % (Ten percent) of the Ex-works cost of HTLS conductor to be supplied in this package. This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the bidder.

(iii) A valid collaboration agreement for technology transfer / license to design, manufacture, test and supply of 220kV or above voltage level HTLS conductor/core of same technology as that of the conductor/core being offered in this package in India.

Note: 1: If Principal/collaborator/sister concern conductor manufacturer company is a foreign entity then it should submit performance certificate from an end user located in a country other than the country where the product has been manufactured during last seven (7**) years and must be in satisfactory operation[#] for at least two (2) years as on the originally scheduled date of bid opening.

Note2: In case bidder is a holding company, the technical experience referred to in clause 4.1 above shall be of that holding company only (i.e. excluding its subsidiary/parent/group/sister concern[##]companies etc.). In case bidder is a subsidiary of a holding company, the technical experience referred to in clause 4.1 above shall be of that subsidiary company only (i.e. excluding its holding company).

4.2 Experience of Erector:-

(i) The erector should have completed stringing of HTLS conductor for transmission line of cumulative circuit kilometres of not less than 50% of the estimated circuit kilometres of 220kV or higher voltage class in India as a prime contractor/sub-contractor or as a partner in a Joint Venture+ within the last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originallyscheduled date of bid opening.

OR

(ii) The erectors who do not have experience for HTLS conductor stringing shall also be considered if stringing have been completed for any type of conductor of 220kV or

higher voltage transmission line for cumulative circuit kilometres of not less than 100 km as a prime contractor or as a partner in a Joint Venture+ within the last seven (7) years and the same should have been in satisfactory operation for a period of at least 02 years as on the originally scheduled date of bid opening.

However,the warranty obligations for additional period of two (2) years over and above the warranty period as specified in the bidding documents shall be applicable for which an amount of 5 % (Five percent) of the cost of the total Project value in the form of BG shall be furnished by the bidder.

This warranty obligation guarantee shall be in addition to the contract performance guarantee to be submitted by the bidder.

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

5.0 Financial Position

5.1 The bidder should have adequate financial capability to meet the following minimum criteria:

a) Net Worth requirement of QR

Net Worth for last three financial years should be positive. (Total assets less total liabilities shall be positive) .

b) Minimum Average Annual Turnover (MAAT) requirement for the last three years of the bidder should not be less than;

MAAT = (Cost Estimate x 1.5/Completion period in years)

MAAT = Rs 43,43,04,078 /-

(For the purpose of arriving at MAAT, total income, except non-recurring income e.g. Sale of fixed assets shall be considered).

Further the completion period for calculating MAAT shall be considered as 1 year even if the Contractual Completion period is less than 1 year.

c) Liquid Asset (LA) requirement of

LA = (Cost Estimate x 3/Completion period in months).

LA = Rs 7,23,84,013 /-

(For the purpose of arriving at LA, Current Assets less Inventories and prepaid expenses shall be considered i.e. LA=Current Asset-Inventories-Prepaid Expenses)

Further, the Completion Period for calculating LA shall be considered as 12 months even if the Contractual Completion period is less than 12 months. The cost Estimate referred above shall include GST and other taxes & duties.

In case bidder is a holding company, financial position criteria referred to in clause 5.1 above shall be of that holding company only (i.e. excluding its subsidiary/group companies). In case bidder is a subsidiary of a holding company, financial position criteria referred to in clause 5.1 above shall be of that subsidiary company only (i.e. excluding its holding company).

In case bidder has established manufacturing facility in India and yet to complete three (3) financial years, the Net Worth and average of the turnover as per financial statement for completed financial years shall be considered for the purpose of compliance to the specified Net Worth and MAAT requirements.

Relaxation for Start-Ups^/ MSEs:

Start-Ups^/ MSEs, meeting the specified requirements at Para 5.1 (a) above in Financial Position shall also be considered qualified if they meet Eighty (80) % of the requirement specified at Para 5.1(b) & 5.1(c) above in Financial Position.

^ Start-Ups as defined by DIPP, applicable as on the originallyscheduled date of bid opening.

6.0 Techno-Commercial and Legal Arrangement of Joint Venture/Consortium:

The figures for each of the partners of the joint venture/consortium shall be added together to determine the bidder's compliance with the minimum qualifying criteria set out in Clause 5.1 (a), (b) & (c) above. However, in order for a joint venture to qualify, partners of the joint venture/consortium must meet the following minimum criteria:

(a) All the partners of the JV/Consortium shall meet individually the Financial Position criteria given at 5.1 (a) above.
(b) The lead partner shall meet, not less than 40% of the minimum criteria given at Para 5.1 (b) & (c) above.
(c) Each of the other partner(s) shall meet not less than 25% of the criteria given at 5.1(b) & (c) above.

In case of Joint Venture/consortium, the following conditions shall also apply:

i. The bid, and in case of successful bid, the specified Form of Agreement shall be signed so as to be legally binding on all partners (Form enclosed).

ii. Each of the Partners of the Joint Venture/consortium must meet the minimum qualifying requirements given under clause 4.1 or 4.2. However, all the partners of Joint Venture/consortium shall meet collectively, the requirements of Clauses 4.1 and 4.2 above.

iii. One of the partners shall be nominated as Lead Partner, and 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. Thus the lead partner shall be authorized to represent the joint venture/ consortium for the purpose of execution of the Contract. The payment shall be in the name of joint venture/ consortium. The authorization shall be evidenced by submitting a Power of Attorney signed by legally authorized signatory of all the partners as per bidding documents.

iv. All 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 of this

effect shall be included in the authorization mentioned under (iii) above as well as in the Bid Form and in the Contract Form (in case of a successful bid).

Agreement entered into by the Joint Venture/consortium partners shall be submitted with the bid.

7 .0 Financial & Capacity Requirements

Bidder shall be financially sound.

i) Bidder shall submit a certificate from their Banker(s) as per format indicating various fund based/non fund based limits sanctioned to the bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the originallyscheduled date of bid opening.
ii) Bidder shall submit a monthly cash flow projection for execution of the contract having regard to implementation schedule. Bidder should indicate how funding gap in each month is proposed to be met.
iii) Bidder shall submit the complete Annual reports together with Audited statement of accounts of the company for last five years.

In the event the Bidder (being a company registered/ incorporated outside India or otherwise) is not able to furnish the above information of its own (separate), being a subsidiary company and the accounts are being consolidated with their Group/ Holding/ Parent/sister concern## company, the Bidder should submit the balance sheet, income statement, other information as required, of its own (separate), (not of its Group/ Holding/ Parent/ sister concern## company) duly certified by:

i) Their statutory Auditor; or
ii) A Certified Public Accountant; or
iii) Their Company Secretary certifying that it is based on audited accounts, as the case may be.

Similarly, if the Bidder happens to be a Group / Holding / Parent company, the Bidder should submit the above information of its own (separate), exclusive of its Subsidiaries, duly certified by:

i) Their statutory Auditor; or
ii) A Certified Public Accountant; or
iii) Their Company Secretary certifying that it is based on audited accounts, as the case may be.

Format A: Format for the bidders in respect of clause 4.1:

(Lead partner in case of Joint Venture) [In case of Joint Venture bidder, the QR data of each of the other partner (in support of meeting the requirement Annexure-A, Section-BDS, Volume-I of the bidding documents] is also is to be furnished, as applicable, using this format

Name of the Bidder (as per 4.1 above) (Single Firm/Lead Partner/ Partner of a Joint Venture)		
1.	No. of years the bidder is a manufacturer of Conductor	Last _____ years.
2.	Name of Contract	
3.	Contract Reference No. & Date of Award	
4.	Name and Address of the Purchaser/Utility for whom the Contract was executed by bidder/Partner e-mail ID Telephone No. Fax No.	 _____ _____
5	Scope of work involved in the supply of ACSR/AAAC/ACAR/AACSR and High Temperature Low Sag (HTLS) Conductor having at least minimum thirty three (33) number of strands or minimum 150 sq. mm Aluminum cross section area of same technology as that of conductor being offered in the package) under the above Contract	□ Manufacture □Testing □ Supply - for the above Contract for Conductor. (*Tick only whichever is/are applicable*)
5.1	Total no. of Kms. of ACSR/AAAC/ACAR/AACSR and High Temperature Low Sag(HTLS) Conductor supplied in the above Contract No. of strands supplied in the Contract detailed above (Bidder to furnish details of only ACSR/AAAC/ACAR/AACSR and High Temperature Low Sag(HTLS) Conductor having at least same or more number of strands as that of the conductor being offered in the package supplied in the Contract)	_____ Kms. _____ Nos.
5.2	Date of completion of the above Contract	_____ (dd/mm/yyyy)
5.3	No. of years the above referred Conductor is in operation as on the date of bid opening	_____ years

5.4	Details of documents submitted in support of stated experience/Contract/ design, infrastructure and manufacturing facilities and capacity and procedures including quality control	

(Use separate sheet for each experience/ Contract)

Format B: Format for the Erector in respect of clause 4.2:

(Lead partner in case of Joint Venture) [In case of Joint Venture bidder, the QR data of each of the other partner (in support of meeting the requirement Annexure-A, Section-BDS, Volume-I of the bidding documents] is also is to be furnished, as applicable, using this format

Name of the Erector (as per 4.2 above) (Single Firm/Lead Partner/ Partner of a Joint Venture)		
1.	No. of years of experience of erector	Last _____ years.
2.	Name of Contract	
3.	Contract Reference No. & Date of Award	
4.	Name and Address of the Purchaser/Utility for whom the Contract was executed by Erector e-mail ID Telephone No. Fax No.	 _____ _____
5	Scope of work for carrying out stringing works under the above Contract	□ Stringing of HTLS Conductor □ Stringing of Other Conductor (Specify the type of Conductor) - for the above Contract for (*Tick only whichever is/are applicable*)
5.1	Total no. of Kms. of carrying out stringing works in the above Contract	_____ Kms. _____ Nos.
5.2	Date of completion of the above Contract	_____ (dd/mm/yyyy)
5.3	No. of years the above Line/Work is in operation as on the date of bid opening	_____ years

5.4	Details of documents submitted in support of stated experience/Contract and capacity and procedures including quality control	
5.5	To be qualified for award of contract, whether bidder has provided evidence to the satisfaction of the Owner of their capability and adequacy of resources to carry out the contract effectively.	□ Yes □ No

(Use separate sheet for each experience/ Contract)

8.0 The Bidder shall furnish documentary evidence in support of the qualifying requirement stipulated as above.

Date:.....

Place:...

(Signature)……..

(Printed Name)……...

(Common Seal)……

(Designation)……..

ATTACHMENT-4

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

LIST OF APPROVED SUBCONTRACTORS

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Prior to award of Contract, the following details shall be completed indicating those sub-contractors proposed by the Bidder by Attachment to its bid that are approved by the Employer for engagement by the Contractor during the performance of the contract.

The following Subcontractors are approved for carrying out the item of the facilities indicated. Where more than one Subcontractor is listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. No Subcontractors shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

Item of Facilities	Approved Subcontractors	Nationality

ATTACHEMENT-5

Tender No. T25R220472

Package-IV: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

(Commercial Deviations)

Dear Sirs,

The following are the Commercial Deviations and variations from and exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except for these deviations, the entire work shall be performed as per your specifications and documents.

S.No.	Volume/Clause No.	Ref./Page No.	Details of Deviation	Reason/ Justification of Deviation	Withdrawal Price in Rupees

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-6

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(DEVIATIONS ON IMPORTANT CONDITIONS)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sirs,

Sub. : Deviation on Important Conditions along with their withdrawal price.

The following are the Deviations/variations/exceptions to the provisions of important conditions stipulated in Clause 11.2 of ITB, Conditions of Contract, Volume-I. We undertake to execute the contract in line with the provisions of bidding documents in respect of above said clauses in case DTL agree to pay us the withdrawal price indicated below against each such deviations/variations/exceptions.

Volume of bidding document	Section	Clause No.	Page No.	Statement of deviations/ variations/ exceptions	Withdrawal Price in Rupees

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-7

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

TECHNICAL DEVIATIONS

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sir,

The following are the Technical Deviations and variations from and exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except for these deviations, the entire work shall be performed as per your specifications and documents.

S.No.	Volume/Clause No.	Ref./Page No.	Details of Deviation	Reason/ Justification of Deviation	Withdrawal Price in Rupees

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: 1. Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.
2. The deviations and variations, if any, shall be brought out separately for each of the equipment.

ATTACHMENT-8

Tender No. T25R220472

Package-IV: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

(Additional Information)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We have enclosed with our proposal the following additional information for the subject package.

Sl. No.	Brief description of Information	Ref. & Page No.

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-9

Tender No. T25R220472

Package-IV: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

(BOUGHT-OUT & SUB-CONTRACTED ITEMS)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We hereby furnish the details of the items/sub-assemblies; we propose to buy for the purpose of subject package.

Sl. No.	Item Description	Quantity Proposed be bought/Sub-contracted	Source of Supply

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-10

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(WORK COMPLETION SCHEDULE)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

We hereby declare that the following Work Completion Schedule shall be followed by us for the subject package.

Sl. No.	Description of Work	Period in Months (from the date of Award of Contract)
1.	Completion of detailed engineering a) Commencement b) Completion	
2.	Procurement of equipment & raw materials	
3.	Tests a) Commencement b) Completion	
4.	Manufacturing a) Commencement b) Completion	
5.	Shipments a) Commencement b) Completion	
6.	Establishment of site office	
7.	Receipt at final destination at site a) Commencement b) Completion	
8.	Erection a) Commencement b) Completion	
9.	Testing & Commissioning a) Commencement b) Completion	

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-11

Tender No. T25R220472

Package-IV: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

(LIST OF SPECIAL TOOLS & TACKLES)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We hereby furnish below the list of special tools & tackles for erection and commissioning of equipment for the subject package. The prices for these tools & tackles are already included in the lumpsum bid price.

Sl. No.	For Equipment	Item Description	Unit	Quantity

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-12

Tender No. T25R220472

Package-IV: **Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.**

(INFORMATION REGARDING EX-EMPLOYEES OF "DTL")

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We hereby furnish the details of Ex-Employees of DTL who had retired/resigned at the level of General Manager and above from DTL and subsequently have been employed by us.

Sl. No.	Name of Person with designation in DTL	Date of Retirement/ resignation from DTL	Date of joining and designation in our Organisation

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

ATTACHMENT-14

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

(PRICE ADJUSTMENT DATA)

Refer BDS

ATTACHMENT-15

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(GUARANTEE DECLARATION)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sirs,

We declare that the equipment offered shall meet the rating and performance requirements stipulated in Technical specification for various equipment or indicated in Data requirement. Further the various parameter of the HTLS conductor, based on which average ohmic losses shall be evaluated in accordance with clause no. 1.10 of section-II of technical specification, Volume-II, are given herein below :

Further, the guaranteed AC resistance & Guaranteed Average Ohmic loss of the HTLS conductor, based on which differential price evaluation shall be evaluated in accordance with clause no. 1.3.2 of section-II of technical specification, Volume-II, are given herein below :

S.No	Guaranteed AC Resistance at 1200 A (in Ohm/Km) (Rac)	Guaranteed Average Ohmic loss (in KW) = 95472 x R_{ac}
1.		

Date:.....

Place:.....

(Signature).....

(Printed Name).....

(Designation).....

(Common Seal).....

ATTACHMENT-16

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder's Name & Address:

To,
Delhi Transco Limited,
Shakti Sadan Kotla Road,
New Delhi- 110002 (India),
Phone: 23230026, Fax No. 011-23232721
Email: dgm.cbp@dtl.gov.in

INTEGRITY PACT

Integrity Pact

Between

Delhi Transco Limited

having its Registered Office at Shakti Sadan, Kotla Road, New Delhi -110 002

herein after referred to as

"DTL"

and

_____

(Insert the name of the Sole Bidder/Lead Partner of Joint Venture)

having its Registered Office at _____

(Insert full Address)

_____

and

_____

(Insert the name of the Partner(s) of Joint Venture/agent, as applicable)

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

having its Registered Office at _____

(Insert full Address)

_____

Herein after referred to as

"The Bidder/Contractor"

Preamble

DTL intends to award, under laid-down organisation procedures, contract(s) for _____ Package

(Insert the name of the package)

and Specification Number _____DTL values full compliance with all relevant

(Insert Specification Number of the Package)

laws and regulations, and the principles of economical use of resources, and of fairness and transparency in its relations with its Bidders/Contractors.

In order to achieve these goals, DTL and the above named Bidder/Contractor enter into this agreement called **'Integrity Pact'** which will form a part of the bid.

It is hereby agreed by and between the parties as under:-

Section I – Commitments of DTL

(1) DTL commits itself to take all measures necessary to prevent corruption and to observe the following principles:

(a) No employee of DTL, personally or through family members or relative(s), will in connection with the tender, or the execution of the contract, demand, take a promise for or accept, for him/herself or third person, any material or other benefit which he/she is not legally entitled to.

(b) DTL will, during the tender process treat all Bidder(s) with equity and fairness. DTL will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or for the execution of contract.

(c) DTL will exclude form evaluation of Bids its such employee(s) who has any personnel interest in the Companies/Agencies participating in the Bidding/Tendering process.

The action stipulated in this Integrity Pact is without prejudice to any other Legal action that may follow in accordance with the provisions of the relevant law in force relating to any civil or criminal proceedings.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

(2) If Managing Director obtains information on the conduct of any employee of DTL which is a criminal offence under the relevant Anti-Corruption Laws of India or illegal under the Indian Contract Act or Indian Laws, or if there be a substantive suspicion in this regard, he will inform its Chief Vigilance Officer and in addition can initiate disciplinary actions under its Rules.

Section II – Commitments of the Bidder/Contractor

(1) The Bidder/Contractor commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

(a) The Bidder/Contractor will not, directly or through any other person or firm, offer, promise or give to DTL, or to any of DTL's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange an advantage during the tender process or the execution of the contract.

(b) The Bidder/Contractor will not enter into any illegal agreement or understanding, whether formal or informal with other Bidders/Contractors. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or actions to restrict competitiveness or to introduce cartelization in the bidding process.

(c) The Bidder/Contractor will not commit any criminal offence under the relevant Anti-Corruption Laws of India, further, the Bidder/Contractor will not use for illegitimate purposes or for purposes of restrictive competition or personal gain, or pass on to others, any information provided by DTL as part of the business relationship, regarding plans, technical proposals and business details, including information of any type contained or transmitted electronically.

(d) The Bidder/Contractor of foreign origin shall disclose the name and address of the Agents/representatives in India, if any, involved directly or indirectly in the Bidding. Similarly, the Bidder/Contractor of Indian Nationality shall furnish the name and address of the foreign principals, if any, involved directly or indirectly in the bidding.

(e) The Bidder/Contractor will, when presenting his bid, disclose any and all payments he has made, or committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and/or with the execution of the contract.

(f) The Bidder/Contractor will not misrepresent facts or furnish false/forged documents/information in order to influence the bidding process or the execution of the contract to the detriment of DTL.

(2) The Bidder/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

Section III – Disqualification from tender process and exclusion from future contracts

(1) If the bidder, before contract award, has committed a serious transgression through a violation of Section II or in any other form such as to put his reliability or credibility as Bidder into question, DTL may disqualify the Bidder from the tender process or terminate the contract, if already signed, for such reason.

(2) If the Bidder/Contractor has committed a serious transgression through a violation of Section II such as to put his reliability or credibility into question, DTL may after following due procedures also exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder/Contractor and the amount of the damage. The exclusion will be imposed for a minimum of 12 months and maximum of 3 years and it has to be decided by the Competent authority.

(3) If the Bidder/Contractor can prove that he has restored/Recouped the damage caused by him and has installed a suitable corruption prevention system, DTL may revoke the exclusion prematurely with the approval of Competent Authority.

Section IV – Liability for violation of Integrity Pact

(1) If DTL has disqualified the Bidder from the tender process prior to the award under Section III, DTL may forfeit the Bank Guarantee under the Bid.

(2) If DTL has terminated the contract under Section III, DTL may forfeit the Contract Performance Guarantee of this contract besides resorting to other remedies under the contract.

Section V – Previous Transgression

(1) The Bidder shall declare in his Bid that no previous transgressions occurred in the last 3 years with any other Public Sector Undertaking or Government Department that could justify his exclusion from the tender process.

(2) If the bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section VI – Equal treatment to all Bidders/Contractors

(1) DTL will enter into agreements with identical conditions as this one with all Bidders.

(2) DTL will disqualify from the tender process any bidder who does not sign this Pact or violate its provisions.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

Section VII – Punitive Action against violating Bidders/Contractors

If DTL obtains knowledge of conduct of a Bidder or a Contractor or his subcontractor or of an employee or a representative or an associate of a Bidder or Contractor or his Subcontractor which constitutes corruption, or if DTL has substantive suspicion in this regard, DTL will inform the Chief Vigilance Officer (CVO).

(*)Section VIII – Independent External Monitor/Monitors

(1) DTL has appointed a panel of Independent External Monitors (IEMs) for this Pact with the approval of Central Vigilance Commission (CVC), Government of India, out of which one of the IEMs has been indicated in the NIT.

(2) The IEM is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement. He has right of access to all project documentation. The IEM may examine any complaint received by him and submit a report to Managing Director, DTL at the earliest. He may also submit a report directly to the CVO and the CVC, in case of suspicion of serious irregularities attracting the provisions of the PC Act. However, for ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter shall be referred to the full panel of IEMs, who would examine the records, conduct the investigations and submit report to Managing Director, DTL, giving joint findings.

(3) The IEM is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Managing Director, DTL.

(4) The Bidder(s)/Contractor(s) accepts that the IEM has the right to access without restriction to all documentation of DTL related to this contract including that provided by the Contractor/Bidder. The Bidder/Contractor will also grant the IEM, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his documentation. The same is applicable to Subcontractors. The IEM is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s)/Sub-Contractor(s) with confidentiality.

(5) DTL will provide to the IEM information as sought by him which could have an impact on the contractual relations between DTL and the Bidder/Contractor related to this contract.

(6) As soon as the IEM notices, or believes to notice, a violation of this agreement, he will so inform the Managing director, DTL and request the Managing Director, DTL to discontinue or take corrective action, or to take other relevant action. The IEM can in this regard submit non-binding recommendations. Beyond this, the IEM has no right

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the IEM shall give an opportunity to DTL and the Bidder/Contractor, as deemed fit, to present its case before making its recommendations to DTL.

(7) The IEM will submit a written report to the Managing Director, DTL within 8 to 10 weeks from the date of reference or intimation to him by DTL and should the occasion arise, submit proposals for correcting problematic situations.

(8) If the IEM has reported to the Managing Director, DTL a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Managing Director, DTL has not, within the reasonable time taken visible action to proceed against such offence or reported it to the CVO, the Monitor may also transmit this information directly to the CVC, Government of India.

(9) The word '**IEM**' would include both singular and plural.

(*) This Section shall be applicable for only those packages wherein the IEMs have been identified in Section – I: Invitation for Bids and/or Clause 9 in Section –III : Conditions of Contract, Volume-I of the bidding documents.

Section IX – Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor after the closure of the contract and for all other Bidder's six month after the contract has been awarded.

Section X – Other Provisions

(1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the establishment of DTL. The Arbitration clause provided in the main tender document/contract shall not be applicable for any issue/dispute arising under Integrity Pact.

(2) Changes and supplements as well as termination notices need to be made in writing.

(3) If the Contractor is a partnership firm or a consortium or Joint Venture, this agreement must be signed by all partners, consortium members and Joint Venture partners.

(4) Nothing in this agreement shall affect the right of the parties available under the General conditions of Contract (CC/GCC) and Special Conditions of Contract (SCC).

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

(Office Seal)

(5) Views expressed or suggestions/submissions made by the parties and the recommendations of the CVO/IEM[#] in respect of the violation of this agreement, shall not be relied on or introduced as evidence in the arbitral or judicial proceedings (arising out of the arbitral proceedings) by the parties in connection with the disputes/differences arising out of the subject contract.

CVO shall be applicable for packages wherein IEM are not identified in Section IFB/BDS of Condition of Contract, Volume-I. IEM shall be applicable for packages wherein IEM are identified in Section IFB/BDSof Condition of Contract. Volume-I

(6) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(Office Seal)

Name :_____

Designation: _____

Witness 1 :_____

(Name &Address)_____

_____

_____

Witness 2 :_____

(Name &Address)_____

_____

_____

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

Name : _____

Designation: _____

Witness 1 :_____

(Name & Address)_____

_____

_____

Witness 2 :_____

(Name & Address)_____

_____

_____

(Signature)_____ (Signature) _____

(For & On behalf of DTL)

(Office Seal)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)

ATTACHMENT-18

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(CHECK LIST)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We have enclosed with our proposal the following additional information for the subject package.

	Particulars	
Bid Validity	Whether Bid is valid is as stipulated in ITB from the date of bid opening.	Yes/No
Bid Security amount	Whether Bid security amount and form is enclosed as per ITB.	Yes/No
Bid Security Validity	Whether bid security is valid for a period as stipulated in ITB.	Yes/No
Bid Signatory	Power of Attorney of Signatory of Bid as per Section ITB	Yes/No
	Technical Specification	
1.	Is the material offered according to the specifications required by the purchaser, if not, please state the deviation from the same and deviation statement thereof	Yes/No
2	Have you submitted copies of Type Test Certificates in physical form in respect of material offered?	Yes/No
3	Have you submitted dimension drawings leaflets, descriptive and illustrative catalogues in physical form (if necessary)?	Yes/No
4	Whether product conforms to relevant ISS and our technical particulars?	Yes/No
5	Have you submitted in physical form (i) the copy of NIT duly signed & stamped on each page ,(ii) copies of past supplies and (iii) performance certificates?	Yes/No

6	Whether testing facilities as per IS for conducting various tests are available with you?	Yes/No
	Terms and Condition	
1.	Do you agree to all clauses of General Conditions of our tender documents?	Yes/No
2	If you do not agree to any/all the clauses, please state clearly the clause which you do not agree and state the modification in respect of clauses of which you do not agree.	Yes/No
3	Do you agree to furnish security deposit if order is placed with you?	Yes/No
4	Whether agreeable to DTL's liquidate damages clause for late completion of work.?	Yes/No
5	Are you agreeable to inspection clause?	Yes/No
6	Any further particulars not otherwise covered in the tender specifications submitted physically?	Yes/No
7	Quantity offered against each item be quoted. Are you prepared to accept order for bigger quantity as per NIT ?	Yes/No
Part-I	**Techno-commercial Bid**	
a)	Whether undertaking for corrupt & fraudulent practice signed and submitted.	Yes/No
b)	Whether Bid form duly completed, signed and submitted.	Yes/No
c)	Whether following Attachments submitted:	Yes/No
d)	Attachment 1 :"Bid security".	Yes/No
e)	Attachment 2: "Power of Attorney".	Yes/No
f)	Attachment 3: "Qualifying Requirement Data".	Yes/No
g)	Attachment 4: "List of approved Subcontractors".	Yes/No
h)	Attachment 5: "Commercial Deviations".	Yes/No
i)	Attachment 6: "Deviations on important Conditions".	Yes/No
j)	Attachment 7: "Technical Deviations".	Yes/No
k)	Attachment 8: "Additional Information".	Yes/No
l)	Attachment 9: "Bought Out and Sub-contracted items"	Yes/No
m)	Attachment 10: "Work completion schedule" .	Yes/No
n)	Attachment 11: "List of Special Tools and Tackles" .	Yes/No
o)	Attachment 12: "Information regarding ex-employees of Employer in Bidder's firm".	Yes/No
p)	Attachment 14:"Price Adjustment Data."	Yes/No
q)	Attachment 15: "Guarantee Declaration".	Yes/No
r)	Attachment 16: "Integrity Pact".	Yes/No
s)	Attachment 18: "Check list".	Yes/No
t)	Attachment 19: Affidavit of Self certification regarding Minimum	Yes/No

	Local Content in line with PPP-MII order **and MoP Order, as applicable** (submission of Hard Copy in 'Original'), to be submitted on a non-judicial stamp paper of Rs. 100/-.	
u)	Attachment 20: Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with PPP-MII order and **MoP Order, as applicable** (submission of Hard Copy in 'Original') to be submitted on the letter head of the auditor/ cost accountant.	Yes/No
v)	Attachment 21: Undertaking for not indulging in Corrupt & Fraudulent practice	Yes/No
w)	Attachment 22: Certification by the Bidder as per DoE Order no-F.No.7/10/2021-PPD(1) dt 23.02.2023 in line with ITB Clause 1.2.2 (In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture)	Yes/No
x)	Attachment no 23: Details of complete type test report of all the equipment as per QR and in accordance with latest IEC / NIT in the prescribed format	Yes/No
y)	Attachment no 24: Indemnity Bond	Yes/No
Part-II	Price Bid	
a)	Whether Price Bid submitted.	Yes/No
b)	Whether Bid form duly completed, signed and submitted.	Yes/No
c)	Whether following Price Schedules submitted:	Yes/No
d)	Schedule 1: " Price break-up Plant and Equipment (including Mandatory Spares) to be supplied."	Yes/No
e)	Schedule 2: "Break-up of Local Transportation, Insurance and other Incidental Services."	Yes/No
f)	Schedule 3: "Price Breakup of Installation Charges."	Yes/No
g)	Schedule 4: "Grand summary of the quoted bid price."	Yes/No
Tender Document/NIT	Whether Tender document along with all amendments duly signed & stamped on each page submitted.	Yes/No

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

Note: **(i)** Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Attachment.

(ii) Replies against each item should be complete without any ambiguity. Terms such as refer covering letter etc. shall not be acceptable unless the replies/ information are specific and complete

ATTACHMENT-19

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela- Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Format for Affidavit of Self certification regarding Local Content in line with PPP-MII order dated 15/06/2017, its revision dated **16/09/2020**& their latest amendments thereof **and MoP Order dated 16/11/2021** & their latest amendments thereof, as applicable, to be provided on a non-judicial stamp paper of Rs. 100/-.

Date:

I _____S/o, D/o, W/o, _____Resident of_____ hereby solemnly affirm and declare as under:

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Order, 2017 of Government of India issued vide Notification No:P-45021/2/2017 -BE-II dated 15/06/2017, its revision dated **16/09/2020**& their latest amendments thereof, (hereinafter **PPP-MII order**), and 'Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content)' order **dated 16/11/2021** & their latest amendments thereof, issued by Ministry of Power (hereinafter **MoP order**) and **any subsequent modifications/ Amendments, if any** and

That the information furnished hereinafter is correct to the best of my knowledge and belief and I undertake to produce relevant records before the procuring entity/DTL or any other Government authority for the purpose of assessing the local content of goods/services/works supplied by me for **Turnkey Package (Insert the name of Package and Tender no.)**.

That the local content for all inputs which constitute the said goods/services/works has been verified by me and I am responsible for the correctness of the claims made therein.

That the 'Local Content 'as defined in the PPP-MII order and MoP order in the goods/services/works supplied by me for Turnkey Package (Insert the name of Package and Tender no.) is …… percent (%).

That the goods/services/works supplied by me for **Turnkey Package (Insert the name of Package and Tender no.)** meet the 'Local Content' requirement as defined in the PPP-MII order **and MoP order for 'Class –I local supplier'**.

That the value addition for the purpose of meeting the 'Local Content 'has been made by me at …… (*Enter the details of the location(s) at which value addition is made)*.

That in the event of the local content of the goods/services/works mentioned herein is found to be incorrect and not meeting the prescribed Local Content criteria, based on the assessment of procuring agency (ies)/DTL/Government Authorities for the purpose of assessing the local content, action shall be taken against me in line with the PPP-MII order, **MoP order** and provisions of the Integrity pact/ Bidding Documents.

I agree to maintain the following information in the Company's record for a period of 8 years and shall make this available for verification to any statutory authority.

i Name and details of the Local Supplier
(Registered Office, Manufacturing unit location, nature of legal entity)

ii. Date on which this certificate is issued

iii. Goods/services/works for which the certificate is produced

iv. Procuring entity to whom the certificate is furnished

v. Percentage of local content claimed and whether it meets the Local Content prescribed for **'Class –I local supplier'**

vi. Name and contact details of the unit of the Local Supplier (s)

vii. Sale Price of the product

viii Ex-Factory Price of the product

ix. Freight, insurance and handling

x. Total Bill of Material

xi List and total cost value of input used to manufacture the Goods/to provide services/in construction of works

xii. List and total cost of input which are domestically sourced. Value addition certificates from suppliers, if the input is not in-house to be attached

xiii. List and cost of inputs which are imported, directly or indirectly

For and on behalf of…… (Name of firm/entity)
Authorized signatory (To be duly authorized by the Board of Directors)
<Insert Name, Designation and Contact No.>

ATTACHMENT-20

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Certificate from statutory auditor or cost auditor of the company giving the percentage of Local Content, in line with **PPP-MII order** dated 15/06/2017, its revision dated **16/09/2020** & their latest amendments thereof, **and MoP order** dated **16/11/2021** & their latest amendments thereof, as applicable *[to be submitted on the letter head of the issuer.]*

Dear Sir,

We have read and understood the provisions of "Public Procurement (Preference to Make in India) Order, 2017" dated 15/06/2017, its revision dated **16/09/2020** & their latest amendments thereof[hereinafter, "PPP-MII Order"] issued by Department for promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India, and 'Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content)' order dated **16/11/2021** & their latest amendments thereof issued by Ministry of Power [hereinafter, "MoP order"] and **any subsequent modifications/ Amendments, if any**.

In line with the provisions of the PPP-MII Order **and MoP Order**, M/s. ……*[Enter the name of the Bidder] [*hereinafter, **"Class-I Local Supplier***]* have submitted an Affidavit of self-certification to M/s. Delhi Transco Limited [hereinafter, DTL] regarding Local Content in Goods/Services/Works to be supplied by the **"Class-I Local Supplier"** for **Turnkey Package (Insert the name of Package and Tender No.)**, wherein they have agreed to abide by the terms and conditions of the PPP-MII Order **and MoP Order**.

Further, in line with the PPP-MII Order, the statutory auditor or cost auditor of the company shall provide a certificate giving the percentage of Local Content in the Goods/Service/Works to be supplied by the **"Class-I Local Supplier"** for **Turnkey Package (Insert the name of Package and Tender No.)**.

Accordingly, we, the Statutory Auditor(s) / Cost auditor of the **"Class-I Local Supplier"**, certify that the Local Content as defined under the PPP-MII **and MoP Order**, in the Goods/Service/Works to be supplied by the **"Class-I Local Supplier"** for **Turnkey Package (Insert the name of Package and Tender No.)** is …….. Percentage [*specify the percentage of Local content*].

For and on behalf of, Date:

<<Statutory Auditor's/Cost auditor's attestation>>
Firm Reg No. Membership No.

Note: This is a guiding format. In case the bidder submits the certificate in a format different from the above, the same may be considered provided it meets the intent and purpose, as may be ascertained by DTL.

ATTACHMENT-21

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

UNDERTAKING FOR NOT INDULGING IN CORRUPT & FRAUDULENT PRACTICE

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

We declare that all the documents submitted or would be submitted by us in this tender are/would be genuine, and in case any discrepancy is found in the declaration/documents submitted by us at any stage, action can be taken against us as deemed fit by DTL.

We further declare that in the submission of this tender no agent, middleman or any intermediary has been, or will be engaged to provide any services, or any other item of work related to the award and performance of this contract. We further confirm and declare that no agency commission or any payment which may be construed as an agency commission has been, or will be, paid and that the tender price does not include any such amount.

We acknowledge the right of the employer, if he finds to the contrary, to declare, our tender to be non-compliant and if the contract has been awarded to declare the contract null and void.

STAMP & SIGNATURE OF AUTHORISED SIGNATORY

ATTACHMENT-22

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Certification by the Bidder as per order no. F.No.7/10/2021-PPD(1) dated **23/02/2023** issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India (DoE Order) in line with ITB Clause 1.2.2

(In case of a Joint Venture bid, the declaration shall be given by all partners of the Joint Venture)

Dear Sir,

We have read and understood the provisions of Order no.F.No.7/10/2021-PPD(1)(Order Public Procurement no.4) dated **23/02/2023** regarding "Restriction under Rule 144(xi) of General Financial Rules" issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, Government of India [hereinafter collectively "**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 not from such a country or, if from such a country, has been registered with the Competent Authority and will not subcontract any work to a subcontractor/sub vendor from such countries unless such subcontractor/sub vendor fulfils all requirement in this regard and is eligible to be considered. [*Where applicable, evidence of* ***valid registration by the Competent Authority shall be attached***.]

We also undertake to comply the above said DoE order dt. 23.02.2023 and **any subsequent modifications/ Amendments, if any**.

We further declare that any misrepresentation or submission of false/forged document/information in this regard this would be ground for immediate termination and further legal action in accordance with law.

Date :
Place :

(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

ATTACHMENT-23

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder has to submit details of complete type test report of all the equipment as per QR and in accordance with latest IEC / NIT in the below format

S. No.	Equipment	IEC Clause Ref.	Type of test	Type Test Description/
				a) Manufacturer b) Model no. test conducted on c) Report No.: d) Lab. Name: e) Date of Test: f) Date of Issue: g) IEC: h) Ref Page

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

ATTACHMENT-24

Tender No. T25R220472

Package-IV: Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(INDEMNITY BOND)

Bidder's Name & Address

To,
Delhi Transco Limited,
Shakti Sadan, Kotla Road,
New Delhi-110002 (India),
Phone: 23230026,
Fax No. 011-23232721,
Email: dgm.cbp@dtl.gov.in

Dear Sir,

One set of Indemnity Bond on non judicial stamp paper of Rs 100/-, duly signed by our authorized representative and stamped is annexed herewith for loss caused in case of legal proceedings w.r.t Infringement of Patent.

Date :

Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

INDEMNITY BOND

By this bond M/s ___*(Company Name)*_____ having its registered office at __(*Address*)_____ hereinafter referred to as 'Bidder' binds himself to pay to Delhi Transco Limited (DTL) hereinafter referred to as 'Principal', the sum as determined by DTL as a consequence of infringement of patent by _*(Company Name),* in the event any legal proceedings initiated or otherwise with respect to violation of the patent against DTL and/or the usage of product which infringes the patent in relation to the tender for Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis. against Tender No T25R220472.

In witness whereof the Bidder put his hand on this _____ day of _____, 2026.

BIDDER

WITNESSES: -

1.

2.

SECTION-III

GUARANTEED TECHNICAL PARTICULARS

(SCHEDULE 1)

GUARANTEED TECHNICAL PARTICULARS OF HTLS CONDUCTOR

(TO BE FILLED BY BIDDER)

Sl.	Description	Unit	Value guaranteed by the Bidder
1.	Name & address of Manufacturer		
2.	Construction of conductor/ Designation of conductor as per IEC:1089		
3.1	**PARTICULARS OF RAW MATERIALS**		
3.1	Outer Layers a) Applicable Standard(if any) b) Type of Aluminum alloy c) Minimum purity of aluminum d) Maximum Copper content e) Zirconium content i) Maximum ii) Minimum f) Other elements---------- i) ---------- ii) ----------	 % % % % % %	
3.2	Inner Core a) Applicable Standard(if any) b) Material of core c) Chemical composition of core i) ---------- ii) ----------	 % %	
3.3	Zinc used for galvanization of inner core (if applicable) a) Minimum purity of zinc	%	
3.4	Chemical Composition of Misch Metal coating on core wires (if applicable) i) Zinc ii) Aluminium iii) Other elements----------	% % %	
3.5	Aluminium used for Aluminium Cladding (if applicable) a) Minimum purity of aluminum b) Maximum Copper content c) Other elements----------	 % %	

	i) ---------- ii)……..	% %	
4.	**STRANDS OF OUTER CONDUCTING PART (AFTER STRANDING)**		
4.1	Number of outer layers	Nos.	
4.2	Number of strands a) 1st Layer from core b) 2nd Layer from core c) 3rd Layer from core …… ……..	 Nos. Nos. Nos. ……. ……..	
4.2	Diameter of strands a) Nominal b) Maximum c) Minimum	 mm mm mm	
4.3	Minimum Breaking load of strand a) Before stranding b) After stranding	 kN kN	
4.4	Resistance of 1m length of strand at 20 deg. C	Ohm	
4.5	Final Modulus of elasticity	Kg/sq. mm	
4.6	Final Coefficient of linear expansion	Per ^{0} C	
5	**INNER CORE STRANDS/ INNER CORE (AFTER STRANDING)**		
5.1	Number of layers in inner core (excluding central wire)		
5.2	Number of strands a) 1st Layer from centre (excluding central wire) b) 2nd Layer from centre c) 3rd Layer from centre …… ……..	 Nos. Nos. Nos. ……. ……..	
5.3	Diameter a) Nominal b) Maximum c) Minimum	 mm mm mm	
5.3	Minimum Breaking load of strand/Core a) Before stranding b) After stranding	 kN kN	

5.4	Resistance of 1m length of strand at 20 deg. C	Ohm	
5.5	Final Modulus of elasticity	Kg/sq. mm	
5.6	Final coefficient of linear expansion	Per ^{0} C	
5.7	**Aluminum cladding of INVAR core (if applicable)**		
	a) Thickness of cladding		
	i) Maximum	mm	
	ii) Minimum	mm	
	b)Minimum no. of twists in a gauge length equal to 100 times diameter of wire which the strands can withstand in the torsion test		
	a) Before stranding	Nos.	
	b) After stranding	Nos.	
	c) Minimum elongation of strand for a gauge length of 250 mm	%	
	d) Resistance of 1m length of strand at 20 deg. C	Ohm	
5.8	**Galvanizing/ Misch Metal coating (if applicable)**		
	a) Minimum mass of zinc coating per sqm. of uncoated wire surface.	gm	
	b) Minimum mass of Misch metal coating per sqm. of uncoated wire surface (if applicable).	Nos.	
	c) Min. no. of twists which a single strand shall withstand during torsion test for a length equal to 100times dia of wire after stranding.	Nos.	
	d) Minimum elongation of strand for a gauge length of 250 mm	%	
6	**FILLER (if applicable)**		
6.1	Type & Designation of Filler		
6.2	Chemical composition of Filler		
6.3	Mass of Filler	Kg/km	
7	**COMPLETE HTLS CONDUCTOR**		
7.1	Cross section drawing of the offered conductor enclosed	Yes/No	

7.2	Diameter of conductor a) Nominal b) Maximum	 mm mm		
	c) Minimum	mm		
7.3	UTS (minimum) of Conductor	kN		
7.4	Lay ratio of conductor a) 1st layer from centre (excluding central wire) b) 2nd Layer c) 3rd Layer d) 4th Layer		Max. 	Min.
7.5	DC resistance of conductor at 20°C	Ohm/km		
7.6	Final Modulus of elasticity			
	a) Upto transition temperature	Kg/sq mm		
	b) Above transition temperature	Kg/sm m		
7.7	Coefficient of linear expansion			
	a) Upto transition temperature	Per deg C		
	b) Above transition temperature	Per deg C		
7.8	Calculation for transition temperature Enclosed	Yes/No		
7.9	Transition temperature (corresponding to ---m ruling span and tension at ruling condition as per 7.19)	Deg C		
7.10	Minimum Corona Extinction Voltage (line to ground) under Dry condition .	kV(rms)		
7.11	RIV at 1MHz and 156 kV (rms)under dry conditions .	Micro-volts		
7.12	Maximum permissible conductor temperature for continuous operation	Deg C		
7.13	Maximum permissible conductor temperature for short term operation	Deg C		
7.14	Permissible duration of above short term operation	Minutes		
7.15	Steady state conductor temperature at specified conductor current of 1200 A and under Ambient conditions detailed in Clause 1.2.1			

	of the Technical Specification for HTLS conductor		
7.16	AC resistance at maximum continuous operating temperature corresponding to specified maximum operating current (1200 A under ambient condition enclosed as per Technical Specification for HTLS conductor)	Ohm/km	
7.17	AC resistance at continuous operating temperature corresponding to specified operating current of 1200 A (under ambient condition enclosed as per Clause 1.2.1 of the Technical Specification for HTLS conductor)	Ohm/km	
7.18	Details of Creep characteristic for HTLS conductor enclosed (as per Clause 1.4.5 of the Technical Specification for HTLS conductor)	Yes/No	
7.19	**Sag Tension Calculation**		
7.19.1	Sag Tension Calculation enclosed (clause 1.4.1 of Section-IV of the Technical Specification for HTLS conductor)	Yes/No	
7.19.2	Tension at 32 deg. C & no wind	Kg	
7.19.3	Sag & tension at maximum continuous operating temperature (corresponding to current of 1200 A and Ambient conditions detailed in Technical Specification for HTLS conductor)	Meters & Kgs	
i)	Tension for following conditions:		
a.	32 deg. C & full wind condition	kg	
b.	32 deg. C & Nil wind condition	kg	
c.	Minimum tempt. & Nil wind condition	kg	
d.	Minimum tempt. & 36% of full wind Condition		
e.	32 deg. C & 75% of full wind condition		

7.19.4	Tension at transition temperature	kg	
7.20	Direction of lay for outside layer		
7.21	Linear mass of the Conductor a) Standard b) Minimum c) Maximum	 Kg/km Kg/km Kg/km	
7.22	Standard length of conductor	M	
7.23	Maximum length of conductor that can be offered as single length	M	
7.24	Tolerance on standard length of conductor	%	
7.25	Drum is as per specification	Yes/No	
7.26	No. of cold pressure butt welding equipment available at works	Nos.	

******

Annexure-C

GUARANTEED TECHNICAL PARTICULARS OF SUSPENSION HARDWARE FITTINGS (To be filled by the Bidder)

Sl. No.	Description	Unit	Value guaranteed by the Bidder
1.	Name & address of Manufacturer		
2.	Address of Manufacturer		
3.	Drawing enclosed	Yes/No	
4.	Maximum magnetic power loss of suspension clamp at conductor / sub- conductor current of amperes (at steady state conductor temperature)	Watt	
5.	Slipping strength of suspension assembly (clamp torque Vs slip curve shall be enclosed)	kN	
6.	Particulars of standard/AGS Standard / AGS preformed armour rod set for suspension assembly		
	a) No. of rods per set	No.	
	b) Direction of lay		
	c) Overall length after fitting on conductor	mm	
	d) Actual length of each rod along its helix	mm	
	e) Diameter of each rod	mm	
	f) Tolerance in		
	i) Diameter of each rod	±mm	
	ii) Length of each rod	±mm	
	iii) Difference of length between the longest and shortest rod in a set	±mm	
	g) Type of Aluminium alloy used for manufacture of PA rod set		
	h) UTS of each rod	Kg/mm^2	

7.	Particulars of Elastomer (For AGS Clamp only)		
	a) Supplier of elastomer		
	b) Type of elastomer		
	c) Shore hardness of elastomer		
	d) Temperature range for which elastomer is designed		
	e) Moulded on insert		
8.	UTS of suspension clamp		
9.	Purity of Zinc used for galvanizing	%	
11.	Minimum corona extinction voltage under dry condition [for 400kV lines]	kV (rms)	
12.	Radio interference voltage at 1 Mhz for phase to earth voltage of 320 kV (dry condition) [for 400kV lines]	µV	
13.	Maximum permissible continuous operating temperature of		
	i) Clamp body	Deg. C	
	ii) Standard/AGS preformed rods	Deg. C	

GUARANTEED TECHNICAL PARTICULARS OF TENSION HARDWARE FITTINGS (To be filled by the Bidder)

Sl. No.	**Description**	**Unit**	**Value guaranteed by the Bidder**
1.	Name of Manufacturer		
2.	Address of Manufacturer		
3.	Drawing enclosed	Yes/ No	
4.	Purity of aluminum used for aluminum sleeve	%	
5.	Material for steel sleeve		
	(i) Type of material with chemical		

	composition			
	(ii) Range of Hardness of material (Brinnel Hardness)	BHN	From …….to ……..	
	(iii) Weight of zinc coating	gm/m^2		
			Aluminium / Alloy	Steel
6.	Outside diameter of sleeve before compression	mm		
7.	Inside diameter of sleeve before compression	mm		
8.	Length of sleeve before compression			
9.	Dimensions of sleeve after compression			
	(a) Corner to Corner			
	(b) Surface to Surface			
10.	Length of sleeve after compression			
11.	Weight of sleeve			
	(a) Aluminium/ aluminum Alloy	kg		
	(b) Steel	kg		
	(c) Total	kg		
12.	Electrical resistance of dead end assembly as a percentage of equivalent length of Conductor	%		
13.	Slip strength of dead end assembly	kN		
14.	UTS of dead end assembly	kN		
15.	Purity of Zinc used for galvanizing	%		
16.	Design calculation of yoke plates and sag adjustment plate enclosed.	Yes / No		
17.	Minimum corona extinction voltage under dry condition [for 400kV lines]	kV (rms)		

18.	Radio interference voltage at 1 Mhz for phase to earth voltage of 320 kV (dry condition) [for 400kV lines]	µV	
19.	Maximum permissible continuous operating temperature of dead end assembly	Deg . C	

GUARANTEED TECHNICAL PARTICULARS OF MID SPAN COMPRESSION JOINT FOR HT/HTLS CONDUCTOR (To be filled by the Bidder)

Sl. No.	**Description**	**Unit**	**Value guaranteed by the Bidder**	
1.	Name of Manufacturer			
2.	Address of Manufacturer			
3.	Drawing enclosed		Yes/No	
4.	Suitable for conductor size	mm		
5.	Purity of aluminium used for aluminium sleeve	%		
6.	Material for steel sleeve			
	(i) Type of material with chemical composition			
	(ii) Range of Hardness of material (Brinnel Hardness)	BHN	From …….to ……..	
	(iii) Weight of zinc coating	gm/m^2		
			Aluminium / alloy	Steel
7.	Outside diameter of sleeve before compression	mm		
8.	Inside diameter of sleeve before compression	mm		
9.	Length of sleeve before compression			
10.	Dimensions of sleeve after compression			
	(a) Corner to Corner			
	(b) Surface to Surface			
11.	Length of sleeve after compression			

12.	Weight of sleeve		
	(a) Aluminium	kg	
	(b) Steel	kg	
	(c) Total	kg	
13.	Slip strength	kN	
14.	Resistance of the compressed unit expressed, as percentage of the resistivity of equivalent length of bare conductor.	%	
15.	Minimum Corona extinction voltage under dry condition [for 400kV lines]	kV (rms)	
16.	Radio interference voltage at 1 MHz for phase to earth voltage of 320 kV under dry condition[for 400kV lines]	μV	
17.	Maximum permissible continuous operating temperature of mid span compression joint	Deg. C	

GUARANTEED TECHNICAL PARTICULARS OF REPAIR SLEEVE FOR HT/HTLS CONDUCTOR (To be filled by the Bidder)

Sl. No.	**Description**	**Unit**	**Value guaranteed by the Bidder**
1.	Name of Manufacturer		
2.	Address of Manufacturer		
3.	Drawing enclosed	Yes/No	
4.	Suitable for conductor size	mm	
5.	Purity of Aluminium / Al Alloy type	%	
6.	Dimension of sleeve before compression		
	i) Inside diameter of sleeve	mm	
	ii) Outside dimensions of sleeve	mm	
	iii) Length of sleeve	mm	
7.	Dimension of sleeve after compression		

	i) Corner to Corner	mm	
	ii) Surface to Surface	mm	
	iii) Length of sleeve	mm	
8.	Weight of sleeve	Kg	
9.	Minimum Corona extinction voltage under dry condition [for 400kV lines]	kV (rms)	
10.	Radio interference voltage at 1 MHz for phase to earth voltage of 320 kV dry condition) [for 400kV lines]	μV	
11.	Maximum permissible continuous operating temperature of Repair Sleeve	Deg. C	

NOTE: Tolerances, wherever applicable, shall also be specified.

GUARANTEED TECHNICAL PARTICULARS OF VIBRATION DAMPER FOR HT/HTLS CONDUCTOR (IF APPLICABLE) (To be filled by the Bidder)

Sl. No.	**Description**	**Unit**	**Value guaranteed by the Bidder**	
1.	Name of Manufacturer			
2.	Address of Manufacturer			
3	Drawing enclosed			
	(a) Design Drawing	YES / NO		
	(b) Placement Chart	YES / NO		
4.	Suitable for conductor size	mm		
5.	Total weight of one damper	kg		
			Right	Left
6.	Diameter of each damper mass	mm		
7.	Length of each damper mass	mm		

8.	Weight of each damper mass	kg		
9.	Material of damper masses			
10.	Material of clamp			
11.	Material of the stranded messenger cable			
12.	Number of strands in stranded messenger cable			
13.	Lay ratio of stranded messenger cable			
14.	Minimum ultimate tensile strength of stranded messenger cable	Kg/m m^2		

15.	Slip strength of stranded messenger cable (mass pull off)	kN		
			Right	Left
16.	Resonance frequencies			
	(a) First frequency	Hz		
	(b) Second frequency	Hz		
17	Designed clamping torque	Kg-m		
18.	Slipping strength of damper clamp			
	(a) Before fatigue test	kN		
	(b) After fatigue test	kN		
19.	Magnetic power loss per vibration damper watts for ---Amps, 50 Hz Alternating Current [average continuous operating current]	watts		
20.	Minimum corona Extinction voltage kV (rms) under dry condition [for 400kV lines]	kV		
21.	Radio Interference Voltage at 1 MHz for phase to earth voltage of 320 kV (rms) Microvolts under dry condition [for 400kV lines]	µV		
22.	Maximum permissible continuous operating temperature of Vibration Damper	Deg. C		

23.	Percentage variation in reactance after fatigue test in comparison with that before fatigue test	%	
24.	Percentage variation in power dissipation after fatigue test in comparison with that before fatigue test	%	

NOTE: Tolerances, wherever applicable, shall also be specified.

GUARANTEED TECHNICAL PARTICULARS OF BUNDLE SPACER FOR HT/HTLS CONDUCTOR (IF APPLICABLE) (To be filled by the Bidder)

Sl. No.	**Description**	**Unit**	**Value guaranteed by the Bidder**	
1.	Name of Manufacturer			
2.	Address of Manufacturer			
3.	Drawing enclosed			
	(a) Design Drawing		YES / NO	
	(b) Placement Chart		YES / NO	
4	Suitable for conductor size	mm		
5.	Material / Manufacturing process of component parts			
			Material	Manufacturing Process
	(a) Insert			
	(b) Main body			
	(c) Retaining rods (if any)			
6.	Retaining rods (if used)			
	(a) Type of alloy used			
	(b) Number of retaining rods used for each spacer	no.		
	(c) Diameter	mm		

	(d) Length	mm	
	(e) Weight	kg	
7.	Elastomer		

	(a) Contractor			
	(b) Type			
	(c) Moulded on insert			
	(d) Shore hardness			
	(e) Thickness on insert	mm		
	(f) Temp. range for which designed	°C		
8.	Minimum ultimate tensile strength of spacer			
	(a) Compressive load	kN		
	(b) Tensile load	kN		
9.	Weight of Spacer	kg		
10.	Designed clamping torque(if applicable)	kg. m		
			Before Vibration	After Vibration
11.	Slipping strength of spacer clamp	kN		
12.	Magnetic power loss per spacer for ---- A, 50 Hz Alternating Current (at steady state conductor temperature)	Watts		
			Maximum	Minimum
13.	Electrical resistance of elastomer cushioned spacer	ohm		
14.	Minimum corona Extinction voltage kV (rms) under dry condition [for 400kV lines]	kV		
15.	Radio Interference Voltage at 1 MHz for phase to earth voltage of 320 kV (rms) Microvolts under dry condition [for 400kV lines]	µV		
16.	Maximum permissible continuous operating temperature of Bundle spacer	Deg. C		

NOTE: Tolerances, wherever applicable, shall also be specified.

GUARANTEED TECHNICAL PARTICULARS OF RIGID SPACER FOR JUMPER FOR HTLS CONDUCTOR

(To be filled by the Bidder)

Sl. No.	Description	Unit	Value guaranteed by the Bidder
1.	Name of Manufacturer		
2.	Address of Manufacturer		
3.	Drawing enclosed		
	(a) Design Drawing	YES / NO	
	(b) Placement Chart	YES / NO	
4	Suitable for conductor size	mm	
5.	Material of component parts		
	(a) Clamp		
	(b) Main body		
6.	Manufacturing process for		
	(a) Clamp		
	(b) Main body		
	(e) Weight	kg	
7.	Elastomer		
	(a) Contractor		
	(b) Type		
	(c) Moulded on insert		
	(d) Shore hardness		
	(e) Thickness on insert	mm	
	(f) Temp. range for which designed	°C	

8.	Minimum ultimate tensile strength of spacer		
	(a) Compressive load	kN	

	(b) Tensile load	kN		
9.	Weight of Spacer	kg		
10.	Designed clamping torque(if applicable)	kg.m		
11.	Slipping strength of spacer clamp	kN		
12.	Magnetic power loss per spacer for Watts --- Amps, 50 Hz Alternating Current (at steady state conductor temperature)	watt		
			Maximum	Minimum
12.	Electrical resistance of elastomer cushioned spacer	ohm		……
13.	Minimum corona Extinction voltage kV (rms) under dry condition [for 400kV lines]	kV (rms)		
14.	Radio Interference Voltage at 1 MHz for phase to earth voltage of 320 kV (rms) Microvolts under dry condition [for 400kV lines]	μV		
15.	Maximum permissible continuous operating temperature of rigid spacer	Deg. C		

NOTE: Tolerances, wherever applicable, shall also be specified.

GUARANTEED TECHNICAL PARTICULARS OF SPACER DAMPER FOR HTLS CONDUCTOR (IF APPLICABLE)

(To be filled by the Bidder)

Sl. No.	**Description**	**Unit**	**Value guaranteed by the Bidder**
1.	Name of Manufacturer		
2.	Address of Manufacturer		
3.	Drawing enclosed		
	(a) Design Drawing	YES / NO	
	(b) Placement Chart	YES / NO	

4	Suitable for conductor size	mm		
5.	Material of component parts			
	(a) Clamp			
	(b) Main body			
6.	Type of Clamps			
7.	Type of Damping element			
8.	Manufacturing process for			
	(a) Clamp			
	(b) Main body			
	(e) Weight	kg		
9.	Elastomer			
	(a) Contractor			
	(b) Type			
	(c) Moulded on insert			
	(d) Shore hardness			
	(e) Thickness on insert	mm		
	(f) Temp. range for which designed	°C		
10.	Minimum ultimate tensile strength of spacer			
	(a) Compressive load	kN		
	(b) Tensile load	kN		
11.	Weight of Spacer	kg		
12.	Designed clamping torque(if applicable)	kg. m		
13.	Slipping strength of spacer clamp	kN		
14.	Magnetic power loss per spacer for Watts 1574 Amps, 50 Hz Alternating Current	watt		
			Maximum	Minimum
15.	Electrical resistance of elastomer cushioned spacer	ohm		

16.	Minimum corona Extinction voltage kV (rms) under dry condition [for 400kV lines]	kV (rms)	
17.	Radio Interference Voltage at 1 MHz for phase to earth voltage of 320 kV (rms) Microvolts under dry condition [for 400kV lines]	µV	
18.	Maximum permissible continuous operating temperature of spacer damper	Deg. C	

NOTE: Tolerances, wherever applicable, shall also be specified.

*****

SECTION-IV

PRICE SCHEDULES (PACKAGE-I)

Tender No. T25R220472 **Price Schedule -1**

Package-I : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan- Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address

To
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Plant and Equipment (including Mandatory Spares Parts) to be supplied.

S.No.	Item Description	HSN Code	Whether HSN is confirmed. if not, indicate applicable the HSN code #	Unit	Qty	EX-WORKS PRICE		Mode of Transaction Direct/ Bought Out	Taxes & Duties		
						Unit Price	Total Price		GST		
									Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount (INR)
1	2	3	4	5		8	9	10	11	12	13
Parrt-I	**Main Material and Equipments**										
1	**Supply of Line Materials**										
1.1	High Temperature Low Sag (HTLS) Conductor (as per specification)	76042920		KM	294				18%		
2.0	**Hardware fittings suitable for HTLS conductor with clamps**										
a)	Double I Suspension Hardware fittings	73082011		Set	18				18%		
b)	Single I suspension hard ware fittings	73082011		Set	534				18%		
c)	Single "I" Suspension Pilot Hardware fittings	73082011		Set	142				18%		
d)	Single Tension Hardware fittings	73082011		Set	1584				18%		
e)	Double Tension Hardware fittings	73082011		Set	114				18%		
f)	Single I suspension hard ware fittings for twin HTLS	73082011		Set	48				18%		
g)	Single Tension Hardware fittings for twin HTLS	73082011		Set	120				18%		
3.0	Vibration Damper	73082011		No.	2520				18%		
4.0	**Composite Polymer Insulator String**										
a)	90 kN	85469090		No.	102				18%		
b)	160 KN	85469090		No.	180				18%		
5.0	Material required for earthing of equipments/Structure	73082011		LS	1				18%		
6.0	**Supply of sub station equipments**										
(a)	220kV outdoor type single phase CT of ratio 1600-800/1-1-1-1-1A with 150% extended current rating along with terminal connector etc.	85359090		No.	30				18%		
(b)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator with earth switch with terminal connectors etc.	85359090		No.	8				18%		
(c)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator without earth switch with terminal connectors etc.	85359090		No.	10				18%		
(d)	245kV, 2500A SF6 Circuit Breaker (3PH) along with Mechanism, supporting structure, marshalling box and terminal connector etc.	85359090		No.	5				18%		
7.0	Busbar Spacers for Twin HTLS	73082011		Lot	1				18%		
8.0	T-clamp with jumper cone set for complete jumpering work	73082011		Lot	1				18%		
9.0	Petty items clamps/ connectors required for completion of work.	73082011		LS	1				18%		
	TOTAL of Part I										

Tender No. T25R220472 **Price Schedule -1**

Package-I : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan- Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address

To
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Plant and Equipment (including Mandatory Spares Parts) to be supplied.

S.No.	Item Description	HSN Code	Whether HSN is confirmed. if not, indicate applicable the HSN code #	Unit	Qty	EX-WORKS PRICE		Mode of Transaction Direct/ Bought Out	Taxes & Duties		
						Unit Price	Total Price		GST		
									Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount (INR)
1	2	3	4	5		8	9	10	11	12	13
Part-II	**Mandatory Spares**										
1	High Temperature Low Sag (HTLS) Conductor (as per specification)	76042920		KM	15				18%		
2	**Hardware fittings suitable for HTLS conductor with clamps**										
a)	Double I Suspension Hardware fittings	73082011		Set	1				18%		
b)	Single I suspension hard ware fittings	73082011		Set	26				18%		
c)	Single "I" Suspension Pilot Hardware fittings	73082011		Set	7				18%		
d)	Single Tension Hardware fittings	73082011		Set	79				18%		
e)	Double Tension Hardware fittings	73082011		Set	6				18%		
f)	Single I suspension hard ware fittings for twin HTLS	73082011		Set	3				18%		
g)	Single Tension Hardware fittings for twin HTLS	73082011		Set	6				18%		
3	Vibration Damper	73082011		No.	126				18%		
4	**Composite Polymer Insulator String**										
a)	90 kN	85469090		Nos.	5				18%		
b)	160 KN	85469090		Nos.	9				18%		
5	Mid Span Compression Joint	73082011		Nos.	60				18%		
6	Repair Sleeve	73082011		Nos.	30				18%		
7	Dies set for Dead end clamp	73082011		Nos.	1				18%		
8	Dies Set Jumper cone	73082011		Nos.	1				18%		
9	Dies set Mid Span Joint	73082011		Nos.	1				18%		
10	Dies Set Repair Sleave	73082011		Nos.	1				18%		
	TOTAL of Part II										
	TOTAL i.e. [I+II]										

Note : **Bidder is required to quote prices in this Schedule for all the individual items/sub-items.**
HSN Code shall be filled by Bidder
In case any additional equipment is required, the same shalll be supplied without any additional payment and the offer should be complete and comprehensive.
Date :
Place :

Signature : _____
Designation _____
Common Seal

Tender No. T25R220472 **Price Schedule -2**

Package-I : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan- Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address :

To,
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Local Transportation, Insurance and other Incidental Services.

				Transport Services							Insurance and other Incidental Services						
								Taxes & Duties							Taxes & Duties		
								GST							GST		
S.No.	Item Description	Unit	Qty	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount
1	2	3	4	5	6	7	8= (4X7)	9	10	11= 8*(9 or 10)	12	13	14	15 = (4X14)	16	17	18= 15*(16 or 17)
Part-I	**Main Material and Equipments**																
1	**Supply of Line Materials**																
1.0	High Temperature Low Sag (HTLS) Conductor (as per specification)	KM	294	996519				18%			997136				18%		
2.0	**Hardware fittings suitable for HTLS conductor with clamps**																
a)	Double I Suspension Hardware fittings	Set	18	996519				18%			997136				18%		
b)	Single I suspension hard ware fittings	Set	534	996519				18%			997136				18%		
c)	Single "I" Suspension Pilot Hardware fittings	Set	142	996519				18%			997136				18%		
d)	Single Tension Hardware fittings	Set	1584	996519				18%			997136				18%		
e)	Double Tension Hardware fittings	Set	114	996519				18%			997136				18%		
f)	Single I suspension hard ware fittings for twin HTLS	Set	48	996519				18%			997136				18%		
g)	Single Tension Hardware fittings for twin HTLS	Set	120	996519				18%			997136				18%		
3.0	Vibration Damper	No.	2520	996519				18%			997136				18%		
4.0	**Composite Polymer Insulator String**																
a)	90 kN	No.	102	996519				18%			997136				18%		
b)	160 KN	No.	180	996519				18%			997136				18%		
5.0	Material required for earthing of equipments/Structure	LS	1	996519				18%			997136				18%		
6.0	**Supply of sub station equipments**																
(a)	220kV outdoor type single phase CT of ratio 1600-800/1-1-1-1-1A with 150% extended current rating along with terminal connector etc.	No.	30	996519				18%			997136				18%		
(b)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator with earth switch with terminal connectors etc.	No.	8	996519				18%			997136				18%		
(c)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator without earth switch with terminal connectors etc.	No.	10	996519				18%			997136				18%		
(d)	245kV, 2500A SF6 Circuit Breaker (3PH) along with Mechanism, supporting structure, marshalling box and terminal connector etc.	No.	5	996519				18%			997136				18%		
7.0	Busbar Spacers for Twin HTLS	Lot	1	996519				18%			997136				18%		
8.0	T-clamp with jumper cone set for complete jumpering work	Lot	1	996519				18%			997136				18%		
9.0	Petty items clamps/ connectors required for completion of work.	LS	1	996519				18%			997136				18%		
	TOTAL of Part I																

Tender No. T25R220472 **Price Schedule -2**

Package-I : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan- Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address :

To,
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Local Transportation, Insurance and other Incidental Services.

				Transport Services							Insurance and other Incidental Services						
								Taxes & Duties							Taxes & Duties		
								GST							GST		
S.No.	Item Description	Unit	Qty	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount
1	2	3	4	5	6	7	8= (4X7)	9	10	11= 8*(9 or 10)	12	13	14	15 = (4X14)	16	17	18= 15*(16 or 17)
Part-II	**Mandatory Spares**																
1	High Temperature Low Sag (HTLS) Conductor (as per specification)	KM	15	996519				18%			997136				18%		
2	**Hardware fittings suitable for HTLS conductor with clamps**																
a)	Double I Suspension Hardware fittings	Set	1	996519				18%			997136				18%		
b)	Single I suspension hard ware fittings	Set	26	996519				18%			997136				18%		
c)	Single "I" Suspension Pilot Hardware fittings	Set	7	996519				18%			997136				18%		
d)	Single Tension Hardware fittings	Set	79	996519				18%			997136				18%		
e)	Double Tension Hardware fittings	Set	6	996519				18%			997136				18%		
f)	Single I suspension hard ware fittings for twin HTLS	Set	3	996519				18%			997136				18%		
g)	Single Tension Hardware fittings for twin HTLS	Set	6	996519				18%			997136				18%		
3	Vibration Damper	No.	126	996519				18%			997136				18%		
4	**Composite Polymer Insulator String**																
a)	90 kN	Nos.	5	996519				18%			997136				18%		
b)	160 KN	Nos.	9	996519				18%			997136				18%		
5	Mid Span Compression Joint	Nos.	60	996519				18%			997136				18%		
6	Repair Sleave	Nos.	30	996519				18%			997136				18%		
7	Dies set for Dead end clamp	Nos.	1	996519				18%			997136				18%		
8	Dies Set Jumper cone	Nos.	1	996519				18%			997136				18%		
9	Dies set Mid Span Joint	Nos.	1	996519				18%			997136				18%		
10	Dies Set Repair Sleave	Nos.	1	996519				18%			997136				18%		
	TOTAL of Part II																
	TOTAL i.e. [I+II]																

Note : **Bidder is required to quote prices in this Schedule for all the individual items/sub-items.**
SAC Code shall be filled by Bidder
In case any additional equipment is required, the same shalll be supplied without any additional payment and the offer should be complete and comprehensive.

Date
Place :

Signature : _____
Printed Name _____
Designation _____
Common Seal _____

Tender No. T25R220472 **Price Schedule- 3**

Package-I : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan- Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address :

To
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Installation Charges

S.No.	Item Description	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit	Qty	Unit Charges (INR)	Total Charges (INR)	Taxes & Duties		
								GST		
								Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount (INR)
1	2	3	4	5	6	7	8	9	10	11
1	Installation of necessary hardware,hoisting of insulator strings, installation and stringing of HTLS conductor including fixing of conductor accessories to complete the job	995461		KM	294			18%		
2	Material required for earthing of equipments/Structure	995461		LS	1			18%		
3	**ETC of sub station equipments**									
a)	220kV outdoor type single phase CT of ratio 1600-800/1-1-1-1-1A with 150% extended current rating along with terminal connector etc.	995461		Nos.	30			18%		
b)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator with earth switch with terminal connectors etc.	995461		Nos.	8			18%		
c)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator without earth switch with terminal connectors etc.	995461		Nos.	10			18%		
d)	245kV, 2500A SF6 Circuit Breaker (3PH) along with Mechanism, supporting structure, marshalling box and terminal connector etc.	995461		Nos.	5			18%		
4	Petty items clamps/ connectors required for completion of work.	995461		LS	1			18%		
5	Dismantling of six ACSR Zebra conductor including disc insulators, hardware fittings and other accessories etc. and transportation from site to DTL store or other site store alongwith proper stacking etc.	995461		LS	1			18%		
6	Dismantling of existing ACSR zebra conductor 220 kV Busbars with insulators , fittings and other accessories and transportation of same to DTL store /site with proper stacking of material	995461		LS	1			18%		
7	Dismantling of 220 kV equipments alongwith associated accessories and transportation of same to DTL store /site									
a)	220 kV CT	995461		Nos.	30			18%		
b)	220 kV Isolator with Earth Switch	995461		Nos.	8			18%		
c)	220 kV Isolator without Earth Switch	995461		Nos.	10			18%		
d)	220 kV Circuit Breaker	995461		No.	5			18%		
	Total:									

Note :
Bidder is required to quote prices in this Schedule for all the individual items/sub-items.
SAC Code shall be filled/confirmed by Bidder
In case any additional equipment is required, the same shalll be supplied without any additional payment and the offer should be complete and comprehensive.

Date
Place :

Signature : _____
Printed Name _____
Designation _____
Common Seal _____

Tender No. T25R220472	Price Schedule-4

Package-I : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring for Bamnauli-Najafgarh, Najafgarh-Tikrikalan- Kanjhawala , Kanjhawala-Bawana, Bawana - DSIIDC Bawana 220kV D/C ACSR Zebra Transmission Line alongwith replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder's Name and Address :	

I. GRAND SUMMARY OF THE QUOTED BID PRICE.

S.No	DESCRIPTION	Total Price (INR)	
		PRICE	GST
1	**TOTAL PRICE SCHEDULE-1** Plant and Equipment (including Mandatory Spares) to be supplied.		
2	**TOTAL PRICE SCHEDULE-2** Local Transportation, Insurance and other Incidental Services.		
3	**TOTAL PRICE SCHEDULE-3** Installation Charges		
	GRAND TOTAL 'A ' = [1 + 2 + 3]		

II. We declare that the following are our quoted bid price in INR for the entire Scope of work as specified in the

A. Quoted Bid Price Excluding taxes & duties (Grand Summary of the quoted Bid Price as in I above.):

i. In Figures:INR	
ii. In Words: INR:	

B. Applicable Taxes & Duties and other levies, payable additionally, in respect of the transaction between the Owner and the Contractor (Total Amount to be mentioned).

i. GST (Total Amount to be mentioned)	
ii. **Total taxes & duties(i) :**	

C. Total Quoted Bid Price including Taxes and Duties and other levies, if contract is awarded to us i.e A+B above

i. In Figures:INR	
ii. In Words: INR:	

Date :
Place :

Signature : _____
Printed Name _____
Designation _____
Common Seal _____

SECTION-IV

PRICE SCHEDULES (PACKAGE-II)

Tender No. T25R220472 **Price Schedule -1**

Package-II : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address

To
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Plant and Equipment (including Mandatory Spares Parts) to be supplied.

S.No.	Item Description	HSN Code	Whether HSN is confirmed. if not, indicate applicable the HSN code #	Unit	Qty	EX-WORKS PRICE		Mode of Transaction Direct/ Bought Out	Taxes & Duties		
						Unit Price (INR)	Total Price (INR)		GST		
									Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount (INR)
1	2	3	4	5		8	9	10	11	12	13
Parrt-I	**Main Material and Equipments**										
1	**Supply of Line Materials**										
1.1	High Temperature Low Sag (HTLS) Conductor (as per specification)	76042920		KM	47				18%		
2.0	**Hardware fittings suitable for HTLS conductor with clamps**										
a)	Single I suspension hard ware fittings	73082011		Set	18				18%		
b)	Single "I" Suspension Pilot Hardware fittings	73082011		Set	87				18%		
c)	Single Tension Hardware fittings	73082011		Set	300				18%		
d)	Double Tension Hardware fittings	73082011		Set	120				18%		
3.0	Vibration Damper	73082011		No.	408				18%		
4.0	**Composite Polymer Insulator String**										
a)	90 KN	85469090		Nos.	105				18%		
b)	160 KN	85469090		Nos.	540				18%		
5.0	Material required for earthing of equipments/Structure	73082011		LS	1				18%		
6.0	**Supply of sub station equipments**										
(a)	220kV outdoor type single phase CT of ratio 1600-800/1-1-1-1-1A with 150% extended current rating along with terminal connector etc.	85359090		Nos.	15				18%		
(b)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator with earth switch with terminal connectors etc.	85359090		Nos.	2				18%		
(c)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator without earth switch with terminal connectors etc.	85359090		Nos.	4				18%		
7.0	Petty items clamps/ connectors required for completion of work.	73082011		LS	1				18%		
	TOTAL of Part I										

Tender No. T25R220472 **Price Schedule -1**

Package-II : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address

To
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Plant and Equipment (including Mandatory Spares Parts) to be supplied.

S.No.	Item Description	HSN Code	Whether HSN is confirmed. if not, indicate applicable the HSN code #	Unit	Qty	EX-WORKS PRICE		Mode of Transaction Direct/ Bought Out	Taxes & Duties		
						Unit Price (INR)	Total Price (INR)		GST		
									Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount (INR)
1	2	3	4	5		8	9	10	11	12	13
Part-II	**Mandatory Spares**										
1	High Temperature Low Sag (HTLS) Conductor (as per specification)	76042920		KM	2				18%		
2	**Hardware fittings suitable for HTLS conductor with clamps**										
a	Single I suspension hard ware fittings	73082011		Set	1				18%		
b	Single "I" Suspension Pilot Hardware fittings	73082011		Set	4				18%		
c	Single Tension Hardware fittings	73082011		Set	15				18%		
f	Double Tension Hardware fittings	73082011		Set	6				18%		
3	Vibration Damper	73082011		Set	21				18%		
4	**Composite Polymer Insulator String**										
a	90 KN	85469090		Set	4				18%		
b	160 KN	85469090		Set	27				18%		
5	Mid Span Compression Joint	73082011		Nos.	10				18%		
6	Repair Sleeve	73082011		Nos.	5				18%		
7	Dies set for Dead end clamp	73082011		Nos.	1				18%		
8	Dies Set Jumper cone	73082011		Nos.	1				18%		
9	Dies set Mid Span Joint	73082011		Nos.	1				18%		
10	Dies Set Repair Sleave	73082011		Nos.	1				18%		
	TOTAL of Part II										
	TOTAL i.e. [I+II]										

Note : **Bidder is required to quote prices in this Schedule for all the individual items/sub-items.**
HSN Code shall be filled by Bidder
In case any additional equipment is required, the same shalll be supplied without any additional payment and the offer should be complete and
Date :
Place :

Signature : _____
Designation _____
Common Seal _____

Tender No. T25R220472 **Price Schedule -2**

Package-II : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address :

To,
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Local Transportation, Insurance and other Incidental Services.

S.No.	Item Description	Unit	Qty	Transport Services							Insurance and other Incidental Services						
				SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Taxes & Duties GST Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Taxes & Duties GST Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount
1	2	3	4	5	6	7	8= (4X7)	9	10	11= 8*(9 or 10)	12	13	14	15 = (4X14)	16	17	18= 15*(16 or 17)
Parrt-I	**Main Material and Equipments**																
1	**Supply of Line Materials**																
1.1	High Temperature Low Sag (HTLS) Conductor (as per specification)	KM	47.00	996519				18%			997136				18%		
2.0	**Hardware fittings suitable for HTLS conductor with clamps**																
a)	Single I suspension hard ware fittings	Set	18.00	996519				18%			997136				18%		
b)	Single "I" Suspension Pilot Hardware fittings	Set	87.00	996519				18%			997136				18%		
c)	Single Tension Hardware fittings	Set	300.00	996519				18%			997136				18%		
d)	Double Tension Hardware fittings	Set	120.00	996519				18%			997136				18%		
3.0	Vibration Damper	No.	408.00	996519				18%			997136				18%		
4.0	**Composite Polymer Insulator String**																
a)	90 KN	Nos.	105.00	996519				18%			997136				18%		
b)	160 KN	Nos.	540.00	996519				18%			997136				18%		
5.0	Material required for earthing of equipments/Structure	LS	1.00	996519				18%			997136				18%		
6.0	**Supply of sub station equipments**																
(a)	220kV outdoor type single phase CT of ratio 1600-800/1-1-1-1-1A with 150% extended current rating along with terminal connector etc.	Nos.	15.00	996519				18%			997136				18%		
(b)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator with earth switch with terminal connectors etc.	Nos.	2.00	996519				18%			997136				18%		
(c)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator without earth switch with terminal connectors etc.	Nos.	4.00	996519				18%			997136				18%		
7.0	Petty items clamps/ connectors required for completion of work.	LS	1.00	996519				18%			997136				18%		
	TOTAL of Part I																
Part-II	**Mandatory Spares**																
1	High Temperature Low Sag (HTLS) Conductor (as per specification)	KM	2	996519				18%			997136				18%		

Tender No. T25R220472 **Price Schedule -2**

Package-II : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address :

To,
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Local Transportation, Insurance and other Incidental Services.

				Transport Services							Insurance and other Incidental Services						
								Taxes & Duties							Taxes & Duties		
								GST							GST		
S.No.	Item Description	Unit	Qty	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount
1	2	3	4	5	6	7	8= (4X7)	9	10	11= 8*(9 or 10)	12	13	14	15 = (4X14)	16	17	18= 15*(16 or 17)
2	**Hardware fittings suitable for HTLS conductor with clamps**							18%			997136				18%		
a	Single I suspension hard ware fittings	Set	1	996519				18%			997136				18%		
b	Single "I" Suspension Pilot Hardware fittings	Set	4	996519				18%			997136				18%		
c	Single Tension Hardware fittings	Set	15	996519				18%			997136				18%		
d	Double Tension Hardware fittings	Set	6	996519				18%			997136				18%		
3	Vibration Damper	Set	21	996519				18%			997136				18%		
4	**Composite Polymer Insulator String**							18%			997136				18%		
a	90 KN	Set	4	996519				18%			997136				18%		
b	160 KN	Set	27	996519				18%			997136				18%		
5	Mid Span Compression Joint	Nos.	10	996519				18%			997136				18%		
6	Repair Sleave	Nos.	5	996519				18%			997136				18%		
7	Dies set for Dead end clamp	Nos.	1	996519				18%			997136				18%		
8	Dies Set Jumper cone	Nos.	1	996519				18%			997136				18%		
9	Dies set Mid Span Joint	Nos.	1	996519				18%			997136				18%		
10	Dies Set Repair Sleave	Nos.	1	996519													
	TOTAL of Part II																
	TOTAL i.e. [I+II]																

Note : **Bidder is required to quote prices in this Schedule for all the individual items/sub-items.**
SAC Code shall be filled by Bidder
In case any additional equipment is required, the same shalll be supplied without any additional payment and the offer should be complete and comprehensive.

Date
Place :

Signature : _____
Printed Name _____
Designation _____
Common Seal _____

Tender No. T25R220472 **Price Schedule- 3**

Package-II : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur- Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address :

To
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Installation Charges

S.No.	Item Description	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit	Qty	Unit Charges (INR)	Total Charges (INR)	Taxes & Duties		
								GST		
								Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount
1	2	3	4	5	6	7	8	9	10	11
1	Installation of necessary hardware,hoisting of insulator strings, installation and stringing of HTLS conductor including fixing of conductor accessories to complete the job	995461		KM	47.00			18%		
2	Material required for earthing of equipments/Structure	995461		LS	1.00			18%		
3	**ETC of sub station equipments**									
a)	220kV outdoor type single phase CT of ratio 1600-800/1-1-1-1-1A with 150% extended current rating along with terminal connector etc.	995461		Nos.	15.00			18%		
b)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator with earth switch with terminal connectors etc.	995461		Nos.	2.00			18%		
c)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator without earth switch with terminal connectors etc.	995461		Nos.	4.00			18%		
4	Petty items clamps/ connectors required for completion of work.	995461		LS	1.00			18%		
5	Dismantling of six ACSR Zebra conductor including disc insulators, hardware fittings and other accessories etc. and transportation from site to DTL store or other site store alongwith proper stacking etc.	995461		LS	1.00			18%		
6	Dismantling of 220 kV equipments alongwith associated accessories and transportation of same to DTL store /site									
a)	220 kV CT	995461		Nos.	15			18%		
b)	220 kV Isolator with Earth Switch	995461		Nos.	2			18%		
c)	220 kV Isolator without Earth Switch	995461		Nos.	4			18%		
	Total:									

Bidder is required to quote prices in this Schedule for all the individual items/sub-items.
Note : SAC Code shall be filled/confirmed by Bidder
In case any additional equipment is required, the same shalll be supplied without any additional payment and the offer should be complete and comprehensive.

Signature : _____

Date
Place :

Printed Name _____
Designation _____
Common Seal _____

Tender No. T25R220472	**Price Schedule-4**

Package-II : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220 kV Gopalpur-Timarpur- Subzi Mandi Transmission Line at interconnecting substation of DTL (Delhi) on turnkey basis.

Bidder's Name and Address :	

I. GRAND SUMMARY OF THE QUOTED BID PRICE.

S.No	DESCRIPTION	Total Price (INR)	
		PRICE	**GST**
1	**TOTAL PRICE SCHEDULE-1** Plant and Equipment (including Mandatory Spares) to be supplied.		
2	**TOTAL PRICE SCHEDULE-2** Local Transportation, Insurance and other Incidental Services.		
3	**TOTAL PRICE SCHEDULE-3** Installation Charges		
	GRAND TOTAL 'A ' = [1 + 2 + 3]		

II. We declare that the following are our quoted bid price in INR for the entire Scope of work as specified in the

A. Quoted Bid Price Excluding taxes & duties (Grand Summary of the quoted Bid Price as in I above.):

i. In Figures:INR	
ii. In Words: INR:	

B. Applicable Taxes & Duties and other levies, payable additionally, in respect of the transaction between the Owner and the Contractor (Total Amount to be mentioned).

i. GST (Total Amount to be mentioned)	
ii. **Total taxes & duties(i) :**	

C. Total Quoted Bid Price including Taxes and Duties and other levies, if contract is awarded to us i.e A+B above

i. In Figures:INR	
ii. In Words: INR:	

Date :
Place :

Signature : _____
Printed Name _____
Designation _____
Common Seal _____

SECTION-IV

PRICE SCHEDULES (PACKAGE-III)

Tender No. T25R220472 **Price Schedule -1**

Package-III : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address

To
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Plant and Equipment (including Mandatory Spares Parts) to be supplied.

S.No.	Item Description	HSN Code	Whether HSN is confirmed. if not, indicate applicable the HSN code #	Unit	Qty	EX-WORKS PRICE		Mode of Transaction Direct/ Bought Out	Taxes & Duties		
						Unit Price (INR)	Total Price (INR)		GST		
									Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount (INR)
1	2	3	4	5		8	9	10	11	12	13
Parrt-I	**Main Material and Equipments**										
1	**Supply of Line Materials**										
1.1	High Temperature Low Sag (HTLS) Conductor (as per specification)	76042920		KM	76				18%		
2.0	**Hardware fittings suitable for HTLS conductor with clamps**										
a)	Double I Suspension Hardware fittings	73082011		Set	30				18%		
b)	Single I suspension hard ware fittings	73082011		Set	105				18%		
c)	Single "I" Suspension Pilot Hardware fittings	73082011		Set	111				18%		
d)	Single Tension Hardware fittings	73082011		Set	318				18%		
e)	Double Tension Hardware fittings	73082011		Set	126				18%		
f)	Single I suspension hard ware fittings for twin HTLS	73082011		Set	48				18%		
g)	Single Tension Hardware fittings for twin HTLS	73082011		Set	156				18%		
3.0	Vibration Damper	73082011		No.	468				18%		
4.0	**Composite Polymer Insulator String**										
a)	90 kN	85469090		Nos.	240				18%		
b)	160 KN	85469090		Nos.	594				18%		
5.0	Material required for earthing of equipments/Structure	73082011		LS	1				18%		
6.0	**Supply of sub station equipments**										
(a)	220kV outdoor type single phase CT of ratio 1600-800/1-1-1-1-1A with 150% extended current rating along with terminal connector etc.	85359090		Nos.	39				18%		
(b)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator with earth switch with terminal connectors etc.	85359090		Nos.	10				18%		
(c)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator without earth switch with terminal connectors etc.	85359090		Nos.	8				18%		
7.0	Busbar Spacers for Twin HTLS	73082011		Lot	1				18%		
8.0	T-clamp with jumper cone set for complete jumpering work	73082011		Lot	1				18%		
9	Petty items clamps/ connectors required for completion of work.	73082011		LS	1				18%		
	TOTAL of Part I										

Tender No. T25R220472 **Price Schedule -1**

Package-III : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address

To
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Plant and Equipment (including Mandatory Spares Parts) to be supplied.

S.No.	Item Description	HSN Code	Whether HSN is confirmed. if not, indicate applicable the HSN code #	Unit	Qty	EX-WORKS PRICE		Mode of Transaction Direct/ Bought Out	Taxes & Duties		
						Unit Price (INR)	Total Price (INR)		GST		
									Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount (INR)
1	2	3	4	5		8	9	10	11	12	13
Part-II	**Mandatory Spares**										
1	High Temperature Low Sag (HTLS) Conductor (as per specification)	76042920		KM	3.8				18%		
2	**Hardware fittings suitable for HTLS conductor with clamps**										
a)	Double I Suspension Hardware fittings	73082011		Set	2				18%		
b)	Single I suspension hard ware fittings	73082011		Set	5				18%		
c)	Single "I" Suspension Pilot Hardware fittings	73082011		Set	5				18%		
d)	Single Tension Hardware fittings	73082011		Set	16				18%		
e)	Double Tension Hardware fittings	73082011		Set	6				18%		
f)	Single I suspension hard ware fittings for twin HTLS	73082011		Set	2				18%		
g)	Single Tension Hardware fittings for twin HTLS	73082011		Set	8				18%		
3	Vibration Damper	73082011		No.	23				18%		
4	**Composite Polymer Insulator String**										
a)	90 kN	85469090		Nos.	12				18%		
b)	160 KN	85469090		Nos.	30				18%		
5	Mid Span Compression Joint	73082011		Nos.	15				18%		
6	Repair Sleeve	73082011		Nos.	7				18%		
7	Dies set for Dead end clamp	73082011		Nos.	1				18%		
8	Dies Set Jumper cone	73082011		Nos.	1				18%		
9	Dies set Mid Span Joint	73082011		Nos.	1				18%		
10	Dies Set Repair Sleave	73082011		Nos.	1				18%		
	TOTAL of Part II										
	TOTAL i.e. [I+II]										

Note : **Bidder is required to quote prices in this Schedule for all the individual items/sub-items.**
HSN Code shall be filled by Bidder
In case any additional equipment is required, the same shalll be supplied without any additional payment and the offer should be complete and comprehensive.
Date :
Place :

Signature : _____
Designation _____
Common Seal _____

Tender No. T25R220472 **Price Schedule -2**

Package-III : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address :

To,
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Local Transportation, Insurance and other Incidental Services.

				Transport Services							Insurance and other Incidental Services						
								Taxes & Duties GST							Taxes & Duties GST		
S.No.	Item Description	Unit	Qty	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount (INR)
1	2	3	4	5	6	7	8= (4X7)	9	10	11= 8*(9 or 10)	12	13	14	15 = (4X14)	16	17	18= 15*(16 or 17)
Part-I	**Main Material and Equipments**																
1	**Supply of Line Materials**																
1.1	High Temperature Low Sag (HTLS) Conductor (as per specification)	KM	76	996519				18%			997136				18%		
2.0	**Hardware fittings suitable for HTLS conductor with clamps**																
a)	Double I Suspension Hardware fittings	Set	30	996519				18%			997136				18%		
b)	Single I suspension hard ware fittings	Set	105	996519				18%			997136				18%		
c)	Single "I" Suspension Pilot Hardware fittings	Set	111	996519				18%			997136				18%		
d)	Single Tension Hardware fittings	Set	318	996519				18%			997136				18%		
e)	Double Tension Hardware fittings	Set	126	996519				18%			997136				18%		
f)	Single I suspension hard ware fittings for twin HTLS	Set	48	996519				18%			997136				18%		
g)	Single Tension Hardware fittings for twin HTLS	Set	156	996519				18%			997136				18%		
3.0	Vibration Damper	No.	468	996519				18%			997136				18%		
4.0	**Composite Polymer Insulator String**																
a)	90 kN	Nos.	240	996519				18%			997136				18%		
b)	160 KN	Nos.	594	996519				18%			997136				18%		
5.0	Material required for earthing of equipments/Structure	LS	1	996519				18%			997136				18%		
6.0	**Supply of sub station equipments**																
(a)	220kV outdoor type single phase CT of ratio 1600-800/1-1-1-1-1A with 150% extended current rating along with terminal connector etc.	Nos.	39	996519				18%			997136				18%		
(b)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator with earth switch with terminal connectors etc.	Nos.	10	996519				18%			997136				18%		
(c)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator without earth switch with terminal connectors etc.	Nos.	8	996519				18%			997136				18%		
7.0	Busbar Spacers for Twin HTLS	Lot	1	996519				18%			997136				18%		
8.0	T-clamp with jumper cone set for complete jumpering work	Lot	1	996519				18%			997136				18%		
9	Petty items clamps/ connectors required for completion of work.	LS	1	996519				18%			997136				18%		
	TOTAL of Part I																
Part-II	**Mandatory Spares**																
1	High Temperature Low Sag (HTLS) Conductor (as per specification)	KM	3.8	996519				18%			997136				18%		
2	**Hardware fittings suitable for HTLS conductor with clamps**																
a)	Double I Suspension Hardware fittings	Set	2	996519				18%			997136				18%		
b)	Single I suspension hard ware fittings	Set	5	996519				18%			997136				18%		

Tender No. T25R220472 **Price Schedule -2**

Package-III : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address :

To,
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Local Transportation, Insurance and other Incidental Services.

				Transport Services							Insurance and other Incidental Services						
								Taxes & Duties GST							Taxes & Duties GST		
S.No.	Item Description	Unit	Qty	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount (INR)
1	2	3	4	5	6	7	8= (4X7)	9	10	11= 8*(9 or 10)	12	13	14	15 = (4X14)	16	17	18= 15*(16 or 17)
c)	Single "I" Suspension Pilot Hardware fittings	Set	5	996519				18%			997136				18%		
d)	Single Tension Hardware fittings	Set	16	996519				18%			997136				18%		
e)	Double Tension Hardware fittings	Set	6	996519				18%			997136				18%		
f)	Single I suspension hard ware fittings for twin HTLS	Set	2	996519				18%			997136				18%		
g)	Single Tension Hardware fittings for twin HTLS	Set	8	996519				18%			997136				18%		
3	Vibration Damper	No.	23	996519				18%			997136				18%		
4	**Composite Polymer Insulator String**																
a)	90 kN	Nos.	12	996519				18%			997136				18%		
b)	160 KN	Nos.	30	996519				18%			997136				18%		
5	Mid Span Compression Joint	Nos.	15	996519				18%			997136				18%		
6	Repair Sleave	Nos.	7	996519				18%			997136				18%		
7	Dies set for Dead end clamp	Nos.	1	996519				18%			997136				18%		
8	Dies Set Jumper cone	Nos.	1	996519				18%			997136				18%		
9	Dies set Mid Span Joint	Nos.	1	996519				18%			997136				18%		
10	Dies Set Repair Sleave	Nos.	1	996519				18%			997136				18%		
	TOTAL of Part II																
	TOTAL i.e. [I+II]																

Note : **Bidder is required to quote prices in this Schedule for all the individual items/sub-items.**
SAC Code shall be filled by Bidder
In case any additional equipment is required, the same shalll be supplied without any additional payment and the offer should be complete and comprehensive.

Date
Place :

Signature : _____
Printed Name _____
Designation _____
Common Seal _____

Tender No. T25R220472 **Price Schedule- 3**

Package-III : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

(Schedule of Rates and Prices)

Bidder's Name and Address :

To
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Installation Charges

S.No.	Item Description	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit	Qty	Unit Charges (INR)	Total Charges (INR)	Taxes & Duties		
								GST		
								Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount
1	2	3	4	5	6	7	8	9	10	11
1	Installation of necessary hardware,hoisting of insulator strings, installation and stringing of HTLS conductor including fixing of conductor accessories to complete the job	995461		KM	76			18%		
2	Material required for earthing of equipments/Structure	995461		LS	1			18%		
3	**ETC of sub station equipments**									
a)	220kV outdoor type single phase CT of ratio 1600-800/1-1-1-1-1A with 150% extended current rating along with terminal connector etc.	995461		Nos.	39			18%		
b)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator with earth switch with terminal connectors etc.	995461		Nos.	10			18%		
c)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator without earth switch with terminal connectors etc.	995461		Nos.	8			18%		
4	Petty items clamps/ connectors required for completion of work.	995461		LS	1			18%		
5	Dismantling of six ACSR Zebra conductor including disc insulators, hardware fittings and other accessories etc. and transportation from site to DTL store or other site store alongwith proper stacking etc.	995461		LS	1			18%		
6	Dismantling of existing ACSR zebra conductor 220 kV Busbars with insulators , fittings and other accessories and transportation of same to DTL store /site with proper stacking of material	995461		LS	1			18%		
7	Dismantling of 220 kV equipments alongwith associated accessories and transportation of same to DTL store /site									
a)	220 kV CT	995461		Nos.	39			18%		
b)	220 kV Isolator with Earth Switch	995461		Nos.	10			18%		
c)	220 kV Isolator without Earth Switch	995461		Nos.	8			18%		
	Total:									

Bidder is required to quote prices in this Schedule for all the individual items/sub-items.

Note : SAC Code shall be filled/confirmed by Bidder

In case any additional equipment is required, the same shalll be supplied without any additional payment and the offer should be complete and comprehensive.

Signature : _____
Printed Name _____
Designation _____
Common Seal _____

Date
Place :

Tender No. T25R220472	**Price Schedule-4**

Package-III : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of 220KV D/C Geeta Colony-Patparganj, Patparganj-IP and IP-Pragati Zebra Conductor Transmission Line along with replacement of associated equipments/Busbars at interconnecting substations of DTL (Delhi) on turnkey basis.

Bidder's Name and Address :	

I. GRAND SUMMARY OF THE QUOTED BID PRICE.

S.No	DESCRIPTION	Total Price (INR)	
		PRICE	GST
1	**TOTAL PRICE SCHEDULE-1** Plant and Equipment (including Mandatory Spares) to be supplied.		
2	**TOTAL PRICE SCHEDULE-2** Local Transportation, Insurance and other Incidental Services.		
3	**TOTAL PRICE SCHEDULE-3** Installation Charges		
	GRAND TOTAL 'A ' = [1 + 2 + 3]		

II. We declare that the following are our quoted bid price in INR for the entire Scope of work as specified in the

A. Quoted Bid Price Excluding taxes & duties (Grand Summary of the quoted Bid Price as in I above.):

i. In Figures:INR	
ii. In Words: INR:	

B. Applicable Taxes & Duties and other levies, payable additionally, in respect of the transaction between the Owner and the Contractor (Total Amount to be mentioned).

i. GST (Total Amount to be mentioned)	
ii. **Total taxes & duties(i) :**	

C. Total Quoted Bid Price including Taxes and Duties and other levies, if contract is awarded to us i.e A+B above

i. In Figures:INR	
ii. In Words: INR:	

Date :
Place :

Signature : _____
Printed Name _____
Designation _____
Common Seal _____

SECTION-IV

PRICE SCHEDULES (PACKAGE-IV)

Tender No. T25R220472 **Price Schedule -1**

Package-IV : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis..

(Schedule of Rates and Prices)

Bidder's Name and Address

To
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Plant and Equipment (including Mandatory Spares Parts) to be supplied.

S.No.	Item Description	HSN Code	Whether HSN is confirmed. if not, indicate applicable the HSN code #	Unit	Qty	EX-WORKS PRICE		Mode of Transaction Direct/ Bought Out	Taxes & Duties		
						Unit Price (INR)	Total Price (INR)		GST		
									Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount (INR)
1	2	3	4	5		8	9	10	11	12	13
Part-I	**Main Material and Equipments**										
1	**Supply of Line Materials**										
1.1	High Temperature Low Sag (HTLS) Conductor (as per specification)	76042920		KM	211				18%		
2.0	**Hardware fittings suitable for HTLS conductor with clamps**										
a)	Double I Suspension Hardware fittings	73082011		Set	36				18%		
b)	Single I suspension hard ware fittings	73082011		Set	528				18%		
c)	Single "I" Suspension Pilot Hardware fittings	73082011		Set	164				18%		
d)	Single Tension Hardware fittings	73082011		Set	570				18%		
e)	Double Tension Hardware fittings	73082011		Set	42				18%		
f)	Single I suspension hard ware fittings for twin HTLS	73082011		Set	60				18%		
g)	Single Tension Hardware fittings for twin HTLS	73082011		Set	96				18%		
h)	Double Tension Hardware fittings for twin HTLS	73082011		Set	48				18%		
3.0	Vibration Damper	73082011		No.	1488				18%		
4.0	**Composite Polymer Insulator String**										
a)	90 kN	85469090		Nos.	114				18%		
b)	160 KN	85469090		Nos.	252				18%		
5.0	Material required for earthing of equipments/Structure	73082011		LS	1				18%		
6.0	**Supply of sub station equipments**										
a)	220kV outdoor type single phase CT of ratio 1600-800/1-1-1-1-1A with 150% extended current rating along with terminal connector etc.	85359090		Nos.	30				18%		
b)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator with earth switch with terminal connectors etc.	85359090		Nos.	4				18%		
c)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator without earth switch with terminal connectors etc.	85359090		Nos.	6				18%		
d)	245kV, 2500A SF6 Circuit Breaker (3PH) along with Mechanism, supporting structure, marshalling box and terminal connector etc.	85359090		Nos.	4				18%		
e)	220kV, 1600 A 3 pole MOM, Tandem Isolator without earth switch with terminal connectors etc.	85359090		Nos.	4				18%		
7.0	Busbar Spacers for Twin HTLS	73082011		Lot	1				18%		
8.0	T-clamp with jumper cone set for complete jumpering work	73082011		Lot	1				18%		
9.0	Petty items clamps/ connectors required for completion of work.	73082011		LS	1				18%		
	TOTAL of Part I										

Tender No. T25R220472 **Price Schedule -1**

Package-IV : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis..

(Schedule of Rates and Prices)

Bidder's Name and Address

To
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Plant and Equipment (including Mandatory Spares Parts) to be supplied.

S.No.	Item Description	HSN Code	Whether HSN is confirmed. if not, indicate applicable the HSN code #	Unit	Qty	EX-WORKS PRICE		Mode of Transaction Direct/ Bought Out	Taxes & Duties		
						Unit Price (INR)	Total Price (INR)		GST		
									Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount (INR)
1	2	3	4	5		8	9	10	11	12	13
Part-II	**Mandatory Spares**										
1	High Temperature Low Sag (HTLS) Conductor (as per specification)	76042920	18%	KM	10				18%		
2	**Hardware fittings suitable for HTLS conductor with clamps**										
a)	Double I Suspension Hardware fittings	73082011	18%	Set	2				18%		
b)	Single I suspension hard ware fittings	73082011	18%	Set	26				18%		
c)	Single "I" Suspension Pilot Hardware fittings	73082011	18%	Set	8				18%		
d)	Single Tension Hardware fittings	73082011	18%	Set	28				18%		
e)	Double Tension Hardware fittings	73082011	18%	Set	2				18%		
f)	Single I suspension hard ware fittings for twin HTLS	73082011	18%	Set	3				18%		
g)	Single Tension Hardware fittings for twin HTLS	73082011	18%	Set	5				18%		
h)	Double Tension Hardware fittings for twin HTLS	73082011	18%	Set	2				18%		
3	Vibration Damper	73082011	18%	No.	74				18%		
4	**Composite Polymer Insulator String**										
a)	90 kN	85469090	18%	Nos.	6				18%		
b)	160 KN	85469090	18%	Nos.	12				18%		
5	Mid Span Compression Joint	73082011	18%	Nos.	40				18%		
6	Repair Sleave	73082011	18%	Nos.	20				18%		
7	Dies set for Dead end clamp	73082011	18%	Nos.	1				18%		
8	Dies Set Jumper cone	73082011	18%	Nos.	1				18%		
9	Dies set Mid Span Joint	73082011	18%	Nos.	1				18%		
10	Dies Set Repair Sleave	73082011	18%	Nos.	1				18%		
	TOTAL of Part II										
	TOTAL i.e. [I+II]										

Note : **Bidder is required to quote prices in this Schedule for all the individual items/sub-items.**
HSN Code shall be filled by Bidder
In case any additional equipment is required, the same shalll be supplied without any additional payment and the offer should be complete and comprehensive.
Date :
Place :

Signature : _____
Designation _____
Common Seal

Tender No. T25R220472 **Price Schedule -2**

Package-IV : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis..

(Schedule of Rates and Prices)

Bidder's Name and Address :

To,
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Local Transportation, Insurance and other Incidental Services.

				Transport Services							Insurance and other Incidental Services						
								Taxes & Duties							Taxes & Duties		
								GST							GST		
S.No.	Item Description	Unit	Qty	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount
1	2	3	4	5	6	7	8= (4X7)	9	10	11= 8*(9 or 10)	12	13	14	15 = (4X14)	16	17	18= 15*(16 or 17)
Part-I	**Main Material and Equipments**																
1	**Supply of Line Materials**																
1.0	High Temperature Low Sag (HTLS) Conductor (as per specification)	KM	211	996519				18%			997136				18%		
2.0	**Hardware fittings suitable for HTLS conductor with clamps**																
a)	Double I Suspension Hardware fittings	Set	36	996519				18%			997136				18%		
b)	Single I suspension hard ware fittings	Set	528	996519				18%			997136				18%		
c)	Single "I" Suspension Pilot Hardware fittings	Set	164	996519				18%			997136				18%		
d)	Single Tension Hardware fittings	Set	570	996519				18%			997136				18%		
e)	Double Tension Hardware fittings	Set	42	996519				18%			997136				18%		
f)	Single I suspension hard ware fittings for twin HTLS	Set	60	996519				18%			997136				18%		
g)	Single Tension Hardware fittings for twin HTLS	Set	96	996519				18%			997136				18%		
h)	Double Tension Hardware fittings for twin HTLS	Set	48	996519				18%			997136				18%		
3.0	Vibration Damper	No.	1488	996519				18%			997136				18%		
4.0	**Composite Polymer Insulator String**																
a)	90 kN	Nos.	114	996519				18%			997136				18%		
b)	160 KN	Nos.	252	996519				18%			997136				18%		
5.0	Material required for earthing of equipments/Structure	LS	1	996519				18%			997136				18%		
6.0	**Supply of sub station equipments**																
(a)	220kV outdoor type single phase CT of ratio 1600-800/1-1-1-1-1A with 150% extended current rating along with terminal connector etc.	No.	30	996519				18%			997136				18%		
(b)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator with earth switch with terminal connectors etc.	No.	4	996519				18%			997136				18%		
(c)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator without earth switch with terminal connectors etc.	No.	6	996519				18%			997136				18%		
(d)	245kV, 2500A SF6 Circuit Breaker (3PH) along with Mechanism, supporting structure, marshalling box and terminal connector etc.	No.	4	996519				18%			997136				18%		
(e)	220kV, 1600 A 3 pole MOM, Tandem Isolator without earth switch with terminal connectors etc.	Nos.	4	996519													
7.0	Busbar Spacers for Twin HTLS	Lot	1	996519				18%			997136				18%		
8.0	T-clamp with jumper cone set for complete jumpering work	Lot	1	996519				18%			997136				18%		
9	Petty items clamps/ connectors required for completion of work.	LS	1	996519				18%			997136				18%		
	TOTAL of Part I																

Tender No. T25R220472 **Price Schedule -2**

Package-IV : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis..

(Schedule of Rates and Prices)

Bidder's Name and Address :

To,
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Local Transportation, Insurance and other Incidental Services.

S.No.	Item Description	Unit	Qty	Transport Services							Insurance and other Incidental Services						
				SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Taxes & Duties GST Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Taxes & Duties GST Amount	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit Charges (INR)	Total Charges (INR)	Taxes & Duties GST Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Taxes & Duties GST Amount
1	2	3	4	5	6	7	8= (4X7)	9	10	11= 8*(9 or 10)	12	13	14	15 = (4X14)	16	17	18= 15*(16 or 17)
Part-II	**Mandatory Spares**																
1	High Temperature Low Sag (HTLS) Conductor (as per specification)	KM	10	996519				18%			997136				18%		
2	**Hardware fittings suitable for HTLS conductor with clamps**																
a)	Double I Suspension Hardware fittings	Set	2	996519				18%			997136				18%		
b)	Single I suspension hard ware fittings	Set	26	996519				18%			997136				18%		
c)	Single "I" Suspension Pilot Hardware fittings	Set	8	996519				18%			997136				18%		
d)	Single Tension Hardware fittings	Set	28	996519				18%			997136				18%		
e)	Double Tension Hardware fittings	Set	2	996519				18%			997136				18%		
f)	Single I suspension hard ware fittings for twin HTLS	Set	3	996519				18%			997136				18%		
g)	Single Tension Hardware fittings for twin HTLS	Set	5	996519				18%			997136				18%		
h)	Double Tension Hardware fittings for twin HTLS	Set	2	996519				18%			997136				18%		
3	Vibration Damper	No.	74	996519				18%			997136				18%		
4	**Composite Polymer Insulator String**																
a)	90 kN	Nos.	6	996519				18%			997136				18%		
b)	160 KN	Nos.	12	996519				18%			997136				18%		
5	Mid Span Compression Joint	Nos.	40	996519				18%			997136				18%		
6	Repair Sleave	Nos.	20	996519				18%			997136				18%		
7	Dies set for Dead end clamp	Nos.	1	996519				18%			997136				18%		
8	Dies Set Jumper cone	Nos.	1	996519				18%			997136				18%		
9	Dies set Mid Span Joint	Nos.	1	996519				18%			997136				18%		
10	Dies Set Repair Sleave	Nos.	1	996519				18%			997136				18%		
	TOTAL of Part II																
	TOTAL i.e. [I+II]																

Note : **Bidder is required to quote prices in this Schedule for all the individual items/sub-items.**
SAC Code shall be filled by Bidder
In case any additional equipment is required, the same shalll be supplied without any additional payment and the offer should be complete and comprehensive.

Date
Place :

Signature : _____
Printed Name _____
Designation _____
Common Seal _____

Tender No. T25R220472 **Price Schedule- 3**

Package-IV : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis..

(Schedule of Rates and Prices)

Bidder's Name and Address :

To
Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi-110002

Installation Charges

S.No.	Item Description	SAC Code	Whether SAC code is confirmed. If not, indicate applicable SAC code	Unit	Qty	Unit Charges (INR)	Total Charges (INR)	Taxes & Duties		
								GST		
								Rate	Whether rate of GST is confirmed.if not, indicate applicable rate of GST #	Amount
1	2	3	4	5	6	7	8	9	10	11
1	Installation of necessary hardware,hoisting of insulator strings, installation and stringing of HTLS conductor including fixing of conductor accessories to complete the job	995461		KM	211			18%		
2	Material required for earthing of equipments/Structure	995461		LS	1			18%		
3	**ETC of sub station equipments**									
a)	220kV outdoor type single phase CT of ratio 1600-800/1-1-1-1-1A with 150% extended current rating along with terminal connector etc.	995461		Nos.	30			18%		
b)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator with earth switch with terminal connectors etc.	995461		Nos.	4			18%		
c)	220kV, 1600 A 3 pole MOM, Horizonal Centre Break Isolator without earth switch with terminal connectors etc.	995461		Nos.	6			18%		
d)	245kV, 2500A SF6 Circuit Breaker (3PH) along with Mechanism, supporting structure, marshalling box and terminal connector etc.	995461		Nos.	4			18%		
e)	220kV, 1600 A 3 pole MOM, Tandem Isolator without earth switch with terminal connectors etc.	995461		Nos.	4			18%		
4	Petty items clamps/ connectors required for completion of work.	995461		LS	1			18%		
5	Dismantling of six ACSR Zebra conductor including disc insulators, hardware fittings and other accessories etc. and transportation from site to DTL store or other site store alongwith proper stacking etc.	995461		LS	1			18%		
6	Dismantling of existing ACSR zebra conductor 220 kV Busbars with insulators , fittings and other accessories and transportation of same to DTL store /site with proper stacking of material	995461		LS	1			18%		
7	Dismantling of 220 kV equipments alongwith associated accessories and transportation of same to DTL store /site									
a)	220 kV CT	995461		Nos.	30			18%		
b)	220 kV Isolator with Earth Switch	995461		Nos.	4			18%		
c)	220 kV Isolator without Earth Switch	995461		Nos.	10			18%		
d)	220 kV Circuit Breaker	995461		Nos.	4			18%		
	Total:									

Note :
Bidder is required to quote prices in this Schedule for all the individual items/sub-items.
SAC Code shall be filled/confirmed by Bidder
In case any additional equipment is required, the same shalll be supplied without any additional payment and the offer should be complete and comprehensive.

Date
Place :

Signature : _____
Printed Name _____
Designation _____
Common Seal _____

Tender No. T25R220472	Price Schedule-4

Package-IV : Design, Supply, Erection, Testing & Commissioning for HTLS Re-Conductoring of DSIIDC Bawana- Narela-Mandola 220 kV D/C ACSR Zebra Transmission Lines along with replacement of associated equipments and Busbars at interconnecting substations of DTL (Delhi) on turnkey basis..

Bidder's Name and Address :	

I. GRAND SUMMARY OF THE QUOTED BID PRICE.

S.No	DESCRIPTION	Total Price (INR)	
		PRICE	GST
1	**TOTAL PRICE SCHEDULE-1** Plant and Equipment (including Mandatory Spares) to be supplied.		
2	**TOTAL PRICE SCHEDULE-2** Local Transportation, Insurance and other Incidental Services.		
3	**TOTAL PRICE SCHEDULE-3** Installation Charges		
	GRAND TOTAL 'A ' = [1 + 2 + 3]		

II. We declare that the following are our quoted bid price in INR for the entire Scope of work as specified in the

A. Quoted Bid Price Excluding taxes & duties (Grand Summary of the quoted Bid Price as in I above.):

i. In Figures:INR	
ii. In Words: INR:	

B. Applicable Taxes & Duties and other levies, payable additionally, in respect of the transaction between the Owner and the Contractor (Total Amount to be mentioned).

i. GST (Total Amount to be mentioned)	
ii. **Total taxes & duties(i) :**	

C. Total Quoted Bid Price including Taxes and Duties and other levies, if contract is awarded to us i.e A+B above

i. In Figures:INR	
ii. In Words: INR:	

Date :
Place :

Signature : _____
Printed Name _____
Designation _____
Common Seal _____